

Science Advice Consultation

Innovation and Research Organisations and Programmes
Department of Further and Higher Education, Research, Innovation and Science

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To Whom it may Concern

The Environmental Protection Agency (EPA) welcomes this opportunity to provide feedback and to contribute to the public consultation on sourcing science advice in Ireland. The EPA supports the newly created dedicated Evidence for Policy function within the Department of Further and Higher Education, Research, Innovation and Science. We are also fully supportive of the Mission of the Civil Service Renewal 2030, namely “To offer objective and evidence-informed advice to Government, respond to developments, and deliver Government objectives while striving to achieve optimal outcomes in the long-term national interest.”

One of the strategic outcomes detailed in the EPA’s Strategic Plan 2022-2026¹ is to be an effective voice for Ireland’s environment, and trusted as an independent and transparent source of environmental evidence and information. In this regard, a priority for the EPA is to get the best available environmental science to decision-makers when they need it and in a format that is useful.

Common challenges persist across all levels of scientific advice provision including the environment: how to protect the independence of advice while ensuring that it is listened to; how to develop a trusted relationship with policymakers, while maintaining transparency and accountability in the eyes of the public and the science community alike; and how to undertake appropriate quality assurance.

The main points associated with the EPA’s submissions on sourcing science advice in Ireland is highlighted here and expanded in further detail below in answer to the specific questions.

- Science advice must build on existing structures to leverage existing expertise and capacity across the public service and to avoid duplication.
 - In particular, the EPA has a legislative basis to provide scientific advice to Ministers of the Government on key environmental challenges including climate change, water quality, air quality, reducing exposure to radon and chemicals.

¹ <https://www.epa.ie/publications/corporate/governance/epa-strategic-plan-2022---2026.php>

- In this capacity, the EPA regularly provides scientific advice to policy makers drawing on our knowledge of the environment which is derived from our monitoring, assessment, regulation and enforcement roles.
- In establishing new science advice structures in Ireland, it will be important to leverage and avail of such scientific capacity already built up within the wider public service in Ireland.
- Sourcing science advice often relies on relationships between science and policymaker communities. These relationships, built on trust, are important. However, we also need structures, procedures and competencies to support the systematic use of science for policymaking which will strengthen policy development
- Science advice should be sourced from a multi-disciplinary and cross-sectoral group of science advisors. The new structures should include relevant transdisciplinary actors including both soft and hard sciences.
- In sourcing science advice, non-scientific experts and civil society stakeholders should be engaged in framing and/or developing advice to build trust in the science advice structures and processes
- The EPA has a wide range of examples of how evidence and science effectively supported environmental policy across, for example, climate change, air policy, waste prevention and radon control. Specific references are provided below and further information is available if required.
- Sourcing science advice should include strengthening and consolidating ex-ante impact assessment and ex-post policy evaluation in relation to environmental and health implications.
- In relation to mobilising existing resources, mechanisms should be put in place to facilitate greater access to the data essential to the modelling, between and by Government Departments and public agencies within the science advice structure. Systems and processes for timely data collection, access and analysis, and modelling techniques to integrate different data types are also required.
- Effective engagement with science advisory structures requires resources to build capacity to use scientific evidence. This will require funding for effective science-policy interfaces and activities at a national level.
- In relation to linking with EU processes and structures, the EPA has responsibility for coordinating Ireland's participation in the European Environment Agency's country network called the European Environment Information and Observation Network (EIONET). We see a strong potential to link national science advice processes, related to the environment, with these EU structures. This would make use of the potential in the pan-European network for sharing best practice and learnings related to the science-policy environmental ecosystems. Particular areas of focus for the EEA networks that may provide learnings in Ireland include horizon scanning, foresight and uncertainties analysis

Please find enclosed the responses to the Public Consultation questions. We would welcome the opportunity to discuss/contribute further in the process of setting new science advice structures in Ireland.

Yours faithfully,



Dr. Eimear Cotter

Director of the Office of Evidence and Assessment

Question 1

How should science advice fit into the overall policy process, including the broad reform agenda (such as the generation of evidence for policy, and strengthening policy development and foresight in the public service)?

The EPA makes a number of points in relation to how science advice should fit into the overall policy process including the broad reform agenda.

- Sourcing science advice must build on existing structures leveraging existing expertise and capacity within the public service. The EPA has a legislative basis for providing scientific advice to Ministers of the Government on key environmental challenges including climate change, water quality, air quality, reducing exposure to radon and chemicals. In this regard, we regularly provide scientific advice to policy makers in Governmental Departments and State Agencies based on our expertise, evidence and research. It will important to leverage this knowledge and expertise built up over many years and not duplicate it.
- Currently, advice or input into policy development in Ireland tends to rely on the strength of relationships with relevant Government policymakers rather than on formal or public structures. Whilst strong working relationships between scientific/technical communities and the policy sphere are critical, the new science advice mechanisms should establish structures, procedures and competencies to support the systematic use of science for policymaking.
- Science advice should be sourced from a multi-disciplinary and cross-sectoral group of science advisors. The new structures should include relevant transdisciplinary actors including scientists and policymakers. Consideration should also be given how to engage non-scientific experts and civil society stakeholders in framing and/or developing advice to build trust in the science advice structures and process².

Overall, it is critical to:

- Clearly define the remit, roles and responsibilities of the science advisors.
- Certify their independence and autonomy.
- Ensure the transparency and openness of their processes.
- Stress that they act as honest brokers, not advocates.
- Recognise the limitations to interpret and use scientific claims.
- Underline that the advice given should be sound, unbiased and legitimate.

In addition, the structure should also allow for advice to be provided even when not sourced/requested by the policy sector. This is particularly relevant when the policy agenda is at the setting stage of the policy process, where science advice could contribute to raising the awareness and giving priority of an issue. “The evidence needs here are in terms of identifying new problems or the build-up of evidence regarding the magnitude of a problem, so that relevant policy actors are aware that the problem is indeed important. A key factor here is the credibility of evidence but also the way evidence is communicated defining the question (come from policy or from advisors themselves)” (Ní Cheallacháin et al., 2013)³.

² <https://www.oecd.org/coronavirus/policy-responses/providing-science-advice-to-policy-makers-during-covid-19-4eec08c5/>

³ https://www.epa.ie/publications/research/communicating-research/133_AquaTT_Interactive.pdf

Scientific advice should also clearly include an assessment and clear communication of uncertainties (or probabilities). Transparency in scientific advisory processes is of the utmost importance. As far as possible, scientific advice and associated evidence should be made publicly available in a timely manner.

For reference, the OECD⁴ sets out the science advice process as:

1. Framing of the question
2. Selecting the advisors
3. Producing the advice
4. Communicating and using the advice

Assessing the impact of the science advice could be the fifth step but is often over-looked.

In addition, advice qualities are reflected in the EPA published principles for our evidence (and advice) services ([Governance | Environmental Protection Agency \(epa.ie\)](#))

Question 2

What examples and experience do you have where advice has been effectively sourced and applied?

A 2019 OECD Review of the EPA included the following examples where advice has been effectively sourced and applied:

- The EPA's National Waste Prevention Programme, which is delivered by the EPA through partnerships with local authorities, regional waste offices, government agencies and public bodies as well as sectoral groups and bodies. [NWPP research project Circular Economy NWPP](#) ;
- Development and implementation of the National Radon Control Strategy and through this, the EPA has undertaken a range of campaigns and activities to minimise the exposure of members of the public to radon gas in their homes and workplaces. [National Radon Control Strategy \(epa.ie\)](#)

EPA-funded research across the higher education sector, which includes the involvement of policymakers in the design of the research question (pre-award) and post-award monitoring of the projects, provides several examples and experience where science advice was efficiently and effectively sourced and applied, e.g.:

- The Joint Research Programme on Unconventional Gas Exploration and Extraction (UGEE), which was managed by the EPA on behalf of three departments. This resulted on a ban on fracking in Ireland and Northern Ireland guided by the precautionary principle (<https://www.epa.ie/publications/research/ugee-joint-research-programme/ugeeisr.php>).
- There are approximately 500,000 domestic wastewater treatment systems (DWWTS) in Ireland. A series of EPA funded research projects on DWWTS led to formulation of Guidelines and Codes of Practices. It provided independent advice on how to properly operate a DWWTS. ([Water EPA Research Report 251](#); [Water EPA Research Report 253](#)). [2021 CodeofPractice Web.pdf \(epa.ie\)](#)

⁴ OECD (2015-04-20), "Scientific Advice for Policy Making: The Role and Responsibility of Expert Bodies and Individual Scientists", *OECD Science, Technology and Industry Policy Papers*, No. 21, OECD Publishing, Paris. <http://dx.doi.org/10.1787/5js3311jcpwb-en>

- The new Solid Fuels Regulations, agreed in July 2022 and which are extending the Smoky Coal ban to a full nationwide ban, were informed by the advice and evidence generated by two EPA-funded projects (i.e. SAPHIRE and AEROSOURCE) ([SAPHIRE EPA AIR Research Report 407](#); [AEROSOURCE EPA Air research report No.385.php](#)).
- The 2012 and 2018 National Climate Adaptation Frameworks (DECC) both drew on, and extensively referenced, national and EU research advices in their formulation. [2012 - National Adaptation Framework](#) ; [2018 Adaptation Framework](#)

Question 3

What examples and experience do you have where advice could be more effectively sourced and applied?

The European Environment Agency published a report in 2001 entitled “Late lessons from early warnings: the precautionary principle 1896–2000”⁵ which provides interesting and relevant information in the context of answering this question.

Late lessons from early warnings is about gathering information on the hazards of human economic activities and taking action to better protect both the environment and the health of the humans and ecosystems that are dependent on it, and then living with the consequences. An extract of the conclusions is copied below:

“The case studies reviewed in this book show that there is much that can be learnt from history. Such learning begins with two basic observations:

- Regulatory appraisal and control of technologies and economic development involves balancing the costs of being too restrictive on innovation with the hazards and costs of being too permissive, in situations of scientific uncertainty and ignorance. The case studies provide many examples where regulatory inaction led to costly consequences that were not — and sometimes could not have been — foreseen.
- The case studies also provide many examples where ‘early warnings’, and even ‘loud and late’ warnings, were clearly ignored; where the scope of hazard appraisal was too narrow; and where regulatory actions were taken without sufficient consideration of alternatives, or of the conditions necessary for their successful implementation in the real world.”

Within the new approach to sourcing science advice in Ireland, the EPA recommends including a mechanism to support horizon scanning, foresight and uncertainties. Within the environmental domain, there are cross European networks of experts being established by the European Environment Agency and Member countries to share policy practice on foresight. We would recommend that a national network be established to draw from these learnings and apply them in a national context (see EPA coordinated EIONET arrangements <https://forum.eionet.europa.eu/>)

Whilst the skills for *ex-ante* economic assessment for policy intervention are reasonably robust, these skills are less well developed in relation to environmental and health implications. Moreover, it would seem that there is inconsistency in the application of *ex-ante* assessment across the policy domains leading us to suggest that capacity building in these aspects would benefit and would facilitate the timely application of scientific advices.

⁵ https://www.eea.europa.eu/publications/environmental_issue_report_2001_22

Another insight that flows from the EU ‘Late Lessons from Early Warnings’ report is that we are poor in Ireland at *ex-post* analysis in relation to previous policy interventions. There are important roles for science advices in relation to *ex post* analysis and this will should lead to better future, or follow-on, policy initiatives and their implementation.

Question 4

How could any existing sources be better mobilised?

Any new science advice structure should build on existing structures leveraging existing expertise and capacity within the system. In order to ensure a cross-departmental approach (whole-of-Government) - this should be coordinated centrally, utilising the advisory expertise and experience within the relevant Departments and State agencies.

Mechanisms should be put in place to facilitate greater access to the data essential to the modelling, between and by Government departments and public agencies within the science advice structure. Systems and processes for timely data collection, access and analysis, and modelling techniques to integrate different data types are also required.

One could consider the development of Knowledge Hubs on specific topics, which would act as:

- A platform for sharing scientific knowledge
- A structure for integration of research findings and data
- Provision of authoritative information and assessments to:
 - o Determine progress in development of scientific understanding
 - o Inform policy, decision making and actions
- A primary source of information and key communications tool

The key components could include:

- Development of scientific understanding
- Data collection, analysis and communication
- Stakeholder engagement and support systems
- Science-policy-practice

In addition, we must ensure that all relevant stakeholders are involved in the process - connecting with other innovators in the wider ecosystem (i.e. outside the public sector) – including academia, industry, enterprise, and research bodies; engaging and working in new partnerships to support objective, evidence-based policymaking.

Question 5

What kind of individual skills and competencies do science advisors, scientists, and government officials need to develop to effectively populate/engage with science advisory structures?

Effective population and engagement with science advisory structures requires resources to build capacity to use scientific evidence. This will require funding for effective science-policy interfaces and activities at a national level.

The EC Joint Research Centre 2017 paper on skills for evidence-informed policy making⁶ provides a very relevant answer to this question which are summarised below:

- Understand Policy & Science, understand the key drivers of the policy process and anticipate what evidence will be needed in the future.
- Have good interpersonal skills which is essential to building trust and solving problems that occur in creating and applying knowledge to policymaking.
- Ability to synthesis research.
- Manage collaborative expert communities by developing networking and facilitation skills.
- Effectively communicate scientific knowledge. The communication of research to a non-scientific audience requires effective communication skills, using content-related tools like infographic design, succinct writing, public speaking and data visualisation tailored to the audience.
- Translate the evidence to advise policymakers, helping them to understand the impact of policy choices.
- Engage with citizens and stakeholders
- Monitor and evaluate the impact of research evidence on policymaking is a specific skill needed to continuously improve the impact of evidence on policymaking.

A useful source of information relating to the skills and competencies needed for various stakeholders in this space is the 2021 JRC publication Values and Identities - a policymaker's guide.

[JRC Publications Repository - Values and Identities - a policymaker's guide \(europa.eu\)](#)

The report contains important insights for policymakers to adapt their work to the challenges of our time, including a dedicated toolbox section. The scientific review and toolbox are complemented by findings from a dedicated Eurobarometer on Values and Identities commissioned for this purpose

Question 6

How can we make sure that citizen involvement, public trust and experience-based knowledge is included in any science advisory structure?

It is important that citizens are included in any science advisory structure at a number of levels.

According to the 2015 OECD report on Scientific Advice for Policy Making⁷:

A number of advisory bodies have gone one step further and included within their expert committees some representatives of civil society, including stakeholder groups (industry organisations, consumer associations) and lay persons. A clear distinction should be made between stakeholder groups - including NGOs - which represent specific views from civil society, and laypersons, who are expected to represent the broader public. Stakeholder representatives are often 'experts' in their own right and may also be scientists. They make an important contribution on science policy advisory structures in some countries (such as the Mexican

⁶ <https://ec.europa.eu/jrc/communities/en/community/evidence4policy/news/framework-skills-evidence-informed-policy-making>

⁷ OECD (2015-04-20), "Scientific Advice for Policy Making: The Role and Responsibility of Expert Bodies and Individual Scientists", *OECD Science, Technology and Industry Policy Papers*, No. 21, OECD Publishing, Paris. <http://dx.doi.org/10.1787/5js3311jcpwb-en>

Consultative Forum on Science and Technology) and in areas such as health. In these and other areas they can play a role in providing early warning of the potential socioeconomic impacts of policy recommendations.”

Question 7

How can the Irish system be better-connected to EU and EU-27 science advice processes?

The European Environment Agency (EEA) along with its country network called the European Environment Information and Observation Network (EIONET) underwent an extensive modernisation process in 2021 with the following aim: *EEA and EIONET will together constitute the leading network for policy-relevant environment and climate knowledge at European Union and Country levels.* The EIONET network is now structured to better respond to urgent environmental challenges and opportunities through knowledge exchange, use of data, and use of new or emerging technologies.

The EPA has legal responsibility for coordinating Ireland’s participation in the EEA-EIONET and we see a strong potential to link national science advice processes, related to the environment, with these EU structures. This would make use of the potential in the pan-European network for sharing best practice and learnings related to navigating the science-policy interface related to environment challenges and the ambitions of the European Green Deal. We would be happy to engage with DFHERIS further in this regard.

Furthermore, greater connectivity with the EU and EU-27 science advice mechanisms will be enabled by first mapping our own system, using a common typology of organisations providing scientific advice and typology of advisory functions. The typology described in the 2022 European Commission JRC Final discussion paper on Science for policy in Portugal⁸ is a possible starting point.



⁸ Simões, V.C., *Science for policy in Portugal*, Melchor, L. and Krieger, K., editor(s), EUR 31023 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-49470-6, doi:10.2760/88096, JRC128856