

Report: Pivotal moment for humanity as tipping point threats and opportunities accelerate

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The world has reached a pivotal moment as threats from Earth system tipping points—and progress towards positive tipping

points—accelerate, a new report shows.

The Global Tipping Points Report—the most comprehensive assessment of tipping points ever conducted—says humanity is currently on a disastrous trajectory. Parts of the Global Tipping Points Report will be published in [a special issue](#) of the journal *Earth System Dynamics*.

The speed of fossil fuel phase out and growth of zero-carbon solutions will now determine the future of billions of people.

The report says current global governance is inadequate for the scale of the challenge and makes six key recommendations to change course fast, including coordinated action to trigger positive tipping points.

A tipping point occurs when a small change sparks an often rapid and irreversible transformation, and the effects can be positive or negative.

Based on an assessment of 26 negative Earth system tipping points, the report concludes "business as usual" is no longer possible—with rapid changes to nature and societies already happening, and more coming.

With [global warming](#) now on course to breach 1.5°C, at least five Earth system tipping points are likely to be triggered—including the collapse of major ice sheets and widespread mortality of warm-water coral reefs.

As Earth system tipping points multiply, there is a risk of catastrophic, global-scale loss of capacity to grow staple crops.

Without [urgent action](#) to halt the climate and ecological crisis, societies will be overwhelmed as the natural world comes apart.

Alternatively, emergency global action—accelerated by leaders meeting now at COP28—can harness positive tipping points and steer us towards

a thriving, sustainable future.

The report lays out a blueprint for doing this, and says bold, coordinated policies could trigger positive tipping points across multiple sectors including energy, transport, and food.

A cascade of positive tipping points would save millions of lives, billions of people from hardship, trillions of dollars in climate-related damage, and begin restoring the [natural world](#) upon which we all depend.

The report was produced by an international team of more than 200 researchers, coordinated by the University of Exeter, in partnership with Bezos Earth Fund.

"Tipping points in the Earth system pose threats of a magnitude never faced by humanity," said Professor Tim Lenton, of Exeter's Global Systems Institute.

"They can trigger devastating domino effects, including the loss of whole ecosystems and capacity to grow staple crops, with societal impacts including mass displacement, political instability and financial collapse.

"But tipping points also offer our best hope: we need to prioritize and trigger positive tipping points in our societies and economies.

"This is already happening in areas ranging from renewable energy and [electric vehicles](#) to [social movements](#) and plant-based diets.

"Now is the moment to unleash a cascade of positive tipping points to ensure a safe, just and sustainable future for humanity."

Calling for reinforcements

"Currently, our global governance system is inadequate to deal with the coming threats and implement the solutions urgently required," said Dr. Manjana Milkoreit, from the University of Oslo.

"Some Earth system tipping points are now likely to be triggered, causing severe and disproportionate impacts within and between nations.

"This provides an urgent impetus to strengthen adaptation and loss and damage governance, adjusting existing frameworks and increasing resources to account for tipping point threats.

"Averting this crisis—and doing so equitably—must be the core goal of COP28 and ongoing global cooperation.

"Good global governance can make this happen, especially by triggering positive tipping points."

Dr. Steve Smith, at the University of Exeter, said, "Just as with Earth system tipping points, positive tipping points can combine to reinforce and accelerate each other.

"For example, as we cross the tipping point that sees [electric vehicles become the dominant form of road transport](#), battery technology continues to get better and cheaper.

"This could trigger another positive tipping point in the use of batteries for storing renewable energy, reinforcing another in the use of heat pumps in our homes, and so on.

"Many areas of society have the potential to be 'tipped' in this way, including politics, social norms and mindsets.

"Human history is full of examples of abrupt social and [technological](#)

[change](#).

"Learning from these examples, we must switch our focus from incremental change to transformative action—tipping the odds in our favor."

The report includes six key recommendations:

- Phase out fossil fuels and land-use emissions now, stopping them well before 2050.
- Strengthen adaptation and "loss and damage" governance, recognizing inequality between and within nations.
- Include tipping points in the [Global Stocktake](#) (the world's climate "inventory") and Nationally Determined Contributions (each country's efforts to tackle climate change)
- Coordinate policy efforts to trigger positive tipping points.
- Convene an urgent global summit on tipping points.
- Deepen knowledge of tipping points. The research team supports calls for an IPCC Special Report on tipping points.

Kelly Levin, Chief of Science, Data and Systems Change for the Bezos Earth Fund, said, "Climate change is the defining issue of our time; it is essential that we advance the science on global tipping points to address the threats and opportunities ahead.

"The path we choose now will determine the future of humanity, and this extraordinary report sets out the Earth system tipping points we need to prevent, the governance we need to urgently implement, and critically the positive tipping points we need to trigger to transform our society and world.

"Solving the climate and nature crises will require major transitions across most multiple sectors—from shifting diets to restoring forests to

phasing out the internal combustion engine.

"Given the required scale of action, we must target the most beneficial positive tipping points so that change takes off in a way that is unstoppable.

"At Bezos Earth Fund, we are dedicated to identifying and triggering positive tipping points in this decisive decade.

"The Global Tipping Points Report paves the way."

More information: Global Tipping Points Report, *Earth System Dynamics* (2023).

https://esd.copernicus.org/articles/special_issue1247.html

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