Progressing or regressing:

The future of environmental science under new UK governance

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Contents

4 Executive summary

5 Introduction

6 UK environmental governance: how does the system work?

6 What is environmental governance?
7 What is the Environmental Improvement Plan (EIP)?
7 What is the Outcome Indicator Framework (OIF)?
7 What is the Environmental Principles Policy Statement (EPPS)?
8 What are the legally-binding environmental targets?
9 What are the interim environmental targets?
10 What are Arms-Length Bodies?
10 What is the Office for Environmental Protection (OEP)?
11 How is environmental research funded and developed?

12 Progress or regression: how has UK governance changed since 2016?

12 How does the EU system of environmental governance operate?
13 How has the UK replaced those systems since leaving the EU?
14 Regression in law – what does the Retained EU Law Act mean for governance?
14 Regression in kind – what has changed since the UK left the EU?
15 European Green Deal: comparing UK and EU environmental policy

20 Looking forward: a model for democratic reason and cooperative science

20 How can science inform decision-making?
21 How can we upscale solutions?

22 What next?

23 Appendix I: What does the EIP mean for environmental specialisms?

34 Appendix II: Outcome Indicator Framework
34 What indicators are covered by the OIF?
38 What equivalent UK indicators exist for the evidence covered by the EEA's Environmental Indicator Catalogue?

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About the Institution of Environmental Sciences (IES):

The IES is a visionary organisation leading debate, dissemination and promotion of environmental science and sustainability. We promote an evidence-based approach to decision and policy making.

We are devoted to championing the crucial role of environmental science in ensuring the well-being of humanity now and in the future.

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Executive Summary

Over the past 50 years, emerging environmental crises have made clear that the relationship between environmental governance, environmental science, and environmental outcomes is fundamental to creating the world that people wish to see. In the past decade, that relationship has been hollowed-out in the UK, leaving a chasm of uncertainty that divides society from many of the benefits that the environment can provide.

Since the UK voted to exit from the European Union in 2016, continuous efforts have been made by the UK Government to discover a new way to achieve environmental outcomes. The objective has been to establish a UK-specific regime that governs environmental policy, without regressing on the level of environmental standards provided.

The latest analysis from the IES provides a gap analysis on how much progress has been made towards replacing EU environmental governance systems with UK equivalents:

- Governance arrangements are in place to replace many of the functions of the EU's governance system, though governance gaps remain, both in the letter of the law – where the extent of the European Commission's level of authority is not replicated in the UK environmental governance – and in practice, where the regulatory capacity of UK oversight bodies and courts has not yet truly been tested;
- Most policies and proposals associated with the European Green Deal have corresponding policies in the UK, though the environmental standards associated with those policies are not universally equivalent;
- The Retained EU Law Act leaves considerable uncertainty around the future of environmental rules and regulations in the UK, posing the threat of regression in law, as well as regression in kind;
- Equivalent UK data is already collected (or could be extrapolated) for many of the indicators in the European Environmental Indicator Catalogue, however a considerable portion of the data is not consolidated in DEFRA's Outcome Indicator Framework or the JNCC's Biodiversity Indicators, leaving some noteworthy data gaps.

Many of these gaps have emerged not through malice or incompetence, but through the 'hollowing-out' of the science-policy interface, and the weakening of the relationship between science and society. Recent years have seen science become politicised as health and environmental policy decisions increasingly present challenges for securing social, economic, and environmental outcomes. To ensure a future where environmental governance is strong and people get the environmental outcomes they demand, we need a new approach, based on democratic reason which unites government, public, and scientific perspectives.

Over the next 50 years, science must be positioned to empower communities with the information to make positive choices about the future when they have the capacity to support change; it must be given the tools to supply evidence across the environment that prepares us for environmental challenges before they arise; and it must produce the professional guidance and standards needed to do so reliably and consistently.

By the end of the year, the IES will have published a though-leading Vision Statement on the future of the environmental sciences, taking forward the evidence in this report and how the environment sector can contribute to that future. We will also have launched an Environmental Policy Implementation Community (EPIC) following our merger with Environmental Protection UK, which will serve as a leading example of the new interfaces we can develop between science, policy, and the public.

The stakes have never been higher for nature and the benefits it can provide. As we look to the future, the responsibility of modern environmental science must be to forge new communities to unite policy, the public, and the power of environmental science to use rigorous evidence to change the face of the natural world and what it means for the people who live in it.

Introduction

The Institution of Environmental Sciences (IES) is a membership organisation representing nearly 6000 environmental scientists and standing up for the voice of science, scientists, and the natural world in policy. We promote and raise public awareness of environmental science by supporting professional scientists and academics.

As a professional body, the IES represents the voices of environmental professionals, sharing insights from the front lines of environmental work. We are particularly well-placed to represent a transdisciplinary approach to those insights, drawing members working in air quality, land condition, climate, nature, sustainability, water, education, and anywhere else where environmental work is underpinned by science.

As a result, the IES is uniquely positioned to examine interactions between complex natural and social systems from a scientific perspective. We are a leading voice in 'systems thinking' perspectives and transformative approaches to change. Our work often takes place at the convening space between science, policy, and professional practice.

This report provides IES members with an introduction to the changes in governance arrangements since the UK's exit from the European Union, the implications for environmental policy affecting environmental science, and the ramifications for gaps in governance arrangements and data.

Naturally, it also addresses material with significant relevance for policy makers and other organisations involved in the implementation of policy. Where gaps in the governance framework are identified, the report sets out a vision of a future role for science in supporting governance by empowering communities with the necessary evidence to make informed decisions about the environment.

UK environmental governance: how does the system work?

What is environmental governance?

Environmental governance covers the systems used for the management, protection, and enhancement of the natural environment, as well as the legislation, regulations, and other measures necessary to ensure those outcomes and balance them against other societal interests.

On a theoretical level, environmental governance can be divided into several elements, all of which are necessary to the overall functioning of the system. These elements are both substantive (i.e. bodies, groups, or individuals that enact part of the system of governance) and constitutive (i.e. documents, rules, and norms that shape how governance is enacted).

The **Executive**, typically the Government, is responsible for running the country, and as a result, it is principally responsible for executing environmental policy and guiding the overall course of environmental governance. However, given the Executive's significant power and influence, it is often also the main subject of governance measures.

The **Bureaucracy** handles planning, implementation, and delivery of environmental policy, often also playing a role in the collection of data and the provision of advice to decision makers. Examples in the UK include any Government Departments, as well as their equivalents in Devolved Administrations.

The **Legislature** is responsible for approving and (in some instances) proposing new legislation, which forms the legal basis of most tools of environmental governance. It also plays a key scrutiny function in environmental governance, reviewing the actions of the Executive or Bureaucracy and scrutinising the condition of environmental resources. In the UK, the Houses of Parliament are the primary legislature, alongside the Devolved Parliaments (the Scottish Parliament, Senedd Cymru, and the Northern Ireland Assembly).

Regulators and Oversight Bodies are responsible for enforcing environmental rules and regulations, investigating potential breaches of those rules, and/or holding the Government and other actors to account for the short and long-term delivery of environmental commitments. Typically these take the form of 'Arms-length Bodies' with varying degrees of executive and budgetary independence. Examples in the UK include the Office for Environmental Protection, the Environment Agency, the Climate Change Committee, or devolved bodies such as Natural Resources Wales or the Scottish Environmental Protection Agency.

Participants also play a key role in environmental governance, ranging across Non-Governmental Organisations, networks, citizen or business groups, think tanks, advocacy organisations, voters and other citizens. These broad coalitions help to shape governance by setting expectations, often driving action on particular issues and feeding into the policy process through soft influence. The Institution of Environmental Sciences fits into this category by engaging with other elements of governance on behalf of our members.

At the top of most systems of environmental governance is a **vision level** document (or uncodified vision), which serves as the constitution under which all other environmental governance operates, bringing together the overall vision for how the environment should be governed. In the UK, this role is played by high-level documents such as the Environmental Improvement Plan (EIP), which set a vision for environmental improvement and consolidate other strategies, plans, and targets (though the EIP also contains some framework level details).

To engage the vision-level document, environmental governance typically relies on strategies and plans which operate at the **framework level**. These tend to take the form of Strategies in conjunction with groups of targets, working on the strategic level to guide the overall effort of the system of governance towards action in a particular area of environmental governance. For effective governance, they should include precise commitments on objectives, as well as the measures necessary to ensure delivery on those objectives. Examples in the UK include the Government's Net Zero Strategy or Nature Recovery Network.

To support the delivery of those strategies, environmental governance systems often employ principles of norms at the **decision making level**. These fulfil the role of ensuring that strategic objectives are included from a cross-governmental perspective, supporting overall decision making and avoiding unintended consequences or siloed approaches. In the UK, the Environmental Principles Policy Statement serves this function.

Ultimately, environmental governance is executed at the **implementation level** through regulations and the operationalisation and delivery of environmental policies. Regardless of how ambitious or comprehensive commitments are at the vision level, they cannot manifest into environmental outcomes without successful implementation. These tend to take the form of specific regulations or legislation, such as Biodiversity Net Gain or the Environment Act.

What is the Environmental Improvement Plan (EIP)?

The Environmental Improvement Plan (EIP) is the UK Government's primary policy document for meeting its strategic environmental commitments in England. The current edition, published in January 2023, is the second EIP, following the 25 Year Environment Plan published in 2018.

Across the EIP, the Government sets out its progress, targets, and commitments across 10 strategic environmental goals, bringing together measures to secure environmental improvement, as well as consolidating and cross-referencing existing strategies and international commitments made elsewhere. As such, the EIP plays the governance role of a vision level document but also includes many elements consistent with a framework level document.

Details of the measures laid out in the current EIP are available in the chapter on UK environmental improvement and what it means for environmental specialisms. The EIP's 10 Goals are:

1. Thriving plants and wildlife;
2. Clean Air;
3. Clean and plentiful water;
4. Managing exposure to chemicals and pesticides;
5. Maximise our resources, minimise our waste;
6. Using resources from nature sustainably;
7. Mitigating and adapting to climate change;
8. Reduced risk of harm from environmental hazards;
9. Enhancing biosecurity;
10. Enhancing beauty, heritage, and engagement with the natural environment.

The Devolved Administrations have equivalent policy documents for addressing their environmental ambitions. Scotland progresses these commitments through its Environmental Strategy, supported with reports to Parliament on environmental governance arrangements.

Wales primarily handles its strategic environmental objectives through the Wellbeing of Future Generations, but also has subject-specific strategies on issues across the environment, such as Net Zero, Air Quality, and overflows.

Northern Ireland has its own Environment Strategy (subject to final approval by the Executive) and has committed to produce an Environmental Improvement Plan, with the former likely to serve as the basis for the latter.

What is the Outcome Indicator Framework (OIF)?

To support the implementation and delivery of the Environmental Improvement Plan for England, the Government has produced an Outcome Indicator Framework (OIF) as a series of indicators and measures relating to the 10 goals in the EIP. The role of the OIF is to measure progress towards those goals and provide a more precise description of the environmental change that the Government is seeking to address.

The OIF includes 66 indicators, which are arranged into 10 themes. Although the themes do not precisely align with the goals in the EIP, the set of indicators as a whole is designed to cover the full range of environmental goals and targets. Within the EIP, specific indicators from the OIF are outlined for the monitoring and evaluation of the Plan's implementation.

While the majority of the indicators under the OIF are functional, some are interim indicators or still in development, requiring further adjustment before a final indicator is in place for monitoring and evaluation purposes.

The OIF plays a crucial role in the overall functioning of environmental governance. Ultimately, to ensure that policy measures are effective, their success must be monitored and evaluated. When doing so, it is essential that the data being measured actually reflects the state of the system or element of the environment under consideration. Precise and consistent indicators are a crucial means of ensuring that commitments are not only implemented, but that they truly manifest into environmental improvement.

Appendix I outlines the OIF in full, as well as the data used to support each indicator.

What is the Environmental Principles Policy Statement (EPPS)?

Under the Environment Act 2021, Government Ministers are required to have due regard to a set of environmental principles laid out in the Environmental Principles Policy Statement (EPPS). The principles and Policy Statement were subject to a consultation process which resulted in the final EPPS. The duty to consider the Policy Statement in decision making will take effect from November 2023.

The role of the principles is to ensure that environmental considerations are factored into cross-governmental decision making, so that decisions by one department of minister consider the broader environmental context so that they do not unnecessarily have a negative effect on the state of the environment.

There are five environmental principles:

- The **integration principle**, that "*environmental protection should be integrated into the making of policies"* such that *"policymakers should look for opportunities to embed environmental protection and/or enhancement across fields of policy – not just those directly related to the environment*".
- The **prevention principle**, that "*government policy should aim to prevent environmental harm"* such that *"environmental damage [including environmental pollution, damage and environmental harm], such as CO2 emissions, pollution or biodiversity loss, is avoided*".
- The **rectification at source** principle, that "*environmental damage should, as a priority, be addressed at its origin to avoid the need to remedy its effects later [which] should result in approaches that are more cost-effective, efficient, and equitable in the long-term*".
- The **polluter pays** principle, that "*where possible, the costs of pollution should be borne by those causing it, rather than the person who suffers the effects of the resulting environmental damage, or the wider community*".
- The **precautionary principle**, that "*where there are threats of serious or irreversible environmental damage, a lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation*" (as defined by the 1992 Rio Declaration.

The process for considering the principles is laid out in the EPPS and applies whenever Ministers are making policy, which the Statement says "*can be broadly understood as an intended course of action adopted to achieve an objective*". While the latter definition is broad, the Statement explicitly notes that the duty applies at the framework and strategic levels, not at the level of individual decisions, such as planning or licensing decisions.

Ministers are expected to iteratively apply the principles throughout policy development, from the outset through any subsequent stages, subject to a degree of proportionality. This process should identify potential positive or negative environmental effects with the goal that the principles should inform the design of policy.

Following the application of the principles, the EPPS suggests that Ministers could act by amending or reframing a policy, ensure the future application of the principles by embedding one or more of them in policy, or delay the delivery of a policy to gather more implementation before acting.

While elements of the EPPS apply outside England, the majority of environmental decisions are devolved to the relevant administrations. Scotland, Wales, and Northern Ireland have equivalent duties to consider environmental principles in their governance regime following the UK's exit from the EU.

What are the legally-binding environmental targets?

The Environment Act 2021 establishes the duty for the UK Government to set legally-binding long-term environmental targets, covering biodiversity, water, air, and waste in England.

In each of those areas, the Government was required to set at least one legally-binding target, as well as an additional target addressing PM2.5. The process for scoping, evidencing, and setting the targets began in 2020 and concluded in December 2022, having missed the deadline set out in the Environment Act.

In the final framework of targets approved by Parliament, there are 13 legally-binding targets:

1. **Species' extinction risk**: reduce the risk of species' extinction by 2042, when compared to the risk of species' extinction in 2022.
2. **Restoration or creation of wildlife-rich habitat**: in excess of 500,000 hectares of a range of wildlife-rich habitats are to be restored or created by 31st December 2042.
3. **2030 species abundance target**: the overall relative species abundance index on 31st December 2030 indicates that the decline in the abundance of species has been halted.
4. **Reverse the decline of species abundance**: the overall relative species abundance index by 31st December 2042 is (a) higher than the overall relative species abundance index for 31st December 2022; and (b) at least 10% higher than the overall relative species abundance index for 31st December 2030.
5. **Marine Protected Areas (MPAs)**: before the end of 31st December 2042 (a) the number of protected features which are in favourable condition within all relevant MPAs is not less than 70% of the total number of all protected features within relevant MPAs; and (b) all other protected features within relevant MPAs are in recovering condition.
6. **Woodland and trees**: by the end of 31st December 2050 at least 16.5% of all land in England is covered by woodland and trees outside woodland.
7. **Agriculture and water**: the load of each of the following (a) total nitrogen, (b) total phosphorus, (c) sediment, entering the water environment through agricultural diffuse pollution is, by 31st December 2038, at least 40% lower than agricultural diffuse pollution in the year from 1st January 2018 to 31st December 2018.
8. **Waste water**: the load of total phosphorus discharged into freshwaters from discharges of treated waste water … is, by 31st December 2038, at least 80% lower than discharges in the year from 1st January 2020 to 31st December 2020.

9. **Abandoned metal mines**: the length of relevant waters polluted by any of the following: (a) arsenic, (b) cadmium, (c) copper, (d) lead, (e) nickel, (f) zinc; from abandoned metal mines is, by 31st December 2038, at least 50% lower than in the year from 1st January 2022 to 31st December 2022.
10. **Water demand**: the volume of potable water supplied per day per head of population in England is, by 31st March 2038, at least 20% lower than in the year from 1st April 2019 to 31st March 2020.
11. **PM2.5 concentration**: by the end of 31st December 2040 the annual mean level of PM2.5 in ambient air must be equal to or less than 10 μg/m^3.
12. **PM2.5 population exposure**: there is at least a 35% reduction in population exposure by the end of 31st December 2040, as compared with the average population exposure in the three-year period from 1st January 2016 to 31st December 2018.
13. **Residual waste**: by the end of 31st December 2042 the total mass of residual waste for the calendar year 2042 does not exceed 287 kilograms per head of population in England.

During the scoping process, other targets were considered for inclusion in the framework, including one on soil health. However, these targets were removed prior to the Consultation period and are not represented in the final list of targets.

The legally-binding targets focus almost entirely on England and do not have direct equivalents in the Devolved Administrations of the UK, which operate under their own frameworks for Government targets across environmental policy.

What are the interim environmental targets?

Along with the release of the Environmental Improvement Plan for England, a series of interim targets were published to support progress towards the environmental targets between 2023 and 2028. In alignment with the legally-binding targets, the interim targets focus on biodiversity, water, air, and waste.

Unlike the long-term targets, the interim targets are not legally-binding, though they are designed to indicate whether or not sufficient progress is being made towards the longer-term targets, so it is expected that they are taken seriously as an indication of the Government's progress towards its legal obligations.

The interim targets are:

1. **Restoration or creation of wildlife-rich habitat**: To restore or create 140,000 hectares of a range of wildlife-rich habitats outside protected sites by 31 January 2028, compared to 2022 levels.
2. **SSSI condition assessments**: All Sites of Special Scientific Interest (SSSIs) will have an up-to-date condition assessment by 31 January 2028.
3. **SSSIs in favourable condition**: 50% of SSSIs to have actions on track to achieve favourable condition by 31 January 2028.
4. **Woodland and trees**: Increase tree canopy and woodland cover by 0.26% of land area (equivalent to 34,000 hectares) by 31 January 2028.
5. **Marine Protected Areas**: For 48% of designated features in Marine Protected Areas (MPAs) to be in favourable condition, with the remainder in recovering condition, by 31 January 2028.
6. **PM2.5 concentration**: By the end of January 2028, the highest annual mean concentration in the most recent full calendar year must not exceed 12 μg/m^3 of PM2.5.
7. **PM2.5 population exposure**: Compared to 2018, the reduction in population exposure to PM2.5 in the most recent full calendar year must be 22% or greater.
8. **Agriculture and water (reduction)**: Reduce nitrogen, phosphorus and sediment pollution from agriculture to the water environment by 10% by 31 January 2028.
9. **Agriculture and water (sensitive catchments)**: Reduce nitrogen, phosphorus and sediment pollution from agriculture to the water environment by 15% in catchments containing protected sites in unfavourable condition due to nutrient pollution by 31 January 2028.
10. **Waste water**: Reduce phosphorous loadings from treated wastewater by 50% by 31 January 2028, against a 2020 baseline.
11. **Abandoned metal mines**: Construct eight mine water treatment schemes and 20 diffuse interventions to control inputs of target substances to rivers by 31 January 2028.
12. **Water demand**: Reduce the use of public water supply in England per head of population by 9% by 31 March 2027 and 14% by 31 March 2032.
13. **Water leakage**: Reduce leakage by 20% by 31 March 2027 and 30% by 31 March 2030 by the end of January 2028.
14. **Residual waste per person**: Reduce residual waste (excluding major mineral waste) produced per person by 24% by the end of January 2028.
15. **Residual waste (total tonnage)**: Reduce residual waste (excluding major mineral waste) in total tonnes by 21% by the end of January 2028.
16. **Municipal residual waste**: Reduce municipal residual waste produced per person by 29% by the end of January 2028.
17. **Food waste**: Reduce residual municipal food waste produced per person by 50% by the end of January 2028.

18. **Plastic waste**: Reduce residual municipal plastic waste produced per person by 45% by the end of January 2028.
19. **Paper and card waste**: Reduce residual municipal paper and card waste produced per person by 26% by the end of January 2028.
20. **Metal waste**: Reduce residual municipal metal waste produced per person by 42% by the end of January 2028.
21. **Glass waste**: Reduce residual municipal glass waste produced per person by 48% by the end of January 2028.

What are Arms-Length Bodies?

Arms-Length Bodies (ALBs) are a category of Public Bodies which are designed to operate with a varying degree of independence in order to carry out tasks in the public interest on behalf of the Government.

ALBs exist on a spectrum of independence and separation from the Government. On one end of the scale are executive agencies, which still fall under the legal authority of a given government department but perform specific tasks with administrative independence. They typically still fall under ministerial accountability but may have greater autonomy than a typical government department. An example of an executive agency is the Met Office.

Other ALBs may be constructed as Non-Departmental Public Bodies (NDPBs), which are set aside from the Government and any relevant departments, working within strategic frameworks which are set by ministers. NDPBs are often given the task of enforcing rules, advising the Government, or scrutinising other public bodies. An example of a NDPB is the Environment Agency.

Some ALBs play the role of non-ministerial departments, which are government departments in their own right, but which do not fall under the authority of a given minister (though they typically have a 'sponsoring minister' to manage their relationship with Parliament). They tend to be accountable to Parliament but have their own budgets and staff. An example of a non-ministerial department is Ofgem.

In the context of environmental governance, many ALBs play a crucial role in enforcing, regulating, and monitoring the success of environmental policy. Bodies such as the Office for Environmental Protection offer advice and carry out an oversight function to ensure that the Government is meeting its commitments, while bodies such as Natural England or the Environment Agency are directly involved in enforcing regulations on the ground. ALBs may also play a role in data collection and fact-finding.

Some of the ALBs and non-ministerial departments most relevant to environmental governance include:

- Climate Change Committee
- Defra's Science Advisory Council
- Environment Agency
- Environmental Standards Scotland
- Historic Environment Scotland
- Joint Nature Conservation Committee
- Marine Management Organisation
- Met Office
- Natural England
- Natural Environment Research Council
- Natural Resources Wales
- NatureScot
- Office for Environmental Protection
- Ofgem
- Ofwat
- Planning Inspectorate
- Science Advisory Committees
- Scottish Agricultural Wages Board
- Scottish Environmental Protection Agency
- UK Research and Innovation

What is the Office for Environmental Protection (OEP)?

The Office for Environmental Protection (OEP) is an Arms-Length Body responsible for protecting and improving the environment in England and Northern Ireland, which it achieves by holding to account public authorities and the Government. It was created by the Environment Act 2021 as part of the environmental governance arrangements which emerged from the UK's exit from the European Union (EU).

Covering a range of functions, the OEP is responsible for scrutiny and advice to the Government, monitoring and reporting on environmental plans and law, and investigations and enforcement in cases where public bodies fail to comply with environmental law. Despite this array of functions, the OEP is not a direct successor organisation to the roles played by the European Commission during the UK's membership of the EU, with limited functions by comparison.

Equivalent organisations in the devolved administrations have subtly different remits and approaches. In Scotland, Environmental Standards Scotland (ESS) plays the same role as the OEP, though the Scottish Environmental Protection Agency (SEPA) serves as Scotland's primary environmental regulator and functions alongside ESS in Scotland's environmental governance landscape. In Wales, these functions are primarily fulfilled by the Interim Environmental Protection Assessor for Wales (IEPAW).

How is environmental research funded and developed?

Environmental governance relies on data and evidence to function correctly. Not only is data essential to identifying environmental challenges, it plays a fundamental role in monitoring solutions to determine whether or not they are effective.

With environmental governance often operating at long timescales, it is not enough to wait until a course of action is completed to begin monitoring. To that end, environmental research is a crucial part of the environmental governance landscape.

In the UK, public research funding is primarily delivered through the non-departmental public body called UK Research & Innovation (UKRI), with environmental research typically funded by the Natural Environment Research Council (NERC). In some cases, one of UKRI's other research councils (such as the Economic and Social Research Council or Innovate UK) may also be responsible for funding research with relevance to environmental science. UKRI funds specific research projects as well as providing funding for research institutes.

UKRI has a budget which is evaluated by the Government during the spending review, which typically represents about half the UK's total funding for research & development. UKRI determines how to spend that budget in line with its strategy, which affects how much money is available for each of its research councils and how much is available for collective programmes of work. The research councils then allocate their individual budgets to specific work programmes and projects across the research landscape.

Progress or regression: how has UK governance changed since 2016?

When the UK exited from the European Union, commitments were made in the UK-EU Trade and Cooperation Agreement that neither party would weaken or reduce the levels of protection previously afforded at the end of the transition period (i.e. that there would be non-regression on existing social and environmental protections).

One of the UK's most important goals after exiting from the EU has been to find a system that helps support environmental protection and improvement. Crucially, the opportunity of a UK-specific (and devolved) regulatory system is the ability to tailor governance arrangements to the particularities of one country, allowing for improvements on regulations which have not historically been calculated to fit the UK context, such as agricultural payment schemes and environmental assessments for developments.

In reality, the question of whether the UK's new governance arrangements represent meaningful improvement or declining standards will require careful further examination. Governance is only as strong as it is in practice, so the future of environmental standards will depend on how the new regime operates in practice.

How does the EU system of environmental governance operate?

The European Union's environmental governance is closely tied to its overall governance framework. The EU represents 27 member states, governing roughly 450 million people. The EU has seven institutions responsible for its governance:

- **The European Council**: the EU's supreme political authority which comprises the Heads of State of member states and is responsible for the direction of the EU and its priorities. The European Council negotiates pressing political issues and can issue Guidelines, Declarations, or Resolutions, which subsequently must be translated into EU law by the other institutions.
- **The Council of the European Union**: one of the EU's legislative bodies which comprises government ministers from each member state, deliberating policy proposals from the Commission. When environmental issues are being discussed, each member state's environment minister would typically meet in Brussels to discuss them. The Environment Council typically meets three or four times a year.
- **The European Parliament**: the EU's other legislative body which comprises 705 Members of the European Parliament (MEPs) directly elected by national populations in member states. It deliberates policy proposals from the Commission and controls the EU budget. Elections are held every five years and MEPs sit in one of seven political groups based on their party affiliation. There are 20 standing committees which consider specific issues, such as Environment, Public Health, & Food Safety, Transport & Tourism, and Agriculture & Rural Development.
- **The European Commission**: the EU's main executive body, comprising an elected President and a College of Commissioners selected by each member state. The Commissioners each have responsibility for a policy portfolio, such as Environment, Oceans, & Fisheries, Agriculture, and the European Green Deal. The Commission is responsible for creating legislative proposals for the Council and the Parliament to consider, and also has responsibility for enforcing EU law.
- **The European Court of Justice**: the EU's supreme court of law, comprising one judge from each member state. Panels of 3, 5, or 15 judges adjudicate matters relating to EU (but not national) law, and may have matters referred to them by national courts, although there is no formal route of appeal for decisions made in national courts. It has constitutional powers which allow it to invalidate unlawful decisions of EU bodies.
- **The European Central Bank**: the EU's Central Bank, responsible for issuing euro banknotes and governing the monetary policy of the EU. It has no direct role in environmental policy.
- **The European Court of Auditors**: the EU's audit body, responsible for auditing the finances of the EU. It comprises one member from each member state and has no direct role in environmental policy.

For more information on the EU and its policy process, read the IES's 2015 briefing paper: Influencing the EU.

How has the UK replaced those systems since leaving the EU?

Since the UK's exit from the European Union, significant efforts have been undertaken to review and replace the system of environmental governance that the UK inherited from the EU. In terms of the substantive structures, organisations, and policy levers involved in the EU's environmental governance, the vast majority have direct equivalents in the new UK environmental policy landscape, as detailed in the table below:

Element of EU governance	Element of UK governance
European Council	UK Government
Council of the EU	UK Parliament
European Parliament	UK Parliament
European Commission (executive role)	UK Government and Cabinet
European Commission (enforcement)	Various; oversight from relevant bodies (England & Northern Ireland: Office for Environmental Protection; Scotland: Environmental Standards Scotland; Wales: Interim Environmental Protection Assessor for Wales), practical enforcement from regulators such as the Environment Agency (and equivalents), some functions not directly replaced
European Court of Justice	UK Supreme Court (with some functions now redundant)
EU Environmental Action Programme to 2030	England & Northern Ireland: Environmental Improvement Plan; Scotland: Environmental Strategy for Scotland; Wales: various strategy documents
Environmental principles in the Treaty on the Functioning of the EU (precautionary, prevention, rectification at source, polluter pays)	Environmental Principles Policy Statement (precautionary, prevention, rectification at source, polluter pays, integration)
Legally-binding targets in the EU Environmental Action Programme	Legally-binding environmental targets set through the Environment Act
161 indicators in the EEA's Environmental Indicator Catalogue	66 indicators in the UK Outcome Indicator Framework, see Appendix II
Horizon Europe	Plans for the UK to associate to Horizon Europe, with Horizon Europe Guarantee scheme to protect research funding until association is completed
Common Agricultural Policy	England: Environmental Land Management Schemes and Sustainable Farming Incentive; Scotland: Basic Payment Scheme and support payments; Wales: Rural Payments Wales; Northern Ireland: Area-Based Schemes and Environmental Farming Scheme
EU Common Fisheries Policy	Joint Fisheries Statements and Fisheries Management Plans
REACH with the authority of the European Chemicals Agency	UK REACH with authority split between the Health & Safety Executive and Environment Agency
Directorate-General for Health & Food Safety	UK Animal and Plant Health Agency

In terms of institutions, the only substantive shift in governance structures since the UK's exit from the EU is that the functions of the European Commission are not fully represented in the equivalent oversight and regulatory bodies created to replace them.

The commitment to non-regression on existing environmental protections has manifested into the creation or transfer of the majority of elements of environmental governance. Despite that, it has not meant that there is non-regression in practice, as several of the replacements for elements of the EU governance framework operate within different scopes, or with different levels of authority, to their past counterparts. For example, the dissimilar role of the UK Supreme Court, coverage of the legally-binding targets, and scope of the new Outcome Indicator Framework (see Appendix II).

In the short-term, it will be difficult to assess whether new institutions will operate in such a way in practice that environmental protections are equal to those under their predecessors. There is potential for oversight bodies such as the OEP to increase *de facto* standards. Equally, there is the possibility that regression on environmental standards becomes the reality in practice, even if the creation of new bodies means that regression has been sufficiently avoided to discharge the UK's obligations under the Trade and Cooperation Agreement.

Regression in law – what does the Retained EU Law Act mean for governance?

Since the UK's exit from the European Union, the UK Parliament has passed the Retained EU Law (Revocation and Reform) Act 2023, with the intention to address EU laws which still have effect in the UK going forwards. Retained EU law will either be:

- Approved and retained in law going forwards;
- Reformed and either updated or replaced with UK-created alternatives;
- Revoked where they are no longer relevant to the UK;
- Given an explicit extension for further consideration.

Schedule 1 of the Act contains a list of EU-derived laws which will 'sunset' out of force at the end of 2023, meaning that they will no longer apply or be recognised as part of UK law. The Schedule contains roughly 600 pieces of legislation, including many environmental rules and protections. While that means that the majority of the more than 3700 laws initially covered by the act (including nearly 1800 linked to the environment) are now being approved or replaced, there is still a significant portion of environmental rules which will be revoked.

The House of Lords sought to amend the Act to include a clause preventing regression on environmental commitments, however this amendment was not accepted by Members of Parliament in the House of Commons and is not featured in the final Act. The result is that the revocation of environmental rules leaves open the possibility for regression on environmental commitments in law, as well as in practice.

While opposing the amendment to make non-regression legally-binding, the Government has committed to avoiding environmental regression in line with its previous international commitments, as well as the substance of the Environmental Improvement Plan for England. The Government has until the end of 2023 to see through that commitment or risk serious regression on the current state of environmental governance across the UK.

Careful scrutiny will be necessary to ensure that regression is avoided in more than the Government's ambitions, and that the actual state of environmental law in the UK is at least as strong as it was when the UK left the EU.

Regression in kind – what has changed since the UK left the EU?

Since the UK left the EU, both have continued to develop their environmental policy and governance in response to the unfolding interlinked environmental challenges facing the world, such as climate change, biodiversity loss, and environmental pollution. To that end, many of the environmental policies that the UK would have been subject to if it had stayed in the European Union have now proceeded without its input, and without applying to the UK.

As a result, when considering whether the UK's environmental policy and governance is as strong as it would have been if the country had stayed as a member of the EU, it is not just enough to look at regression by the strictest letter of the law; we also need to look at 'regression in kind': the question of whether the UK has effectively regressed on the commitments it would have made by slowing its own progress or whether the UK has progressed further than it would have within the EU, causing the the EU to have seen regression in kind by losing the UK as a driver of environmental policy within the EU.

Since the UK's exit from the European Union in January 2020, the EU has announced several key environmental policy initiatives, including the European Green Deal and new circular economy measures. These can be directly compared to the UK's own environmental progress through the Environmental Improvement Plan (and equivalent measures in the devolved administrations), the UK Net Zero Strategy, and other recent environmental policy announcements (see Appendix I).

European Green Deal: comparing UK and EU environmental policy

The European Green Deal is an EU initiative, first presented in 2019, combining a range of policies with the intention of improving the well-being and health of future generations, focused on eight goals:

- Fresh air, clean water, healthy soil and biodiversity
- Renovated, energy efficient buildings
- Healthy and affordable food
- More public transport
- Cleaner energy and cutting-edge clean technological innovation
- Longer lasting products that can be repaired, recycled and re-used
- Future-proof jobs and skills training for the transition
- Globally competitive and resilient industry

With the Green Deal as a focal point, the EU has produced a substantial number of environmental policy changes since the UK exited the Union. To provide a simple comparison between the state of UK environmental policy compared to the environmental policy change which would have happened if the UK had remained in the EU, these measures are outlined below.

EU Green Deal policy	UK equivalent policies
Measures focusing on governance, finance, and the economy	
The European Green Deal Investment Plan and Just Transition Mechanism, intended to increase private finance through EU finance mechanisms, while providing tailored financial and practical support for workers in regions and industries requiring substantial transformation.	Since 2019, the UK has produced two Green Finance Strategies and supported the COP26 Just Transition Declaration. In Scotland, the Just Transition Commission and its predecessor have been progressing work towards a Just Transition in Scotland.
The European Industrial Strategy, focused on managing the industrial transition to a green and digital economy.	During the same period, the UK published a Growth Plan focused on recovering from the COVID pandemic, as well as a Plan for a Green Industrial Transition and a UK Digital Strategy.
A new approach to the EU's Sustainable Blue Economy, centred on the BlueInvest Initiative which supports sustainable and innovative technologies for the blue economy.	The UK has no equivalent strategic approach but supports funding for the ocean economy through the Blue Planet Fund.
Measures focusing on climate change	
The European Climate Law (legally enshrining the EU's net zero and interim climate targets, along with measures to track progress), the European Climate Pact (as a collaborative network supporting climate action), the Climate Target Plan and Impact Assessment (which provide further details supporting the EU's climate target, how it will be achieved, and the evidence to support it) and further measures to deliver on climate targets (including the Fit-For-55 Plan for a Green Transition.	Before exiting from the EU, the UK had already enshrined its net zero target in law, and in 2021, the UK published its own Net Zero Strategy, which has subsequently been followed by a Carbon Budget Delivery Plan. There is no direct UK equivalent to the European Climate Pact, but in 2021 the UK hosted COP26, for which it held the Presidency, supporting a wider network of international climate collaboration.
The EU Adaptation Strategy, which focuses on the EU's commitment to adaptation to the effects of climate change.	The UK updates its Climate Change Risk Assessment every 5 years in line with the work of the National Adaptation Programme. There are also specific measures in the Environmental Improvement Plan focused on adaptation.
The EU Adaptation Strategy, which focuses on the EU's commitment to adaptation to the effects of climate change.	The UK updates its Climate Change Risk Assessment every 5 years in line with the work of the National Adaptation Programme. There are also specific measures in the Environmental Improvement Plan focused on adaptation.

Proposals on carbon removal, recycling and storage (setting out the EU's action plan on developing sustainable ways to increase carbon removals) and the voluntary Carbon Removal Certification which provides a means of certifying high-quality carbon removal.	The UK Net Zero Strategy addresses the UK's plan for carbon cycling, though the UK has no other specific action plan on carbon removals. The UK also directly funds efforts to increase carbon removal, recycling, and storage.
The EU has provided multiple updates to the Emissions Trading System (ETS) to strengthen it, as well as updating the ETS rules on aviation (to expedite the phase out of free allowances.	Since leaving the EU, the UK has replaced its participation in the EU ETS with its own Emissions Trading Scheme and subsequent updates.
Proposals have been put in place for a 'Social Climate Fund' to address the social impacts of the emissions trading system for the building and road transport sectors by dedicating a share of the revenue from the new system to supporting member states with energy efficiency for buildings and access to low-emission mobility.	The UK Emissions Trading Scheme has no equivalent ring-fenced fund.
Proposals have been made for a Net Zero Industry Act to support the competitiveness of EU technologies to address climate change through a simplified regulatory environment and other facilitating conditions.	The UK has produced a Net Zero Research and Innovation Framework with further details of the actions which will be taken to facilitate innovation in the Carbon Budget Delivery Plan.
Measures focusing on resources and the circular economy	
Adoption of the Circular Economy Action Plan which includes 35 actions and a monitoring framework to increase the sustainability of products across the EU and empower consumers to make more sustainable choices.	In the UK, DEFRA and the Devolved Administrations released a Circular Economy Package policy statement to outline the approach of the UK to transposition of the EU's updated measures in its Circular Economy Package, which the Action Plan builds upon, including through England's Resources and Waste Strategy and EIP, Scotland's Circular Economy Strategy, and equivalent strategies in Wales and Northern Ireland.
Ongoing work to revise certain aspects of the Waste Framework Directive, with a particular focus on implementing the objectives of the Strategy for Sustainable and Circular Textiles and the food waste targets of the Farm to Fork Strategy.	In England, the EIP commits to publishing a new 'maximising resources and minimising waste programme' for key sectors, including food and textiles.
Proposals have been put forward for reform of the Packaging and Packaging Waste Directive, with the goal to prevent the production of packaging waste, and to promote reuse of packaging and recycling and other forms of recovering packaging waste.	In the UK, the EIP outlines England's approach to packaging reform, particularly through the Collection and Packaging Reforms (the implementation and reform of Extended Producer Responsibility, Deposit Return Schemes, and more consistent municipal recycling collections), many of which also apply to different extents in the Devolved Administrations.
A revised Critical Raw Materials Act has been proposed, updating the list of critical raw materials and identifying strategic raw materials, with the goal of setting benchmarks for EU domestic capacity across raw material supply chain.	In 2022, the UK published a Critical Minerals Strategy, which was refreshed in March 2023.
Adoption of common proposals for the common repair of all goods across the EU, including a 'right to repair' for consumers.	In 2021 the UK also introduced regulations seeking to enable consumer choices around repairing goods.
Further implementation of Extended Producer Responsibility Schemes as covered by the Waste Framework Directive is ongoing.	Further implementation of Extended Producer Responsibility Schemes as covered by the Waste Framework Directive is ongoing.

Measures focusing on nature and biodiversity	
The EU Biodiversity Strategy, which sets out the EU's long-term approach to biodiversity and seeks to create a network of protected areas.	The UK's ambitions for biodiversity are covered by the EIP, the Nature Recovery Network, the Green Finance Strategy, and in Scotland by the Scottish Biodiversity Strategy; both the UK and EU have also now agreed to the Kunming-Montreal Global Biodiversity Framework.
Regulations have been introduced to address deforestation in products and supply chains.	Equivalent measures were implemented through the UK Environment Act and Scotland's Forestry Strategy.
Proposals have been put forward for an EU Nature Restoration Law, which would seek to restore habitats and ecosystems across Europe through legally-binding targets and measures including National Restoration Plans.	In the UK, legally-binding targets for nature are set under secondary legislation linked to the Environment Act, and several nature recovery measures are already functional or operating pilot schemes, such as Local Nature Recovery Strategies, Landscape Recovery project funding, and other schemes in the Nature Recovery Network.
Updates to the Action Plan for the illegal wildlife trade, including to align with international agreements, strengthen enforcement, and build capacity through partnerships.	The EIP sets out the UK's approach to addressing the illegal wildlife trade, including through funding from the Illegal Wildlife Trade Challenge Fund.
Revisions have been issues to the action framework for the EU Pollinators Initiative, seeking to halt and reverse pollinator decline in the EU.	The UK also updated its National Pollinator Strategy with a Pollinator Action Plan in 2022; Scotland is mid-way through its Pollinator Action Strategy 2017-2027 and issues annual progress reports.
Measures focusing on food and agriculture	
The Farm to Fork Strategy, which aims to aiming to make EU food systems fair, healthy and environmentally-friendly, supported by a proposed legislative framework and an Organic Action Plan.	After exiting from the EU, the UK published an Agricultural Transition Plan, a National Food Strategy, and began transitioning towards Environmental Land Management Schemes for agriculture; the EIP also commits to an updated Food Security Report in 2024 and the Government has published an update following the UK Farm to Fork Summit in 2023; Scotland has published its own Agricultural Transition Plan, passed the Good Food Nation (Scotland) Act, and has begun transitioning towards a new Farm Payments support scheme. Wales has passed the Agriculture (Wales) Act 2023, outlining its measures for Sustainable Land Management going forward.
Adopting an Action plan on protecting and restoring marine ecosystems and published a Report on the implementation of regulations relating to the Common Market Organisation for fishery and aquaculture products, addressing the protection and restoration of marine environments and the long-term future of sustainable fisheries.	The UK has committed to implementing the Joint Fisheries Statement and delivering Fisheries Management Plans starting in 2023, and has set legally-binding targets on the condition of Marine Protected Areas, while designating new Highly-Protected Marine Areas.
New proposals have been put forward to reform marketing standards for agri-food products, focused on origin labelling, food waste, and packaging.	The UK has taken no equivalent action on the marketing of agri-food products specifically, though the EIP commits to mandatory recycling labelling for most packaged products by 31 March 2026 and the UK already has standards for origin labelling.
Measures focusing on energy	
Publication of the EU strategy on energy system integration to support the transition of the EU towards a more sustainable energy system, facilitated by the EU Hydrogen Strategy, EU Methane Strategy, and the EU Offshore Renewable Energy Strategy.	The UK's energy transition is governed by the British Energy Security Strategy, "Powering Up Britain" delivery plan, and Energy Security Plan.
The REPowerEU Initiative and Plan to increase the sustainability and independence of EU energy sources, supported by reformed EU gas purchasing and storage options.	The UK's strategic approach to the transition is covered by the British Energy Security Strategy and Energy Security Plan.

Measures to implement the energy system integration strategy, including the European Gas Demand Reduction Plan, proposals to update rules on renewable hydrogen, modernise of the European Battery Alliance, and the EU framework to decarbonise gas markets, promote hydrogen and reduce methane emission.	the UK's Energy Security Strategy and Plan are supported by the Net Zero Hydrogen Fund, Floating Offshore Wind Manufacturing Investment Scheme, UK Methane Memorandum, and the creation of Great British Nuclear.
Market reforms, including the emergency market intervention on energy bills, proposed reforms to EU Electricity Market, and reform of the EU Energy Efficiency Directive.	The UK has also engaged in energy market reforms, published energy efficiency and retrofit plans, and addressed the regulation of UK power generation through the Strategy and Policy Statement for energy policy in Great Britain.
Measures focusing on the built environment	
Publishing the Renovation Wave Strategy to renovate EU Buildings and improve energy efficiency.	The UK has similar strategic details in its British Energy Security Strategy and Heat and Buildings Strategy, supported by various measures and funding through the Home Upgrade Grant, the Social Housing Decarbonisation Fund and Green Heat Networks Fund.
The New European Bauhaus Initiative and associated measures, including a capacity-building programme for the reconstruction of Ukraine.	The UK has no equivalent initiative but has pursued reforms to design in the built environment through reforms to the NPPF in England and NPF4 in Scotland.
Measures focusing on chemicals, waste, and pollution	
The EU Chemicals Strategy for Sustainability and its 80 associated actions, with the aim to better protect citizens and the environment, while boosting innovation for safe and sustainable chemicals.	Since leaving the EU, the UK has brought REACH into UK law as UK REACH, and committed in the EIP to its own Chemicals Strategy which is due to be published in 2023.
Proposals for new regulations on waste shipments, which would seek to regulate waste exports to promote environmentally sound waste management and address illegal shipments.	In 2021, the UK introduced an updated Plan for Waste Shipments; in the EIP, it has also committed to banning the export of plastic waste to countries that are not members of the OECD and committed to introducing a mandatory digital waste tracking service to address illegal waste exports which is due to be in place by 2024.
Publishing the EU Zero Pollution Action Plan, which sets out a vision for 2050 and binding targets for 2030 which the goal of reducing pollution to air, water, and soil below levels which are no longer harmful for humans or the environment (including an updated list of pollutants and the EU Soil Strategy).	The UK has some equivalent targets on waste, air and water pollution, but has no equivalent targets on soil or noise pollution (and the binding air targets are substantially different between the two regimes); there is no single action plan for addressing pollution across the UK, though there are many system-specific strategies across different parts of the UK: the air quality strategy for England, English Integrated Water Plan, the Cleaner Air for Scotland strategy, Scottish Hydro Nation Strategy, Scottish Soil Framework, Clean Air Plan for Wales, Water Strategy for Wales, and the Clean Air Strategy for Northern Ireland; though the Government initially committed to a Soil Health Action Plan for England, this commitment was not met and the Government's approach to soil pollution is addressed through the EIP; Wales is currently developing a Soil Policy Statement.
Adoption of proposals to update and modernise the Industrial Emissions Directive to increase the focus on energy, water and material efficiency, while promoting the use of less toxic or non-toxic chemicals in industrial processes.	Though the UK has not produced an equivalent plan since leaving the EU, it has revised its implementation of the Best Available Techniques (BAT) framework in the form of UK BAT, as well as publishing an Industrial Decarbonisation Strategy to lower industrial emissions.
Proposals to phase down fluorinated Greenhouse Gases and Ozone-depleting substances.	The UK has continued to update its own regulation of F gases and Ozone-depleting substances and both the UK and the EU are on track to meet their obligations under the Montreal Protocol.

Revisions to the Urban Wastewater Treatment Directive to support the goals of the Zero Pollution Action Plan, primarily through strengthened enforcement, modelling, and monitoring.	In England the Integrated Water Plan is supported by the Strategic Policy Statement to Ofwat and updated Drainage and Wastewater Management Plans, as well as a new binding target on wastewater; in Scotland, the Scottish Government's strategic goals for water are supported by SEPA's water supply and waste water sector plan.
Measures focusing on transport	
Proposals to modernise EU transport and encourage more sustainable travel by promoting active transport and rail travel and developing charging infrastructure.	The UK Transport Decarbonisation Plan has similar objectives, supported by the Rail Environment Policy Statement, the Zero Emission Vehicle mandate, and the creation of Active Travel England and the Scottish Active Travel Framework.
Measures to increase the sustainability of fuel, including the FuelEU Maritime Initiative on shipping emissions and ReFuelEU Aviation proposals and acceleration of the development of alternative fuels infrastructure, along with updated rules for trading for aviation and maritime emissions.	The UK has produced plans to address maritime emissions through the Clean Maritime Plan and Maritime 2050 Roadmap, both of which address maritime fuel, and has begun taking steps to work towards Sustainable Aviation Fuel for the aviation industry.
Measures to address emissions from road vehicles, including stricter CO2 emission performance standards for new cars and vans, New Euro 7 standards on pollutant emissions from vehicles, and the 2030 zero emissions target for heavy-duty vehicles.	The UK's Transport Decarbonisation Plan sets out several measures to transition towards lower emission or zero-emission vehicles, including the Zero Emission Vehicle mandate, research into mitigation options for brake and tyre wear, the early exploration of a single regulatory framework for all road vehicles, and a delivery plan for transitioning to zero emission cars and vans.
Other environmental measures associated with the European Green Deal	
An initiative to support a strong and sustainable EU algae sector.	Though the UK algae sector is smaller than the equivalent EU sector, the UK has published a report on transforming the sector and the English seafood sector has produced an English Aquaculture Strategy.
Proposals for common criteria against greenwashing, intended to prevent misleading environmental claims.	While the UK has not adopted these criteria, the Competition & Markets Authority has published a Green Claims Code and conducted multiple investigations into greenwashing.
The EU has also published Delivery Factsheets for the Green Deal.	There are no equivalent publications in the UK.

While many of the proposals and initiatives in the EU's Green Deal have equivalent policies in the UK, there remain gaps in the environmental policy landscape, particularly around governance, soil health, and the built environment. For the most part, these policy gaps do not amount to environmental regression, either in principle or in practice, though they present the strong possibility that the UK will decelerate its environmental ambitions relative to the pace of change within the EU.

At the same time, the UK's exit from the EU has allowed for the development of country-specific regulation on key environmental issues such as environmental payments for sustainable farming, revised proposals for Environmental Impact Assessments, and green finance measures and taxonomies. Many of these policies still face significant questions about whether they will lead to positive outcomes, so the challenge for environmental policy will be to ensure that these opportunities represent greater progress than any potential 'regression in kind' on other issues.

More information about the full range of environmental policies in the UK since it left the European Union is available in Appendix I: 'What does the EIP mean for environmental specialisms?'

Looking forward: a model for democratic reason and cooperative science

Since the UK exited the European Union, while environmental governance bodies and rules have been replaced with equivalents in many instances, there has been a weakening of the system as a whole, leaving gaps in governance and standards which are stronger in name but weaker in practice.

Seven years of political challenges have seen a gradual shift to a position of rules without governance, plans without strategy, underpinned by the ideal that it is preferable to aspire for better outcomes through strong words than to secure them through regulation and oversight.

Crucially, the position of science in that governance system has been subtly diminished: where previously an inherent value was afforded to collecting environmental evidence and using science to learn more about the state of the environment, environmental science in the UK has now been relegated to a specific tool for gathering information on the Government's objectives, where its input is often unwelcome on issues beyond the questions that the Government is already willing to ask.

The presentation of scientific facts has become increasingly politicised, causing some communities to feel that their voice in decision making has been compromised. Where increasingly complex evidence has led to more direct relationships between science and policy makers, there has been an estrangement of science from the public, leading to a decline in trust in the scientific community.

Where different groups disagree about the best way forward, science should be in a position to provide them with the evidence they need to inform their choices. Without evidence, uninformed debates can exacerbate division, often at the expense of the outcomes valued by either side. Regardless of what people value or the decisions they choose to make about their future, their ability to gain value from engagement with science has been diminished.

Even within government, the relationship between science and decision making could be stronger. Consistent efforts by civil servants to improve that relationship have not yet led to a systematic integration of science into the policy-making process, and differences in processes, values, and forms of communication can bring evidence and policy out of alignment with one another.

As a result, the role of science has been reduced from an indispensable advisor to one among many consultees, often outweighed in the aggregate by loud or politically-sensitive voices. Without the support of science, many remain disenfranchised from the means to make meaningful decisions about what they value. Even when scientific evidence is used to set targets or objectives, it is often not seen through into the implementation of policy, as few leaders want to commit themselves to the long-term path of ambitious science-led action.

How can science inform decision-making?

In recent years, the relationship between science and society has become much more politicised. While events such as the COVID-19 pandemic have increased trust in science with the majority of the population, they have also isolated parts of the public from science, while other issues such as the UK's exit from the EU have led to a rise in distrust in expert perspectives.

It is crucial that scientists work to rebuild public trust and develop a positive relationship with society, so that science can serve the interests of communities. An informed public must be able to make decisions about the kind of future that it would seek to create for the country, for which it requires robust evidence. Without science as a defence against misinformation, the public and politicians are often disempowered from selecting the pathways which best represent their actual interests or beliefs.

To do so, the traditional science-policy interface should adapt for a new generation: rather than separating the relationship between science and policy makers from the relationship between policy and the public, science should be a medium through which the public can engage with policy decision which affect them.

Community-empowering science must serve the role of a 'boundary organisation', which Susan Owens described as existing "*at the frontier of science and politics … typically involve[ing] actors from both sides; their boundary work typically consists in part in the creation of 'boundary objects' … which can be interpreted differently by individuals within each social world.*"[1] In its role empowering communities, science must provide the neutral evidence needed for each community to interpret and make its own decisions.

Unless science gives the public the information, tools, and mind-sets needed to engage in policy, communities will inevitably be alienated from the means to access knowledge. In a world where science exists only to provide answers to the questions asked by governments, the public loses power over how decisions are made, and both science and public policy lose their legitimacy.

Our approach to democratising knowledge and reason should be founded on sound principles of modern, socially-conscientious

science. The evidence we provide must be legitimate, so it should be independent, neutral, transparent and representative. It must be robust, so it should be reliable, valid, and coherent. It must also be relevant, so it should be accessible to the public and should empower public discussion of policy issues and what they mean for people's lives.

How can we upscale solutions?

If the science-policy interface cannot currently work through our system of governance, then we must find a way that it can work beyond governance.

The answers already exist: carbon literacy, citizen's assemblies, environmental networks. We need to scale up those solutions and bring them together to create the modern model of cooperative science. In that model, science cannot be an isolated advisor or a distant voice, it must be integrated into communities and decision making organisations so that it can speak to – and with – the people it exists to serve.

Research-oriented science must be trusted to identify and advise on potential solutions to environmental challenges, while also discovering more information about the natural world. Research has a fundamental role to play in supporting policy, but its scope must be wider than solely pursuing existing government objectives, so funding systems and environmental indicators should be agile enough to facilitate broad research that provides us with the information we need to respond to future environmental challenges before they emerge.

Professional science must be properly resourced to support the implementation and delivery of environmental policy across contexts. Insights from the front lines of policy delivery need to be taken seriously and effectively disseminated to both policy makers and the public. Professional registration, competency, and guidance all have a crucial role to play in ensuring the high standards of professional science needed to meet our environmental objectives.

As we look to the future, the environment sector should facilitate and unite the different faces of environmental science and the roles which it must play to support the creation of a better relationship between science, policy, and the public.

[1] Owens, S. (2015). *Knowledge, Policy, and Expertise: The UK Royal Commission on Environmental Pollution* 1970-2011. Oxford University Press.

What next?

Throughout the second half of 2023, the IES will be working with the extensive network of partners who have been engaged as part of the Future of ES23 horizon scanning & foresight project to build a vision for the future of environmental science that solves the challenges facing the world.

At the same time, the new Environmental Policy Implementation Community (EPIC) will bring together the expertise of IES members with the longstanding voice of Environmental Protection UK to address the implementation of environmental policy across the new regime of environmental governance in England, across the UK, and beyond.

In both projects, the IES will be working to build on the model outlined in this report for environmental science intertwined with environmental governance. The last 7 years have led to a significant shift in environmental governance that has invited challenges and opportunities across the natural world.

The next 7 years will bring us to the edge of our ambitions to address the interlinking climate crisis and ecological emergency. They must also bring us back into the realm of sound and modern environmental governance so that we can overcome the challenges while making the most of the opportunities..

As the IES outlines its strategic perspective on the future of the environmental sciences, it will provide a direction for the future of our members and how they interact with policy, environmental governance, and society. As EPIC grows into a new community, it will form the template of the modern science-policy interface, an energised and interdisciplinary hub of professionals, academics, and organisations working together from the design of policy through to its implementation.

Together, we have the power to transform the next decade of environmental governance, across the UK and abroad. A future exists where principles of transparent evidence, robust data, and ambitious and coherent action are achieved in practice. The challenge for scientists and policy makers will be to take the necessary steps to fulfil the promise of that future.

Appendix I: What does the EIP mean for environmental specialisms?

This chapter outlines the broad implications of the Environmental Improvement Plan for England for each specialism of the environmental sciences, as well as the policy decisions that IES members can expect to be influencing their work as a result. It was first published in June 2023 as a briefing paper to support the 'Regulatory Landscape' theme of the IES's Future of ES23 horizon scanning and foresight project and is included here for context.

While the majority of these changes apply only to England, some have ramifications for the whole of the UK.

Acoustics

Acoustics, sound, and noise pollution are not explicitly addressed in the EIP, nor are any of the 10 high-level goals aimed at addressing acoustics. However, the significant potential for co-benefits arises from several areas of the plan which may have positive (or detrimental) consequences for the sound environment, depending on their implementation.

Read about changes in other specialisms for more information about:

- Air quality: measures to address air pollution, the causes of which may substantially overlap with the causes of noise pollution;
- Built environment: proposals for the planning system, which may significantly influence soundscapes in proximity to new developments and urban areas;
- Conservation and ecology: plans to address biodiversity and ecosystems which are likely to intersect with the influence of acoustics on nature;
- Transport: further details of the Government's plans for the future of transport systems, including their decarbonisation, which may have either positive or negative effects on soundscapes.

Air Quality

- Primarily, the UK Government's action on air quality is focused on meeting specific legal targets and not exceeding specified limit values. The EIP outlines several key delivery mechanisms in support of reaching the legally-binding targets. Those measures include:
- Measures to address, but not ban, domestic burning of solid fuels and promote a shift from more-polluting appliances, in conjunction with limits on sulphur content and smoke emissions from domestic burning in Smoke Control Areas;
- Reviewing the communication of air quality information and running targeted campaigns to promote best practice for stoves, fireplaces, and domestic burning;
- Assessing the efforts of Local Authorities to improve air quality, re-aligning air quality zones with local government boundaries, and providing supporting guidance and funding (though the EIP makes no commitment to 'new' funding);
- Committing to a new Air Quality Strategy (which has now been published following a brief consultation) and Local Transport Plan guidance to provide Local Authorities with more support in making decisions;
- Consulting on improvements to the mechanisms for developing industrial process standards so that they better reflect environmental goals, particularly for smaller industry (where petrol stations, metals processing, and quarrying are specifically mentioned) based on the Best Available Techniques (BAT) approach;
- Measures to address nutrient use in agriculture, including through the Sustainable Farming Incentive, a consultation on extending environmental permitting to dairy and intensive beef farms, and new funding for infrastructure and technology – with a view to addressing ammonia emissions, inorganic fertilisers, and emissions from increased anaerobic digestion;
- Increasing the rollout of Clean Air Zones;
- Commissioning a review of regulations governing air quality on the rail network, in conjunction with a Stations Air Quality Monitoring Network supported by £4.5million of funding;
- Seeking co-benefits for air from the refreshed Clean Maritime Plan and other measures to address the environmental impact of the domestic maritime sector.

Naturally, there are also many other areas of the EIP which may directly or indirectly influence air, with the potential for both risks as well as significant co-benefits in the delivery of the Plan. Read about changes in other specialisms for more information about:

- Climatology and carbon management: climate mitigation and adaptation, which may produce trade-offs or co-benefits for air quality;
- Built environment: planning and other consenting processes affecting air quality;

- Energy: measures to address energy systems, which may produce co-benefits or risks for air quality;
- Impact Assessment: the reform of Environmental Impact Assessment, including its consequences for air quality;
- Transport: measures to address transport systems including the transition to 'zero emissions vehicles', which may produce co-benefits or risks for air quality;

Archaeology

One of the 10 high-level goals in the EIP is 'Enhancing beauty, heritage and engagement with the natural environment', which raises several issues related to archaeology, mostly indirectly through support for heritage and engagement with nature:

- A reiterated commitment to deliver a new Natural History GCSE by 2025, which may contribute towards improving the skills pipeline for environmental professionals working in archaeology;
- Continued support for UNESCO Global Geoparks, Biosphere Reserves and World Heritage Sites, as well as the implication of ongoing support for the Historic Building Restoration project to fund the restoration of historical buildings in National Parks;
- A commitment to include marine heritage in future marine plans, including through the marine Natural Capital and Ecosystem Assessment programme's review of evidence on the cultural value of UK fisheries;
- More information about proposals for Conservation Covenants and their role in the conservation of natural or heritage features, which extends to protection of heritage features, such as archaeological sites.

The next section on the built environment outlines proposals for the planning system and buildings, which may also be relevant to environmental scientists working in the archaeological specialism, while subsection sections on conservation and ecology and water have information on measures addressing specific iconic landscapes such as national parks or chalk streams.

Built Environment

As part of the transition following the UK's exit from the European Union, the Levelling-Up & Regeneration Bill will make significant changes to processes affecting the built environment, particularly through the planning system, where Environmental Impact Assessments and Strategic Environmental Assessments are expected to be replaced with Environmental Outcomes Reports (EORs). A similar scale of change is taking place in Scotland with the release of its Fourth National Planning Framework (NPF4) and in the other devolved administrations.

Changes to the National Planning Policy Framework (NPPF), were subject to consultation at the start of 2023, providing some expectations about how those processes will interact with air quality in the future. For more information about the interactions between the Levelling-Up & Regeneration Bill and the built environment, read the latest briefing paper from the IES.

The EIP also highlights several other policy changes which are likely to affect the built environment:

- The introduction of a Land Use Framework in 2023, which will set out an approach to how land is used across multiple objectives;
- A new Nutrient Mitigation Scheme to balance the creation of thousands of new homes while also creating wetland habitat, supported by up to £30million of investment;
- A promise to deliver existing commitments to build more parks and incorporate green infrastructure in towns and cities;
- Ongoing measures for heat adaptation, including the newly introduced requirement to address overheating in the Building Regulations and the inclusion of the importance of Local Plans considering the long-term implications of climate change in the NPPF.

There are also several other areas of the EIP which are likely to influence the built environment. Read about changes in other specialisms for more information about:

- Air quality: Building Regulations, ventilation requirements, and indoor air;
- Climatology and carbon management: climate resilience, particularly to flood risk and other impacts of climate change;
- Conservation and ecology: habitats and the effects that conservation measures may have on planning and the built environment;
- Water: Building Regulations and their implications for water efficiency.

Climatology and Carbon Management

Primarily, the Government's policy on climate change is set out in its Net Zero Strategy, though the EIP's seventh goal, 'Mitigating and adapting to climate change', consolidates and supplements the Government's approach to the climate. The EIP highlights the following commitments:

- A reiteration of the Government's intention to publish the third National Adaptation Programme by the end of 2023 (when the second programme is due to end);
- Measures to support climate adaptation, including a £10million Water Management Grant Scheme and an increase

in the scope of adaptation reporting on climate readiness for UK business and infrastructure;

- Funding for 35,000 hectares of peatland restoration to take place by 2025 via the Nature for Climate Peatland Grant Scheme, alongside the launch of a £6.6million programme for lowland peat research and development and the other commitments in the England Peat Action Plan;
- Government responses to ongoing calls for evidence on methane suppressing feed products for livestock farming systems and the UK Emissions Trading Scheme;
- A reiteration of plans to deliver on the commitment to spend £11.6billion in international climate finance over the period 2021-2026, at least £3billion of which will be devoted to climate solutions which protect and restore nature (the latter of which is expected to align with nature-based solutions in many instances);
- Ongoing leadership globally to address climate action, biodiversity loss, and land degradation, including support for developing countries.

Within the EIP, direct commitments on new climate funding are broadly limited to those which have already been promised, so in many ways, the role of the EIP is to consolidate existing commitments on climate change, rather than to announce new measures. To that end, the EIP highlights the role of other key policies, such as farming incentives and the forthcoming Land Use Framework, in the overall effort to address climate change.

Outside of the EIP, there have been several additional developments on UK climate policy. On 18th July 2022, the High Court ruled that the UK's Net Zero Strategy was unlawful. The High Court determined that further details were required to meet the UK's obligations under the Climate Change Act, as the Strategy lacked sufficient evidence of the measures which would limit UK emissions to the levels set out in the UK's Sixth Carbon Budget. In addition, a 5% shortfall was identified in the Strategy's reductions, so the Court also required the Government to give an explanation of the policies which would fill that gap.

These gaps had previously been identified in March by the IES and in June by the UK Climate Change Committee. The Government was ordered to provide further plans by April 2023. Meanwhile, an independent 'Net Zero Review' was commissioned with a specific mandate to determine whether the Government's approach to net zero is sufficiently pro-growth and pro-business.

The Review reported back in January 2023, identifying net zero as "*the economic opportunity of the 21st century*". It set out 10 long-term missions to be completed by 2035 and 25 immediate actions to be completed by 2025, with a view to creating infrastructure and facilitating action by businesses and local government. Many of these recommendations are reflected in the Government's updated climate commitments.

An update to the Strategy has now been produced by the Government, somewhat addressing the requirements of the Sixth Carbon Budget but not completely filling the gap. Further measures are expected, but these are not likely to come before the next general election. New announcements include:

- Carbon Budget Delivery Plan (quantifying expectations for delivery against the carbon budgets as a result of specific decarbonisation measures, as well as risks and timescales for delivery; the quantifications are based on a significant number of assumptions, including around the confidence of delivery in certain sectors, and do not amount to the full reductions required to meet the Sixth Carbon Budget);
- Strategic Framework for International Climate and Nature Action (identifying the need to address climate change and nature together and outlining the Government's existing measures and commitments);
- Finance Strategies for International Climate Finance and Green Finance, as well as a framework for scaling up private investment on nature and sustainable farming;
- Powering Up Britain (details of which are covered under Energy);
- Energy Security Plan (details of which are covered under Energy);
- Net Zero Growth Plan (providing responses to the Net Zero Review and the Climate Change Committee's Progress Report, outlining other policy measures, and highlighting the economic opportunities associated with the transition to net zero);
- UK Net Zero Research & Innovation Framework Delivery Plan (setting out the Government's rationale for funding, along with priorities for funding areas);
- Responses to the Net Zero Review, the consultation on sustainable aviation fuel (ahead of a newly-published second consultation), the consultation on the Energy Company Obligation, the consultation on power Bio-Energy with Carbon Capture and Storage, and the consultation on consumer experience at public charge-points;
- Consultations on a regulations for new cars and vans, carbon leakage, clean heat standards, hydrogen production & industrial carbon capture, emissions from aviation fuel (following the first consultation in 2021), the regulatory regime for ESG ratings providers, and community benefits for Electricity Network Transmission Infrastructure; and
- Other specific policy instruments as indicated in the announcements above.

For more information on the Government's Net Zero Strategy and climate policy in the UK, read the IES's Manifesto for Transformative Change and Gap Analysis on the 2021 version of the Strategy.

Due to the complex interactions between climate change and other natural systems, many of the other areas of the EIP are also likely to influence climate change. In particular, read about changes in other specialisms for more information about:

- Conservation and ecology: habitats and the potential co-benefits that conservation measures may have for climate change;
- Energy: measures addressing energy supply and its effects on climate change;
- Forestry and landscaping: trees, tree planting, and other landscape-scale measures in the EIP;
- Marine and coastal: ocean-based solutions to climate change and other marine policy measures.

Conservation and Ecology

Several of the EIP's goals address issues affecting conservation, including 'Thriving plants and wildlife', 'Clean and plentiful water', 'Using resources from nature sustainably', 'Enhancing biosecurity', and 'Enhancing beauty, heritage, and engagement with the natural environment'.

Many of the Government's commitments on nature and ecology are covered by international commitments such as the Convention on Biological Diversity (and the recently-agreed Kunming-Montreal Global Biodiversity Framework) or through legally-binding targets. However the EIP also outlines several key delivery mechanisms in support of achieving its goals for nature. These include:

- Reiteration of the Government's commitment to protecting 30% of land by 2030, supported by a map of progress by the end of 2023, 19 new nature recovery projects in England by 2025, and 25 new National Nature Reserves by 2027;
- Ongoing support for Landscape Recovery projects, including a second round of projects in 2023, as well as a commitment to implement the measures agreed in the Government's response to the Glover Review on Landscapes, updated Protected Landscape management plan guidance, and new guidance for public authorities on the strengthened biodiversity duty;
- Expansion of mandatory Biodiversity Net Gain to most developments by November 2023 and continued rollout of Local Nature Recovery Strategies throughout 2023;
- Establishment of a UK Wetland Inventory to support the mapping of wetlands and further measures to protect habitats;
- Delivery of existing commitments on sustainable agriculture, countryside stewardship, and other forms of land management, including peatland and biodiverse woodland restoration;
- Measures to restore protected sites, including updating evidence on site condition, new Protected Sites Strategies by 2025, and the continued use of existing measures such as the Conservation and Enhancement Scheme for SSSIs;

Ongoing support for species protection through measures such as Species Conservation Strategies, the Species Recovery Programme, the National Pollinator Strategy & Action Plan, and action plans to address non-native invasive species led by the Non-Native Species Inspectorate;

- An updated Green Finance Strategy (which has subsequently been supplemented with a framework for scaling up private investment on nature and sustainable farming and a Strategic Framework for International Climate and Nature Action), as part of a commitment across England to raise at least £500 million a year in private finance for nature recovery by 2027, rising to over £1billion by 2030;
- Support for nature protection and restoration abroad, including through a UK Overseas Territories Biodiversity Strategy and the expanded and restructured £90million Darwin Initiative to address biodiversity challenges and support poverty reduction in developing countries, as well as £30million additional funding to tackle the illegal wildlife trade between 2022 and 2025;
- More information on the Government's plans for implementing the 2023 Plant Biosecurity Strategy, along with a commitment to revise the Tree Health Resilience Strategy;
- Measures to support woodland creation and agro-forestry (for more information see Forestry & Landscaping);
- Measures to support marine biodiversity (for more information see Marine & Coastal);
- Measures to support the sustainable use of natural resources (for more information see Sustainability);
- Measures to support the quality of freshwater resources, with potential benefits for freshwater biodiversity (for more information see Water).

Within the EIP, direct commitments on new funding for nature are broadly limited to those which have already been promised. To that end, the EIP highlights the role of other key policies in supporting biodiversity and nature, such as farming incentives, the various components of the Nature Recovery Network, and the forthcoming Land Use Framework.

There are also several other areas of the EIP which are likely to influence conservation, ecology, and nature. Read about changes in other specialisms for more information about:

- Archaeology: measures to improve access to nature and cultural heritage, including co-benefits and risks for conservation sites and habitats;

- Built environment: planning and other consenting processes affecting conservation and habitats;
- Climatology and carbon management: climate mitigation and adaptation, including their co-benefits and risks for biodiversity;
- Forestry and landscaping: measures to support woodland creation and agro-forestry, with potential co-benefits and risks for nature;
- Land condition: measures addressing soil health;
- Marine and coastal: measures to support marine biodiversity;
- Sustainability: the Government's plans for the sustainable use of natural resources, with potential co-benefits and risks for nature;
- Water: other measures to address water, many of which may have effects on nature, particularly for freshwater biodiversity.

Education and Training

While the Department for Education's (DfE) Sustainability & Climate Change Strategy is the UK's primary policy instrument on environmental education and for addressing the relationship between education and the environment, the Environmental Improvement Plan has some significant measures which relate to education and training, particularly in the context of the desire to create additional green jobs, which is a 'cross-cutting' theme of the EIP.

Specific measures in the EIP relating to education and training include:

- Opportunities associated with the forestry sector, particularly for apprenticeships, T-Levels, and technical training routes, as well as for the resolution of barriers associated with provision;
- Cross-departmental work with the Department for Education, including exploration of ways to connect schools with nature-based careers and scoping options for a digital skills hub to collate resources on forestry education and careers (though details are not provided on the extent to which additional resources can be expected to support these activities);
- Measures to integrate sustainability into different forms of education, including new occupational standards for FE teachers to build sustainability into learning, a 'National Education Nature Park' approach to school land, and the ongoing development of a pilot for the Climate Action Award;
- Ongoing actions to connect children with nature through school, including research into the best ways to deliver outdoor learning, following the Children and Nature Programme;
- A reiteration of the commitment for a new Natural History GCSE by 2025.

Specific policy commitments in the EIP may also have consequences for education and the delivery of technical training. For more information, read about changes in other specialisms or CEDHE and the IES's response to the DfE's Sustainability & Climate Change Strategy.

Energy

While energy is not directly associated with any of the EIP's 10 goals, it is heavily linked to Goal 7 on mitigating and adapting to climate change, particularly as the Government's approach to reaching net zero expects to substantially influence the country's approach to energy. It also has a significant relationship with several of the other goals, particularly on buildings, agriculture, land use, and the circular economy.

Primarily, the EIP consolidates existing commitments relating to energy, such as the implementation of the British Energy Security Strategy, removal of unabated coal from the UK energy mix by 2024, integration of energy efficiency and retrofit plans, and measures to address heat adaptation for new buildings.

The EIP also outlined the Government's intention to produce an Energy Security Plan, which has now been published. The Energy Security Plan includes:

- The announcement of a future update on gas storage and other measures to improve gas security, as well as a commitment to outline an approach on the re-balancing of relative gas prices against electricity, in line with the recommendations of the Net Zero Review;
- The creation of Great British Nuclear to lead on delivery of a new nuclear programme, as well as the announcement of competitive bidding processes on small modular reactors;
- Ongoing commitments to the Net Zero Hydrogen Fund and a new competition window for funding, as well as a second competition round on electrolytic hydrogen production;
- A new £160million Floating Offshore Wind Manufacturing Investment Scheme;
- Plans to set up processes for new CCUS clusters;
- The commitment to a consultation later in 2023 on consumer protection for energy markets, which will determine the future of the Energy Price Cap on default tariffs;
- Measures to address energy efficiency through extensions of boiler upgrade and insulation schemes to 2028;
- The commitment to publish action plans on the development time for transmission network projects and accelerating electricity network connections;

- A new consultation on National Policy Statements on energy infrastructure.

The Energy Security Plan was published alongside "Powering Up Britain", a delivery plan for Government policies on energy security and net zero, including commitments to deliver on CCUS, hydrogen, renewable energy, and energy efficiency. The plan broadly serves as an overview to the other announcements on energy security included in the Energy Security Plan and the Government's new climate commitments announced in March.

Following the announcements in March, a further consultation has been announced on a Strategy and Policy Statement for energy policy in Great Britain to inform the work of energy regulators, including Ofgem.

Several other areas of the EIP are also likely to influence energy systems. Read about changes in other specialisms for more information about:

- Built environment: building regulations and other changes to the built environment which may affect domestic energy and energy efficiency measures;
- Climatology and carbon management: climate change mitigation, the measures announced in the March update to the Government's climate commitments, and related policies, all of which are likely to have significant effects on the energy sector;
- Waste management: measures to address resource use and efficiency, which are likely to affect the current approach to energy recovery from waste and similar policies.

Environmental Management

As a whole, the EIP serves as a policy document addressing the Government's plans for the management of the environment, so the entire Plan has direct implications for environmental management.

Many professionals working in environmental management will be working across disciplines with systems and resources across the environmental sciences. Read about changes in each of those specialisms for more information about:

- Air quality: the Government's Air Quality Strategy and the management of air quality;
- Built environment: changes to the planning system and rules surrounding developments;
- Climatology and carbon management: the Government's Net Zero Strategy and its implications for carbon management and corporate governance;
- Conservation and ecology: implementation of the Kunming-Montreal Global Biodiversity Framework and the management of ecosystems and biodiversity;
- Energy: measures to address the sustainability of the energy system, as well as to promote energy efficiency within buildings;
- Impact Assessment: reform of Environmental Impact Assessment and plans for Environmental Outcomes Reports;
- Land condition: measures to address the use of land, including soil health and the management of soil resources;
- Marine and coastal: plans to address the marine environment, including the management of marine and coastal resources;
- Sustainability: sustainable management of economic resources, including global supply chains, the food system, and natural resources;
- Waste management: the circular economy, resource use, and the management of waste, including requirements for packaging, labelling, and products.

Forestry and Landscaping

Sustainable forestry plays a significant role in a number of the EIP's objectives, particularly for Goal 1: 'Thriving plants and wildlife' and Goal 6: 'Using resources from nature sustainably'. The Plan recognises that there are likely to be landscape-level consequences of many of the other measures across the EIP, particularly through changes to agricultural payments, though there are also a number of measures specifically addressing forestry. Those measures include:

- Implementation of the England Trees Action Plan, the England Woodland Creation Offer, the Government's Keepers of Time Policy on ancient and native woodlands, and the expansion of England's Community Forest network through the England Woodland Creation Partnership;
- Review the National Planning Policy Framework to ensure protections on ancient and native woodlands, introduce a new legal duty on Local Planning Authorities to consult which the Secretary of State before granting permission to plans affecting ancient woodlands, and to consult on new protections for long-establishment woodland;
- Direct support for agroforestry through the rollout of the agroforestry standard for the Sustainable Farming Incentive by 2024, further development of Countryside Stewardship, grants for forestry equipment through the Farming Equipment and Technology Fund, and further pilot schemes to support agroforestry;
- Guidance, funding, and updated regulatory processes for multi-functional woodland creation, developed in partnership with commercial forestry, as well as the publication of the Timber in Construction Policy Roadmap;
- Measures to remove barriers to tree planting, including through voluntary carbon markets, skills development and capacity building, reviewing tax guidance, reducing approval

timeframes, the use of public land, and potentially through the UK Emissions Trading Scheme and the development of a voluntary Woodland Water Code;

- Support for the forestry skills pipeline, including the Woods into Management Forestry Innovation Funds, a new Forestry Training Fund, expansion of the Professional Forester scheme, and other measures to support apprenticeships, T-Levels, and technical education, including the potential for a digital skills hub;
- Revising the Tree Health Resilience Strategy, while reducing pressures on tree health through the Deer Management Strategy and Grey Squirrel Action Plan;
- The publication of a practice guide on riparian woodland creation for the UK Forestry Standard, alongside ongoing support for the Woodlands for Water programme.

There are also several other areas of the EIP which are likely to influence forestry, woodlands, and landscapes. Read about changes in other specialisms for more information about:

- Built environment: planning and other consenting processes affecting forestry and landscapes;
- Climatology and carbon management: climate mitigation and adaptation, including their co-benefits and risks for woodlands;
- Conservation and ecology: measures to support nature and biodiversity, with potential co-benefits and risks for landscapes, land use, and woodland creation;
- Sustainability: the Government's plans for the sustainable use of natural resources, with potential consequences for forestry and landscaping.

Impact Assessment

Primarily, Government reforms of Impact Assessment (covering both Environmental Impact Assessments (EIA) and Strategic Environmental Assessments (SEA)) are being pursued through the Levelling-Up & Regeneration Bill and the Retained EU Law Bill, as well as the associated consultations on the Levelling-Up Bill, National Planning Policy Framework (NPPF), and Environmental Outcomes Reports (EORs). See the section on the Built Environment for more information.

To that end, the EIP has limited direct consequences for specialists in Impact Assessment beyond the ongoing reforms. Specific policy commitments in the EIP may have consequences for Impact Assessment and individual developments. For more information, read about changes in other specialisms or catch up with the latest analysis from the IES.

Land Condition

While the EIP references a number of areas of policy affecting land systems and land condition, significant areas of policy relating to contaminated land, brownfield land, and many other topics linked to the land condition sector are not directly addressed in the Plan. These are instead expected to be addressed through other policy documents, including the forthcoming Land Use Framework.

Despite this, the EIP raised several important considerations for the land condition context. In particular, the EIP contains several measures relating to soils, in lieu of a Soil Health Action Plan for England, including plans to publish a baseline map of soil health for England by 2028, publish a soil health indicator through the Outcome Indicator Framework, bring 40% of England's agricultural soil into sustainable management by 2028, and improve guidance and best practice for farmers and for consistent data collection.

In the land condition context, measures include revisions to the Code of Practice for the sustainable use of soil on construction sites and the development of a Soil Re-Use and Storage Depot scheme to help prevent soil going to landfill, with pilots due in 2026. The Government has also committed to supporting the development of markets for ecosystem services, including soil carbon codes, though it acknowledges that this work is likely to be led by the wider sector.

The Plan also indirectly addresses a number of topics which are likely to influence land condition. Read about changes in other specialisms for more information about:

- Built environment: planning and other consenting processes affecting land and land condition;
- Climatology and carbon management: climate mitigation and adaptation, including their co-benefits and risks for land;
- Conservation and ecology: habitats and the effects that conservation measures may have on planning and the built environment;
- Waste management: measures to address resource use and efficiency, including those which may affect the approach to emerging contaminants and land condition.

Marine and Coastal

Although marine and coastal environments are not explicitly mentioned in any of the EIP's 10 Goals, those environments are key factors in three of the Goals: Goal 1 'Thriving plants and wildlife', which addresses marine biodiversity; Goal 6 'Using resources from nature sustainably', which addresses fisheries management and marine resources; and Goal 7 'Mitigating and adapting to climate change', which acknowledges the role of the marine environment in addressing climate change.

Measures on marine biodiversity in England are constructed to support the delivery of the UK Government's legally-binding target on marine biodiversity (and linked interim target), including:

- Implementation of the UK Marine Strategy, the North-East Atlantic Environment Strategy, and the Kunming-Montreal Global Biodiversity Framework, including protection of

30% of our sea through the Nature Recovery Network and ongoing negotiations to secure an implementing Agreement under the UN Convention on the Law of the Sea for marine protected areas in Areas Beyond National Jurisdiction;

- Development of Marine Net Gain as an equivalent to terrestrial Biodiversity Net Gain for infrastructure developments at sea;
- Designation of Highly Protected Marine Areas (the first of which have now been designated) and strengthened protections for marine areas by 2024;
- Ongoing support for the ReMeMaRe (Restoring Meadow, Marsh and Reef)) initiative, with a goal to restore 15% of priority habitats along the English coast by 2043;
- Reiterated commitments to increase marine conversation funding, including £20 million through competitive ocean grants and £17 million through the World Bank's PROBLUE programme;
- Further measures to address chemical and plastic pollution to the marine and coastal environment (for more information see the section on waste management).

Measures on marine resources include:

- Implementation of the Joint Fisheries Statement and the delivery of Fisheries Management Plans starting in 2023, alongside continued monitoring and implementation of marine plans and the development of sustainable ocean plans with the support of the High Level Panel for a Sustainable Ocean Economy;
- A new commitment to publish transparent assessments of the sustainability outcomes of annual fisheries negotiations;
- Measures to address bycatch of cetaceans and seal species, including ongoing support for the Bycatch Mitigation Initiative and trials to explore existing gear;
- Continued support for the Marine Natural Capital and Ecosystem Assessment Programme to provide an evidence base on ecological, societal, and economic information about marine resources;
- Optimisation of marine space through the Marine Spatial Prioritisation cross-governmental programme;
- Ongoing support for the IUU Fishing Action Alliance established at the Lisbon Ocean Conference, including support for developing countries to sustainably management resources through the Blue Planet Fund and support for data collection and enforcement through Ocean Partnerships.

Measures on the marine environment and climate change include:

- Supporting the UK Blue Carbon Evidence Partnership and the Marine Natural Capital and Ecosystem Assessment to build data and evidence on blue carbon ecosystems and services;
- Delivering on commitments to reduce maritime emissions through the Transport Decarbonisation Plan, the Clean Maritime Plan, and Maritime 2050 Roadmap;
- Further measures through the Government's Energy Security Strategy and its plans for offshore wind (for more information see the section on energy).

Odour

Odour, nuisance smells, and other scent-related consequences of pollutants are not explicitly addressed in the EIP, nor are any of the 10 high-level goals aimed at addressing odour specifically. However, the significant potential for co-benefits arises from several areas of the plan which may have positive (or detrimental) consequences for odour management, depending on their implementation.

Read about changes in other specialisms for more information about:

- Air quality: measures to address air pollution, the causes of which may substantially overlap with the pollutants affecting odour;
- Built environment: proposals for the planning system, which may significantly influence odour in proximity to new developments and urban areas;
- Conservation and ecology: plans to address biodiversity and ecosystems, some of which are likely to be related to the influence of odour on the natural environment;
- Transport: further details of the Government's plans for the future of transport systems, including their decarbonisation, which may have either positive or negative effects on odour environments.

Sustainability

One of the EIP's high-level goals is 'Using resources from nature sustainably' (Goal 6), which directly addresses many of the Government's commitments on sustainability. Throughout the EIP, the other goals also cover measures which are relevant to the specialism of sustainability and the sustainable use and management of resources. These measures are addressed in the context of their associated specialisms.

Under Goal 6, the EIP outlines measures to address the sustainability of global supply chains, including the implementation of commitments under the Kunming-Montreal Global Biodiversity Framework, the Glasgow Leaders' Declaration on Forests and Land Use, the Forest, Agriculture and Commodity Trade Dialogue (FACT), and the Forest and Climate Leaders' Partnership.

The primary mechanisms of action are Voluntary Partnership Agreements, where Indonesia, Ghana, and Vietnam are the initial priority partners, and through collaboration with commodity

producers, consumer countries, and the private sector, supported by Overseas Development Aid. Given the inherently bilateral and multilateral nature of trade agreements, most of the EIP's commitments are about negotiating objectives, rather than specific policy announcements.

The EIP also sets out measures to support the transition to a sustainable food system, in line with the recommendations set out in the National Food Strategy. These measures are intended to work alongside the Land Use Framework, due to be published in 2023. Measures include a new food data partnership, mandatory methodology for eco-labels, new funding in partnership with UK Research & Innovation (UKRI) for research into agri-food innovation across the supply chain, and a revised approach to the sustainability of approach to public sector food and catering.

Read about changes in other specialisms for more information about:

- Built environment: measures to address the sustainability of buildings and new developments;
- Energy: measures to address the sustainability of the energy system, as well as to promote energy efficiency within buildings;
- Forestry and landscaping: measures to address the sustainable management of forestry and timber, as well as the use of land more generally;
- Land condition: measures to address the sustainable use of land, including soil health and other measures to promote the sustainability of soil resources;
- Marine and coastal: measures to address the sustainable management of marine resources, including sustainable fisheries management;
- Waste management: measures to address the sustainable and circular use of resources and the management of waste, including requirements for packaging, labelling, and products.

Transport

Most of the Government's environmental commitments relating to transport are already covered by the Transport Decarbonisation Plan, the Net Zero Strategy, and sector-by-sector transition plans, such as the Clean Maritime Plan. To that end, the EIP primarily consolidates and supplements the Government's approach to transport.

The EIP highlights the following commitments:

- Measures to support the transition to 'zero emission vehicles' and the Transport Decarbonisation Plan, including the Zero Emission Vehicle mandate, research into mitigation options for brake and tyre wear, and the early exploration of a single regulatory framework for all road vehicles;
- Delivery of the Rail Environment Policy Statement, including commissioning a review of regulations governing air quality on the rail network, in conjunction with a Stations Air Quality Monitoring Network supported by £4.5million of funding;
- Reiterated support for active travel through the creation of Active Travel England, funding of the Sustrans National Cycle Network, and the commitment to build thousands of miles of cycling routes;
- Delivering the Clean Maritime Plan and Maritime 2050 Roadmap to support the transition of the maritime sector, as well as committing to an updated Clean Maritime Plan and a consultation on extending the North Sea Emission Control Area to cover the Irish Sea.

Read about changes in other specialisms for more information about:

- Air quality: measures on air quality, including new guidance for Local Transport Plans and other measures addressing transport-related emissions;
- Climatology and carbon management: measures to address the mitigation of transport-related emissions, as well as those to support increased resilience for transport infrastructure;
- Marine and coastal: measures to address the sustainability of maritime transport.

Waste Management

Goal 4 of the EIP is 'Managing exposure to chemicals and pesticides' and Goal 5 is 'Maximise our resources, minimise our waste', both of which deal directly with resource use, waste, and pollution. Goal 6 addresses 'Using resources from nature sustainably', which also has ramifications for resource use.

Many of the measures in the EIP addressing waste and resources exist to support the delivery of the Government's legally-binding targets on waste (and linked interim targets which address specific types and origins of waste). The measures in the EIP are also supported by other strategic policy documents, such as the Resources and Waste Strategy. Those measures include:

- Reiteration of the Government's commitment to publishing a new Chemicals Strategy in 2023, as well as a revised UK national action plan for the sustainable use of pesticides (drawing on Integrated Pest Management approaches), the former of which will take a risk-based approach, explicitly outlining the Government's plans to address emerging chemicals of concern such as Per- and Poly-fluorinated Substances (PFAS) and Endocrine Disrupting Chemicals (EDCs);
- Continued implementation of the Litter Strategy for England including further publication of the fly-tipping toolkit, a review of the Code of Practice on Litter and Refuse, and £800,000 new funding for councils to address 'fly-tipping';
- Continued implementation of UK REACH and the UK REACH Work Programme, including the development of a UK REACH

Alternative Transitional Registration model;

- Plans to work with stakeholders and industry to address key chemical pollutants, including Persistent Organic Pollutants (POPs), Polychlorinated Biphenyls (PCBs), and mercury;
- Measures to increase recycling rates, including a Deposit Return Scheme for plastic and metal drinks containers from October 2025, mandatory recycling labelling for most packaged products by March 2026 and all packaged products by March 2027, and ongoing support for WRAP and the RecycleNow campaign;
- Measures to address the circularity of products from the supply side, such as the implementation of packaging Extended Producer Responsibility from 2024 and a ban on the supply of single-use plastics from October 2023;
- Measures to reform and modernise waste management through a mandatory digital waste tracking service and updates to waste exemptions and the waste carriers, brokers and dealers regime, as well as ongoing implementation of the Antimicrobial Resistance National Action Plan;
- A commitment to developing a plan to minimise the amount of biodegradable municipal waste going to landfill from 2028, as well as measures to address soil being sent to landfill (for more information see Land Condition);
- Ongoing support for international action on chemical pollution, including £6 million of Official Development Assistance investment to support capacity building in middle and lower income countries, £330 million through the Global Environment Facility to address the most toxic and harmful chemicals, and the establishment of up to 25 plastic partnerships with countries through the Global Plastic Action Partnership (GPAP) by 2025, as well as ongoing work to support the creation of a Science Policy Panel for pollution as an equivalent to the IPCC and IPBES;
- Further regulation of UK waste exports, including a ban on exporting plastic waste outside the Organisation for Economic Cooperation and Development (OECD) and the requirement of consent from countries importing waste electrical and electronic equipment.

Further announcements are expected later in 2023, particularly the announcement of the Government's Chemicals Strategy and the ongoing work of the UK Chemicals Stakeholder Forum.

Read about changes in other specialisms for more information about:

- Conservation and ecology: the implementation of the Kunming-Montreal Global Biodiversity Framework and its implications for environmental pollution;
- Land condition: measures to address soil health and to prevent soils being classified as waste or sent to landfill;
- Sustainability: measures to address the sustainable use of natural resources, including through international supply chains and the National Food Strategy;
- Water: measures to address water pollution from agriculture, chemicals, metals, and wastewater, which may have repercussions on chemicals and waste management.

Water

Goal 3 of the EIP is 'Clean and plentiful water' and several other areas of the Plan also reference considerable co-benefits for water systems, particularly in the context of biodiversity, pollution, and the use of natural resources.

Many of the measures in the EIP addressing water exist to support the delivery of the Government's legally-binding targets on water (and linked interim targets). Those measures include:

- Reiterating the commitment to deliver on the Storm Overflows Discharge Reduction Plan, as well as to utilise the fines and measures set out in legislation to drive action by water companies, supported by an increase in the water company enforcement budget of £2.2 million per year;
- Measures to reduce nutrient pollution from wastewater, including requiring the production of Drainage and Wastewater Management Plans, as well as upgrades to 160 wastewater treatment works by 2028 and a further 400 by 2038, including for anaerobic digestion;
- Measures to reduce nutrient pollution from agriculture, including through Catchment Sensitive Farming, the Sustainable Farming Incentive, and Diffuse Water Pollution Plans;
- Expanding the Water and Abandoned Metal Mines programme with 40 new schemes by 2038;
- Supporting the Chalk Stream Strategy launched by the Catchment-Based Approach Chalk Stream Restoration Group;
- Delivery of the Integrated Water Plan and Roadmap for Water Efficiency, including reviewing water efficiency options in planning, building regulations and non-household buildings (the latter through voluntary schemes), as well as work with regulators and water companies to put in place Water Resource Management Plans and Drought Plans, reduce consumption, and deliver a 50% reduction in leakage by 2050;
- Designation of the National Policy Statement for Water Resources Infrastructure to support new infrastructure for water supply;
- Measures to encourage innovative water efficiency approaches in buildings, including technologies and approaches to funding and maintenance, while also considering fittings-based approaches to water efficiency, and new efficiency standards for homes in areas of serious water stress;

- Changes to planning and building regulations, including mandatory Sustainable Drainage Systems in new developments, as well as a review of the Building Regulations 2010 and the associated water efficiency, water reuse and drainage standards;
- Measures to address abstraction, including use of the Water Resources Licensing Digital Service to restrict abstraction during low flow levels and modernisation of the regime through the Environmental Permitting Regulations;
- Support for delivery capacity, including catchment officers in each area, nutrient advisers in the Planning Advisory Service, and supported capacity for Natural England.

Read about changes in other specialisms for more information about:

- Built environment: planning and other consenting processes affecting the water environment;
- Climatology and carbon management: nature-based solutions to climate change, including climate resilience to flood risk and other measures which may affect the water environment and run-off pollution to watercourses;
- Conservation and ecology: measures to address biodiversity, including freshwater ecology;
- Waste management: measures to address chemical and plastic pollution, as well as issues such as antimicrobial resistance, and their consequences for the water environment.

Appendix II: the Outcome Indicator Framework

The Outcome Indicator Framework encompasses 66 indicators which form the basis of evaluation and monitoring for the Environmental Improvement Plan for England. These indicators represent the key data which form the basis of the Government's monitoring of environmental improvement.

These indicators also hold a place of priority in environmental policy making and may have other functions, such as serving as priority indicators for environmental outcomes as part of the proposed Environmental Outcomes Reports regime.

What indicators are covered by the OIF?

- **A: Air**
  - A1: Emissions for five key air pollutants

    This indicator shows changes in the emissions of the 5 key air pollutants: sulphur dioxide (SO2), fine particulate matter (PM2.5), nitrogen oxides (NOX), non-methane volatile organic compounds (NMVOC) and ammonia (NH3).
  - A2: Emissions of greenhouse gases from natural resources

    This indicator tracks the changes in greenhouse gas (GHG) emissions from natural resources. The indicator shows the annual net amount of GHG emissions from land use and land use change, forestry, agriculture, and waste sectors and from the use of fluorinated gases. It measures GHG emissions on a 'territorial' basis, which means that only emissions occurring within England's borders are included.
  - A3: Concentrations of fine particulate matter (PM2.5) in the air

    This indicator is a measure of the level of long-term exposure of people to harmful airborne fine particulate matter (PM2.5). It is determined by calculating the annual population-weighted mean concentration of PM2.5 in the air, assessed as background concentrations per 1km square.
  - A4: Rural background concentrations of ozone (O3)

    This indicator tracks changes in rural background concentration of ozone (O3). It is determined by calculating the annual average of the maximum daily 8-hour mean concentrations of O3 measured at all rural measurement sites on Defra's Automatic Urban and Rural Network (AURN).
  - A5: Roadside nitrogen dioxide (NO2) concentrations

    This indicator tracks changes in average roadside concentration of nitrogen dioxide (NO2).
  - A6: Exceedance of damaging levels of nutrient nitrogen deposition on ecosystems

    This indicator shows changes in the percentage of sensitive habitats exceeding the internationally agreed threshold for harmful effects (critical load) of nutrient nitrogen deposition.
  - A7: Area of land exposed to damaging levels of ammonia (NH3) in the atmosphere

    This indicator tracks changes in the amount of land area affected by damaging levels of ammonia (NH3) in the air.
- **B: Water**
  - B1: Pollution loads entering waters (Interim)

    This indicator will track changes in the inputs and discharges of selected contaminants such as nutrients and some toxic chemicals to rivers or directly to the sea, for example through sewage pipelines or activities such as agriculture inputting substances directly.
  - B2: Serious pollution incidents to water

    This indicator shows changes in the number of pollution incidents impacting on water health, including in rivers, lakes, reservoirs, canals, coasts, estuaries and groundwater.
  - B3: State of the water environment (Interim)

    The indicator comprises several metrics including percentage of water tests meeting good (or better) status for ecology and chemistry, percentage of water bodies achieving good ecological status, and compliance of waters specially protected for specific uses such as drinking water abstraction and nature conservation.
  - B4: Condition of bathing waters

    This indicator assesses the condition of bathing waters. It shows the percentage of designated bathing waters meeting conditions sufficient to minimise the risk of harm to bathers from faecal pollution. It is based on a set of microbiological tests (measuring E.coli and intestinal enterococci) performed on waters used for bathing.

- B5: Water bodies achieving sustainable abstraction criteria

This indicator shows changes in the percentage of surface waters (rivers, lakes, reservoirs and estuaries) and groundwater (including wetlands fed by groundwater) where sustainable abstraction criteria are met.

- B6: Natural functions of water and wetland ecosystems (Interim)

This indicator will track changes in the naturalness of ecosystem functioning across water and wetland ecosystems in England.

- B7: Health of freshwaters assessed through fish populations (Interim)

This indicator tracks changes in populations of native freshwater fish in England. An interim indicator is presented here that shows (a) the proportion of principal salmon rivers at risk in England and, additionally, (b) the classification of fish species within English rivers.

- **C: Seas & Estuaries**

  - C1: Clean seas: marine litter (Interim)

This indicator of clean seas shows changes in the amount of litter in the marine environment, including litter on beaches, on the seafloor and floating litter.

  - C2: Seabed subject to high pressure from human activity (Interim)

This indicator tracks changes in the distribution and intensity of potential physical disturbance caused by human activities on the seabed.

  - C3: Diverse seas: status of marine mammals and marine birds (Interim)

This indicator of diverse seas tracks changes in status assessments of marine mammals and marine birds.

  - C4: Diverse seas: condition of seafloor habitats (Interim)

This indicator of diverse seas evaluates the condition of seafloor habitats. Seafloor habitats assessed include soft sediment invertebrate communities and intertidal communities of seagrass, rocky shore macroalgae and saltmarshes. Once developed the indicator will assess the impact of human activities on seafloor habitats.

  - C5: Diverse seas: condition of pelagic habitats (Interim)

This indicator of marine biodiversity tracks changes in the Good Environmental Status (GES) of pelagic habitats. The assessment is based on (a) changes in lifeforms that make up plankton communities, and (b) changes in the biomass of phytoplankton and the abundance of zooplankton.

  - C6: Diverse seas: status of threatened and declining features (In development)

This indicator of diverse seas shows changes in the status of vulnerable features flagged for protection, either listed in national legislation or international agreements.

  - C7: Healthy seas: fish and shellfish populations (Interim)

This indicator tracks the health of our seas using assessments of fish populations: The first metric looks at the size of the fish in a community (Typical Length) and the second looks at the composition of fish communities (Mean Maximum Length).

  - C8: Healthy seas: marine food webs functioning (In development)

This indicator will track the health of our seas using metrics based on the size, structure and function of different feeding levels in marine food webs.

  - C9: Healthy seas: seafloor habitats functioning (Interim)

This indicator will show changes in the natural functionality and extent of seafloor habitats able to support a healthy and productive ecosystem.

  - C10: Productive seas: fish and shellfish stocks fished sustainably (Interim)

This indicator shows changes in the proportion of commercial fish and shellfish stocks that are within safe biological limits and fished sustainably.

  - C11: Productive seas: status of sensitive fish and shellfish stocks (Interim)

This indicator tracks changes in the population status (occurrence, abundance and condition) of fish and shellfish species at risk of depletion.

- **D: Wildlife**

  - D1: Quantity, quality and connectivity of habitats (Interim)

This indicator will measure the extent, condition and connectivity, of terrestrial and freshwater habitats in England.

  - D2: Extent and condition of protected sites – land, water and sea (Interim)

This indicator currently has 2 components: (a) extent of protected sites on land, freshwater and at sea and (b) condition of terrestrial SSSIs on land and water.

  - D3: Area of woodland in England

This indicator shows change in the area of broadleaved and conifer woodland in England.

- D4: Relative abundance and/or distribution of widespread species (Interim)

This indicator will use regularly collected data to track changes in relative abundance and/or distribution of species which are widespread and characteristic of different broad habitats in England including birds, bats, butterflies, moths, other invertebrates, and plants.

- D5: Conservation status of our native species

This indicator will track changes in the national extinction risk faced by terrestrial, freshwater and marine species using the International Union for Conservation of Nature's (IUCN) Red List categories and criteria.

- D6: Relative abundance and distribution of priority species in England (Interim)

This indicator has 2 components: (a) changes in the relative abundance of those priority species for which suitable abundance data are available; and (b) changes in distribution of those priority species for which distribution data are available.

- D7: Species supporting ecosystem functions (Interim)

Further research is required to develop this indicator, building on the existing UK pollinator indicator and defining species groups and functions for inclusion.

- **E: Natural Resources**

  - E1: Area of productive agricultural land

This indicator shows annual changes in land used for agriculture in 3 categories: grassland (including sole rough grazing); crops (including horticulture and perennial crops); and uncropped arable (land left fallow or under environmental management).

  - E2: Volume of agricultural production

This indicator shows annual changes in the index of output volume which provides an overall measure of total production across the wide range of agricultural commodities. The index is calculated using agreed international standards.

  - E3: Volume of inputs used in agricultural production

This indicator shows the index of the volume of inputs as an overall measure of the total inputs used with price effects removed. This includes all inputs including intermediate consumption, land, labour and depreciation of capital.

  - E4: Efficiency of agricultural production measured by Total Factor Productivity

This indicator is based on the ratio of inputs (indicator 'E3 Volume of inputs used in agricultural production') to outputs (indicator 'E2 Volume of agricultural production') such that the higher the value, the more efficiently inputs are converted into outputs.

  - E5: Percentage of the annual growth of trees in English woodlands that is harvested

This indicator shows changes in the percentage of annual softwood and hardwood growth in England that is harvested annually. Separate statistics are available for softwood, hardwood, and both in total.

  - E6: Volume of timber brought to market per annum from English sources

This indicator shows changes in the volume of commercial timber brought to market from woodlands in England by Forestry England from the nation's forests, and by other owners of woodland. It is a measure of the level of active management of woodland assets for economic productive purposes.

  - E7: Healthy soils (In development)

More work is being done to define exactly what the indicator will include but it could include physical properties (such as a measure of soil structure), chemical properties (such as soil carbon, nutrients and pH), bare ground (soil) and a measure of soil biological activity. This indicator is not limited to agricultural soils.

  - E8: Efficient use of water

This indicator shows changes in the efficient use of water, focussing on (a) leakage and (b) per capita consumption.

  - E9: Percentage of our seafood coming from healthy ecosystems, produced sustainably (In development)

This is a composite indicator that tracks the sustainability of seafood, fish and aquaculture products. It will combine metrics on production (covering harvesting and subsequent preparation), management and impact on the environment.

- **F: Resilience**

  - F1: Disruption or unwanted impacts from flooding or coastal erosion (In development)

This indicator will track changes in the impacts of flooding and coastal erosion on people's lives. The policy statement sets out a commitment to develop a national set of indicators that will enable progress to be tracked towards the aim of increasing resilience in flood and coastal erosion risk management.

  - F2: Communities resilient to flooding and coastal erosion (In development)

This indicator will allow us to monitor trends over time to better understand the impact of our policies and take action to protect and benefit our communities to build resilience everywhere.

- F3: Disruption or unwanted impacts caused by drought (Interim)

The indicator focuses on disruption to public water supply due to drought by tracking changes in a Supply Demand Balance Index (SDBI).

- **G: Natural Beauty and Engagement**
  - G1: Changes in landscape and waterscape character (In development)

This is a composite indicator of changes in landscape and waterscape character in England. It will combine findings from 3 developing strands of landscape monitoring work. Firstly, a statistical database and spatially mapped monitoring of changes in landscape and waterscape character in National Character Areas (NCA) and protected landscapes across all of England. Secondly, monitoring at an England scale of the public's perceptions of landscape character and how those perceptions relate to the landscape change trends being identified. Thirdly, findings will be informed by on-going monitoring (since 2013) of environmental outcomes in our protected landscapes (National Parks and Areas of Outstanding Natural Beauty).

- G2: Condition of heritage features including designated geological sites and scheduled monuments

This indicator consists of 2 measures that describe (a) the condition of geological and geomorphological (landforms and the processes which create them) heritage features of Sites of Special Scientific Interest (SSSIs) and (b) the condition of Scheduled Monuments.

- G3: Enhancement of green/blue infrastructure (Interim)

This indicator will show changes in the quantity, quality, accessibility and, ultimately, multiple functions of green and blue infrastructure.

Currently, the indicator components are (a) population with close proximity to green space (b) levels of perception and expectation of quality (c) weighted percentage who agree with specific statements about accessibility and quality.

- G4: Engagement with the natural environment (Interim)

This indicator will track changes in people's engagement with the natural environment. A range of measurements may be indicative of engagement with the natural environment, but for the purposes of this indicator, data covering the broadest possible aspects of nature and engagement were sought.

- G5: People engaged in social action for the environment (Interim)

Multiple measurements will be used within this indicator as indicative of social actions which people can take to care for and restore the environment.

- G6: Environmental attitudes and behaviours (Interim)

This indicator will track changes in people's attitudes and behaviours relating to the environment, such as the importance people place on environmental issues, as well as behaviours in key policy areas relating to care for the environment. This may include positive behaviours to support the environment and sustainable use of natural resources, such as waste, water and energy.

- G7: Health and wellbeing benefits (Interim)

This indicator will aim to show the benefits to human health and well-being that can be gained through England's natural environments. This includes benefits gained from more people engaging with nature, but also more passive benefits through improvements in natural environments that may impact on human health and well-being (for example, improvements in air quality, climate regulation, and noise mitigation). The indicator will aim to track changes for people in disadvantaged groups and others who may benefit the most.

- **H: Biosecurity, Chemical and Noise**
  - H1: Abatement of the number of invasive non-native species entering and establishing against a baseline (Interim)

This indicator will show how the number of invasive non-native species entering Great Britain has been abated (reduced) by comparing a predicted trend for establishment of invasive non-native species against actual establishment.

- H2: Distribution of invasive non-native species and plant pests and diseases (Interim)

This indicator will show changes in the distribution of non-native invasive species and plant pests that have already established in England.

- H3: Emissions of mercury and persistent organic pollutants to the environment (Interim)

This indicator shows changes in emissions of mercury and persistent organic pollutants (POPs) to air, land, and water from measured, calculated, and modelled sources.

- H4: Exposure and adverse effects of chemicals on wildlife in the environment (Interim)

This indicator tracks changes in the exposure of wildlife to chemicals in the environment over time and considers the potential risks to wildlife from chemicals in terrestrial, freshwater and marine ecosystems.

- H5: Exposure to transport noise (In development)

This indicator will track changes in the exposure of people to noise from transportation sources. It does not include neighbour and neighbourhood noise. The indicator will show

the estimated number of people exposed to noise levels (in 5 decibel bands) from the most significant road, rail and air sources.

- **J: Resource Use and Waste**
  - J1: Carbon footprint and consumer buying choices (Interim)

This indicator tracks the carbon footprint of England's residents, by showing changes in the greenhouse gas (GHG) emissions associated with final demand for goods and services in England.

  - J2: Raw material consumption

This indicator shows trends in the amount of (a) raw material consumption (RMC) per capita and (b) the amount of gross value added (GVA) per unit of raw material consumption.

  - J3: Municipal waste recycling rates (Interim)

This indicator shows changes in municipal waste recycling rates in England. The municipal waste recycling rate is the fraction of household waste and waste similar in nature and composition to household waste, which is recycled. The indicator reflects levels of everyday waste that is recycled and not sent for final disposal.

  - J4: Residual waste arising by type and sector (Interim)

This indicator shows how much waste is incinerated and landfilled in England rather than recycled, reused or treated further up the waste hierarchy.

  - J5: Prevent harmful chemicals from being recycled (In development)

This indicator will track the amount of banned or restricted chemicals in waste which is being destroyed.

  - J6: Waste Crime (Interim)

This indicator tracks changes in the scale of key aspects of waste crime. Current data reported include illegal waste sites and fly-tipping.

- **K: International**
  - K1: Overseas environmental impacts of UK consumption of key commodities (Interim)

This indicator tracks the impact on the environment globally resulting from the UK's domestic consumption, linked to the sustainability of the products we consume. The indicator is based on multi regional input-output (MRIO) modelling, which is used to model global trade flows representing the monetary inputs and outputs across different countries and their commercial sectors.

  - K2: Developing countries better able to protect and improve the environment with UK support (In development)

This indicator will report outcomes of UK investment programmes into nature. These programmes support developing countries to protect and improve the environment, address illegal wildlife trade, mitigate and adapt to climate change and alleviate poverty.

  - K3: Status of endemic and globally threatened species in the UK Overseas Territories (Interim)

This indicator assesses the proportion of endemic species in the UKOTs that are considered threatened on International Union for Conservation of Nature (IUCN) Red List assessments.

  - K4: Extent and condition of terrestrial and marine protected areas in the UK Overseas Territories (Interim)

This indicator will have 2 components: (a) extent and (b) condition of UKOT protected areas. It will show changes in the coverage of protected areas and other effective area-based conservation measures (OECMs) across the UKOTs, from a 2020 baseline.

What equivalent UK indicators exist for the evidence covered by the EEA's Environmental Indicator Catalogue?

While the EEA's Environmental Indicator Catalogue and DEFRA's Outcome Indicator Framework (OIF) exist for different purposes and have different scopes, they both provide the baseline for the kind of environmental data being routinely collected for the purpose of assessing environmental improvement and protection.

Where some issues are covered by other Government Departments, they are typically not addressed by the OIF, such as indicators related to energy and climate change. Many indicators are also addressed through the UK Biodiversity Indicators. The table below indicates where an equivalent indicator exists, either in the OIF or in another set of indicators.

Environmental Indicator Catalogue indicator	Closest equivalent in OIF or elsewhere
Common farmland bird index	UK Biodiversity Indicator C5. Birds of the wider countryside and at sea
Final energy consumption by agriculture/ forestry per hectare of utilised agricultural area	E3: Volume of inputs used in agricultural production (although the indicator does not address energy consumption specifically, the Farm Business Survey collects this data)
Greenhouse gas emissions from agriculture	A2: Emissions of greenhouse gases from natural resources
Sales of pesticides by type of pesticide	**Currently no UK-wide directly-equivalent indicator is available**, though similar historic data on pesticide usage by type of pesticide in England was privately collected by the Food and Environment Research Agency
Share of irrigable and irrigated areas in utilised agricultural area (UAA)	Collected under DEFRA National Agriculture Statistics Chapter 2
Share of main land types in utilised agricultural area (UAA)	Collected under DEFRA National Agriculture Statistics Chapter 2
Share of main livestock types in total livestock units (LSU)	Collected under DEFRA National Agriculture Statistics Chapter 8
Area under organic farming	Collected under DEFRA National Agriculture Statistics Chapter 12
Daily calories supply per capita by source	**Currently no UK-wide directly-equivalent indicator is available**, though equivalent data could be extrapolated from the results of the National Diet and Nutrition Survey
Heat and cold — mean air temperature	Equivalent data collected by the Met Office
Livestock density index	Equivalent data collected under DEFRA National Agriculture Statistics Chapter 8
Harmonised risk indicator 1 for pesticides by categorisation of active substances	**Currently no UK-wide directly-equivalent indicator is available.**
Use of more hazardous pesticides	**Currently no UK-wide directly-equivalent indicator is available**, though similar historic data on pesticide usage by type of pesticide in England was privately collected by the Food and Environment Research Agency
Drought impact on ecosystems in Europe	F3: Disruption or unwanted impacts caused by drought
Atmospheric greenhouse gas concentrations	Equivalent data can be extrapolated from UK Greenhouse Gas Emissions Statistics
Exceedance of air quality standards in Europe	Some data has equivalents covered by A1: Emissions for five key air pollutants, A3: Concentrations of fine particulate matter (PM2.5) in the air, A4: Rural background concentrations of ozone, and A5: Roadside nitrogen dioxide (NO_2) concentrations; some data has no equivalent
Exposure of Europe's ecosystems to ozone	**Currently no UK-wide directly-equivalent indicator is available**, but similar data could be extrapolated from A4: Rural background concentrations of ozone
Urban population exposed to PM10 concentrations exceeding the daily limit value	Equivalent data could be extrapolated from data collected on roadside PM10 concentrations as part of the Automatic Urban and Rural Network
Years of life lost due to PM2.5 exposure	Equivalent data could be extrapolated from A3: Concentrations of fine particulate matter (PM2.5) in the air
Air emission intensity from industry	Equivalent data is available through UK Greenhouse Gas Emissions Statistics and A1: Emissions for five key air pollutants
Ammonia emissions from agriculture	A2: Emissions of greenhouse gases from natural resources
Ammonia emissions from agriculture - % of total emissions	Equivalent data can be extrapolated from A2: Emissions of greenhouse gases from natural resources
Average CO_2 emissions per km from new passenger cars	Equivalent data can be extrapolated by combining UK Greenhouse Gas Emissions Statistics and DFT/DVLA's Vehicle Statistics
CO_2 performance of new passenger cars in Europe	Equivalent data can be extrapolated by combining UK Greenhouse Gas Emissions Statistics and DFT/DVLA's Vehicle Statistics
Emissions and energy use in large combustion plants in Europe	Equivalent data is available through UK Greenhouse Gas Emissions Statistics

Environmental Indicator Catalogue indicator	Closest equivalent in OIF or elsewhere
Emissions of the main air pollutants in Europe	A1: Emissions for five key air pollutants
Greenhouse gas emission intensity of fuels and biofuels for road transport in Europe	Equivalent data can be extrapolated from UK Greenhouse Gas Emissions Statistics
Net greenhouse gas emissions	UK Greenhouse Gas Emissions Statistics
Greenhouse gas emissions from transport in Europe	Equivalent data is available through UK Greenhouse Gas Emissions Statistics
Heavy metal emissions in Europe	Equivalent data is collected by the National Atmospheric Emissions Inventory
Hydrofluorocarbon phase-down in Europe	Equivalent data can be extrapolated from UK Greenhouse Gas Emissions Statistics
Persistent organic pollutant emissions	H3: Emissions of mercury and persistent organic pollutants to the environment
Pollutant emissions from transport	Equivalent data can be extrapolated from UK Greenhouse Gas Emissions Statistics
Total greenhouse gas (GHG) emission trends and projections in Europe	Equivalent data is available through UK Greenhouse Gas Emissions Statistics
Consumption of ozone-depleting substances	This data is collected in line with the UK Ozone-Depleting Substances and Fluorinated Greenhouse Gases Common Framework
Consumption of chemicals by hazardousness - EU aggregate	Currently no UK-wide directly-equivalent indicator is available.
Contribution to the international 100bn USD commitment on climate related expending	Equivalent information is published as part of the UK International Climate Finance Strategy
Global and European temperature	Equivalent data collected by the Met Office
Arctic and Baltic Sea ice	Not relevant in UK context
Climate related economic losses	Equivalent data could be extrapolated from F1: Disruption or unwanted impacts from flooding or coastal erosion and F3: Disruption or unwanted impacts caused by drought
Economic losses from climate-related extremes in Europe	Equivalent data could be extrapolated from F1: Disruption or unwanted impacts from flooding or coastal erosion and F3: Disruption or unwanted impacts caused by drought
Heat and Health	Equivalent data is collected by ONS and the UK Health Security Agency
Glaciers	Not relevant in UK context
Ice sheets	Not relevant in UK context
Wet and dry — heavy precipitation and river floods	Equivalent data collected by the Met Office
Wet and dry - mean precipitation	Equivalent data collected by the Met Office
Snow and ice — snow, glaciers and ice sheets	Not relevant in UK context
Use of renewable energy for transport in Europe	Equivalent data is collected by the ONS
Energy import dependency by products	Equivalent data is collected by the ONS
Final energy consumption	Equivalent data is collected by the ONS
Final energy consumption in households	Equivalent data is collected by the ONS
Final energy consumption in households by fuel	Equivalent data is collected by the ONS
Primary and final energy consumption in Europe	Equivalent data is collected by the ONS
Primary energy consumption	Equivalent data is collected by the ONS
Energy productivity	Equivalent data is collected by the ONS
Greenhouse gas emission intensity of electricity generation in Europe	Equivalent data could be extrapolated from UK Greenhouse Gas Emissions Statistics
Share of renewable energy in gross final energy consumption by sector	Equivalent data can be extrapolated from data collected by the ONS

Environmental Indicator Catalogue indicator	Closest equivalent in OIF or elsewhere
Eco-innovation index	The 16 indicators which comprise the Eco-innovation index can be extrapolated from data collected by the ONS (eco-innovation inputs, eco-innovation activities, resource efficiency outcomes, and socio-economic outcomes), UK Biodiversity Indicator A5. Integration of biodiversity considerations into business activity (eco-innovation activities), UK Intellectual Property Office's Green Channel statistics (eco-innovation outputs), the Enterprise Research Centre (eco-innovation outputs), E8: Efficient use of water (resource efficiency outcomes), the National Energy Efficiency Data-Framework (resource efficiency outcomes), and UK Greenhouse Gas Emissions Statistics (resource efficiency outcomes). EU baseline data for comparison is available through the eco-innovation index.
Equivalent data on eco-innovation focused media coverage is not centrally collated.	
Patents related to recycling and secondary raw materials	Equivalent data can be extrapolated from the UK Intellectual Property Office's Green Channel statistics
Private investment, jobs and gross value added related to circular economy sectors	Equivalent data can be extrapolated from data collected by ONS
Energy taxes	Equivalent data is collected by ONS
Energy taxes by paying sector	Equivalent data is collected by ONS
Share of environmental taxes in total tax revenues	Equivalent data is collected by ONS
Estimated trends in fishing pressure, by fishing area	UK Biodiversity Indicator B2. Sustainable fisheries
Estimated trends in fish stock biomass, by fishing area	UK Biodiversity Indicator B2. Sustainable fisheries
Forest fires in Europe	Barely relevant in UK context but equivalent data is collected by UK Forest Research
Share of forest area	Equivalent data is collected by UK Forest Research
Roundwood production	Equivalent data is collected by UK Forest Research
Total paper and paperboard production	Equivalent data is collected by UK Forest Research
Total sawnwood production	Equivalent data is collected by UK Forest Research
Gross value added of the forestry industry, at basic prices	Equivalent data could be extrapolated from E6: Volume of timber brought to market per annum from English sources
Conservation status of habitats under the EU Habitats Directive	UK Biodiversity Indicator C3a. Status of UK habitats of European importance
Ecosystem coverage in Europe	Equivalent data is collected by ONS Natural Capital Accounts
Land recycling and densification	Equivalent data can be extrapolated from Land Use statistics published by DLUHC
Built-up areas	Equivalent data can be extrapolated from Land Use statistics published by DLUHC
Land take in Europe	Equivalent data can be extrapolated from Land Use statistics published by DLUHC
Landscape fragmentation	D1: Quantity, quality and connectivity of habitats and UK Biodiversity Indicator C2. Habitat Connectivity
Landscape fragmentation pressure and trends in Europe	D1: Quantity, quality and connectivity of habitats and UK Biodiversity Indicator C2. Habitat Connectivity
Productivity of artificial land	Equivalent data can be extrapolated from Land Use statistics published by DLUHC
Settlement area per capita	Equivalent data can be extrapolated from Land Use statistics published by DLUHC
Vegetation productivity	No equivalent data is collected to the data collected under the EU's methodology, which uses the Plant Phenology Index

Environmental Indicator Catalogue indicator	Closest equivalent in OIF or elsewhere
Nationally designated terrestrial protected areas in Europe	D2: Extent and condition of protected sites – land, water and sea and UK Biodiversity Indicator C1. Protected areas
Natura 2000 sites designated under the EU Habitats and Birds Directives	This data is collated under the JNCC's UK National Site Network
Surface of the marine protected areas	Equivalent data collected by JNCC Marine Protected Area Network Statistics; also D2: Extent and condition of protected sites – land, water and sea and UK Biodiversity Indicator C1. Protected areas
Surface of the terrestrial protected areas	D2: Extent and condition of protected sites – land, water and sea and UK Biodiversity Indicator C1. Protected areas
Vector-borne diseases	Due to differing climate conditions, data collected by the EU under the Environmental Indicator Catalogue is not relevant in the UK context
Abundance and distribution of selected European species	UK Biodiversity Indicators C4a. Status of UK priority species – Relative abundance and C4b. Status of UK priority species – Distribution
Common bird index by type of species - EU aggregate	UK Biodiversity Indicator C5. Birds of the wider countryside and at sea
Conservation status of species under the EU Habitats Directive	D5: Conservation status of our native species
Grassland butterfly index - EU aggregate	UK Biodiversity Indicator C6. Insects of the wider countryside (butterflies)
Population living in households considering that they suffer from noise, by poverty status	There is no centralised indicator which has equivalent methodology to the EU indicator, though other relevant data does exist: Similar qualitative data is published by the CIEH, and in Northern Ireland DAERA has published similar data; Quantitative data on noise is collected by DEFRA and will form part of indicator H5: Exposure to transport noise
Industrial pollutant releases to air in Europe	Equivalent data can be extrapolated from A1: Emissions for five key air pollutants and UK Greenhouse Gas Emissions Statistics
Circular material use rate (CEI_SRM030 & SDG_12_41, both of which are functionally equivalent to one another)	Equivalent data can be extrapolated from J2: Raw material consumption and UK Statistics on Waste
Domestic material consumption per capita	Equivalent data can be extrapolated from J2: Raw material consumption and UK Statistics on Waste
Material footprint	Equivalent data can be extrapolated from J2: Raw material consumption
Resource productivity	Equivalent data can be extrapolated from J2: Raw material consumption
Raw material consumption	J2: Raw material consumption
Imperviousness and imperviousness change in Europe	**Currently no UK-wide directly-equivalent indicator is available**, though this may become an element of the E7: Healthy soils indicator. The JNCC report 'Towards indicators of soil health' proposes an approach which could incorporate an equivalent indicator. Some soil sealing data is collected under Scotland's Soil Monitoring Action Plan and some equivalent data can be extrapolated from Land Use statistics published by DLUHC.
Soil moisture deficit	**Currently no UK-wide directly-equivalent indicator is available**, though this may become an element of the E7: Healthy soils indicator. The JNCC report 'Towards indicators of soil health' proposes an approach which could incorporate an equivalent indicator. Some equivalent data is currently published through Countryside Survey Reports and Environment Agency national monthly water situation reports.

Environmental Indicator Catalogue indicator	Closest equivalent in OIF or elsewhere
Estimated soil erosion by water - area affected by severe erosion rate	Currently no UK-wide directly-equivalent indicator is available, though this may become an element of the E7: Healthy soils indicator. The JNCC report 'Towards indicators of soil health' proposes an approach which could incorporate an equivalent indicator. Some equivalent data can be extrapolated from data collected by the ONS under the UK Material Flow Review.
Gross nutrient balance in agricultural land	Currently no UK-wide directly-equivalent indicator is available,though this may become an element of the E7: Healthy soils indicator. The JNCC report 'Towards indicators of soil health' proposes an approach which could incorporate an equivalent indicator. Irregularly, equivalent data is published through DEFRA's soil nutrient balance statistics.
Modal split of freight transport	Equivalent data is published by Transport Statistics Great Britain (TSGB04)
Share of rail and inland waterways in inland freight transport	Equivalent data is published by Transport Statistics Great Britain (TSGB04)
Share of buses and trains in inland passenger transport	Equivalent data is published by Transport Statistics Great Britain (TSGB01)
Volume of passenger transport relative to GDP	Equivalent data is published by Transport Statistics Great Britain (TSGB01)
New registrations of electric vehicles in Europe	Equivalent data is published in DFT/DVLA's Vehicle Licensing Statistics
Recycling rate of e-waste (CEI_WM050 & T2020_RT130, both of which are functionally equivalent to one another)	Equivalent data is published by the Environment Agency
Diversion of waste from landfill in Europe	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Generation of municipal waste per capita	Equivalent data can be extrapolated from J3: Municipal waste recycling rates and DEFRA's UK Waste Statistics
Recycling of bio-waste	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Recycling rate of municipal waste (CEI_WM011, SDG_11_60, t2020_rt120)	J3: Municipal waste recycling rates
Generation of packaging waste per capita	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Generation of plastic packaging waste per capita	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Recovery rates for packaging waste (Rate of recovery or incineration at waste incineration plants with energy recovery)	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Recovery rates for packaging waste (share of recycled packaging waste in all generated packaging waste)	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Recycling rate of packaging waste by type of packaging	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Generation of waste excluding major mineral wastes per domestic material consumption	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Generation of waste excluding major mineral wastes per GDP unit	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Generation of waste excluding major mineral wastes by hazardousness	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Landfill rate of waste excluding major mineral waste	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics

Environmental Indicator Catalogue indicator	Closest equivalent in OIF or elsewhere
Recycling rate of all waste excluding major mineral waste	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Contribution of recycled materials to raw materials demand - end-of-life recycling input rates	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics and data collected by the ONS under the UK Material Flow Review
Generation of packaging waste per capita	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Generation of plastic packaging waste per capita	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Generation of waste by economic activity	J4: Residual waste arising by type and sector
Generation of waste by waste category	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Management of waste excluding major mineral waste, by waste operations	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Recovery rate of construction and demolition waste	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Trade in recyclable raw materials	Equivalent data can be extrapolated from DEFRA's UK Waste Statistics
Waste generation and decoupling in Europe	Equivalent data can be extrapolated by combining DEFRA's UK Waste Statistics and data published by the ONS
Oxygen concentrations in coastal and marine waters surrounding Europe	Equivalent data can be extrapolated from data published periodically through the Cefas Marine Online Assessment Tool
Marine waters affected by eutrophication	Equivalent data can be extrapolated from data published periodically through the Cefas Marine Online Assessment Tool
Bathing sites with excellent water quality by locality	B4: Condition of bathing waters
Biochemical oxygen demand in rivers	Equivalent data is published in the Environment Agency WFD Classification Status reports (though it is not used in classifying the status of water bodies)
Nitrate in groundwater	Equivalent data can be extrapolated from B3: State of the water environment
Nutrients in freshwater in Europe	Equivalent data is collected as supporting evidence for B3: State of the water environment
Oxygen consuming substances in European rivers	Equivalent data is collected as supporting evidence for B3: State of the water environment
Phosphate in rivers	Equivalent data is collected as supporting evidence for B3: State of the water environment
Wet and dry — drought	Equivalent data collected by the Met Office
Chlorophyll in transitional, coastal and marine waters	Equivalent data can be extrapolated from data published periodically through the Cefas Marine Online Assessment Tool
European sea surface temperature	Equivalent data collected by the Met Office
Global and European sea-level rise	Equivalent data collected by the Met Office
Global mean surface seawater acidity	As this is a global indicator, it remains relevant in its existing form
Nutrients in transitional, coastal and marine waters	Equivalent data can be extrapolated from data published periodically through the Cefas Marine Online Assessment Tool
Lake surface temperatures	Equivalent data can be extrapolated from the Environment Agency Surface Water Temperature Archive
Water- and food-borne diseases	The methodology of this indicator is specific to the Baltic Sea, so is not relevant in the UK context
Ocean acidification	As this is a global indicator, it remains relevant in its existing form
Oxygen concentrations in coastal and marine waters surrounding Europe	Equivalent data can be extrapolated from data published periodically through the Cefas Marine Online Assessment Tool

Environmental Indicator Catalogue indicator	Closest equivalent in OIF or elsewhere
Population connected to at least secondary waste water treatment	Equivalent data is published in DEFRA's Wastewater Treatment statistics
Urban waste water treatment in Europe	Equivalent data is published in DEFRA's Wastewater Treatment statistics
Ocean Heat Content	As this is a global indicator, it remains relevant in its existing form
Population connected to public water supply	Equivalent data is collected by the ONS
Use of freshwater resources in Europe	B3: State of the water environment and F3: Disruption or unwanted impacts caused by drought
Water exploitation index, plus (WEI+)	Equivalent data can be extrapolated from B5: Water bodies achieving sustainable abstraction criteria and E8: Efficient use of water
Water productivity	E8: Efficient use of water
Water resources: long-term annual average	Equivalent data can be extrapolated from the Environment Agency Potential Evapotranspiration Dataset, data collected by the Met Office, and the Environment Agency Rainfall and River Flow weekly reports

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