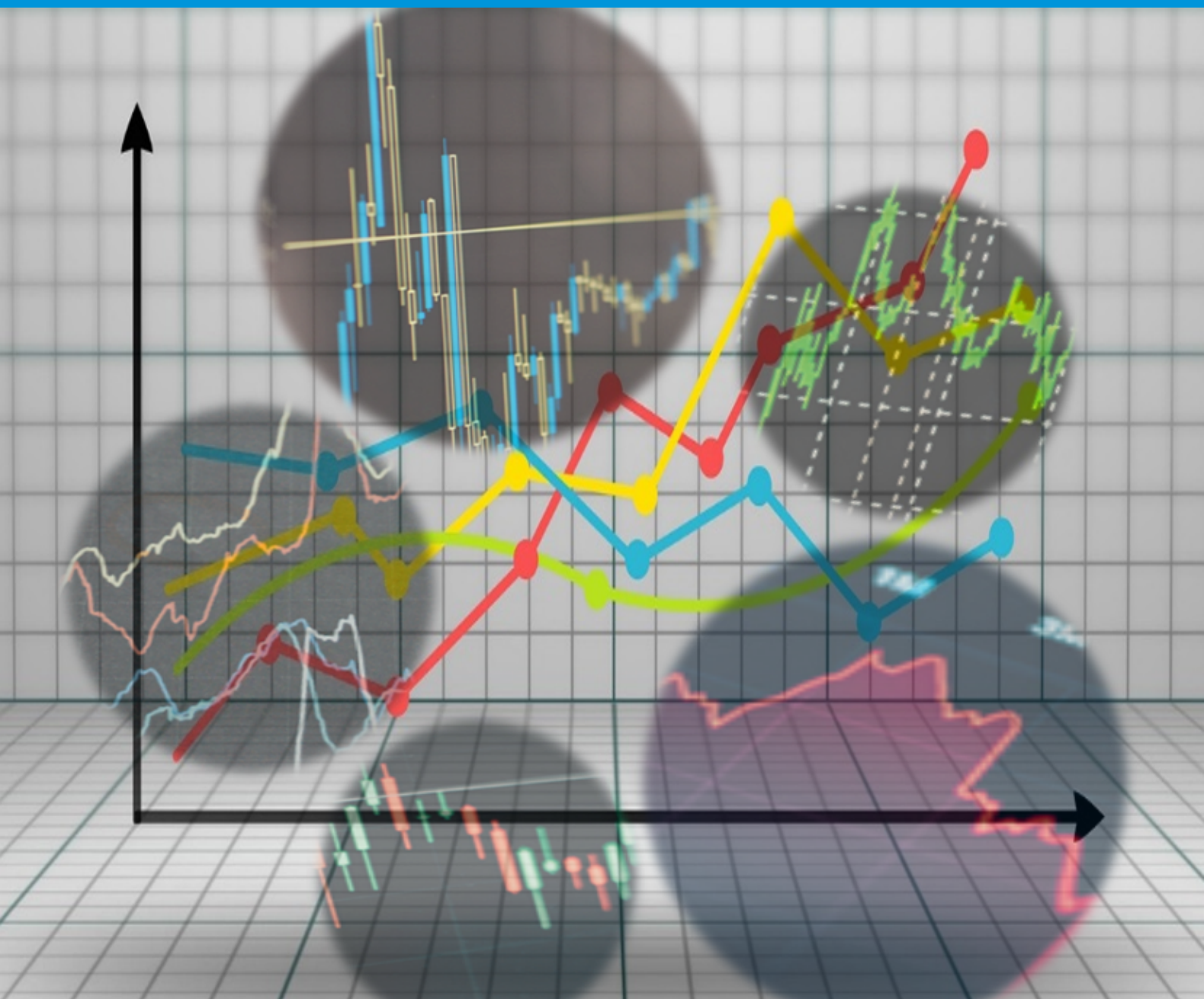




# Megatrends

Future of the Environmental Sciences 2023



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# Future of ES23: Megatrends

## Future of the Environmental Sciences horizon scanning & foresight project

*This is a briefing paper on global megatrends and their effects on the future of environmental science. It was produced as part of the Institution's [Future of ES23 horizon scanning & foresight project](#), and has been produced for IES members and participants at the IES's horizon scanning discussion event on megatrends.*

*The paper is intended to encourage awareness of the nature and effects of megatrends such as climate change and rapid urbanisation to support horizon scanning for environmental professionals and to identify opportunities to inform pathways towards a positive future for environmental science. The paper provides an introductory view, in the context of the breadth of wider literature on the topic of megatrends.*

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## Background

Throughout 2023, the IES is using its platform to unite perspectives across the environment for collective horizon scanning on the [future of the environmental sciences](#). The goal is to create a vision statement which will support the sector to plan ahead, manage risk, and collectively secure a better future for the environment, achieved through [transformative change](#).

The project's first theme, 'Megatrends', reflects on global megatrends and their influence on the environment, economy, and society, as well as the consequences of megatrends at global, national, and sub-national levels. The theme concludes with a [discussion event](#) on Thursday 2nd February 2023, incorporating the views of environmental professionals across disciplines.

## Specialism-specific relevance

This briefing is written for an audience of environmental professionals across disciplines. Specific specialisms which may be affected by the subject-matter of the briefing include:

- Air quality
- Built environment
- Climatology
- Conservation & ecology
- Energy
- Environmental management
- Hydrology
- Sustainability
- Transport

Ultimately, this subject is likely to affect any professional whose work is affected by the global trends that influence society, so may have relevance beyond specific specialisms.

## What are megatrends?

Megatrends are long-term, often irreversible trends which have substantial effects on society as a whole, typically operating at the global scale but often with consequences at every level of society. These trends tend to be the result of holistic factors and have broad and far-reaching implications for how the future will be shaped.

Interlinking megatrends such as climate change, [rapid urbanisation](#), and economic, social, and technological developments are already fundamentally impacting the environment sector, and they have the potential to change the role of environmental science further. As these trends significantly affect the ways that people live their lives and interact with the world around them, they have consequences across the economy.

Many also have specific implications for environmental science, particularly those which relate to environmental challenges, the conditions which frame decisions being made about the environment, or the interface between science and the rest of society.

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### Climate change and environmental challenges

Several [environmental challenges](#) have reached the point of becoming megatrends, most notably climate change. Similarly, biodiversity loss, ecological degradation, pollution, natural resource depletion, and the spread of zoonotic diseases have all been included on lists of megatrends. Systems of consumption and production that have been in place since the industrial revolution have now caused outcomes which are extreme enough to influence widespread trends on a global scale.

Naturally, there are significant consequences for the future of the environmental sciences. Scientific evidence is crucial to identifying, understanding, and responding to each of these environmental challenges. The prominence of these fundamental challenges has led to an integration of environmental science into governance and the world of business, as well as the sight of wider society through media.

At the same time, the consequences of environmental challenges are also likely to influence the future of the environmental sciences. New jobs applying environmental science are likely to be created to manage natural systems in the future, and the way that those jobs operate will be dictated by the limitations imposed by environmental outcomes.

Find out more about environmental challenges and the global community's ability to respond to them in our [analysis piece: Can global cooperation fight back against megatrends?](#)

### Rapid urbanisation

Urbanisation as a process has been taking place to different degrees for hundreds of years. In many developing countries, the process of [rapid urbanisation](#) is significantly shaping what communities and economic conditions will look like in the future, whereas many developed countries already have high degrees of urbanisation, which may be linked to environmental challenges and complex social, environmental, and economic systems.

As a megatrend, therefore, urbanisation is highly contextually divergent and is likely to have different consequences in different places. The commonality between them is the nature of urban and built environments and their interaction with the natural world, which is likely to significantly shape the future of the environmental sciences.

For many, the appeal of urbanisation is largely linked to the accessibility of common goods, whether they are services, connectivity, or wider economic benefits, and the desirability

of those goods means that urbanisation is likely to continue to a considerable degree. To that end, the challenge for the future of the environmental sciences will be to take a [systems approach](#) to the process of urbanisation, ensuring that where it does happen, it does so in ways that appropriately allow for the conservation, integration, or enhancement of the natural world, and that urbanisation only takes place where the benefits for humanity and nature outweigh negative outcomes.

Trends linked to urbanisation also provide opportunities for the future of environmental science. Globalisation and large scale urbanisation has opened the door to internal and international migration, as well as new forms of sub-national governance, the former of which has enhanced the breadth and expertise of environmental science, whereas the latter has provided new spaces to pilot and engage in environmental action.

The core of a [systems approach to environmental science](#) relies on our ability to draw diverse perspectives across disciplines, so as urbanisation continues, environmental science may be shaped by the increasing concentration of science and scientists in specific urbanised geographies, particularly [megacities](#) where emerging science is beginning to become more prolific.

Find out more about rapid urbanisation, its consequences, and how science can respond in our [panel discussion: The impact of rapid urbanisation on air, land and water.](#)

### Global economic, social, and political trends

The global economy is changing, not only in response to the changing political and social landscape, but also as part of the [transition to a greener and net zero economy](#). Awareness of the need for global economic transition has heightened, with the private sector now recognising the substantial economic [costs associated with not transitioning](#), and the financial and reputational risks linked to inaction. As certainty of the investment opportunity of the green transition increases, a net zero economic future becomes more likely, as long as climate science and sustainability continue to guide global action.

While significant changes to transport, infrastructure, and energy systems should be expected, many of the [pathways to net zero](#) are likely to continue the trend of long-term economic growth around the world. [Sustainable development](#) also has the potential to continue to progress, leading to increased social empowerment and global reductions in inequality.

However, to achieve that vision for improved social, economic, and environmental outcomes, significant steps must still be taken to secure that future, rather than one that descends into increased inequality, political conflict, and degraded environments. The role of environmental science will be to

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### Box 1. What is Future of ES23?

By the end of 2023, the IES will create a thought-leading vision statement on the future of the environmental sciences, bringing together interdisciplinary perspectives on horizon scanning from across the environment. This work will support the sector to manage risk, plan ahead, and work towards a better future for the environment achieved through transformative change.

The work is coordinated across six themes, which we will use as a nexus for discussion and as an opportunity to facilitate collaboration:

- Megatrends
- The Science
- The Regulatory Landscape
- The Workforce
- The Job
- The Future

Each theme will be supported by events, webinars, and written content, informing IES members and partners as we collectively consider what the future holds. At the conclusion of each theme, a horizon scanning discussion will bring those voices together in one conversation.

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work with other disciplines, leaders, and communities to steer global action towards [urgent, effective, and just transitions](#).

That challenge may be heightened by an increasingly multipolar world where geopolitics is dynamic and changing, so global efforts to promote cooperation between scientific disciplines and wider engagement with [scientific literacy](#) will be important tools in informing global communities affected by an uncertain world.

Find out more about the future of the global economic transition and its relationship with climate change and environmental degradation in our [webinar: The economics of a clean transition](#).

### Technological development

Technology is evolving at increasingly rapid rates, shaping every element of modern society and the economy. Developments such as social media, AI and machine learning, and biotechnology have all seen significant progress in recent years and that trajectory is likely to continue into the future, significantly influencing the future of the environment and the environmental sciences.

During the COVID-19 pandemic, the pervasiveness of technology allowed for a degree of global interconnectedness which facilitated increased resilience to the nature of the pandemic. Similarly, technology will play an important role in not only mitigating environmental challenges, but supporting increased adaptive capacity as those challenges shape the future.

Environmental science is well-placed to be involved in both, and the practice of environmental science is also being shaped by the availability of best practice enabled by technology on issues such as models for [systems approaches to conservation](#), remote sensing in the marine environment, or [digital transformation towards sustainable business models](#).

### Other trends

There are many other megatrends which are likely to influence the future of the environmental sciences, which are inherently interlinked with many of the other trends shaping the future. As demographics shift and some populations grow older, the future of the global workforce is likely to change, influencing the [need for skills development](#) and the means by which environmental scientists gain those skills.

At the same time, the role of science in society is changing as well. Trust in science will be an important driver of many of the

potential changes in the future of the environmental sciences, and global events such as climate change and COVID-19 influence how people perceive science.

The future role of environmental science may also be shaped by the evolving state of science communication and the interaction between emerging science and the messages it sends to the rest of society, so that relationship will remain crucial for the future.

### What next?

On Thursday 2nd February, the IES will be holding a [discussion event to facilitate conversations](#) about how these megatrends may influence the future of the environmental sciences. The scene will be set by a panel of experts presenting on climate change, urbanisation, and the wider context of megatrends. After the event is finished, it will help to inform the ongoing process of horizon scanning, as well as the project's final vision statement.

How can you get involved?

- [Attend the event](#) to share your views;
- Ask questions to the panel to find out more about the impacts of global megatrends;
- [Get in touch](#) to find out more about our horizon scanning and foresight work, or to privately share your views on the future of the environmental sciences.

### Other relevant resources

Find out more about megatrends and how they are affecting the future of the environmental sciences:

- [Future of the environmental sciences horizon scanning & foresight project](#)
- [What still needs to happen for the UK to reach Net Zero?](#)
- [Can global cooperation fight back against megatrends?](#)
- [The economics of a clean transition](#)
- [Perspectives on the impact of rapid urbanisation on air, land and water](#)
- [What happened at COP27?](#)
- [A manifesto for transformative change](#)



Institution of Environmental Sciences

6-8 Great Eastern Street | London

EC2A 3NT

+44 (0)20 3862 7484

[info@the-ies.org](mailto:info@the-ies.org)

[www.the-ies.org](http://www.the-ies.org)

Registered charity no. 277611