Six recommendations for early-career professionals to join work at the science–policy interface: collective experience from academic, governmental and NGO scientists

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In February 2022, at the fifth session of the United Nations Environmental Assembly (UNEA-5), countries agreed to establish a new intergovernmental science–policy panel on chemicals, waste and pollution prevention. This development marked a historical point that the three planetary environmental emergencies, climate change, biodiversity loss and pollution, have or will soon have dedicated science–policy interfaces (SPIs). Interested scientists, particularly those in their early careers, are increasingly asking one question: "Aside from writing papers, what else can I do to help?"

Scientists conduct research to understand the threats the society is facing and mitigation options. However, the levers for change are rarely in the hands of scientists. In addition to publishing papers, applying the scientific expertise and research to support policy making is critical to drive positive change. SPIs enable such engagements. Examples include dedicated intergovernmental bodies, such as the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Scientists and policymakers also interface at intergovernmental organisations, multilateral conventions, and their scientific advisory bodies. Likewise, the UN Decade of Ocean Science for Sustainable Development provides a new framework for working across the SPI to strengthen ocean management. Additionally, some individuals can become SPIs in their own right by championing two-way dialogue and enable collaboration with their counterparts in the other community.

As co-authors we have all developed our careers after our PhDs working at various SPIs, approaching from different angles in academia, government and civil society. For example, Mengjiao and Zhanyun have been active since early on in bringing scientists' perspectives into the SPI discussion that has led to the aforementioned agreement by countries at UNEA-5. We have benefited from working with each other, improving our understanding of how to best engage at the SPI and champion the role of science in decision making. We would therefore like to share six recommendations drawing on our first-hand experience to support our fellow scientists who would like to engage more at the SPI to drive positive impacts, particularly on the interlinked triple global environmental threats of climate change, biodiversity and pollution.[1]

Shift the mindset: Working at the SPI is enriching, rather than distracting

With a few notable exceptions like IPCC, working at the SPI is still not necessarily well-recognised by academic institutions. For a while, working at the SPI on top of your daily academic research may feel like you are performing two jobs at once, especially for academic scientists. Thus, it may be misconstrued as a distraction from fulfilling requirements for advancing scientific careers like publishing papers.

Experience tells us quite the opposite. Understanding the evidence needs of policymakers and engaging them early can help develop more action-oriented research with greater impact to support decision making. Most importantly, SPI work brings new perspectives and inspiration for novel research directions and provides opportunities to meet like-minded colleagues out of one's immediate academic circle. For example, Zhanyun was inspired by the observed gaps between policy and scientific developments in the Stockholm Convention's implementation. He consequently organised an international team of scientists and regulators that he met at these meetings to develop a study series to inform scientists about policy needs under the Stockholm[2] and other Conventions. Working at the SPI can be time-demanding, but definitely worth it.

Proactively seek out entry opportunities to work at the SPI

Engagement opportunities vary around the world. At a national level, you can seek out opportunities to respond to government consultations. Chris first engaged with policy as a post-doctoral researcher by responding to a call for evidence on microplastics from the UK Government's Environmental Audit Committee. This provided the insight and experience that would help him later secure his current role as a government scientist.

Internationally, various calls for evidence, experts, submissions and peer review can be found through the websites of international organisations, conventions and SPI bodies. Through these websites, you can also identify the corresponding National Focal Points and contact them to offer expert support. That's how Zhanyun started his active participation in SPI work. When he saw the nomination of perfluorooctanoic acid (PFOA) under the Stockholm Convention, on which he completed his doctoral study, Zhanyun contacted the Swiss national focal point. This was welcomed, and they jointly initiated a working document tailored for the negotiation as an outcome.

Alternatively, you can check the participant list and/or accreditation list of a policy meeting, and get in touch with organizations (e.g., an NGO or a UN major group) that share your interests to bring you into the process, e.g., as part of their delegation. Some academic institutions have obtained their own accreditation status (e.g., under the UN Framework Convention on Climate Change) to better engage in the SPI work.

Embrace complexity and consider how you communicate science to non-experts with influence

International policy-making is achieved, in most cases, through working with a broad portfolio of stakeholders with its own set of challenges. The discussion and interventions could be mainly diplomatic and political rather than purely technical, even during some of the supposedly technical meetings. It is therefore often difficult to identify the most important factors driving the negotiation. Additionally, the processes are always highly dynamic with short time windows to react. Such complexity and the unfamiliar policy and diplomatic languages may look daunting to scientists at the beginning, but experience and training will help you overcome these challenges.

There are a handful of materials[3,4] making good cases on why and how to improve scientists' communication with policy makers, including the Handbook for IPCC Authors.[3] The Handbook suggested practical strategies and principles, *inter alia*, to know your audience, to pick your moment, lead with what you know, and connect to what matters to your audience. In short, incorporate the "policy relevance." As policymakers are not always technical experts, be succinct, reduce technical complexity, avoid jargons, and place the issue in the relevant policy context where possible.

Preparing written documents, such as policy briefs, helps organise your thoughts to provide concise and evidence-based messaging to policy makers. To maximize the impact, developing your network can enhance the opportunity of your insights and research to reach policy makers and other decision makers.

Develop your network, build rapport and champion science as a community

A good place to start connecting with government representatives, building rapport and developing trust is during meeting breaks when you can speak more casually. Inform them of your expertise, research and interest in assisting them in policymaking. Use these interactions to also learn about their policy drivers and evidence needs. Becoming a scientist in a policymaker's contact book opens the door for longer-term engagement opportunities when they need expert advice. Whilst representing the UK at the Organisation for Economic Co-operation and Development (OECD), Chris built a network of scientists that he could call upon to review documents, provide expertise, and to join expert groups on UK's behalf.

Similarly, continue building academic networks with those working in this space and engaging with established SPI networks. The UK Universities Climate Network (https://uucn.ac.uk), for example, was established to ensure academic scientists' role in supporting the integration of science and policy on climate change. Likewise, the Universities Policy Engagement Network (https://www.upen.ac.uk) is a community of UK universities committed to increasing the impact of research on policy. Learned societies such as the

Royal Society and the American Association for the Advancement of Sciences (AAAS) also advocate for science in policy.

Building your network will also provide yourself with guidance and support, on professional aspects and also mental and emotional ones, helping you navigate the SPI and deliver you from a low ebb when things get tough.

Seek out training and learn by doing

Once identified an entry opportunity, developing experience at the SPI is a case of learning on the job, but there are a number of training opportunities available to support you. To begin, you could examine your strengths and development areas by consulting guidance such as the Skills Map for Evidence-informed Policymaking (https://ec.europa.eu/jrc/communities/en/community/evidence4policy). Take some time to better understand national and multi-national policies, for example, by reading the UK's 25 Year Environment Plan, the EU's Green Deal, or the outcomes of UNEA-5. Understanding the big picture and overarching objectives of policymakers facilitates your SPI work.

For many multilateral environmental agreements, introductory courses are available on the learning platform provided by InformMEA learning platform (https://elearning.informea.org/course) and the UN Institute for Training and Research (UNITAR) (https://www.unitar.org/free-and-open-courses). The S4D4C project's European Science Diplomacy course (https://www.s4d4c.eu) is a free online course that can help you to understand working at the interface not just of science and policy, but also of diplomacy. The AAAS and the World Academy of Sciences (TWAS) run an annual summer course on science diplomacy (https://www.aaas.org/program/center-science-diplomacy/training), which encourages the application of those from least developed countries.

You may also consider exploring opportunities to join policy teams on placements through your network and through your own institutions or funders. These are valuable ways of developing an understanding of the needs and 'languages' of the policy profession to help you achieve impacts through SPI.

At the end of the day though, it is best to just take the plunge and get involved in the meetings themselves – read their meeting documents and understand their agendas, the hot topics, the rules of procedure, the language of discussions, meeting etiquette, and the style of negotiations, to build up to a point where you are confident in actively contributing. This is becoming increasingly accessible as some negotiations are

live-streamed. If you can join a delegation, look to your more experienced colleagues for guidance and mentorship in developing your understanding and making your contribution. After the meetings, reflect on lessons learned and what you would do differently next time.

Raise awareness of the science-policy interface work

Apart from working at the SPI, it is also critical to constantly raise awareness about your work to your institution's management, as well as your peers both inside and outside the institution e.g., through internal seminars and social media. Increasing the visibility and recognition of your work, it would also catalyse management's understanding of and support for SPI work in general, as well as attract more peer scientists to join this niche but much needed space. MIT has established an office in Washington D.C. since 1991 to maintain a constant flow of information between scientists on the MIT campus and policymakers in Washington,[5] showing that work at SPI can be appreciated and supported by academic institutions.

Time to act is now

Rewarding, eye-opening, and with potential to deliver positive impacts, the SPI journey to get there can be nonetheless lengthy and bumpy, and test our patience. Society is at a key crossroad of history, with enormous and interlinked environmental challenges right in front. As scientists who value the common good and endeavour to bring positive impacts to the Earth and society, it is time to not only conduct research, but also actively engaging in the science–policy interfaces. Let's keep humble, patient, resilient and united.

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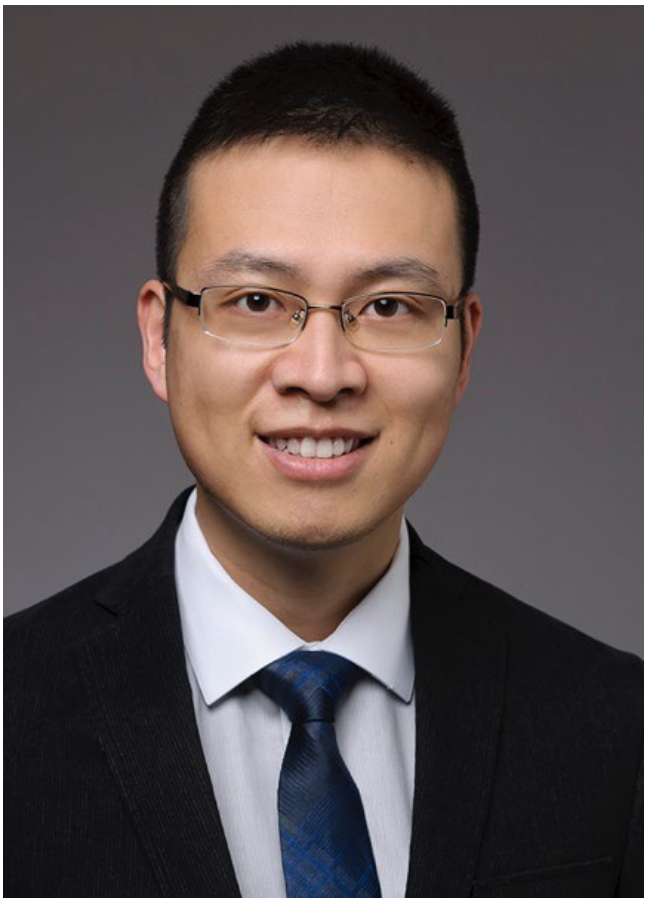
Dr. Christopher Green is a scientist embedded in policy teams at the UK Government's Department for Environment, Food and Rural Affairs (Defra). He spent four years in the International Chemicals Team where he represented the UK at the Organisation for Economic Cooperation and Development (OECD). He led the Secretariat of the Hazardous Substances Advisory Committee to provide independent scientific advisory to chemicals policy teams and is now the policy lead for the UN Decade of Ocean Science in the International Marine Team.



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