Knowledge in a world of transformative change
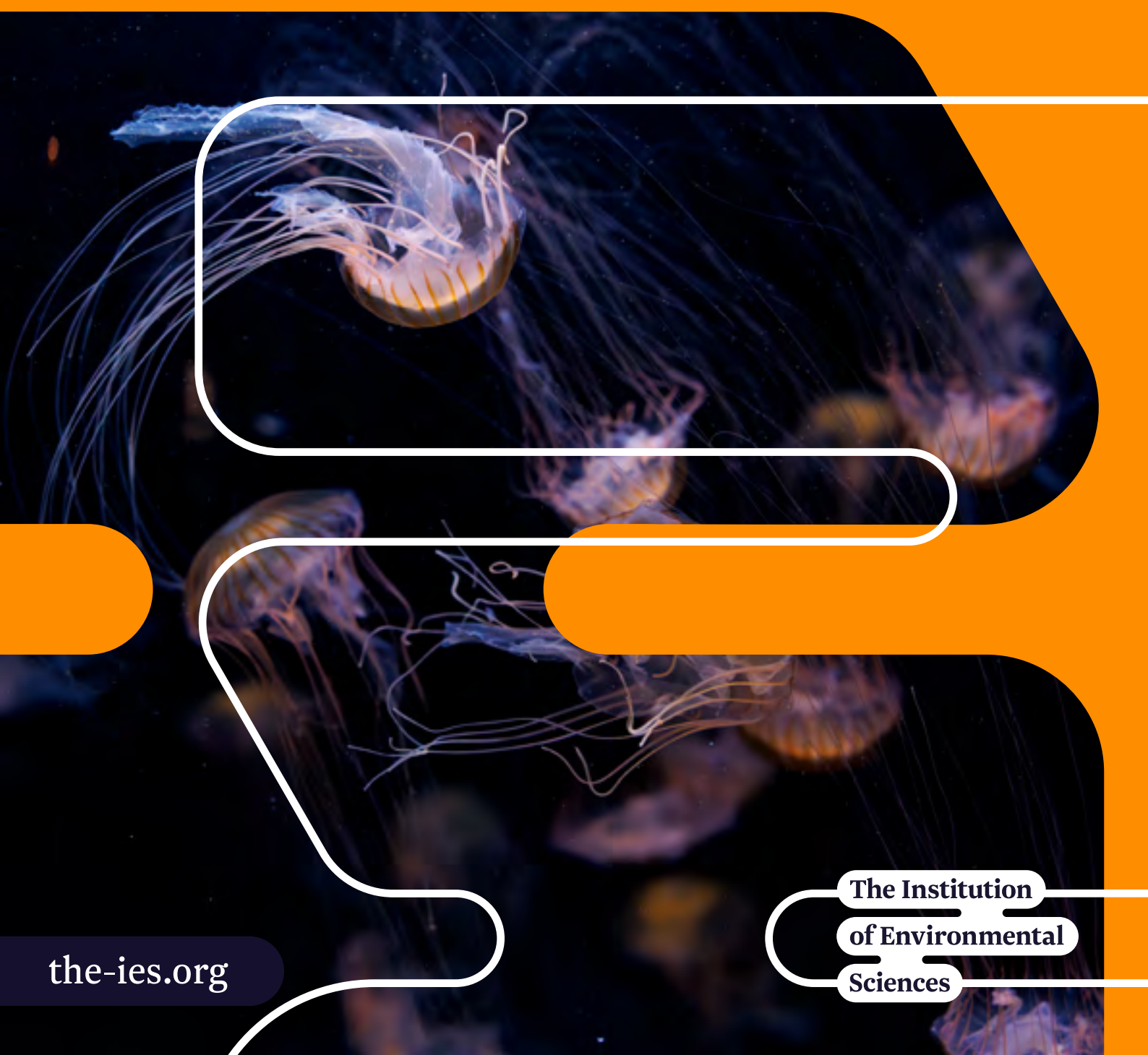
Transformative evidence-informed action for the environment: What do we need to know?

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The Institution of Environmental Sciences

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About the Institution of Environmental Sciences

The Institution of Environmental Sciences (the IES) is at the forefront of uniting the environmental sciences around a shared goal: to work with speed, vision and expertise to solve the world's most pressing environmental challenges, together.

As the global professional membership body for environmental scientists, we support a diverse network of professionals all over the world – and at every stage of their education and careers – to connect, develop, progress and inspire.

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Executive summary

Throughout 2024 and early 2025, the IES engaged in a thematic project exploring the role of knowledge in supporting evidence-informed policy.

The project resulted in several outcomes, including the publication of two reports and a collection of case studies, several discussion events, and extensive analysis on the role of knowledge in environmental policy.

This report brings together the insights from each of those outcomes through a series of reflections on how they contribute to the overall goal of supporting evidence-informed policy.

Ultimately, six components of how knowledge can inform evidence-informed policy:

1. Through worldviews and different forms of knowledge

2. Through evidence that helps us to understand the world and what we know about it

3. Through processes and what we know about how policy making works in practice

4. Through technology and the tools we can use to enhance our knowledge

5. Through understanding the barriers to evidence-informed policy and the roles knowledge can play

6. Through communication and the transfer of knowledge from one person or group to another

When combined, these six components support a concept of transformative evidence-informed action: the means through which knowledge can leverage multiple aspects of the systems underpinning policy and societal change.

To support those seeking to adopt this approach, the report concludes with six 'frames' which can be used to access a more transformative approach to knowledge, each arising from a combination of two of the above components.

Knowledge is an essential element of transformative change. Facing linked and complex environmental crises, we must make full use of it to bring society forwards into a future with thriving people, a healthy economy, and a flourishing environment.

Background

Through our work in policy, the IES hopes to unite science and people to resolve environmental challenges.

Our membership of environmental scientists spans a range of disciplines: from climate to clean air, from water to land condition, and from nature to the built environment. At the IES, we recognise that our members have a lot to say, with the potential to make a big difference in the world of policy.

To support our members as agents of change, we also seek to create and sustain a knowledgeable, skilled, diverse, and trusted environmental profession engaged in the transformation to a sustainable society.

At the heart of that goal is knowing what our members need to know to play a part in evidence-informed action on the environment.

This report addresses that challenge directly, bridging the gap between our vision for the future of environmental science and practical answers to the questions facing IES members engaged in the world of evidence-informed policy.

It is the culmination of a year-long project to address the role of knowledge in environmental policy, bringing together the outcomes of a 'deep dive' research process, two reports, and three panel discussions.

Context

Over recent years, several critical opportunities and challenges have arisen for knowledge and the interface between science, the public, and policy.

Increased opportunities for evidence sharing and knowledge exchange, both within academia and beyond research communities, have fostered a culture of evidence-informed decision making.

Internationally, landmark reports, such as those produced by the Intergovernmental Panel on Climate Change, have produced real change through policy. At the national level, the Nurse Review of the Research, development and innovation landscape has also offered opportunities to improve the future of evidence use in UK policy.

There are also challenges. In the aftermath of the COVID-19 pandemic, the use of science by governments became highly normalised, yet views of experise are also very polarised. This is particularly stark for environmental policy, where decisions face a high degree of politicisation.

The IES plays a unique role within the broader landscape of knowledge and evidence-informed policy making. As a professional body, our members have on-the-ground experience of policy implementation and the state of the environment.

As a member of the Science Council and the Society for the Environment, we play a role in setting standards for the profession and we sit at a crucial nexus point between science and the environment.

Through the Community for Environmental Disciplines in Higher Education (CEDHE), which serves as our education community, the IES manages the largest environmental programme accreditation scheme in the world. We give expert perspectives in the media, we are a UNFCCC admitted observer NGO, and we maintain good relationships with parliamentarians, civil servants, and arms-length bodies.

As a result, the IES has strong links into professional practice, policy making, and academia, playing a crucial boundary role in the generation and exchange of knowledge.

Vision for the future

In 2023, the IES undertook a year-long horizon scanning and foresight project, Future of ES23, working with hundreds of

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>
> Ethny Childs and Joseph Lewis
> Transforming the Planet: Our vision for the future of environmental science

environmental professionals to explore the future of environmental science.

The project consisted of more than 20 dedicated events, over a dozen articles and detailed reports and briefing papers on a few key topics. Over the course of the year, the project explored a total of 661 themes, with more than 1300 connections identified between them.

The project culminated in the publication of 'Transforming the Planet: Our vision for the future of environmental science'. The report sets out a vision for a positive future that can be achieved through coordinated action:

"This is our vision for the future of environmental science. It is one where environmental scientists are knowledgeable, skilled, diverse, trusted, and engaged in the process of transformation.

It is one where people have access to the relevant science to help them solve environmental challenges and co-create a sustainable society where people and nature thrive."

As a custodian for that vision and the positive future it could help to achieve, the IES has continued to work to realise the success factors that will determine whether or not it becomes a reality.

The vision fed directly into our most recent organisational strategy and also supports our Theory of Change by identifying how the IES can effectively engage with our members, policy makers, the public, and education institutes.

With regards to knowledge, several key challenges emerged from our vision for the future:

1. The need for a breadth of perspectives across the environment sector

2. Challenges for consolidating evidence and data to support decision making

3. The translation of increasing recognition of the need for interdisciplinarity and systems thinking into practice, particularly in the context of policy

4. The increasingly ubiquitous role of technology across the environment

5. Challenges for evidence-informed policy in the face of increased politicisation and uncertainty

6. Pressing skills needs across the environmental sciences

Thematic knowledge project

Over the year following the release of the vision, the IES has undertaken a thematic project around the role of knowledge in supporting evidence-informed policy, aimed at addressing some of these challenges and facilitating progress towards the vision.

The Institution's External Policy Advisory Committee engaged in initial discussions, setting out a programme of activities to support a thorough exploration of the theme. As a result of those discussions, six scoping questions emerged as a frame of reference for the thematic project:

1. How can we integrate different understandings of knowledge and the world, including historically underrepresented sources of knowledge?

2. Do the environment sector and the public have sufficient access to accurate and relevant data to inform policy decisions?

3. What do we know about successful policy design, delivery, and evaluation and how can it support future engagement with policy?

4. How can we ensure the technological development increases knowledge in useful ways?

5. How do we promote access to knowledge in the face of politicisation, political uncertainty, and misinformation?

6. How do we make knowledge accessible to the public and how do we communicate complex knowledge?

Over the last 16 months, the knowledge thematic project has sought to uncover answers to these questions across several work-streams:

- A 'deep dive' research project and working group focused on challenges around evidence-informed policy and data accessibility

- A report: 'An evidence-informed environment' summarising the outcomes of that research

- Three panel discussions examining specific issues:

  - Green skills: Priorities, challenges and delivery (hosted in partnership with Green Alliance)

  - Future generations and young voices for the environment

  - Technology and the environment

- Two articles with analysis on the social and cultural context in which knowledge operates:

  - Two perspectives on ways of knowing and being

  - Access to knowledge in a world of uncertainty and politicisation

- A collection of ten case studies for effective engagement with environmental policy: 'Speaking up for science: Case studies for environmental policy'

While each of these work-streams produced its own outcomes, they also all contributed to addressing the overall thematic questions identified above.

Figure 1. Elements of knowledge for transformative evidence-informed action

Human element of knowledge

Knowledge for societal change

How we understand the world

Communication skills & strategies

Barriers to knowledge

Worldviews

Transformative evidence-informed action

Use of technology

Evidence about the world

Knowledge of policy processes

Operating conditions within which knowledge exists

Knowledge for policy change

Tools to facilitate how we use knowledge

Figure 1 sets out the six components of the knowledge landscape identified throughout the thematic project: Worldviews, evidence, process, technology, barriers, and communication. It clarifies how these components can be combined into pairs that produce frames of understanding to leverage knowledge towards the aim of achieving transformative evidence-informed action on the environment. This is outlined in more detail in the next section.

Findings: What do we need to know?

At the conclusion of the project, we identified six components of the knowledge landscape which were particularly important for understanding how systems can be influenced to promote transformative change:

1. **Worldviews:** How people understand the world and the environment

2. **Evidence:** Evidence about the world that can be used to make decisions

3. **Process:** Knowledge of policy processes and how they can be used to create change

4. **Technology:** Knowledge of technology and how it can be used appropriately to make decisions

5. **Barriers:** Barriers to knowledge or how knowledge can be used, such as uncertainty, misinformation, or politicisation

6. **Communication:** How knowledge about the environment is communicated or shared

By combining these components in pairs, they produce frames which can be used to understand knowledge and how it can be leveraged.

1. **Worldviews & Evidence:** Ways that we can understand the world

2. **Evidence & Process:** Knowledge that can support policy change

3. **Process & Technology:** Tools to facilitate the use of knowledge

4. **Technology & Barriers:** Socio-political conditions within which knowledge exists

5. **Barriers & Communication:** Knowledge that can support societal change

6. **Communication & Worldviews:** Human elements that underpin people's relationship with knowledge

When taken together (see Figure 1), the six components present a more complete understanding of the interactions between knowledge, evidence-informed policy, and transformative change. Utilising the frames of reference and the components themselves, a more systemic approach to transformative evidence-informed action is possible.

In practice: Achieving transformative evidence-informed action

IPBES defines transformative change as "a fundamental, system-wide reorganisation across technological, economic and social factors, including paradigms, goals and values."

Transformative change is distinct from incremental change because it seeks transformation, rather than progress within the same basic system. It is distinct from atomistic change because it seeks to change a whole system, rather than any one element on its own.

In order to leverage change on a transformative scale, it should be apparent that both societal change and policy change will be necessary.

People will need to adjust their attitudes and behaviours to address economic and social factors, while policy makers will need to support action across the systemic levers that unlike system-wide reorganisation.

To that end, knowledge has a vital role to play in transformation. The ways that people understand the world and the evidence and tools we have to support decision making each significantly shape how we make decisions, so they will be a crucial part of driving change in society and policy simultaneously.

In that context, evidence, technology, and socio-political conditions can facilitate change or can become barriers to change, so understanding their role will be important for those trying to navigate the path to evidence-informed decision making.

Knowledge is clearly a complex system, but it is also a key leverage point for transformative change. Bringing together these six pillars provides a frame of reference that helps us to understand how knowledge can create change that is transformative.

Change can be most readily effected by applying each of these six framings of knowledge:

- Seeking change without recognising the ways people understand the world may lead to inertia, whereas embedding diverse worldviews and evidence into our approach to change works with the ways people understand the world.

- Applying knowledge to support policy change is the most reliable way to influence change through policy processes, particularly if it is backed by robust and credible evidence.

- Understanding what tools are available to facilitate the application of knowledge provides the strongest possible platform for creating change.

- Without understanding the socio-political conditions within which knowledge exists, that knowledge could be incorrectly applied or not fully leveraged.

- Applying knowledge to support societal change is the most reliable way to influence change through society, particularly if it is informed by the barriers that can prevent action.

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- Trying to effect evidence-informed change without recognising the human element to decision making may fail, whereas recognising a broader category of evidence and how to communicate about it is likely to be more effective.

By combining these six frames of reference and understanding each of the six identified core components of knowledge for evidence-informed policy, efforts to pursue transformative evidence-informed action are most likely to be effective.

"Knowledge has a vital role to play in transformative change … what we know will be a crucial part of driving change in the environment."

Other project outcomes

More information about the IES's thematic project on knowledge for evidence-informed policy can be found by reviewing the key outcomes from other work-streams within the project:

- **Worldviews:**

  - Article: 'Two perspectives on ways of knowing and being'

  - Panel discussion: 'Future generations and young voices for the environment'

- **Evidence:**

  - Report: 'An evidence-informed environment'

- **Process:**

  - Case studies: 'Speaking up for science: Case studies for environmental policy'

- **Technology:**

  - Panel discussion: 'Technology and the environment'

- **Barriers:**

  - Article: 'Access to knowledge in a world of uncertainty and politicisation'

  - Panel discussion: 'Green skills: Priorities, challenges and delivery'

Next steps and priorities for future action

The role of knowledge in facilitating evidence-informed action on environmental challenges will continue to be an important topic for future activities.

While this thematic project from the IES has produced several important outcomes, there are still areas for further exploration, which may warrant future projects to discuss.

One key priority for the environment sector will be to increase capacity for communication and public engagement.

This project was not able to explore fully the role that effective communication can play in creating transformative evidence-informed action for the environment, though it was clear that its role is substantial.

All environmental professionals will need to be better at communicating about science, policy, and the environment with a broad range of stakeholders.

The IES will be working with members to help develop communication skills, while continuing to examine the role that communication can play as part of the wider knowledge landscape.

Another priority area will be to formalise learnings around the use of knowledge and support skills development for practitioners, researchers, and policy makers.

The IES has committed to developing competency frameworks that reflect on core skills for all environmental professionals, with early pilots for air quality and land condition due to be produced before 2027. As the IES reviews and enhances the skills landscape for environmental scientists, these considerations will need to remain relevant.

Naturally, there are also likely to be consequences for policy advocacy: both in terms of what it means for how the IES and our members engage with policy makers, as well as informing recommendations to support better engagement between science and policy in line with what the project has identified as being particularly effective.

Through our work in policy, the IES hopes to unite science and people to resolve environmental challenges. What we know and what we do with that knowledge are both essential ingredients to uniting people to find those solutions.

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