Scientific Advice Mechanism

to the European Commission



November 2024

Interaction of academies on science advice

A report on six workshops

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About this report

SAPEA brings together outstanding interdisciplinary expertise from across Europe to provide independent, high-quality reviews of the evidence thanks to the active participation of academies across Europe. SAPEA aims to strengthen the links among European science academies, ensure active participation of all academies, foster exchange on issues of common interest and share best practices on science for policy.

This report summarises the inputs from academies gathered during a series of workshops organised by SAPEA. These inputs included successful examples from academies experience in science advice, exchanges and discussions on how to address common challenges, and the possible role for SAPEA in supporting interactions between academies.

Background

SAPEA (Science Advice for Policy by European academies) is an integral part of the Scientific Advice Mechanism to the European Commission, which provides independent, interdisciplinary, and evidence-based scientific advice on policy issues to the European Commission. SAPEA is a consortium of academy networks, funded by Horizon Europe, representing a large number of academies from different countries. Through these networks, SAPEA brings together outstanding expertise from natural sciences, engineering and technology, medical, health, agricultural, social sciences, and the humanities.

SAPEA aims to strengthen the links among European academies. In 2017, SAPEA organised two workshops entitled <u>Best practices of interaction between academies and with policymakers</u> in Madrid and Bucharest. The interdisciplinary workshops brought together 80 participants from 25 countries and 52 national academies, each with different backgrounds in humanities, medicine, natural sciences and technology. A wide range of academies presented case studies and strategies to address common challenges in science advice for policy. Discussions at the 2017 workshops showed that there is keen interest from academies to cooperate on topics of mutual interest, such as the role of academies in providing independent scientific advice, the need for inclusion of early career researchers in academy activities, coping with limited financial resources, and overall inter-academy cooperation and interdisciplinarity.

Building on these experiences, SAPEA organised a series of six workshops between September 2023 and October 2024. The format of these workshops varied, with some being held online and others in person. These events provided a unique platform for academies working in different disciplines and from across Europe to exchange and share experiences and good practices on science for policy and science advice, to share common challenges on different aspects of science advice and to discuss solutions together, thus complementing activities of the networks of academies.

Common themes

Throughout this series of six workshops, academies shared their experiences, challenges and good practice on a range of topics relating to their role in providing science advice and engaging with a range of stakeholders, including public audiences. Several common themes emerged from the discussions:

- **Collaboration is key for science advice**, including multidisciplinary and cross sectoral collaboration. Academies are well positioned to bring together different groups to address multidisciplinary challenges, and to engage with different groups, including public audiences, in a meaningful way.
- To support these collaborations and provide high quality and effective science advice, **neutral** platforms for discussion and transparency are needed. These can help foster trust between
 stakeholders and in the provided advice.
- Early- and mid-career researchers are underrepresented in science policy but have valuable contributions to make to science advice and in fostering collaborations. There remain hurdles to their involvement in science advice and SAPEA, including around awareness of opportunities and support to participate in science advice activities.

Quality and methods of science advice

Introduction to the theme

To ensure that advice from the SAM is based on the most up-to-date scientific and technical knowledge publicly available, SAPEA follows clear and transparent guidelines. In the process of updating these guidelines, the SAM has engaged in discussions about quality and methods of science advice such as how to define evidence, what research excellence is today, and the key role of knowledge brokers.

<u>A webinar hosted by SAPEA on 21 September 2023</u> brought together experts in science advice to discuss the key factors to high-quality science advice and how to achieve them. The webinar had 4 expert speakers from academies and the SAM, and over 70 participants from academies and relevant stakeholders for an engaging reflection on the topic.



Examples of good practices

acatech: Transparency of interests for the inclusion of all voices

The National Academy of Science and Engineering of Germany (acatech) has a mandate from the German Federal Government and the Länder to contribute expert knowledge to the policymaking process. To achieve this, acatech relies heavily on cooperation among experts from academia and industry to collaborate on the development of proposed solutions in joint project groups. Acatech governance is shared between representatives from academic research and industry at the presidency, board and membership levels. In its science advice process, acatech proceeds with an analysis of the question, followed by a networking activity bringing in relevant experts and evidence from academia, industry and sometimes policy.

In this context of permanent collaborations between academic research and industry, it is crucial to define excellence for the provided advice, especially with regards to potential biases and conflicts of interests. Acatech president Jan Wörner, who also chaired the working group responsible for the update of SAPEA quality assurance guidelines, highlighted that interests and conflicts of interests can exist at different levels (personal, institutional, commercial) and through different goals (money, power, reputation, and so on). Additionally, he stated that conflicts of interests are usually associated with the private sector, but many more stakeholders display strong interests that could influence science advice, such as individual interests, universities and research institutions, political parties, or government bodies such as ministries. Quality of advice includes handling interests, which does not necessarily mean avoiding conflicts of interests but rather ensuring transparency and clear communication.

Young Academy of Europe: Redefining research excellence and research career assessment

In the current research climate, increasing importance is placed on applied sciences (compared to fundamental research), and research is increasingly interdisciplinary, involving larger teams and accompanied by additional time pressure. Academic researchers in universities also have many non-research duties, such as teaching, management, and outreach. In the traditional system of evaluation, only research publications and research outputs tended to be used as a measure of success. This has greatly impacted researchers and created a high-pressure working climate.

The Young Academy of Europe took part in an initiative led by the European University Association and Science Europe to write an agreement on reforming research assessment. This led to the Coalition for Advancing Research Assessment (CoARA), which now counts over 600 signatories within and beyond Europe. Working groups and national chapters have now been established to investigate the different aspects of the question of research assessment across fields of research. These aspects include, for example, how to advance academic career assessment, how to involve more early- and mid-career researchers, and how to improve research proposal assessment. Some crucial questions remain to be answered, such as defining which problems need solving, the debated use of metrics to assess excellence, and managing and solving the current misconceptions and biases which exist in the assessment of research careers.

European Information Hub at Cardiff University: gathering high-quality evidence

Evidence is the available body of information indicating whether an opinion or proposition is true or valid. There are different types of evidence and sources, which are broadly divided into formal evidence to informal sources, determined by how the evidence is gathered. Research evidence is formal, produced through rigorous methods of collection and reporting, and understanding its production process fosters trust. Policymakers can access both types of evidence, but the research community plays a crucial role in ensuring they have access to relevant formal evidence to support policymaking. Good evidence stems from good research, though different fields may have varying measures of quality. Essential components of good evidence include accessibility to the relevant audience, research design that appropriately addresses the question, transparency and adequacy in methods and reporting, and a link between ethical practice and research quality.

Information specialists, trained to collate and synthesise information efficiently and transparently, work alongside academics to provide a comprehensive picture of existing evidence, forming part of the support system for academic work, including science advice. In this work, context is vital, especially since policymakers often work under tight schedules. Collating and synthesising information in various formats is important, with peer-reviewed literature being the most trusted source. However, other sources like grey literature can be valuable, sometimes offering access to data not available through traditional channels and providing a more current picture. Recognising biases and developing principles to evaluate sources ensures that evidence meets the needs of the final user.

Group of Chief Scientific Advisors: Being a good science advisor

One key aspect supporting the quality of science advice provided by the SAM is independence. SAPEA, the Group of Chief Scientific Advisors and the Commission act independently in the preparation and delivery of advice, while keeping communications channels open and active. Much effort has been put into developing processes to ensure that the SAM's advice is high quality, in particular through systematic literature reviews and involving experts who can assess the quality and relevance of the literature.

Members of the Group of Chief Scientific Advisors are selected by an independent identification committee set up by the Commission. They are nominated by academies and other entities on the basis of scientific excellence and their experience in policy or science communication. They provide recommendations for the Commission to support policy development based on the gathered evidence. Advisors often receive evidence on topics in which they have little knowledge and formulate the recommendations. Part of the skillset of a good advisor is to learn how to communicate with experts in the field, and at the same time to communicate clearly to policymakers. Understanding what we know, what we do not know and what we can never know – and communicating these in the context of uncertainty are also important.

Political considerations, particularly in times of crisis, mean decisions often need to be made quickly but science is not quick. It is important to balance the time needed to produce good evidence and the need to provide quick answers for policymaking, particularly in times of crisis is important. The SAM is not necessarily the best avenue for giving quick advice, where the uncertainty is high. However, the SAM is well placed to look at complex, systemic issues that affect society as a whole, taking more time to gather evidence and thus reduce uncertainty.

Summary of discussions

High-quality science advice relies on stringent quality assurance processes, such as those developed by SAPEA, the GCSA, or acatech, which emphasise transparency, diversity, and excellence. It is important to consider guidelines and processes as living documents that need regular review as the institutions gain experience and as the science policy environment evolves. These principles are mutually reinforcing and require the consideration of scientific evidence from all stakeholders, expertise can be drawn from outside traditional academic circles. Industrial expertise, for instance, significantly enhances the quality of science advice, as both industry and fundamental science are critical. Expanding networks and engaging with diverse perspectives foster innovation within scientific communities, highlighting the importance of broad collaboration.

The academic research landscape is undergoing changes, particularly in the way quality of research and academic achievements are assessed. For instance, narrative-style CVs and alternative metrics for assessing researchers' excellence reflect a shift towards valuing diverse achievements. Notwithstanding these innovations, peer review remains a crucial quality checkpoint for research and scientific evidence. Universities can also play a role in better preparing researchers for science advice and outreach through adapted curriculums. Training academic leaders, and recognising that not everyone is suited for leadership roles, are essential steps for systemic reform.

The inclusion of various types of literature in the evidence base, separate from peer-reviewed sources, has increased, aided by technological tools that provide access to a broader range of publications. Legislative acts, for instance, provide valuable context even without data. Al tools can help collate and synthesise evidence but should complement, not replace, human critical thinking. Al translation tools can also help access multilingual research, which can in turn improve the diversity of evidence. However, critical thinking and methodical assessment by the users are key.

Scientific advisors act as boundary organisations, benefiting from not being topic experts to communicate effectively with policymakers and the public. This impartiality helps avoid biased opinions. Policymakers listen to diverse information sources, including society, and advice is more powerful when echoed by civil society. Scientific training, which encompasses not only research skills but also the ability to tackle complex challenges is part of the journey to becoming a good science advisor. Recent research efforts also highlight key skills and competencies needed by researchers and policy makers for quality science advice. Academies and young academies serve as gateways for experts to proactively share their expertise and inform policy.

Main takeaways

- High-quality science advice relies on the independence of advisory bodies like SAPEA, the Group of Chief Scientific Advisors, and the European Commission. These entities operate independently while maintaining active communication channels, ensuring unbiased and reliable advice.
- Transparency in the disclosure of interests is crucial to include all voices and manage potential biases and conflicts of interest, whether personal, institutional, or commercial.
- Quality guidelines and processes are considered living documents, requiring regular review and updates as advisors gain experience and the science policy environment evolves.
- The reliance on systematic literature reviews, considering different types of literature, and the involvement of field experts are fundamental to the quality assurance processes.
- Including diverse perspectives from academia, industry, and other stakeholders fosters innovation and enhances the quality of science advice. This collaboration broadens the evidence base and ensures a more comprehensive understanding of complex issues.
- There is a shift towards valuing diverse career achievements in the assessment of experts, including their involvement in science policy/science advice initiatives. In additional, universities could better prepare researchers for science advice and outreach.

- Technological tools, including AI, can aid in collating and synthesising evidence or provide access to multilingual evidence, but maintaining critical thinking and methodical assessment of AI-generated content is essential for ensuring the reliability of the evidence.
- Scientific advisors act as boundary organisations, effectively communicating complex scientific information to policymakers and the public. Their impartiality helps avoid biased opinions and enhances the credibility of the advice.

Cooperation among academies for science advice

Introduction to the theme

Cooperation on science advice offers a broad range of opportunities for academies across Europe. This cooperation can take many forms, from individual bilateral projects and partnerships to longterm, large-scale international networks.

In establishing and sustaining these connections, academies face a number of challenges. How can they make the most of these partnerships to navigate complex policy ecosystems? What good practices can be identified in tackling obstacles such as lack of time and resources? And what is needed to ensure that these connections are durable?

To open up dialogue around these challenges, ALLEA led an in-person morning workshop on behalf of SAPEA on 23 May 2024 at the offices of the Berlin-Brandenburg Academy of Sciences and Humanities, on the topic 'Cooperation between academies in scientific advice'. The workshop brought together 90 academy representatives from 26 countries, all involved in the management and development of their organisation.

The workshop was participatory, with plenty of opportunities for reflection, exchange and consensus. Speed discussions were used to explore good practices from across the academies, especially examples of ways in which academies cooperate with a focus on science advice. Highlights of these conversations were shared in plenary, before participants brainstormed and discussed the key benefits of these partnerships and networks. This was followed by group discussions of the main challenges they face in establishing and sustaining cooperation. Finally, participants agreed on recommendations to help address these challenges.



Credit: Stephany Mazon

Examples of good practices

Estonian Academy of Sciences

The Estonian Academy of Sciences has developed a diversity of collaborations and cooperations to inform policy, at national, regional and global levels.

At a national level, the Estonian Academy of Sciences collaborates closely with the Estonian Young Academy of Sciences. Together, they are regularly invited by the government to provide comments on draft laws and regulations. The academy also has a seat on the board of the Foresight Centre in the Parliament of Estonia.

At a regional level, the academies of three Baltic States (Estonia, Latvia and Lithuania) have been collaborating since the 1930s,¹ and this collaboration now also includes two Finnish academies as well as the Hamburg Academy of Science and Humanities (Germany). This collaboration primarily operates through a biennial Conference on Intellectual Cooperation, which rotates among the participating

¹ <u>https://www.akadeemia.ee/en/cooperation/baltic-conference-on-intellectual-co-operation/</u>

countries. However, in between, interactions between the academies' presidents are frequent. A key aspect of this collaboration is the long-standing tradition of the Baltic Academies of Science medals.² The topics for the conference are proposed by the host academy. The usual outcome of the conference is a joint declaration on a pressing issue on behalf of all partners, which often includes policy recommendations and is widely shared with both the public and policymakers. The theme for the 18th conference in 2023, held in Riga, Latvia, was 'Energy for the future society'. In 2021, the 17th conference in Tallinn, Estonia, focused on 'Mathematics for society', with an emphasis on COVID-related issues, while the 19th conference in Helsinki in 2025 will focus on migration.

These conferences tend to generate interest in the host countries: for example, in Estonia the key messages of these conferences are actively communicated to the public and are usually closely reviewed by policymakers.

At a global level, the Estonian Academy of Sciences also collaborates with other academies through networks such as the International Science Council (ISC) or the European Science Advisors' Forum. For example, the ISC European members (including many academies) have agreed on two foci of their efforts relevant to science advice:

- to be actively engaged in the shaping of science advice systems in their countries, and to inspire sister academies to do so
- to consider options for science diplomacy using contacts with sister academies

Catalan academies and joint science advice for parliament

The Consell Assessor del Parlament sobre Ciència i Tecnologia (CAPCIT) is an advisory body of the Parliament of Catalonia, established in 2008, which provides scientific and technological advice. Its purpose is to improve the Parliament's understanding of these fields and assist in shaping public policies related to science and technology. CAPCIT is a mixed body made up of both members of parliament and representatives from leading scientific institutions in Catalonia. The Institute of Catalan Studies and the Royal Academy of Sciences and Arts of Barcelona are actively involved in CAPCIT by contributing experts and knowledge to the discussions and reports commissioned by the body.

Global Young Academy Science Advice Masterclass: a global transdisciplinary approach

As part of the 2024 Global Young Academy (GYA) annual general meeting and conference in Washington DC, USA, in May 2024, the GYA <u>working group on science advice</u> organised a hybrid workshop session, 'GYA science advice masterclass: a global transdisciplinary approach'. Partners for

² https://www.lza.lv/en/activities/news/1501-the-baltic-science-academies-medal-2023

this training workshop included speakers from the International Science Council, the African chapter of the International Network for Government Science Advice, and the Geneva Science and Diplomacy Anticipator. Workshop participants came from the GYA membership, as well as alumni and office staff. Additionally, members of the US Young Academy, the US New Voices, as well as participants from partner organisations were invited.

The aim was to build the capacity of EMCRs in science advice and diplomacy in a transdisciplinary setting and with a global focus, supported by peers and experts in science for policy and diplomacy who shared their expert insights on how to get involved in science advice. The participants were introduced to science advice concepts and related challenges, which was complemented by real-world exercises to be address through a 'systems thinking' approach. A particular focus has been on the role that EMCRs play in science advice, the incentives for their involvement, and capacity-building opportunities for engagement at the interface of science, policy, and diplomacy.

This masterclass provided a basis for the development of a training programme on science advice for GYA members and other EMCRs considering a global transdisciplinary perspective in the future.³

The Celtic Academies Alliance

In 2021, the Royal Irish Academy, the Royal Society of Edinburgh and the Learned Society of Wales formed an alliance with the objectives of promoting and encouraging co-operation, collaboration and shared learning across the three academic and research systems. Their specific aims⁴ are to:

- jointly provide independent expert advice on higher education and research matters and on other shared key issues
- jointly support the evolution of more effective intra-UK and UK-Ireland governance, especially in the post-Brexit context
- jointly work to ensure that the UK Government and its bodies take proper account of the needs and differing situations of the devolved nations, supporting communication and collaboration between the different levels of government

The members of the Celtic Academies Alliance also collaborate regularly and informally with other academies of science in the UK, in a network informally called 'the seven'. Representatives of these academies meet regularly to align and strategise on activities of common interest, avoid duplication in activities, and exchange experiences and practices on any topic, from internal ways of working to

³ More information: <u>https://globalyoungacademy.net/activities/science-advice/</u>

⁴ See for example <u>https://www.ria.ie/work/public-policy-and-international/ireland-uk-relations-2/celtic-academies-alliance/</u>.

external-facing events. In the provision of science advice, this also allows the advice to have more weight and coherence.

acatech: energy systems of the future

With the initiative 'Energy systems of the future', acatech (Germany's national academy of science and engineering), the German National Academy of Sciences Leopoldina, and the Union of the German Academies of Sciences and Humanities provide impulses for the debate on the challenges and opportunities of the German energy transition. This project assembles more than 160 experts from academia and industrial research to develop policy options for the implementation of a secure, affordable and sustainable energy supply. It was launched in April 2013 and will be funded by the Federal Ministry of Education and Research until December 2024. After the current funding period, the project is planned to be renewed under a revised funding system starting in January 2025. For this project, acatech is the lead institution.

The Board of Trustees, representing the academies, bears the overall responsibility for the joint project. The Board of Directors, which is appointed by the Board of Trustees, oversees the strategic direction and outcomes of the project and represents it externally. The project office supports the Board of Directors and project members in their work.



Topics are proposed by the project members, the Board of Trustees, and external project partners. These proposals are assessed by the project office and the Board of Directors and are ranked based on different criteria such as topicality, the preliminary work and existing research gaps. The Board of Directors makes the final decision on the topic and then establishes a working group or a workshop.

The results are intended to make scientific knowledge accessible for the political discussion on energy policy issues. The target group are decision-makers from politics, academia, the industry, civil society organisations as well as the interested public. The main findings of a working group are summarised

in a position paper. Other publication formats are more focused on the specialised public (analyses, supplementary material) or non-professional readers ('In A Nutshell') or give shorter impulses for current political debates (discussion papers). Results are also conveyed in different dialogue formats, from public conferences to confidential discussions with relevant stakeholders.

The project aims to address critical issues in the energy system and offer scientifically-validated solutions for policymakers. Impact is most evident when findings are cited in governmental reports or disseminated within scientific committees and projects. One example is the proposal of a capacity market mechanism to ensure the security of supply by compensating generators for backup generation capacity. This concept, initially discussed in one of the project's position papers (Creating investment incentives, providing reserve capacity: Options for the market integration of renewable energy), sparked further debate among various committees and projects. Consequently, the German government plans to implement a capacity market mechanism in 2028. Other important results include work on sector coupling (published in 2017), on carbon pricing as the key instrument of energy and climate policy (2019), and on the consequences of the Russian attack on Ukraine on the German and European energy sector (2022).

Summary of discussions

The first discussion session on cooperation between academies for science advice focused on the benefits of cooperation. Four core benefits stood out:

- **Expertise and knowledge sharing.** By pooling diverse expertise and knowledge, academies can provide more comprehensive and well-rounded policy advice. This collaborative approach allows for the integration of different scientific perspectives, which can lead to more innovative and effective solutions to complex problems.
- **Credibility.** Participants felt cooperation among academies can enhance the influence of their policy recommendations. When multiple reputable institutions endorse a policy suggestion, it is more likely to be taken seriously by policymakers and stakeholders.
- **Resource optimisation.** Academies can share data, research facilities, and funding opportunities, thereby reducing duplication of efforts and enabling more efficient use of available resources, leading to cost savings and more impactful outcomes.
- **Harmonised policy advice** that is consistent across Europe. This is particularly important for addressing transnational issues that require coordinated action, such as climate change, public health, and technological regulation. By working together, academies can ensure more consistent policy advice, towards unified strategies at the European level.

In the next stage of the workshop, participants discussed the challenges of cooperation. Using a consensus format, they identified a number of key challenges to be taken further in the conversation.

- Several of the challenges related to **structure**. The flow of knowledge across academies is not necessarily easy to organise. And how can structural differences be tackled, given that national academies vary in their function and audiences? One challenge set the ambition of creating large European infrastructure.
- A second key focus of the challenges was the **lack of time** that academies are faced with. How can academies plan cooperation realistically knowing that other priorities may take precedence?
- **Capacity building** was a further common theme among the challenges, with several participants noting lack of training and the need to make better use of researchers as a human resource.
- **Competing interests** were identified as another core challenge. While academies build partnerships, they still compete to some extent and their positions are not always necessarily compatible. How can they ensure this does not detract from their partnerships?

Main takeaways

Participants discussed recommendations for each of the challenges, and each group evaluated the outcomes of one other group to determine the highest priority recommendations within each set. Some of the highest-voted recommendations are summarised below:

- Universities must embed science advice as a core mission. When discussing the challenges of time management, participants felt that the reason lack of time was an issue was due to the lack of priority given to supporting policy. Science advice is expert work and should be recognised as such. Only with a high level of prioritisation and buy-in can academies gain the resources and dedicated funding needed to build the structures that can ensure these partnerships are able to act in a realistic timeframe.
- **Cooperation should clarify objectives and audiences early on.** To overcome challenges related to structural differences from one academy to the next, participants felt it is important to manage expectations. Aligning clearly on the goals, timeframe, structure and target audiences from the outset can help partnerships run more smoothly and better navigate potential conflicting interests.
- Science advice cooperation needs incentives. With the challenge of insufficient training, one major barrier is the lack of incentives for researchers to get involved in partnerships for policy advice. EMCRs in particular should be better incentivised to cooperate on science

advice. Academies should reflect on how this incentivisation could be structured within their institutions.

- Professionals at academies should make opportunities to get to know each other. In conversations around several of the challenges, participants emphasised the importance of personal connections. By developing good working relationships among contact points that can work together in a respectful and constructive way, academies are better equipped to address issues of structural differences and competing interests. Several participants noted that opportunities like the workshop itself were helpful in getting to know each other and sparking potential cooperation.
- Young academies can play a key role in supporting networks of academies. When addressing the challenges related to the structure of networks and how communication flows, participants highlighted the need for visual communication and narratives, and the value that a diverse set of profiles can bring to a network. They underlined the role of Young academies in helping to ensure these assets.

Cooperation with stakeholders in the context of science advice

Introduction to the theme

Academies promote excellence and scientific progress for society. Collaboration with stakeholders is fundamental to translate scientific findings into action. Many academies act as conveners, bringing together researchers and other sectors to discuss key issues, supported by partnerships with relevant stakeholders in civil society or industry.

SAPEA <u>hosted a webinar on 18 April 2024</u> to explore how academies build collaborations and strategic partnerships with a variety of stakeholders to provide scientific advice on complex challenges, using concrete examples from SAPEA academies. The webinar gathered four expert speakers and over 80 participants from academies and other relevant stakeholders for science advice for an engaged discussion around the topic.



From left to right and top to bottom, George Griffin (moderator), Norbert Babcsan (Hungarian Academy of Engineering), Rachel Quinn (Academy of Medical Sciences UK, Jovana Milic (University of Fribourg), Patrick Maestro (SAPEA Board member), and Morten Stage (Total Energies Denmark).

Examples of good practices

Swiss Young Network for Science Policy and Diplomacy

Founded in 2022, Swiss Young Network for Science Policy and Diplomacy (SYNESPOD) is part of the Swiss Young Academy, a division of the Swiss Academies of Arts and Sciences. SYNESPOD brings together perspectives of early career researchers from the natural sciences, social sciences and engineering and is motivated by ongoing societal challenges that affect us beyond national borders – the climate emergency, biodiversity loss, health, and geopolitical crisis. The objective is to provide a network and a platform for science for policy and diplomacy through national and international partnerships with institutions to increase the capacity, impact and visibility of early career researchers within Switzerland and beyond. This ambition has been realised through two activities:

- Science for policy. The focus has been on a capacity building by developing trainings and workshops with partners including international academies and Swiss institutions, Reatch, Geneva Science Policy Interface, and the Swiss academy of Sciences.
- 2. **Science for diplomacy.** This includes partnerships with GYA, ENYA, and international corporations through cooperations with other young academies.

SYNESPOD also collaborates with other young academies such as YASAS, SAPEA, New Voices and Young Academy Finland.

The Danish Academy of Technical Sciences' Carbon 110% Mission Lab

Academies play an important role in bringing industry and academia together to collaborate with an emphasis on the multidisciplinary efforts needed to solve problems that modern society is currently facing. There is an opportunity for regulatory bodies and the social sciences to participate, and a close dialogue with the social sciences is crucial in successfully achieving public acceptance.

The Danish government set a target to reduce CO2 emissions by 110% by 2050. Academia, regulatory bodies and industry are committed to this goal, and the Danish Academy of Technical Sciences has run workshops to support this mission. The workshops bring together people from academia, industry, NGOs, and regulatory bodies for interdisciplinary discussion and collaboration. The workshops are held under Chatham House rules to encourage participants to speak openly and share concerns in an environment built on trust. The academy's role is to tell a multidisciplinary story and to point to areas where new research and technological developments are needed.

Academy of Medical Sciences Forum

The workshops bring together people from academia, industry, NGOs, and regulatory bodies for interdisciplinary discussion and collaboration. The workshops are held under Chatham House rules to encourage participants to speak openly and share concerns in an environment built on trust. The academy's role is to tell a multidisciplinary story and to point to areas where new research and technological developments are needed.

An example of a successful cross-sector collaboration is the development of the COVID-19 vaccine, which in the UK brought together the National Health Service, industry, regulators and academics.

In 2003, the academy's Forum was launched, providing a neutral and independent platform that aims to tackle significant health challenges through cross-sector collaboration. The academy also runs the 'Cross-sector Experience Awards', a funding scheme providing individuals with £100 000 to work in a new organisation in a different sector before returning to their original employer.

The Academy of Medical Sciences recognises that patients and carers bring a unique perspective about challenges, opportunities and priorities in life sciences and health. Their views are valuable for policymakers, giving an insight into what voters are thinking when developing an area of policy.

The Federation of European Academies of Medicine's Forum is based on the UK's Forum and has several patient group members. Their contribution is important as they often distil a very complex problem to a simple question.

The Hungarian Material Industry Technological Platform

The Hungarian Academy of Engineering was established in 1990, and its mission is to lead in the application of science and engineering principles to address Hungary's societal, environmental, economic and technical challenges. The Hungarian Materials Industry Technology Platform aims to establish a high-value-added materials industry and security in Hungary, with hope to collaborate with other European countries, and the rest of the world. With this platform, the academy seeks to enhance its role in the industrialisation processes in Hungary and supports the national industry strategy with knowledge-based representatives.

The platform is a section of the academy which is closely connected to the Hungarian Science academy through individuals. The academy of engineering is closely connected to the Hungarian Academy of Sciences and collaborates with international partners, Euro-CASE and CAETS. The academy's connection to SAPEA has enabled it to use different communication channels and languages.

Summary of discussions

Following presentations, the workshop opened for discussion with all participants on co-operation with stakeholders in the context of science advice. They discussed the importance of capacity building for early- and mid-career researchers at the interface of science and policy. All agree that SAPEA has been successful in involving YASAS in capacity-building for early-career researchers at the interface of science and policy, creating stronger relationships between scientist and policymakers, and strengthening the trust in science.

Participants agreed on the importance of having researchers that can link to other areas of expertise, the key role mentors play for researchers, and the role schoolteachers have in children's science education.

The panel recognised the important role academies play in contributing to a cross-discipline dialogue. Academies are important for developing a neutral communication platform where people can meet outside of their normal organisational structures to discuss current challenges and possible solutions. A main challenge for science is to engage with public audiences. Here, academies play a crucial role in providing an accessible platform.

Main takeaways

- Collaboration and communication and remembering the end goal, that we are doing this for our communities and for society.
- The importance of EMCRs and their capacity to build relationships.
- The importance of mainlining a dialogue, be it inter-disciplinary, cross-disciplinary, or crosssectoral – this work is of the utmost importance to ensure high quality research excellence.
- Academies act as a neutral platform where scientists, industry and regulators meet to discuss sensitive topics in an open and trusting environment.
- An academy's role is to tell a multidisciplinary story and to point to areas where new research and technological developments are needed.
- Academies play a crucial role in outreach and communication.

The involvement of early and mid-career researchers in science advice

SAPEA recognises that diversity is critical to ensuring sound, high-quality science advice. The more diverse the group, the more easily individual biases can be addressed, and a richer range of disciplines and perspectives can be covered. One important aspect of diversity is the career stage. Providing science advice has traditionally been the domain of senior researchers but SAPEA's Strategy of Diversity and Inclusiveness aims to ensure the voices of researchers at all stages of their career are represented.

YASAS, on behalf of SAPEA, led a workshop on May 23rd 2024 at the Berlin-Brandenburg academy of Sciences and Humanities entitled "**Achieving diversity, inclusiveness and the involvement of early-and mid-career researchers in scientific advice**" that brought together 90 academy representatives from 24 countries including 22 from Young academies across Europe to discuss questions around the involvement of EMCRs in SAPEA and science advice more broadly. For example, how can SAPEA better work with EMCRs to ensure they have the support they need to participate in science advice processes? What reflections do they have on the functioning of Europe's Scientific Advice Mechanism? What skills can they develop, and in what ways would they like their participation to be acknowledged?

At the end of the workshop, all workshop attendees reflected and shareed ideas around three key questions. This formed the basis for a fishbowl discussion to explore what could be done differently to facilitate the involvement of a diverse set of EMCRs.

SAPEA simulation game

Much of the workshop centred on a role-playing game, developed by YASAS, that mirrored the steps outlined in the SAPEA Quality Assurance Guidelines, including working group selection, evidence gathering, peer review, and report drafting. Through this simulation of SAPEA's process, participants were able to understand the steps involved in developing an evidence review report, their complexity and the necessary decision-making processes. The game aimed to raise discussion around several key challenges within the process.

Following a short presentation on how SAPEA implements each stage of its evidence gathering process in practice, participants were divided into small groups, each facilitated by a member of the SAPEA team.

First, participants were tasked with recruiting experts from across Europe to form the working group that would oversee the evidence review report. Here, groups were asked to consider factors such as ensuring that EMCRs were well represented while still accounting for a good range of relevant expertise across the working group, as well as exploring other criteria such as geographical representation and gender balance. Next, challenges associated with selecting evidence were discussed. Many factors can affect what evidence is selected (e.g. relevance of the subject, date of publication, scientific or grey literature, open access or not, etc.) – and participants had to deal with disagreements in the group, including those linked to the career stages of the researchers involved, to reach an agreement on which evidence to include. In the final drafting, finalising and handover stages, participants discussed the challenges related to pulling together a significant piece of work in a short space of time, as well as how to address various obstacles, such as integrating peer review comments and keeping up with the latest advances in EU policy.



Credit: Michael Creek.

Summary of discussions

Following the game, the groups came together for a fishbowl discussion, focused on three core questions: how can we better involve EMCRs and improve the nomination process with our academies? What skills can be developed and strengthened through participation in the SAPEA

process? And which credits or forms of acknowledgement would be useful for EMCRs participating in the SAPEA process?

The discussion centred around four key themes:

- The **opportunity for EMCRs to develop key skills**, through participating in the SAPEA process. Examples included negotiation and finding consensus; leadership skills; exploring bias and objectivity in different contexts. Researchers may also benefit from a deeper understanding of policymaking processes and the role that evidence plays in supporting policy, as well as the differences between skills required for reviewing evidence for policy compared to collecting evidence for research. The JRC's Competence Framework 'Science for Policy' was discussed as a useful structure to explore for building capacity in science advice.
- Thinking about how SAPEA can better involve EMCRs, participants felt that many EMCRs remain unaware of the opportunities to work as part of the Scientific Advice Mechanism, despite the calls being circulated throughout YASAS members and that more could be done to ensure that the calls for nominations reach a broader set of EMCRs. YASAS contact points could be better supported in identifying the obstacles to reaching a broader set of EMCRs within each academy, with issues raised relating to communication channels and how these opportunities are framed and incentivised. Further, participants also discussed the possibility of a quota for EMCR representation on SAPEA working groups similar to that applied on gender balance, to help improve numbers and empower individual EMCRs in their work with the SAM.
- Once selected to a working group, the onboarding process for EMCRs could be improved, for example through one-to-one sessions where EMCRs are connected with researchers with more experience at the science-policy interface who can act as a mentor. By standardising the onboarding process, SAPEA could build a community of experienced EMCRs that can provide a support network but also potentially act as ambassadors, supporting the recruitment process.
- Finally, by continuing to build close relationships with senior professionals in academies, SAPEA can explore how they can better support EMCRs in getting involved in science policy activities. How could the timeframe be better adapted to fit academies' needs?

Main takeaways

- Involvement in SAPEA working groups provides a clear opportunity for EMCRs to develop key skills.
- More could be done to ensure that the calls for nominations reach a broader set of EMCRs within academies.

- The onboarding process for EMCRs on SAPEA working groups can be improved.
- SAPEA can work more closely with academies to ensure internal buy-in.

Communications and the science policy interface

Introduction to the workshop

Wider communications activities are vital for the effective provision of science advice, engaging with citizens and stakeholders as well as directly with policymakers. The communications teams of Europe's academies have a wide range of resources, experience and skills, and work in very different cultural, political and institutional climates, but they face a number of shared challenges. For these reasons, SAPEA organised a two-day training workshop for academy communications staff. This workshop aimed not only to promote an exchange of experience and good practice, but also to provide hands-on practical training for communications personnel with a particular focus on those communications activities relevant to communicating about science-for-policy activities. An additional aim of the workshop was to create a lasting network of communications professionals working in Europe's academies, which would enable ongoing exchange beyond the workshop itself.

The workshop was run by SAPEA and hosted in Warsaw by the Polish academy of Sciences on 17–18 October 2023. It was preceded by a webinar among all participants, to discuss the shared challenges faced by academy communications staff in communicating about science advice activities, which was held on 30 June 2023, and followed by the establishment of a permanent online community on LinkedIn.

Summary of webinar on shared challenges

30 people from 28 countries attended a first workshop online to discuss the challenges faced by communications staff of academies in communicating about science-for-policy, and ways to address them collectively. The greatest common challenges identified by the group are shown below, along with the number of votes each received:

- Identifying my audience (18 votes)
- Make message interesting and understandable (17 votes)
- How to reach the most people (15 votes)
- How to communicate our research to non-academic audiences (13 votes)
- Help others understand that communication means lots of work, time & resources (12 votes)

- Limited time and human resources (12 votes)
- Not enough audiovisual skills (11 votes)
- Strategic planning and implementation (11 votes)
- How to use strategically (and implement in practice) paid social media campaigns (11 votes)
- Have time for more strategic thinking (11 votes)
- How to measure impact (10 votes)

Other challenges mentioned included starting a communication strategy from scratch, reaching wider audiences, contact with policy makers, misinformation, the challenging variety of topics and audiences, engaging researchers, use of AI, neutrality, lack of motivation, stakeholder management, lack of media channels, decision-making processes and constraints around messaging.

Analysing the outcomes, the SAPEA team identified a number of the biggest challenges that could be addressed in the October training workshop:

- Identifying audiences
- Social media
- Audiovisual: videos
- Audiovisual: podcasting

Summary of training workshop

The content of this workshop was developed based on the feedback from the preliminary webinar. 32 academies (from 19 countries) were represented by at least one staff member. As this was a practical training workshop rather than a discussion forum, we report below the nature of the sessions rather than a summary of the discussions.

- **Welcome:** SAPEA staff and a Board member welcomed attendees and introduced the Scientific Advice Mechanism, SAPEA, the academy landscape and the purposes of the workshop.
- **Training session 1:** Attendees took part in hands-on training sessions for science advice communication through video editing, podcast production, and social media.
- **Training session 2:** Attendees again took part in hands-on training sessions for science advice communication through video editing, podcast production, and social media.
- **Copernicus Science Centre tour:** Attendees met with staff of the Copernicus Science Centre in Warsaw, toured the facility and discussed science communication with citizens.
- **Presentation:** The SAPEA head of communications presented the SAM communications strategy and discussed approaches to audience targeting.

- **Pitching challenges and clinic:** Attendees presented specific audience-targeting challenges from their own work. Four challenges were selected by the group. Attendees were divided into clinics to share ideas and brainstorm solutions to those challenges.
- **Discussion:** Attendees discussed ways forward and the preferred way to create a permanent network of academy communications professionals. Various options were considered. The group settled on LinkedIn as the best platform. SAPEA communications staff created a LinkedIn group, which has 35 academy members from 22 countries.

Main takeaways

- From the initial networking webinar, common challenges faced by communications staff in academies included identifying audiences, social media, and using audiovisuals. These were taken forward by the SAPEA team to form the basis of the two-day in person training workshop.
- A permanent network of academy communications professionals was established as a LinkedIn group.

Introduction to the workshop

This interactive webinar, arranged by AE on behalf of SAPEA, was held on 12 July 2024. It featured a keynote by Professor David Budtz Pederson, Professor of Science Communication at Aalborg University, followed by a series of presentations of good practice. The webinar ended with four breakout groups, which discussed the opportunities and challenges of effective public engagement.

In his introductory keynote, Professor Pedersen spoke about the role of academies in communicating and promoting science advice to government. Science advice is very much part of the European agenda, and there have been a number of reports and other outputs, including the SAPEA evidence review report 'Making sense of science',⁵ which promote the voices of scientists across a complex ecosystem of science advice. In this context, the value of research is realised through its communication and translation of results into real-world settings – this is the challenge for science and for every player in the ecosystem. It requires the building of trust, visibility and transparency as the means to combat misinformation and increase civic engagement. The role is for 'honest knowledge-brokers', and there is a real demand for policymaking that is evidence-informed.⁶

Creating an engagement plan need not be complicated – think about its purpose, who it will benefit and how, the specific problem(s) you are trying to solve, the values and mindset of your audience and the information they need. The challenge is to connect evidence with people's values; citizens and policymakers choose the evidence that helps them solve their actual problems. The public should be active participants in the science advice process⁷. People have a limited capacity to process

⁵ See: <u>https://scientificadvice.eu/advice/making-sense-of-science-for-policy-under-conditions-of-complexity-and-uncertainty/</u>

⁶ See: <u>European citizens' knowledge and attitudes towards science and technology - September 2021 - - Eurobarometer survey</u> (europa.eu)

⁷ See: Madsen, J. K., de-Wit, L., Ayton, P., Brick, C., de-Moliere, L., & Groom, C. J. (2024). Behavioral science should start by assuming people are reasonable. Trends in Cognitive Sciences. <u>https://doi.org/10.1016/j.tics.2024.04.010</u>

information, so they need it to be simple, accessible, customised, and with opportunities for involvement in how it is applied to policy.⁸ Transparency and diversity of their advice are also important. They should also consider the timing of advice in the context of problem-solving and achieving impact. In conclusion, academies can benefit from more open connections with other players within the ecosystem.

Examples of good practice

Science Made Simple: maximising the impact of public engagement

Science Made Simple is a social enterprise that has a vision to inspire young people to take up a career in STEM, to engage more diverse public audiences and to strengthen connections between researchers and the public. Science Made Simple specialises in simplifying technical messages and has worked with SAPEA on the evidence review report 'Food from the oceans'⁹, where graphic design was used to highlight the key points of the report. Providing context is critical, so that the public understands why the topic is important to them. It is important to offer a 'hook' or connection to individuals' existing interests and passions. It is also about translating strategy and policy into what people can actually do to help in a practical way. The infographics for 'Food from the oceans'¹⁰ and poster.¹¹

acatech: reaching out to society

In Germany, acatech uses several means of public engagement. For example, the Horizons magazine¹² and the podcast Late-Night Tech.¹³ Both are aimed at policymakers and public audiences. Horizons magazine uses colourful graphics and simple language to explain 'big' technology topics to policymakers, the public and business. Horizons is available in a traditional print version but is also being developed as digital, perhaps as a foldable leaflet or poster for download. The podcast was launched in August 2023, with the aim for relaxed, fact-based conversations about current science and technology topics with experts in the field.

⁸ Lupia, Arthur, Uninformed Why People Seem to Know So Little about Politics and What We Can Do about It (2016), <u>https://doi.org/10.1093/oso/9780190263720.001.0001</u>

⁹ See: Food from the oceans – Scientific Advice Mechanism

¹⁰ See: <u>https://scientificadvice.eu/wp-content/uploads/ffo-colouring.pdf</u>

¹¹ See: <u>https://scientificadvice.eu/wp-content/uploads/ffo-poster.pdf</u>

¹² See: <u>https://en.acatech.de/projects/acatech-horizons/</u>

¹³ See: <u>https://en.acatech.de/late-night-tech-the-acatech-horizons-podcast/</u>

Young Academy Finland: Meet a researcher

In 2018, a new law in Finland required schools and higher education institutions to cooperate. YAF introduced 'Meet a researcher',¹⁴ a science education programme. The programme encourages high school pupils to engage with academics at universities, through video calls. The aim of the programme is to allow pupils to explore what an academic career might look like, in any subject area. It is easy to register interest, demand has grown significantly and there is now a pool of about 600 volunteer researchers.

Academia Europaea Budapest Knowledge Hub: public outreach in a broader sense

The Budapest Knowledge Hub is trying to combine arts and science, where art is used as a tool to reach out to people. For example, the Danube Film Club has been launched, with a documentary film Operation Mayfly,¹⁵ where there was a discussion with researchers and film-makers around the environmental challenges raised in the film. Other diverse projects and initiatives organised by the Budapest Hub are aimed at policymakers, researchers, NGOs, teachers and school pupils.

Royal Academy of Engineering: 'This is engineering' campaign

The RAE's 'This is engineering' campaign ¹⁶ was launched in 2018, with the aim to encourage young people from all backgrounds to consider engineering as a career. Based on research into how the engineering profession is perceived by youngsters, the campaign targeted 13–18 year olds, showing how engineering is relevant to their interests, such as music, sports or fashion. Films profile real engineers across the spectrum of gender, ethnicity, educational background and region. The campaign uses different channels of communication to attract the target audience, with influencers and engineering champions on platforms like YouTube and TikTok. There is also a call-to-action with resources and information. Post-campaign research is conducted to gauge the level of response to the films and campaigns. As future developments, there will be new user-generated content, access through other platforms, and more 'champions'.

¹⁴ See: <u>https://nuortentiedeakatemia.fi/en/meet-a-researcher/</u>

¹⁵ See: <u>https://www.elte.hu/en/content/operation-mayfly-a-nature-documentary-by-gergely-balazs-online-film-club-event.e.366</u>

¹⁶ See: <u>https://thisisengineering.org.uk/</u>

Summary of discussions

Four breakout sessions as part of the workshop on public engagement identified good practice in science communication and public engagement, the challenges and how to address them.

A wide variety of examples cited included:

- educational programmes designed to engage children with STEM
- summer schools for school pupils
- collaboration with the cultural sector, such as museums
- stakeholder roundtables
- open debates on 'big topics'
- a regional biodiversity map
- environmental awareness raising across university campuses
- research competitions and prizes

Groups shared factors that had supported the success of their activities, which included:

- the importance of online and multimedia engagement
- generating broadcast and other media interest
- knowing their audience
- linking science to topics of interest to the audience
- seeking collaboration with other organisations

Finally, the groups identified challenges in engaging with public audiences, including:

- building the necessary skills and experience for public engagement
- institutional barriers and/or resistance to change
- working in silos
- stimulating two-way dialogue with communities instead of top-down communication
- reaching diverse international audiences
- measuring and quantifying impact and success

Main takeaways

The challenge for science and for all players in the science advice ecosystem is to bring
research into the hearts and minds of citizens, particularly in an era of fake news and
misinformation. This requires trust-building, visibility and transparency. Effective engagement
planning is crucial.

- Collaboration between academies and other organisations/stakeholders is important; we need to move away from working in silos
- Dialogue and two-way interaction with communities matters i.e. engagement that brings mutual benefit to both the public and to researchers
- Measuring impact, particularly long-term impact, is difficult but necessary
- A mix of methods and a variety of channels and platforms, including online, will reach a broader audience.
- Segmenting and targeting audiences effectively are important
- Engaging effectively with young people and changing mindsets at an early age are key

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Working group members

- Euro-CASE: Ms Elin Elliot (Chair), Head of International Affairs at the Royal Swedish Academy of Engineering Sciences and alternate Euro-CASE board member for Sweden
- Academia Europaea: Ole Petersen, Vice-President of AE, director of the Cardiff University Academia Europaea Knowledge Hub and Alternate Member of the SAPEA Board
- FEAM: Prof. Dominique Bron, Vice-President of FEAM, Member of the Royal Belgian academy of Medicine, Professor of Medicine/Haematology at the Free University of Brussels (ULB), Member of the National Committee of Bioethics
- ALLEA: Paweł Rowiński, Vice-President of the Polish Academy of Sciences (PAS), Member of the ALLEA Board and alternate SAPEA board member
- YASAS: Moniek Tromp, Young Academy of Europe Vice-Chair, President of YASAS, and SAPEA Board Member; Helen Eenmaa, President of YASAS, and SAPEA Board Member (from August 2024)

SAPEA taskforce members

- Marie Franquin (Scientific Policy Officer, Euro-CASE until June 2024)
- Rafael Carrascosa Marzo (Scientific Policy Officer, Academia Europaea, part-time until March 2024)
- Rúben Castro (Scientific Policy Officer, FEAM from December 2022 to June 2024)
- Yvonne Dinter (member of the coordination team)
- Louise Edwards (Scientific Policy Officer, Academia Europaea part-time; Hub Manager, AE Cardiff Knowledge Hub)
- Rudolf Hielscher (Coordinator)
- Nasim Kroegel (member of the coordination Team)
- Stephany Mazon (Scientific Policy Officer, YASAS from May 2023 to September 2024)
- Hannah Macdonald (Scientific Policy Officer, FEAM from June 2024)
- Diana Stanciu (Scientific Policy Officer, YASAS from September to December 2022)

- Céline Tschirhart (Scientific Policy Officer, ALLEA)
- Toby Wardman (Head of Communications)
- Hannah Whittle (Scientific Policy Officer, FEAM until December 2022)



scientificadvice.eu @EUScienceAdvice

Contact us EC-SAM@ec.europa.eu

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