

European Academies



Science Advisory Council

EASAC'S 15th Anniversary Celebration
SCIENCE ADVICE FOR EUROPE
PAST–PRESENT–FUTURE

10–13 May 2016

The Norwegian Academy of Science and Letters

Oslo, Norway

European Academies



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Building science into EU policy: the history of EASAC, 2001–2015

Peter Collins

Origins

The beginning of the new millennium was a time of anxiety, and hope, about many things. Alongside more exotic targets for millennial concern, there was anxiety about the quality of scientific advice available to the institutions of the European Union and hope that better approaches might be put in place. An extreme example of inappropriate advice processes was the appointment by the Science Commissioner, Édith Cresson, of her dentist and close friend Philippe Berthelot as her science adviser between 1995 and 1997, displacing the European Science and Technology Assembly established to advise her predecessor Antonio Ruberti. The resignation of the entire Commission led by Jacques Santer in March 1999 highlighted deeper problems of governance. Advice processes seemed to change with each new Commissioner and, crucially, lacked independence as well as longevity. The scientists of Europe wanted something that would better serve the needs of European policy-making.

One proposal, by the French Science Minister Roger-Gérard Schwartzenberg, was that the Commission should establish a European Academy of Science and Technology during the French presidency of the European Council (July–December 2000) as its source of advice. His ministerial predecessor, Claude Allègre, had tried the same idea two years previously: both evoked strong opposition from leading scientists, and neither came to anything.

It was increasingly recognised that, to be effective, an advice mechanism had to have unequivocal expertise across a wide range of science, had to be institutionally credible, had to be demonstrably independent, and had to be able to engage with all appropriate institutions of the EU. It needed a strong track record in the work of giving policy advice. And, in the EU context, there were clear advantages in having links with each EU Member State.

One possibility was a grouping of academies known as ALLEA (established in 1992 as a standing conference of academies and now, with 56 members from over 40 countries, subtitled the European Federation

of Academies of Sciences and Humanities). A review of strategic options for ALLEA and a full debate at its General Assembly in March 2000 supported aspirations for ALLEA to become more involved in general policy discussions, but nevertheless concluded that it should not take on a specific EU advisory role, not least because of the very significant resource implications. Nor were any of the other existing scientific organisations at European level seen as obvious candidates for such a function.

The Royal Society therefore hosted a dinner, during the General Assembly of the InterAcademy Panel (IAP)¹ in Tokyo in May 2000, to consider options. Present at that dinner, in addition to the Society, were representatives of the Dutch and French academies and the chairman of ALLEA.² The upshot was agreement to explore the possibility of setting up a new organisation based on the established national science academies of individual EU Member States. Such an organisation would have the optimum configuration to engage with the major institutions of the EU and would be able to harness the proven expertise and credibility of the academies to the task of giving independent advice.

The next step was to test out the acceptability of such an approach, both with the potential members and with the intended recipients of its policy advice. This phase lasted into 2001 and was important both for refining the concept and for preparing the ground among policy-makers. A survey confirmed wide support for the core proposal and identified a number of practical issues. This was significant, since each of the national academies was being invited to broaden its existing remit to include giving advice at EU as well as at national level, and also to agree a mechanism by which it could do this collaboratively. Everyone was moving into unfamiliar territory; but they were willing to do so because of the evident need to inject reliable science into EU policy-making.

There were several conflicting ideas about what sort of organisation would work best, how it should be constituted, how it should relate to existing bodies, and how it should operate. A meeting in December 2000 of some of the key players agreed a basic model for the organisation and established two small groups, one to engage with policy-makers who might value scientific advice and the other to draft a formal constitution. Debate continued during the early months of 2001, and agreement was

¹ A grouping of over 130 national science and medical academies from all parts of the world, from 2016 under the name of InterAcademy Partnership.

² The Royal Swedish Academy was also invited but was unable to be present.

finally reached on all the main issues. The formal name of the new organisation was one of the last matters to be settled. Senior representatives of EU institutions joined the founding member academies to launch the European Academies' Science Advisory Council at a meeting hosted by the Royal Swedish Academy of Sciences on 11 June 2001.

The inaugural Chairman was the Foreign Secretary of the Swedish Academy, Uno Lindberg, who served in that capacity until 2004. He was succeeded by David Spearman (Royal Irish Academy, 2004–2007), Volker ter Meulen (Leopoldina, 2007–2010), Brian Heap (Academia Europaea, 2010–2013), and Jos van der Meer (Royal Netherlands Academy, from 2013). The Royal Society, which had a good deal of experience in systematic policy advice work, provided the Secretariat until 2010. The Secretariat then passed to the Leopoldina, by then formally identified as the national science academy of Germany. This move occasioned a review of the 2001 statutes, which led to some detailed modifications but no fundamental changes.

The EASAC concept

The underpinning concept was of EASAC as a Council of senior scientists from each EU Member State, its composition thus mirroring the make-up of the policy-making bodies it was seeking to advise. In order for EASAC to bear obvious scientific legitimacy and authority from the outset, the national science academies (or equivalent bodies) of all (then) 15 EU Member States were invited each to nominate one member of the Council.³ For operational reasons, Council members would serve as individual experts and not as formal representatives of their nominating bodies. EASAC was thus empowered to make all necessary decisions without having formally to refer back to the nominating academies; any other arrangement would have been too cumbersome to meet the normal timescale of policy making.

EASAC is, in effect, the mechanism through which the academies of the EU Member States act collectively to give scientific advice to EU policy-makers, and the individual Council members necessarily liaise very closely with their nominating academies. EASAC draws heavily on the academies in its day-to-day activities, for example for project proposals, for members of working groups and review panels, and for help with maximising the

³ Luxembourg does not have a national science academy or equivalent, so did not participate.

policy impact of reports and statements. EASAC outputs carry the generic authority of the nominating academies, while the Council itself has the degree of operational flexibility required to achieve impact in the sometimes rapidly changing world of science policy.

EASAC was not given formal legal status: its staff were employed by the host national academy and its finances were, similarly, managed by that academy. That arrangement was reviewed and confirmed in 2005 and remains in place. In addition to the greater simplicity of this approach, it was thought that the member academies would feel greater ownership and commitment towards such an organisation than towards a legally distinct entity. It was explicitly understood that, in the event of an unexpected burden falling on the host academy, a collective responsibility would be shared by all EASAC members.

From the outset, it was recognised that there would be advantage in sometimes being able to reach beyond EU boundaries strictly defined. So the Academia Europaea (a pan-European Academy) and ALLEA, with their connections to the European scientific community beyond the EU, were also invited to nominate one member each to the inaugural EASAC Council. And, as additional countries joined the European Union, so their national academies of science were invited to participate in EASAC and nominate a member to the Council. Thus, in 2004, the national academies of eight new accession states accepted invitations to participate in EASAC;⁴ the national academies of Bulgaria and Romania were invited in 2007, and the national academy of Croatia in 2013, when those countries, too, became members of the European Union.

In 2005, the national academy of Switzerland⁵ was invited to attend EASAC Council meetings as an observer. The same status was extended to the Norwegian academy and to the European Federation of Academies of Medicine (FEAM) in 2006. In 2009, in response to an approach from the national academy of Israel, it was formally determined that observer status should be restricted to the national science academies of countries that were members of the European Free Trade Association or that were

⁴ Like Luxemburg, neither Cyprus nor Malta have formal national academies and so were not included. But scientists from all three countries were eligible for membership of the Academia Europaea, and thus had a route into EASAC.

⁵ Switzerland was not a member of the EU or the European Economic Area, but it had many bilateral agreements with the EU, including some that allowed it to participate in scientific programmes.

official candidates for EU membership. A modification of the statutes in 2010 allowed both Norway and Switzerland, at the discretion of Council, to participate as full members of Council.

The work of the Council itself was defined as being to decide on the work that would be carried out in its name, to appoint small groups of relevant experts to do that work, and formally to review completed work before it was released. It was thus concerned with overall direction and priority-setting, and with ensuring quality. Given the wide range of topics to be addressed, the Council would consult its member academies in order to access the requisite range of expertise. In order to promote openness and transparency, all EASAC advice would be published unless the Council explicitly decided otherwise.

EASAC'S mission from the outset was to provide authoritative, independent and timely advice to all relevant policy-making institutions of the EU about the scientific aspects of public policy. This was reflected in its strapline 'Building science into EU policy'. It was not primarily concerned with advising or lobbying about the support of scientific research itself, which several organisations (including ALLEA) were already addressing, though it might be willing to respond to specific requests.⁶ This limitation to the scope of EASAC'S work was reinforced by the fact that, in the same month that EASAC was launched, the new Research Commissioner, Phillippe Busquin, set up the 45-member European Research Advisory Board (EURAB) to advise him on the management of scientific research: it was important that EASAC should not be seen as competing with EURAB.

EASAC was to be financed primarily by its member academies, and would carry out projects initiated by itself. It would also accept requests, and commissions, for advice from EU institutions, notably the European Parliament, the European Commission and the European Council. It was confirmed at the outset that the various member academies would contribute different amounts, on a voluntary basis, to a central pot, with the academy hosting the Secretariat (the Leopoldina since 2010, and the Royal Society before then) likely to contribute most financially. It was also agreed that all participants other than the professional Secretariat would work on a *pro bono* basis and that the expenses of Council members and members of working groups would be met by their member academies except

⁶ A good example of this was EASAC'S input to the European Commission's consultation over the formation of the European Research Council in 2005.

when an external budget was available. This helped to share out the costs. Member academies also made important in-kind contributions by hosting meetings and running project groups.

But funding has always been a challenge, with the biggest area of expenditure being the professional staff needed to support the volunteer experts who are EASAC's most distinctive attribute. Carrying out sophisticated policy studies makes heavy demands on skilled individuals, and building and maintaining relations with key figures in the policy-making apparatus is also a very labour-intensive activity.

The EASAC Council meets twice annually. A pattern was soon established of holding these meetings in the country that was shortly to assume the presidency of the European Council, and of providing within the framework of the meeting an opportunity to engage with relevant national politicians and senior officials in order to facilitate communication during the subsequent presidency. In addition to the Council, a small Bureau comprising the chairman and vice-chairmen⁷ was established to facilitate the conduct of business between Council meetings. From 2011 the Bureau met four times annually.

EASAC has always been aware of the importance of achieving a high profile in Brussels, a city overrun with organisations competing to shape policy in one direction or another. The strategically located Royal Belgian Academy was an obvious asset in this endeavour, but it was not until the end of 2009 that EASAC was able to progress from periodic profile-raising initiatives to establishing a permanent presence in Brussels through the appointment of a liaison officer housed at, and financed by, the Royal Belgian Academies, RASAB. This resulted in a substantially greater frequency of interaction with key policy-makers, reinforcing the personal networks crucial to achieving policy impact. It also facilitated better targeted efforts to ensure that the results of EASAC's work reached the relevant audiences.

Sorting out the structure of EASAC took a significant amount of time and energy. But what really mattered was getting on with some work, showing that the European academies had identified a real need and, in EASAC, had established an effective mechanism for making a difference to the scientific awareness of EU policy-makers. The work began with a series of

⁷ From 2010 they were designated President and Vice-Presidents, to 'facilitate dialogue with policy-makers in Brussels'.

contracts from the European Parliament, but was soon complemented by initiatives devised and funded by EASAC itself, and in some cases by other European organisations.

European Parliament

In a series of high-level meetings during and shortly after the preparatory phase, the leadership of the European Parliament showed strong interest in EASAC as a potential route to bolstering its capacity for dealing with a very wide range of scientific problems and for assessing legislative proposals that it received from, particularly, the European Commission. EASAC's independence and its EU-wide structure, in addition to its obvious scientific authority, were key to this. The Parliament was becoming increasingly powerful in the wake of the treaties of Maastricht (1992), Amsterdam (1997) and Nice (2001) – and later Lisbon (2007) – and, increasingly, recognised its need in this context for better access to scientific expertise.

EASAC's initial point of contact at the working level was the Parliament's in-house STOA service (Science and Technology Options Assessment). STOA provided scientific advice on request to the committees and members of the Parliament, mostly by commissioning it from external sources. In 2002 EASAC signed a framework contract with STOA: to review the feasibility of project requests it was receiving from Parliamentary sources, to assess the quality of completed work it had commissioned, and generally to help raise the profile of science within the Parliament. Activities under the latter heading included helping to organise the first three annual STOA lectures, where a prestige speaker gave a talk to a Parliamentary audience and then led a debate at a dinner with invited guests.

In 2003, EASAC won an analogous framework contract to brief the European Parliament's Environment Committee on the scientific aspects of legislative proposals coming from the Commission, in order to improve the standard of Parliamentary scrutiny and debate. The topics addressed under this contract ranged from arsenic in the air to fluorinated greenhouse gases to technologies for sustainable development. Many of these briefings took the form of short reports, but some involved workshops with scientific experts and Parliamentarians and a published summary of the discussion.

2003 also saw EASAC secure a contract with the European Parliament's Industry Committee to carry out a case study on how Sweden and Finland

had achieved and sustained major increases in their annual R&D spends, and to run a workshop for Parliamentarians on the implications of those experiences for the Barcelona objective of increasing R&D spend across the EU as a whole to an average of 3% of gross domestic product by 2010. A report on the workshop and case studies was published in 2004 and attracted widespread interest.

In 2004 EASAC won a contract from the Parliament's Environment Committee for a study on how to measure increases and decreases in biodiversity. The resultant report was published early the following year and widely disseminated; a Spanish-language version was presented at the Spanish Academy.

Following the 2004 Parliamentary elections, EASAC won a framework contract with the reconstituted European Parliament Industry, Research and Energy Committee. The first output from this was a workshop, organised jointly by EASAC and the Parliament in early 2006, on the extent to which bureaucratic practices impeded the participation of smaller organisations in the Framework Programmes for scientific research. The workshop helped the Parliament in its responsibilities for developing the 7th Framework Programme by exposing examples of good and bad practice.

The framework contract also led to a 2006 study on price-setting in EU electricity markets and a jointly organised workshop in the Parliament a few months later on price-setting in the EU gas markets. These two projects chimed in well with EASAC's developing programme of self-initiated work on energy policy. They were followed by a study on the EU oil shale industry – essentially a study on experience in Estonia, which was then the only EU Member State actively exploiting oil shales on a significant scale, although the material existed in 14 Member States.

After several years of intermittent contact but no further formal arrangements, STOA in 2012 invited EASAC to attend the monthly meetings of its steering panel. Relations soon strengthened to the point where EASAC was regularly invited to make detailed presentations of new reports to the Parliament. New framework contracts followed in 2014 after a competitive bidding process, in the broad fields of energy, life sciences for human well-being, and agriculture, food and biotechnology; but STOA then proved to be slow to propose specific projects within these frameworks.

Projects initiated by EASAC

The advantage of commissioned work, apart from the obvious financial consideration, is that there is a clearly defined customer for each project who, in theory at least, is likely to pay attention to the outcome. The disadvantage is that the customer is setting the agenda (albeit sometimes with the contractor's help). In addition to soliciting and carrying out commissions, therefore, EASAC also wanted to be able to carry out projects of its own devising, drawing public attention to issues that it felt were not being adequately addressed by the policy process. EASAC would, of course, have to finance such projects itself, and provision was made for this. Self-initiated projects sometimes arose from one of the member academies wanting to engage with the European dimensions of policy issues that it was already addressing at national level.

In order to plan strategically for such self-initiated projects, EASAC established two small strategy groups in 2002, with dedicated staff support, covering the broad fields of environment policy and biotechnology/biosciences policy (including infectious diseases). These groups comprised individuals nominated by EASAC member academies who were both expert in the science and knowledgeable about current policy developments. They were charged with elaborating a programme of work and, with Council approval, guiding its implementation. They also had the functions of overseeing commissioned work in their respective fields, and of developing relations with the key targets for EASAC advice, thus raising EASAC's profile among policy-makers. A third strategy group, for energy policy, was added in 2005, with long-term staff support becoming available in 2008.

These three strategy groups, called Steering Panels, enabled EASAC to develop and implement a coherent overall workplan, defining the main spheres of action while allowing scope for initiatives in other areas of policy-making as need and opportunity arose. From 2005, they were restructured as virtual consultative networks, operating primarily through electronic communication. This improved the speed of response and enabled a larger number of experts to be drawn into EASAC's sphere. The Steering Panels began holding regular meetings again from 2008. They now meet twice yearly, often in Brussels to use the opportunity also to engage with relevant EU policy-makers.

Environment

EASAC's self-initiated work on environment policy started with a high-level workshop on transborder pollution, at the instigation of the Athens academy, in 2003 in Athens. The results of the workshop were widely published and were taken up by policy-makers at both EU and UN level.

The work on biodiversity indicators commissioned by the European Parliament Environment Committee stimulated considerable interest within both Parliament and Commission, and also within some national Governments. Prompted by the Royal Society, EASAC therefore undertook a follow-up study on ecosystem services, highlighting the extent to which modern life was critically dependent on a range of efficiently functioning ecosystems. Published in 2009, the report demonstrated how maintaining biodiversity was a practical imperative as well as an ethical one, and put forward a series of recommendations to help sustain the well-being of ecosystems in Europe.

A further report on ecosystem services in 2015 focused on neonicotinoid insecticides and their impact not just on honey bees (which had already been widely reported) but also on other pollinators, on systems of natural pest control, on soil productivity, and on biodiversity. It concluded that the insecticidal benefits of neonicotinoids needed to be reassessed in the light of new knowledge about the extent of their harmful side-effects. This attracted intense coverage in both scientific and general media, in Europe, the USA, China and elsewhere, with one mainstream newspaper in the UK, the *Daily Telegraph*, describing it as 'one of the most authoritative and devastating reports ever issued into the effects of pesticides ... issued this week by an alliance of Europe's most august scientific institutions'. The report was correspondingly attacked by some who felt their commercial interests to be threatened.

The interests of EASAC in the field of environment included water. A study led by the Royal Spanish Academy and published in 2010 highlighted issues affecting the state of groundwater in the countries of southern Europe, and called for special measures to improve the management of groundwater in vulnerable areas. Marine sustainability was the focus of a study developed initially through the UN Ecosystem Assessment Programme and carried out within the frame of the collaborative agreement with the Joint Research Centre (JRC; see below). Published first in summary form on World Oceans Day 2015, the study investigated how current scientific knowledge of marine ecosystems could support an integrated approach to management of the

seas, including fisheries, biodiversity conservation and protection of the marine environment. It concentrated particularly on the seas bordering EU Member States.

EASAC's 2015 review of the circular economy expanded its environmental interests to embrace social science and economics. The review considered both the overall desirability of the circular economy and the substantial barriers impeding transition to it, most notably established pricing systems that failed to accommodate full social and environmental costs. It was intended to support current debate and to serve as a prelude to subsequent, more detailed, reports.

Biosciences and infectious diseases

An important study on crop plant genomics, instigated by the Italian Accademia dei Lincei and published in 2004, was EASAC's first self-initiated output in the biosciences field. The Lincei hosted a follow-up workshop in Rome on plant genetic resources for food and agriculture in November 2009, and this led to a major EASAC report in 2011 setting out the significance of plant genetic resources for the twin challenges of feeding the growing population and of protecting biodiversity, and making proposals for future research.

EASAC decided in 2008 against undertaking work on genetically modified organisms (GMOs), on the basis that it would have little to add to what had already been said. This decision was revisited in 2010, and in 2013 EASAC published a study, with IAP support, that examined the opportunities and challenges for sustainable agriculture of technologies for improving crop genetics. With the involvement of NASAC, the network of 21 national science academies in Africa, the study addressed issues in the developing world as well as the developed world from first-hand experience, and it looked at the impact of European attitudes and policies on research practice and agricultural practice in Africa. The ensuing report, *Planting the future*, evoked a great deal of interest and a considerable number of follow-up actions, within and beyond Brussels, including a workshop in Addis Ababa that brought together very senior representatives of the Commissions of the African and European Unions.

The momentum generated by this activity was enhanced by a 2015 EASAC statement on new plant-breeding techniques, including those involving specific targeted changes in the genome that did not introduce

foreign genes and that therefore raised the question of whether a different regulatory regime was required. And at the end of 2015, EASAC began work on policy issues around genome editing, looking particularly at areas of opportunity and of special caution in agricultural applications and in therapeutic use, and considering overall directions for EU strategy in this complex field of research.

A 2014 report on risks to plant health considered EU priorities for tackling emerging plant pests and diseases. It grew out of a scientific meeting organised by EASAC with invited experts from across the EU, and highlighted how advances in research could inspire new thinking about pest control and about breeding new plant varieties with improved resistance to biotic stresses. A proposed new Commission Regulation on surveillance and eradication of harmful organisms therefore needed to allow flexibility to accommodate such advances.

Infectious diseases constituted the second main thrust of EASAC's work in the very broad sphere of biotechnology/biosciences policy. It started with workshops in Würzburg and Halle in 2004 held under the auspices of the Leopoldina Academy.⁸ EASAC published a report based on these workshops in June 2005, highlighting the growing threat of infectious disease and stressing the need for a Europe-wide programme of research, training and preparation. The report was launched at an influential event in the European Parliament.

This infectious diseases report identified a series of priority areas for EU action. EASAC selected two of these areas, vaccines and antibiotic resistance, and appointed successive working groups, again led by the Leopoldina, to study them in detail and make recommendations to help the EU develop science-based strategies for responding to the specific issues identified. The reports of these studies were published in 2006 and 2007 respectively, and were widely disseminated to EU policy-makers and others, with significant impact. In particular, the Health Directorates-General of both the European Commission and the European Council requested personal briefings on the reports and stayed in close touch with subsequent projects. The Commission strongly encouraged EASAC to extend its work in this area by examining the policy problems associated with zoonoses; and, after completing a statement on the impact of migration on infectious disease in Europe, EASAC produced a report on com-

⁸ The Leopoldina was officially recognised as the national academy of science for Germany from 2008, but had represented Germany on EASAC almost from the outset.

bating the threat of zoonotic infections, which was presented to the European Parliament and other European and national policy-makers.

This was followed by a report in 2009 on drug-resistant tuberculosis, which was re-emerging in Europe after having been thought to have been eradicated. In a statement a month later, EASAC drew attention to the fact that 7% of patients in acute care hospitals in the European Union acquired serious infections after being admitted to hospital. That was followed in 2010 by a study on the possible implications of climate change for the incidence of infectious diseases in Europe. A 2011 report then drew together the main threads of EASAC's work on infectious diseases to date, highlighting common themes and reinforcing the main policy messages.

EASAC returned to the theme of infectious disease in 2014, with a report on antimicrobial drug discovery. This grew out of a three-day workshop supported by the Leopoldina, the Royal Dutch Academy and the Volkswagen Foundation. The report called for increased scientific research to be complemented by work in the social sciences, removal of bottlenecks in early clinical development, a simpler regulatory framework, and efforts to raise public and political awareness of the threat posed by antimicrobial resistance.

Then in 2015 EASAC published a report on gain of function experiments, in which genes were modified to enable the determinants of biological function to be studied. Building on work by several national science academies and by the IAP, the report looked specifically at the case of potentially pandemic pathogens, notably flu, and the associated issues for biosafety and biosecurity. In addition to reinforcing norms of good practice, it called for better sharing of information across EU Member States and enhanced public dialogue, but concluded that in this context there was no requirement for a new advisory body at EU level. The report was warmly welcomed by the European Commission.

Energy

Energy policy, too, has been a long-running focus for EASAC activity. After the work for the European Parliament on the electricity and gas markets, EASAC collaborated with the Royal Swedish Academy in a workshop on hydropower in November 2007. It then undertook a pioneering study, again at the initiative of the Royal Swedish Academy, on

interconnectivity in the European electricity grid. This looked at the planning processes required to stimulate strategic investments in the grid, especially those enabling electricity from small renewable sources to be fed into the grid, against the background of aims to create a pan-European competitive market in electricity. The report was published to considerable media interest in 2009, with a separately printed summary that was widely circulated to policy-makers and industrial concerns.

This was followed by a study on using concentrated solar power as an energy source rather than photovoltaic cells, especially in southern Europe and north Africa, as part of the overall drive towards sustainable and secure electricity generation. The study was supported financially by the IAP, and the Royal Swedish Academy seconded a young scientist to help the secretariat. Published during EASAC's 10th anniversary celebrations in Brussels in 2011, the study concluded that solar power technology could be economically competitive with fossil fuel generation of electricity by 2030.

Diversifying its repertoire of outputs, the energy panel prepared one short statement in 2012 calling for a systems approach to EU policy-making on energy, and another in 2013 urging the European Commission's strategic energy technology plan to give higher priority to research and innovation.

A 2012 Royal Society report on the health, safety and environmental risks associated with hydraulic fracturing ('fracking') to extract shale gas in the UK, and the Leopoldina's active interest in the issue, put shale gas onto EASAC's agenda. After some discussion it was agreed to focus relatively narrowly, on the concerns that had been expressed in the European context about fracking in areas of high population density, about methane leakage and about public acceptability. A report drawing substantially on work already carried out by several individual academies in this area was published in 2014. A statement on oil sands, another contentious area of energy policy, was scheduled to follow in 2016.

In a departure from the normal run of energy projects, and after a long scoping process, EASAC embarked on a study of European space exploration. Specifically, it examined the relative merits of human and robotic missions in various contexts. Its 2014 report, led by the Swiss Academy, reinforced the arguments for continued and intensified efforts in European engagement with space science, and concluded that there were no compelling reasons for human missions in the scientific exploration of the Moon or Mars in the foreseeable future.

Another departure, on the opposite spatial scale, was a project on energy at the level of individual villages in developing countries in Africa and Asia – the ‘smart villages’ initiative. The thinking behind it was that access to sustainable energy services would act as a catalyst for other aspects of development, such as provision of education and healthcare, access to clean water, sanitation and nutrition, and the growth of productive enterprises. Funding was provided by the Malaysian Commonwealth Studies Centre, the Cambridge Malaysian Education and Development Trust and the Templeton World Charity Foundation. EASAC contributed scientific expertise, and a statement with recommendations to the European Commission was planned for late 2016.

Climate change

Climate change has emerged in recent years as a major focus of EASAC activity, and has drawn on the expertise available through both the energy and the environment groups as well as other sources.

An important effort in this area was a study on carbon capture and storage in Europe. This was initiated through discussion with IAP, though in the event it was financed by EASAC. The study elicited inputs from a wide range of external sources, both industrial and academic. It concluded that this approach to reducing emissions of carbon dioxide to the atmosphere had the technical potential to make important contributions to Europe’s efforts to reduce global warming, but that a suitable economic and policy regime, and a strong level of public engagement on the issue, would need to be in place before this potential could be realised. The Chief Scientific Adviser to the Commission President, Anne Glover, and other senior Commission figures participated in the high-profile launch event in Brussels in 2013.

That study followed two other interventions related to climate change. In November 2011 EASAC added its voice to the global scientific consensus around the urgency of achieving major reductions in emissions of greenhouse gases. The context was a meeting of world leaders in Durban for a session of the UN Framework Convention on Climate Change. Ahead of the session, EASAC issued a short statement urging European institutions to take a series of practical steps to facilitate focused initiatives aimed at delivering such reductions. The statement drew on recent work by several individual

member academies. And a year later, noting that, despite all pledges to the contrary, global emissions of greenhouse gases had in practice continued to grow unabated, EASAC reissued the statement as an input to the Doha session of the UN Framework Convention on Climate Change. In 2015, with climate change still accelerating, EASAC documented recent scientific advances bearing on a series of critical political decisions, and urged EU leaders to push for measures to contain global warming below an increase of 2 °C.

One element of the EU's response to the threat of climate change was the 2009 Renewable Energy Directive, which among other things required that, by 2020, 10% of the final consumption of energy in transport, and 20% of energy consumption overall, should come from renewable sources. This put the spotlight on biofuels, on which some EASAC member academies had already carried out studies. Discussions with senior officials from relevant segments of the European Commission identified the sustainability of biofuels and their impacts on biodiversity and food production as matters on which they needed expert advice before making further proposals to the European Parliament. EASAC's consequent report on this challenged the Commission's assumptions about the potential of biofuels to deliver major benefits, and called for a rethink.

A Norwegian-led study in 2013 on adaptation to extreme weather events in Europe reviewed scientific data from the previous 20 years as a means of pressing policy-makers across the EU to devise common strategies to help mitigate the physical, human and economic costs of climate change. The UN Foundation provided financial support. The report was translated into Hungarian: Hungary was one of the central European countries that had suffered particularly severe flooding in the months before the report was published.

Collaboration

EASAC was founded by its member academies collectively as an independent organisation with distinct characteristics. There was a discussion in 2004/05 about how it might relate to another organisation, ALLEA, and whether there was any value in some form of coming together of the two. The conclusion, however, was that they should remain separate and distinct organisations, each developing according to their own strengths and opportunities. ALLEA's membership was drawn from across geographical Europe rather than the EU, included local as well as national bodies, and covered the breadth of humanities as well as natural sciences; and its sci-

entific activities tended to focus on the conduct of science and matters such as ethics and intellectual property. The EASAC Council recognised that the existence of two organisations of European academies could create confusion, but took the view that a merger would create greater confusion and would dilute its own clarity of mission and operation.

The issue came up again in late 2010, with a proposal from ALLEA for closer cooperation in various forms. These discussions led to the outcome that ALLEA and EASAC, and the Academia Europaea, clarified their respective historical missions and boundaries and recognised the possibility of collaboration at project level when warranted by the circumstances of a specific project. The heads of the three organisations started having regular updating meetings in 2012.

In March 2015, EASAC, ALLEA and the Academia Europaea agreed a memorandum of understanding, together with FEAM and Euro-CASE (the collective of engineering academies), on how collaborative projects might be carried out on a case-by-case basis. The MOU was prompted by an interest of the European Commission to support collaboration of the European academy organisations and by the associated requirement for an appropriate structure to apply for funding from the Commission in certain circumstances. EASAC made it clear that any work carried out through the MOU (or any similar collaboration projects of the academy organisations) would be additional to its existing activities and channels of communication, and would not replace them.

Collaboration comes in many forms. For example, from time to time EASAC has issued a statement in effect endorsing at European level work already carried out at national level by one or more of its members. This has proved a useful mechanism for extending the impact of that national work. An important instance of this was EASAC's 2011 report on synthetic biology which called for a public dialogue on the future of the technology and emphasised the need for effective governance: this took as its starting point the recent work of four member academies on the subject. The report was translated from its original English into seven other European languages. An earlier instance was EASAC's 2008 statement on the use of non-human primates in research, supporting and Europeanising the conclusions of a Royal Society working group.

Another approach to collaborative working was trialled in 2008, when the JRC approached EASAC to explore options for sharing expertise. The JRC,

the 'in-house science service' of the European Commission is a directorate-general charged with helping to put EU policy-making onto a scientifically robust foundation by providing scientific and technological support where appropriate. EASAC welcomed the approach, and the first outcome of this was a joint report published in 2011 that examined the potential impact of engineered nanomaterials on human health. The day of publication also saw EASAC and the JRC sign a formal agreement towards closer cooperation, in the name of the common goal to support policy making through independent scientific research. That agreement led initially to a jointly funded and conducted project on the management of spent nuclear fuel and nuclear waste, and the report was launched with the strong involvement of the European Commission. The cooperation agreement was extended for a further three-year term in 2014, one of its products being a joint report on marine sustainability published in 2016.

A collaboration with FEAM, with funding from IAP, led to an influential report on direct-to-consumer genetic testing for health-related purposes. Published in 2012, this alerted EU policy-makers to problems that the rapid commercial exploitation of genetic testing raised about regulation, about support for research and innovation, about professional development and governance, and about public engagement. The report fed into debates over the reform of the Directive on In Vitro Diagnostic Medical Devices.

Building on the collaborative relationship it had already established with IAP, EASAC in 2011 accepted an invitation to take on the role of IAP's affiliated regional network for Europe, thus enabling it to interact more fully with the global network of academies. The election of a former EASAC Chairman, Volker ter Meulen, as Co-Chair of IAP in 2013, further enhanced the links between the two bodies. And in another move to share, and to enrich, its European experience with partners in the wider world, EASAC established a working relationship with NASAC, which analogously represented the African region in IAP. An early benefit of that relationship, already mentioned, was that EASAC was able to involve NASAC in a 2013 study on crop genetic improvement technologies. By early 2016, EASAC and NASAC had started to collaborate – together with the Asian and American networks of science academies, AASSA and IANAS – on a global IAP project, to provide science based analysis and advice on food and nutrition security and sustainable agriculture.

Impact

Any attempt systematically to assess impact in the policy advice business is fraught with pitfalls. However, it is possible to consider how EASAC's relations with the key European policy-makers, and its general reputation, have developed over the years.

In the early days the strategy for getting EASAC off the ground focused on winning external contracts for policy activities, and the European Parliament proved to be the most fruitful source of such work. This was important to both sides at a time when the influence of the Parliament in the conduct of European affairs was growing, and it helped EASAC to build momentum. Soon EASAC was in a position also to develop its own strong programme of European policy initiatives, and a series of timely and high-quality reports across several major areas of policy built up its reputation. Investment of effort in disseminating its messages beyond their immediate target audiences in Brussels reinforced that reputation. Self-initiated projects could often be more innovative, more thorough and more widely influential than commissioned work, especially when led by enthusiastic and committed academics and individuals.

Policy-makers in both Commission and Parliament began to associate themselves with EASAC's work, for example through participation in launch events for new reports and by requests for personal briefings. In a world overflowing with vested interests advocating one policy shift or another, EASAC's claim to offer advice that was disinterested, expert, evidence-based, and pan-European had an obvious attraction: the advice could help to shape evolving policy, and it could be used to justify decisions once made. Science is rarely the sole determinant of policy, but in many areas a coherent account of the scientific aspects is a useful prelude to formation of acceptable policy proposals.

EASAC's leadership put very considerable personal effort into nurturing relationships with the key policy figures in Brussels. This was reinforced by the establishment of a Brussels office at the end of 2009. Networking intensified. The appointment of Anne Glover as Chief Scientific Adviser to the President of the European Commission, José Manuel Barroso, in 2012 gave EASAC an important extra point of contact with European policy-making. EASAC provided her not only with policy support but also with access to an EU-wide, multidisciplinary network of independent expertise. Robert-Jan Smits, Director-General of Research and Innovation in the Commission, was considering ways

to help with the running costs of EASAC's Brussels office. Some individual member academies started raising their profiles in Brussels, which at times reinforced EASAC's profile.

Because of the increased recognition of EASAC and the quality of its work, the European Commission asked for a meeting with the Presidents of the EASAC member academies. This was held in October 2012, chaired by the Chief Scientific Adviser and with no fewer than 14 Directorates-General represented. The day-long discussion of the exigencies of giving and receiving science policy advice led to a written agreement for structured cooperation between the Chief Scientific Adviser and EASAC, complementing the arrangements already in place for collaboration between EASAC and the JRC. This new agreement was intended to give the Commission easy access to EASAC's expertise and to give EASAC facilitated access to the Commission's policy processes in relevant areas. EASAC's independence was safeguarded. It was a powerful endorsement of the EASAC concept.

Ahead of the European elections in 2014 and the installation of a new Commission, EASAC was therefore one of numerous scientific bodies that lobbied for the continuation of the Chief Scientific Adviser post. However, the incoming Commission President, Jean-Claude Juncker, pre-emptorily abolished it in November 2014, amid considerable controversy. This prompted EASAC to think harder about how to communicate with the public. But the outcry from the scientific community also prompted Juncker to reconsider the importance of scientific advice and to look for an alternative approach to securing it. The upshot was the 'Science Advice Mechanism', announced in May 2015, in which a group of seven senior individuals would in effect act as an intermediary between the Commission needing to access scientific expertise and the scientific community able to provide it. It took six months, to November 2015, for the group of seven to be named. EASAC and its partners in the March 2015 MOU (Academia Europaea, ALLEA, Euro-CASE and FEAM) were indicated as one of the scientific groupings from which the seven would seek input. How it will all work in practice remains to be seen.

Meanwhile, Anne Glover joined the former European Commissioner Joaquin Almunia, the Nobel laureate Jules Hoffmann, and the Director-General of the Volkswagen Foundation Wilhelm Krull, in a small Senior Advisory Group appointed to provide external strategic guidance to the EASAC leadership and to help EASAC strengthen its presence in policy-making circles. They will have an important role to play as the EU policy

institutions become more influential, the issues they face become more complex, and the scientific dimension to policy becomes more pervasive.

Reflections

EASAC, and its member academies, have been learning on the job: learning how to work with each other, learning how to carry out policy projects with multinational teams, learning how to turn scientific expertise into policy influence, learning the ways of the EU institutions. The harnessing of such diverse skills and contexts to the production of agreed and authoritative advice across a wide range of policy issues is a notable achievement. The commitment of individual member academies has grown as the enterprise has gathered momentum and delivered results. Some member academies brought deep knowledge of evidence-based policy advice, others have stepped up their policy capability in part in order to engage more fully with EASAC. But it is an unending process: each year budgets have to be negotiated, ideas have to be generated and shared, academies have to identify experts for specific tasks, projects have to be delivered on time. The commitment has to be nurtured.

A great deal depends on the individuals whom the member academies nominate to the EASAC Council and three Steering Panels Biosciences, Energy and Environment. They have to manage EASAC's business and decide on EASAC's science advice activities; they also have to act as champions for EASAC within their academies, and conversely bring their academies' enthusiasms to bear on EASAC's thinking. As the volume and complexity of the work increase, the demands on personal time also increase.

A great deal also depends on the unstinting commitment of EASAC's core team. Successive Chairmen/Presidents and members of the Bureau have given inspirational leadership to the development of the organisation. The core Secretariat - directed by Peter Collins for the first seven years and by Christiane Diehl since 2010 - has been crucial to the effective running of EASAC. And the Programme Directors – Robin Fears (Biosciences since 2002), John Murlis (Environment, 2002-12), Michael Norton (Environment since 2013), John Holmes (Energy, 2008-14), William Gillett (Energy since 2014) - have played a pivotal role in EASAC's success.

EASAC's approach to its work has developed. The early focus on contract work is no longer in the foreground, though it remains an element in

the total package. The range of strategic alliances and partnerships has increased very considerably. EASAC has, deservedly, become more ambitious.

More effort now goes into maximising the policy impact of each project. This begins with the project scoping stage, where the policy issues and the relevance of the science are negotiated. Not all proposals turn into viable projects. Formal review of draft reports, too, is a vital part of the overall quality assurance process. In addition to inherent quality, the timing of reports, statements and other outputs is obviously important to achieving impact, though this can be as unpredictable as the political process itself. Beyond that, high-profile launch events, active and wide-ranging dissemination, engagement with the media, and the production of separate summaries for particular audiences are, necessarily, all now more to the fore than in the early days of EASAC. So are follow-up activities, trying to ensure that policy recommendations not only reach the target audiences but also enter their thinking. EASAC findings feature in leading research journals. Quite a few member academies translate reports and statements for their national audiences, and take other steps to ensure impact on national as well as EU policy-making.

By 2010, EASAC had acquired sufficient experience and expertise in the policy advice business that, with funding from IAP, it ran a programme of workshops over two years, with a variety of contributors, looking at best practice in dialogue between science academies and the policy community. One of the workshops was run with NASAC. The programme led to the publication of guidelines in 2012, and its impact on EASAC member academies became the subject of a PhD study in Finland.

What of the future? EASAC is the answer to a question. That question, asked by the national science academies that constitute EASAC, is about how they can best bring their scientific expertise, their worldly wisdom and their networks of contacts to bear on the business of advising policy-making at EU level in those areas where such experience is relevant; and, specifically, how they can do that in the collaborative manner characteristic of so much EU activity. If the academies lose interest in the question, if they lose interest in trying to advise EU policy-making, or if they choose not to do it collaboratively, then EASAC can have no future. But that scenario does not seem likely. The mission statements and other strategy presentations of many individual EASAC member academies are strongly

and explicitly committed to the task. The challenge for EASAC, then, is to continue to demonstrate its relevance to these ambitions. The new EASAC Senior Advisory Group will contribute importantly to this.

For its members, EASAC needs to continue to show that it understands the business of European policy-making, that it has timely access to the key European policy figures and is respected by them, and that it can pull together a wide enough group of participants to present itself as the face of European science in this context. To sustain and develop its hard-earned reputation among policy-makers, EASAC needs to continue to show that it speaks with real authority on matters of science, that it is independent of vested interest, that its processes are appropriate and effective, and that it can move quickly when it matters.

None of these attributes is static: the policy business is constantly evolving in response to changes in wider society. So EASAC, like every other European organisation, has to thread its path through a shifting landscape, the opportunities and the complexities increasing as the EU becomes more prominent in public life. To do so sure-footedly, it needs to harness its core values and to understand its own strengths. The growth and development of EASAC since its creation in 2001 have justified the vision of its founders. A reflection on its first 15 years is therefore a useful asset in negotiating the coming decades.



Founding meeting of EASAC, Royal Swedish Academy of Sciences, Stockholm 2001. Copyright private



From 2001 to 2010 the EASAC Secretariat was hosted by the Royal Society, London (pictured). Copyright The Royal Society



EASAC Council Meeting, Academy of Athens, Athens 2011. Copyright private



EASAC 10th Anniversary celebration, Royal Belgian Academies, Brussels 2011. Copyright Felix Kindermann



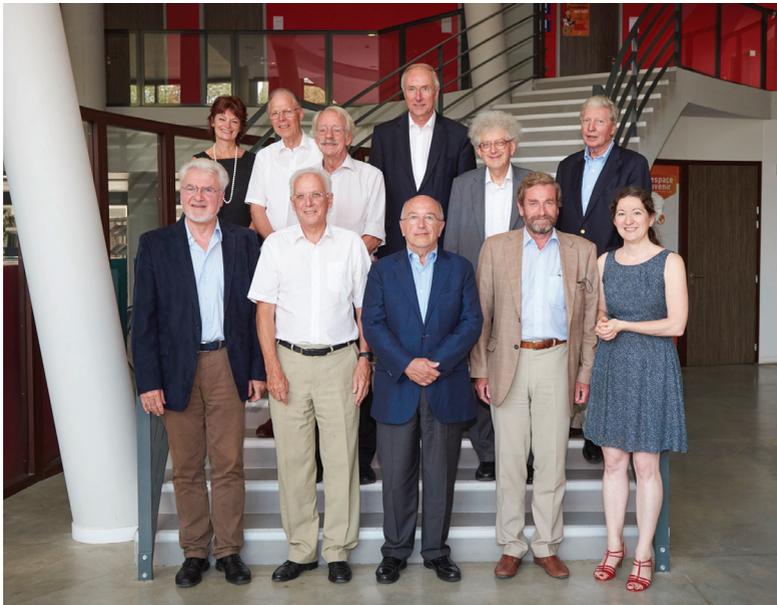
EASAC Council Meeting, Royal Irish Academy, Dublin 2012. Copyright John Ohle



EASAC Council Meeting, German National Academy of Sciences Leopoldina, Halle 2013. Copyright Markus Scholz



From left to right: Volker ter Meulen, EASAC Past President, Joerg Hacker, Leopoldina President, Anne Glover, Chief Scientific Advisor to the European Commission President, Brian Heap, EASAC President, EASAC Council Meeting, German National Academy of Sciences Leopoldina, Halle 2013. Copyright Markus Scholz



Meeting of EASAC Senior Advisory Group, Strasbourg 2015. Copyright Christian Creutz

EASAC and the role of Europe's national academies of science⁹

Jos W M van der Meer, Christiane Diehl, Robin Fears and William Gillett

Background

In 2001, the need to improve the process of providing science advice to policy-makers at EU level was recognised by the science academies of EU Member States, which led to the establishment of the European Academies' Science Advisory Council (EASAC). The organisation was set up to maximise the coherence, efficiency and accountability of delivery of science advice to policy-makers in EU institutions, notably the European Commission and the European Parliament. In doing this, EASAC was also expecting to bring economies of scope and scale to the process by facilitating the sharing of expertise and resources between the science academies of the EU, Norway and Switzerland.

Policy-makers have recognised for centuries the importance of having access to the best scientific understanding, and this is reflected not only in the existence of national science academies in most (25) EU Member States and in many other countries around the world, but also in the fact that these national science academies often receive some support from their governments. Having said that, the pressures on today's policy-makers are such that it is easy for them to forget that they have established these highly skilled centres of excellence and networking, and, as a result, the potential contributions of our national science academies to the policy making process are not always maximised.

Policy-making in today's increasingly globalised economy is becoming ever more complex, and strategies need to be aligned across national boundaries in order to successfully address policy areas which have an international dimension. In recent years, the alignment of national policies and regulations has become particularly important for the EU in the

⁹ This essay is based on an earlier version that appeared in Future Directions for Scientific Advice in Europe (Centre for Science and Policy, 2015; <http://www.csap.cam.ac.uk/projects/future-directions-scientific-advice-europe/>).

areas of bioscience, energy and the environment. At the same time, scientific and technological developments have been moving, and continue to move, very quickly in these areas. It is, therefore, crucial that policy-makers should be regularly provided with the best independent scientific analysis and advice on developments in these (and other) areas.

Being part of EASAC helps to strengthen those science academies in the EU which lack resources, by giving them the opportunity to work together with other academies to produce outputs of the highest quality for EU policy-makers, and which they can then also use for national policy-makers in their own countries. In addition, EASAC has been working with its academies to identify and develop the most efficient ways of providing science advice to policy-makers at both European and national levels. It has then transferred this knowledge and experience to those academy fellows and staff who are engaged in providing policy advice, by drafting specific guidelines and by holding Science-Policy-Dialogue workshops.¹⁰

What is EASAC?

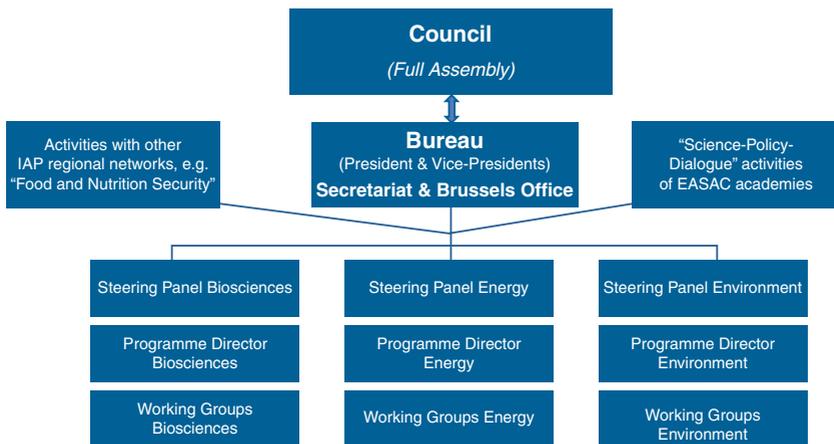
There is a long tradition of academies of science in many parts of Europe. Whereas in previous centuries the role of these meritocratic groups consisted primarily in fostering scientific progress through close exchange of information among the best in their fields, the last few decades have seen a growth in the academies' public role to mobilise the best of European science, as providers of independent advice to policy-makers and sources of information for the public, thus strengthening the transparency and plurality of democratic decision-making processes.

Until recently it would have been fair to say that, while many academies had developed an effective relationship with their national governments in advising on the scientific dimensions in policy-making, the development of an analogous relationship at the European level had been more difficult. Yet, the delivery of science advice to the European Commission, the European Parliament, Council of Ministers and to successive Presidencies of the EU Council, has become increasingly important. In Europe, EASAC is the alliance of the 25 National Academies of Science of the EU Member States, and the science academies of Switzerland and Norway, who have agreed to work together in a network with a

¹⁰ http://www.easac.eu/fileadmin/ppt/Science-Policy-Dialogue/Short_EASAC_Guidelines_PDF.pdf

very simple, jointly funded administrative structure and common working procedures for providing science advice to policy-makers in the EU.

The EASAC Council is made up of representatives of the participating academies and meets twice a year, usually in the academy of the country that will hold the EU presidency six months later. EASAC’s operations are managed by its Bureau, which consists of an elected President, four Vice-Presidents and the immediate Past President, who normally work – in an extended format – together with the chairs of EASAC’s three Steering Panels, the three Programme Directors and the Executive Director.



The structure of EASAC.

The three EU Member States that do not have a national academy of sciences and are thus not represented in EASAC are Malta, Luxembourg and Cyprus. However, Academia Europaea, the pan-European Academy of Science, and ALLEA, the association of all academies in geographic Europe, are represented in EASAC, and the Federation of European Academies of Medicine (FEAM) has observer status.

EASAC’s analysis and advice has to be scientifically excellent, independent, timely, relevant, comprehensible and endorsed by all its member academies. EASAC focuses on three main areas of policy for which high-quality, independent science advice is particularly important to policy-makers:

1. Biosciences – including health and wellbeing, agriculture and food security
2. Environment – including climate change
3. Energy – including sustainable energy and energy security

The member academies of EASAC take great pride in ensuring that EASAC's advice is totally independent, and therefore EASAC does not accept funding from any political, industry or other sources that could be perceived as compromising its independence.

EASAC's budget comes from the membership contributions of its member academies and the InterAcademy Partnership (IAP),¹¹ the global network of science academies. This network has over 140 member academies worldwide and receives support from UNESCO. EASAC is the affiliated regional network of IAP for Europe.

EASAC's working methods and guarantee of quality

EASAC is made up of its assembly (the Council), the President and Vice-Presidents, the Bureau, and three Steering Panels for Biosciences, Energy and Environment. Proposals for new topics usually come through one of these routes. In addition, EASAC maintains contacts with the EU's institutions and encourages them to express their interest in specific science topics; without compromising its independence, EASAC proactively takes into account the views of these institutions when identifying key issues for attention. Of particular importance for the quality of EASAC's work are the Steering Panels, which play a central role not only in the selection of new topics, but also in guiding and reviewing the work as it progresses.

Once a new topic has been selected, a working group is established, for which the best expert scientists within the EU are selected with the help of EASAC's member academies. The working group usually meets two to four times over a period of 9–18 months. When the draft report is ready, it undergoes peer review by independent experts. Each report must be endorsed by EASAC's member academies before it is published in print and on the EASAC website.¹²

¹¹ <http://www.interacademies.net>

¹² EASAC's quality control procedures have been described in detail elsewhere: see Fears, R. and ter Meulen, V. (2011) 'European Academies Science Advisory Council (EASAC)' in Lentsch, J. and Weingart, P. (Eds.) *The Politics of Scientific Advice*. Cambridge: Cambridge University Press.

To enhance the immediate impact of each EASAC report, it is usually launched at a dedicated event in Brussels. EASAC often also publishes non-technical summaries – ‘lay summaries’ – of its reports, for use by its member academies when setting up public debates on important issues.

EASAC recognises that the publication of such a report is not the end of a project, but a resource to be used to catalyse further discussion and inspire action at the EU and national levels. Thus, the work on a particular topic may continue for years after the initial publication. A continuing challenge for EASAC, as for many of its member academies and other science bodies, is to find ways to stimulate and sustain public engagement alongside the interaction with policy-makers. These challenges in the UK were highlighted in the recent collection by Doubleday and Wilsdon.¹³

When the academies see the need to provide a rapid response to an urgent policy issue, a shorter EASAC statement may be produced. This can be done within a few months, but must still be endorsed by EASAC’s member academies before publication.

The member academies use EASAC reports and statements in their national context, and also help to draw attention to issues at an EU level. Often, articles based on EASAC reports are published in scientific journals, such as *Nature*, *The Lancet*, *Science Translational Medicine*, and *Nature Reviews Drug Discovery*.¹⁴

EASAC’S contacts with EU institutions

While EASAC’s main Secretariat is based at the German National Academy of Sciences Leopoldina, it also maintains a Brussels Office at the Royal Academies for Science and the Arts of Belgium (RASAB). This Office facilitates interactions with EU institutions, helps to horizon scan for impending policy developments, maintains contact with key EU officials, and organises launch events for EASAC reports and statements.

EASAC gives priority to maintaining contact at all levels with the European Commission, especially with Directorate-General (DG) Research and Innovation and with the Joint Research Centre (JRC). But EASAC also works

¹³ Doubleday, R. and Wilsdon, J. (2013) ‘Future Directions for Scientific Advice in Whitehall’. www.csap.cam.ac.uk/links/13/451/

¹⁴ Links to all these publications can be found on EASAC’s website (www.easac.eu).

closely with a number of DGs,¹⁵ as well as with European Commission bodies such as the ECDC and EFSA.

Together with the JRC, EASAC has produced joint reports on the 'Impact of Nanomaterials on Human Health' and on 'Spent Nuclear Fuel and its Waste'. Previously, EASAC established a good working relationship with the Bureau of European Policy Advisers, especially the Chief Scientific Advisor, and looks forward to using this experience to build a similarly good relationship with the new European Political Strategy Centre (EPSC). As noted at the recent UK meeting hosted by the Royal Society,¹⁶ in addition to building the capacity to supply science-based evidence to policy-makers, it is also critically important to build the capacity to receive and use that evidence within the policy-making community.

EASAC also provides science advice to the European Parliament, both directly to MEPs and their assistants and through the Science and Technology Options Assessment Panel (STOA), which forms part of the European Parliament's DG for European Parliamentary Research Services (DG EPRS).

Science advice for policy beyond Europe

Many scientists are more accustomed than their policy-making counterparts to working closely with international colleagues across the world. Similarly, many of Europe's science academies are very well connected internationally, and EASAC itself participates actively in the global network of science academies (IAP) as a regional affiliated network for Europe.

Working on science advice for policy beyond Europe is a two-way process, allowing EASAC to use experience from other continents and countries to strengthen its advice to EU policy-makers, as well as to use EU experience as a basis for supporting other academies in giving advice to policy-makers in other countries. Moreover, at the global level academies can collectively deliver strong messages to intergovernmental organisations and other stakeholders. With these aims in mind, EASAC collaborates with the three other regional networks of IAP: the Inter-American Network of Academies of

¹⁵ These include DG Environment, DG Energy, DG Health and Consumers, DG Agriculture and Rural Development, DG Maritime Affairs and Fisheries and DG International Cooperation and Development.

¹⁶ 'The GCSA at 50: reflections on the past, present and future of scientific advice', November 2014, <http://www.csap.cam.ac.uk/news/article-gcsa-50-reflections-past-present-and-future-scient/>

Sciences (IANAS), the Network of African Science Academies (NASAC), and the Association of Science Academies and Societies in Asia (AASSA).

One recent example of such collaboration is EASAC's work with NASAC on 'Agricultural Biotechnology for Sustainable Development in Africa' and on the 'Smart Villages' project for energy provision in off-grid villages in developing countries. EASAC has also collaborated with IAP's other regional networks in delivering global statements on synthetic biology and on antimicrobial resistance.

Looking to the future

The need to provide science advice to policy-makers at both EU and national levels is still growing, and the decision taken in 2001 to set up EASAC has resulted in a growing body of knowledge and expertise in the academies on how to provide such advice, especially at the EU level.

Although the science may indeed sometimes be uncertain and the policy area controversial, what should always be clear is that the processes for generating science advice have been conducted with rigour, respect and responsibility. Collective initiatives do not mean adopting a low common standard of evidence, but rather ensuring consistency in the generation of high-quality science advice. One of the strengths of EASAC is that our advice takes into account the different experiences across the EU Member States, and this diversity of backgrounds may suggest alternative ways to inform policy options. Among the lessons learnt since the inception of EASAC has been the need to maintain scientific robustness at every stage of a project: initial prioritisation of topic to ensure a distinctive contribution; early scoping work; creation of a balanced Working Group; careful handling of scientific uncertainties; and independent peer review. EASAC has also learned how to increase the impact of its outputs, by early and sustained engagement with policy-making and other audiences.

EASAC is now firmly established as a committed EU stakeholder with growing visibility, a dedicated team, and a significant track record of producing timely, independent, clear and constructive advice for EU policy-makers in the areas of biosciences, environment and energy. EASAC can and will also capitalise on opportunities to provide advice on topics outside these three core areas: for example, a report was recently published on European space exploration (see Table 1).

Support for the work of EASAC continues to come mainly from its member academies, including a particularly important contribution from the Leopoldina in Germany, which hosts the EASAC Secretariat, and from RASAB in Belgium, which hosts the Brussels Office.

As the demand for science advice for policy appears likely to continue to grow, and many of the national academies have limited resources as a result of the financial crisis, more funding will be needed to support EASAC's work in the future. This needs to be provided without compromising the independence – or even the *perceived* independence – of EASAC's advice.

The national science academies of Europe have an important contribution to make towards creating a better European dialogue between science and policy. They can help with setting up simple yet effective processes for feeding independent and timely advice from the science community to the institutions of the EU. As a network, EASAC will be at its strongest when its individual member academies have developed their national science–policy dialogue to the fullest extent. In this way, EASAC could be said to reflect one of the key strengths of the EU as a whole.

Jos W M van der Meer is President, Christiane Diehl is Executive Director, Robin Fears is Director of the Biosciences Programme and William Gillet is Director of the Energy Programme at EASAC (Twitter: @EASACnews; www.easac.eu).

List of EASAC reports and statements

Proposal for a Directive relating to arsenic, cadmium, mercury, nickel and PAH (fourth daughter directive under the Air Framework Directive) COM (2003) 423 (Nov 2003)

Proposal for a Regulation on maximum residue levels of pesticides in plant and animal products (Nov 2003)

Proposal for a Regulation on certain greenhouse gases (Nov 2003)

Review of RPA (Risk & Policy Analysts Ltd) report "Inedibles in food product packaging" (Nov 2003)

Review of project proposals submitted by the European Parliament Fisheries Committee to STOA (Jan 2004)

Proposal for a Directive on the protection of groundwater against pollution (Jan 2004)

Review of MVV Consultants and Engineers report on alternative automotive fuel report (Jan 2004)

Proposal for a Regulation on materials and articles intended to come into contact with food (Feb 2004)

Proposal for a Regulation on the addition of vitamins and minerals and of other substances to food (Feb 2004)

Clean Coal Report Review (Feb 2004)

Commission Communication on an action plan for stimulating technologies for sustainable development (Apr 2004)

Towards 3%: attainment of the Barcelona target (Apr 2004)

Genomics and crop plant science in Europe (May 2004)

Impacts of pollution from outside the European Union on Europe's environmental targets (Jun 2004)

A users guide to biodiversity indicators (Mar 2005)

Infectious diseases - importance of co-ordinated activity in Europe (Jun 2005)

Bureaucracy in the 6th Framework Programme (Feb 2006)

Price-setting in the EU electricity markets (Apr 2006)

Vaccines: Innovation and Human Health (May 2006)

Proceedings of a workshop on the EU gas markets held at the European Parliament (Oct 2006)

Tackling antibacterial resistance in Europe (Jun 2007)

Study on the EU oil shale industry (Aug 2007)

Migration and infectious diseases (Sep 2007)

Use of non-human primates (Jan 2008)

The use of EU structural funds in science and technology (Feb 2008)

Combating the threat of zoonotic infections (May 2008)

Ecosystems services and biodiversity in Europe (Feb 2009)

Drug resistant tuberculosis (Mar 2009)

Healthcare-associated infections: the view from EASAC (Apr 2009)

Transforming Europes Electricity Supply (Jun 2009)

Climate change and infectious diseases in Europe (Mar 2010)

Groundwater in the Southern Member States of the European Union (Jun 2010)

Groundwater in the Southern Member States of the European Union: Country Reports France, Greece, Italy, Portugal and Spain (Jul 2010)

Realising European potential in synthetic biology: scientific opportunities and good governance (Dec 2010)

Realising European Potential in Synthetic Biology (Jan 2011)

EU Public Health and Innovation Policy for Infectious Disease (Apr 2011)

Impact of Engineered Nanomaterials on Health (with JRC, Oct 2011)

Infectious Diseases and the Future: Policies for Europe (Oct 2011)

Concentrating Solar Power: its Potential Contribution to a Sustainable Energy Future (Oct 2011)

Addressing the Challenges of Climate Change (Nov 2011)

Plant Genetic Resources for Food and Agriculture (Dec 2011)

Direct-to-Consumer Genetic Testing (with FEAM, Jun 2012)

Addressing the Challenges of Climate Change: an aide memoire for policy makers (Nov 2012)

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