



Earth's limb (Photo: NASA)

On October 12th and 13th, more than 250 people gathered in Reykjavik, Iceland, for the “Global Risk and Stabilization Summit,” to talk about the new level of risk the planet is facing as we pass 1.5C degrees and potential ways to address it. [UCLA's ESI Project](#), which I help direct, was a convening partner of the summit and participated in the discussions.

In a nutshell, reducing greenhouse gas emissions, adapting to climate impacts, and removing carbon from the atmosphere are essential and urgent, but as we heat the planet, we increase the risk of crossing unsafe thresholds (like tipping points or feedback loops that add more heat) that these three approaches alone may not prevent. That gap between the harms climate change will cause and what the commonly accepted climate portfolio can address explains why more attention is being given to interventions in Earth systems.

Underpinning the summit was a shared realization: 2026 has been an alarming year for the global climate. The summit is just one more indication of how the conversation on interventions is accelerating and expanding, drawing more attention, new talent, and new ideas.

Here are three numbers that explain the trends in discussions of Earth system interventions so far in 2026:

1.12 watts per square meter: the Earth's energy imbalance

Of the many warning signs of climate-related and Earth system risks—such as the well-known [increase in global average temperature](#), [the very strong El Niño underway](#), and [carbon dioxide concentrations in the atmosphere](#)—Earth's energy imbalance (or EEI) is one of the most worrisome, yet receives far less attention.

EEI is the difference between the energy the Earth absorbs from the sun and the outgoing radiation from the atmosphere. When EEI is zero, the amount of energy in the Earth system stays the same. When this number is positive, energy (or heat) accumulates in the land, oceans, and atmosphere, changing the global climate. It provides a more comprehensive view of changes in the global climate system than surface temperature alone, which is why it was highlighted in the World Meteorological Organization [2025 State of the Global Climate](#) and the [2025 Indicators of Global Climate Change](#) reports. (The 1.12 watts per square meter figure is drawn from the latter report, and refers to the average EEI from 2013 to 2025 as measured by satellite.)

EEI is positive because of greenhouse gas emissions, which trap heat. But that is only half of the story. Alarmingly, EEI has roughly *doubled* since 2000, principally due to Earth's declining reflectivity. This phenomenon, what *The Economist* calls "[global dimming](#)," is a result of fewer reflective aerosols from pollution, fewer clouds, and less ice, all of which reflect sunlight.

In fact, [as Phil Duffy at Spark Climate Solutions](#) notes, "The warming influence from Earth's declining reflectivity is roughly equal to that from the greenhouse gas effect of all human carbon dioxide emissions since 1750." For those of us trained to think of climate change as solely a problem of greenhouse gases, this is a shocking statistic.

How does EEI relate to Earth system interventions? EEI's acceleration makes addressing climate change more urgent, which leads people to consider responses like large-scale interventions that would otherwise be unthinkable or considered too risky. It also points to gaps in our current approach to climate change, which does not comprehensively address all sources of risk. Additionally, some interventions, like intentionally reflecting more sunlight back to space (also known as solar radiation modification, or SRM) seek to directly counteract the Earth's reduced reflectivity, though they would also have their own risks and uncertainties.

To learn more about EEI, read [this Legal Planet summary](#) by Ted Parson from earlier this year.

Zero: the number of mentions of sunlight reflection or SRM in the UN's recent *Limiting Overshoot* report

In September, the UN Environment Programme (UNEP) released [a report](#) acknowledging what the scientific community has known for some time: we will exceed the long-term 1.5C temperature target.

UNEP makes an important contribution by bringing the scientific reality on temperature rise into the political realm. It also unequivocally states the need for novel and conventional carbon removal.

Yet like many international reports, it is strangely silent on sunlight reflection and other Earth system interventions in the document (other than a short reference to “geoengineering” in the context of ocean-based carbon dioxide removal). The report emphasizes that every increment of temperature increase will create “risks and damages.” “Even if a return to below 1.5°C is secured,” the report writes, “many nations and communities will face irreversible losses and permanently changed conditions.” But the report’s conclusions emphasize only mitigation, adaptation, and carbon removal. As I wrote above, these are essential and urgent, but relying on these approaches alone would mean accepting substantial harm even in the most optimistic scenario. The report does not acknowledge that there is even a whiff of a possibility that sunlight reflection could address risks that would otherwise be unavoidable.

UNEP’s silence in this report reflects the politics of many consensus-based international institutions, in which mentioning sunlight reflection as a potential tool for reducing temperatures remains verboten. Given that UNEP’s 2023 report [One Atmosphere](#) focused on sunlight reflection, the choice appears deliberate. Despite the resistance, increasing temperatures and alarming metrics like accelerating EEI are making more people open to discussing it. In anticipation that the discussion of Earth system interventions will only grow, more countries are seeking to build their scientific, technical, and policy capacities on the topic.

[A recent story in Wired](#) reflects concerns about geopolitical tensions generated from sunlight reflection technologies. Focused on a “war game” scenario by UK academics and Centre for Future Generations, the Wired report describes how

tensions escalated during the simulation, especially between delegates from the U.S., Russia, and China.

I would argue that UNEP's omission of sunlight reflection in this report leaves nations less prepared for these discussions when they inevitably grow. It also deprives countries with fewer resources of credible sources of knowledge on a topic that is rife with misinformation. (To learn more, Michael Thompson of the Alliance for Just Deliberation on Solar Geoengineering [has written thoughtfully](#) on this topic.)

\$100 million: Series B funding round announced by Rainmaker, a “terraforming” company

While interventions remain off the international political agenda and do not receive much public research funding ([the “Exploring Climate Cooling” program at the UK’s Advanced Research and Invention Agency](#) is an exception), signs are emerging that the private sector is taking active interventions in Earth systems more seriously.

Founded in 2023, Rainmaker is a US company with a broad goal of [making “Earth more habitable.”](#) Its focus so far has been cloud seeding, an approach to modifying the weather to increase precipitation. In Rainmaker's case, this means proprietary drones that release small amounts of silver iodide, which has been used for decades in cloud-seeding operations in the United States.

Local weather modification resembles large-scale interventions in several ways. They both involve intentionally intervening in complex Earth systems (for example, the hydrological cycle, aerosol-cloud interactions, or the Earth's reflectivity) to produce a desired effect, sometimes through releases of materials into the environment. They also overlap in some of the relevant scientific domains. For example, aerosol-cloud interactions are an important part of both cloud seeding and marine cloud brightening (a sunlight reflection approach). Consistently modifying the weather could, over time, change a place's climate, given the importance of a climatological variable like rainfall. From an investment perspective, they differ in the policy uncertainty they face: cloud seeding has had a market (albeit a small one) in the United States for decades, whereas there isn't currently a market for large-scale interventions like sunlight reflection. (There is evidence of a backlash toward cloud seeding, however, in [a wave of bills at the state level](#) over the last two years.)

Combined with last year's funding announcement of [\\$60 million for Stardust](#)

[Solutions](#), a company that says it has developed a proprietary particle to cool the planet via releases in the stratosphere, the funding round for Rainmaker will doubtless persuade more investors and entrepreneurs that interventions as a service can be a serious business.

What's Next

These numbers tell diverging stories. The Earth system is changing quickly and absorbing more heat. Governments and international institutions are at risk of moving too slowly. Investors and entrepreneurs, on the other hand, are betting on greater demand for new approaches to address escalating environmental risk. The conversations in Reykjavik recognized the gap between these narratives. Closing it will require public bodies willing to take Earth system interventions seriously, through research funding and policy frameworks that balance urgency and care.