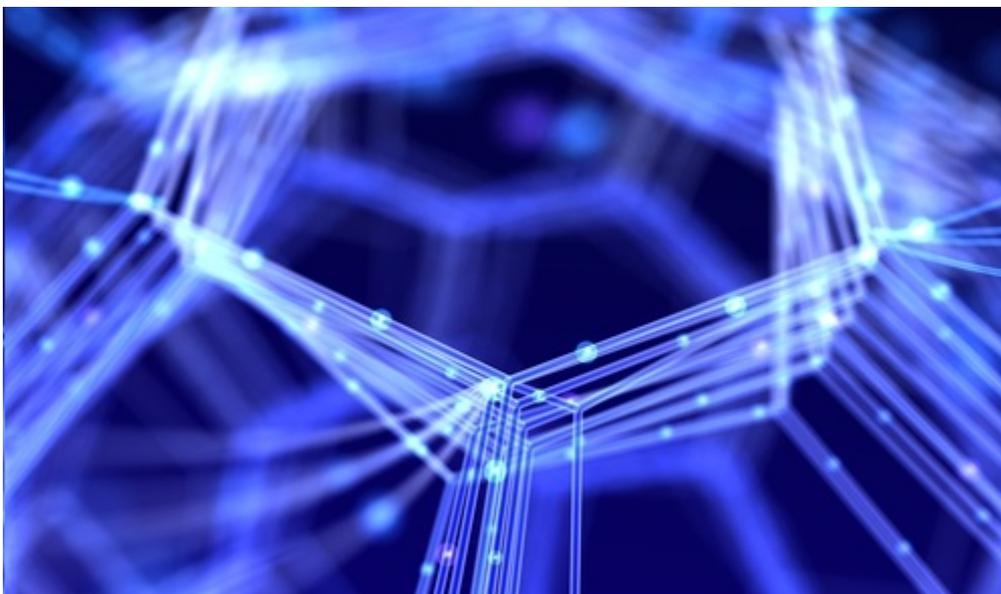




Science policy is one of the key topics on the agenda of the European Science Open Forum event, ESOF2016, in Manchester in July 2016. This article looks at various examples of fields where science policy has a key role to play; be it to convey acceptance of new technology, accompany key funding decisions for large international research projects like the largest radio telescope ever developed--the Square Kilometre Array--or simply help fundamental research turn into innovative solutions.

Sound policies needed to frame scientific and technological progress



ESOF2016 will debate the latest research policy trends

Today, the impact of a scientists' work is far beyond their research group or institution. It is integrated with a wider ecosystem including markets, governments and citizens. All are better connected and more integrated than ever before.

One of the challenges facing policy-makers is the need to take into account the available evidence-base arising from research. Another challenge is to connect the dots with other professionals involved outside science to meet the needs of society. This matters in a wide spectrum of fields--be it when making funding decisions in international research projects, dealing with safety in emerging technologies or bringing the fruit of innovation to market.

In this article, research policy experts share their views on the types of challenges that science policy encounters when designing our scientific and technological future. They are due to speak on science policy-related issues at the forthcoming EuroScience Open Forum ([ESOF2016](#)) event, to be held in

July 2016 in Manchester, UK.

Helping today's policy-makers solve tomorrow's problems

Policy-makers rely on scientific advice and insight to respond to new issues and pre-empt potential future crises. This advice needs to be objective, free from the influence of lobbyist, personal or institutional agendas, and reflect as broad a consensus as possible from the experts in the field.

Policy makers therefore require access to independent advice. For instance, "organisations like EASAC are able to provide unbiased, in-depth advice from outstanding scientists," explains Christiane Diehl, executive director of the European Academies Science Advisory Council (EASAC), based in Halle, Germany, adding: "We've worked with policy-makers and other academy networks on emerging issues like biofuels and GM crops, which have an impact on many people."

Diehl will be contributing to the ESOF session "Cool heads in crises: sound scientific advice in emergencies" that will discuss how to better deliver scientific advice to policy in serious or emergency situations.

EASAC's advice can affect policy at the highest levels, but the approach is not without its limitations. Indeed, establishing a consensus among a large number of working scientists spread around Europe can take time. "We are trying to get faster in providing advice" explains Diehl, "we have three steering panels that already function as a rapid reaction mechanism." She explains that, this year they will embark on a project to develop additional tools as part of working within the new Science Advice Mechanism of the European Commission. She adds: "our goal is to provide a detailed response on important issues [within] six months or less."

When the voices of research are heard in policy, better decisions can be made and more informed laws passed. But equally, national policies need to be considered during research, particularly when the project is large.

Commercialising the materials of the future

Developing trust in the latest research and in the products of innovation is key for the future acceptance of such inventions and discoveries.

For example, in the field of materials science, novel biomaterials to replace cardiac tissue and nanomaterials designed to fend off cancer cells are currently being developed. There are also a myriad of opportunities offered by 2D materials, such as graphene, due to the unusual electronic and mechanical properties of this one carbon atom thick layer.

As part of the process, developing strategic partnerships with trusted bodies and advisers is an important emerging trend in science policy at the international level. This is because accurate, impartial advice is needed before novel applications of research can be more widely used. For instance, "we've partnered with the National Physical Laboratory to make progress on standards in graphene technology, and are working to remove this potential barrier to bringing it to market," says James Baker, business director at the National Graphene Institute in Manchester, UK who will be involved in the ESOF session on "Driverless cars and quantum computers: when disruptive

technologies meet regulation."

When the material concerned is as complex as graphene, the legislation covering its manufacture, use and disposal needs to be detailed enough to be effective. This suggests that new materials need new standards. "Standards are a key enabler to commercialising innovation like graphene," says Baker.

Policy thus can come into play when the fruits of research is about to reach the market. "People in the industry need to be assured that products are safe and effective, across applications," says Baker, "and this means developing standards that are trusted and relevant."

Getting the biggest picture

The development of channels and platforms for engagement between different stakeholders is another interesting ongoing topic in science policy.

Take, for example, the [Square Kilometre Array](#) (SKA). It will be the largest radio telescope ever developed. In addition, it will boast a resolution over 50 times greater than the Hubble Space Telescope. Currently being built at sites in Australia and South Africa, the SKA relies on a global team from over 100 organisations and more than 20 countries.

The SKA Organisation, based at the University of Manchester's [Jodrell Bank](#) in the UK, coordinates this international work. "Projects like the SKA bring together a mix of scientists and government representatives who might not normally collaborate at this level," says Simon Berry, director of policy development at the SKA Organisation. The SKA project will be discussed in the ESOF2016 session on 'Big projects – going beyond the realm of science' featuring, among others, the director general of the SKA Organisation.

With projects at this level, collaborating at such a scale is not always straightforward: "We need to balance the legitimate agendas of the more traditional nations with the newer members of the astronomy community, while trying to meet a huge science and engineering goal at the same time – it's an exciting challenge!"

Whether carrying out such cutting edge research as the SKA, enabling better responses to emerging science and technology-related challenges like EASAC or bringing innovations to the market, policy-makers are increasingly involved in scientific and technological progress. Their role is to give such advances a suitable framework. More than ever, the decisions hinge on balancing available evidence brought by researchers with political and societal pressures.

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