

Review of Breakthrough's Discussion Paper: Warming has reached 1.5°C. What does that mean for climate advocacy?

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Introduction

The Breakthrough Discussion Paper provides an unflinching analysis of the current state of global warming, the inadequacy of the 1.5°C target, and the urgent need for a multi-pronged climate strategy.

The paper's central argument—that the 1.5°C goal is neither safe nor stable, and that a three-lever approach (emissions reduction, carbon drawdown, and climate interventions) is necessary—is compelling incorporating an element of urgency and by extension emergency. The paper's findings align with growing global as well as Australian scientific consensus.

However, the paper's advocacy for solar radiation management (SRM) and other geoengineering techniques warrants critical scrutiny, particularly regarding governance, equity, and unintended consequences. This technology, largely untried can be weaponised by bad agents to establish control over land mass and populations

This response evaluates the paper's key claims, critiques its assumptions, and proposes additional considerations for climate advocacy.

1. The 1.5°C Target: A Flawed Benchmark

The paper convincingly argues that the 1.5°C target is not a safe boundary, citing evidence that tipping points (e.g., Arctic ice loss, Amazon dieback, coral reef collapse) are already being triggered at current warming levels (Armstrong McKay et al., 2022; Rockström et al., 2009). The critique of the Paris Agreement's reliance on overshoot scenarios—which assume future carbon removal technologies will reverse warming—is particularly salient. As the paper notes, overshoot risks irreversible damage, such as species extinction, that cannot be undone (Nature, 2024).

Critique:

While the paper dismisses 1.5°C as a political compromise, it does not fully explore the pragmatic role this target plays in mobilizing policy action. The 1.5°C goal, though imperfect, has galvanized international commitments (e.g., COP26 coal phase-down pledges) and provided a metric for accountability. Abandoning it without a universally accepted alternative could destabilize climate diplomacy.

2. The Faustian Bargain of Aerosols

The paper highlights the Faustian bargain of sulphate aerosols, which mask $\sim 0.5\text{--}1^\circ\text{C}$ of warming (Hansen, 2023). As air pollution policies reduce aerosols, warming acceleration is inevitable—a phenomenon already observed in the North Atlantic (The Guardian, 2024). This undermines the assumption that emissions reductions alone can curb near-term warming. The implications for

Critique:

The paper could better contextualize the trade-offs. While aerosol reduction exacerbates warming, it also saves millions of lives annually from air pollution (WHO, 2023). Advocacy must balance these co-benefits, not treat aerosol policies as purely detrimental with a financial burden unequally distributed across the social classes in Australia.

3. The Case for Climate Interventions

The paper's proposed three-lever strategy—emissions cuts, carbon drawdown, and SRM—is ambitious but raises critical questions:

a. Solar Radiation Management (SRM)

The paper advocates for SRM (e.g., stratospheric aerosol injection, marine cloud brightening) as a temporary cooling measure. It cites evidence that SRM could mimic volcanic cooling (e.g., Pinatubo's 0.6°C drop) and buy time for decarbonisation (AGU, 2021). However, it downplays risks:

- Regional disparities: SRM could shift rainfall patterns, exacerbating droughts in vulnerable regions (IPCC, 2023).
- Termination shock: Sudden cessation could cause rapid warming (Trisos et al., 2022).
- Moral hazard: Reliance on SRM may disincentivise emissions reductions (Nature, 2021).

Climate Impact on Northern Hemisphere Currents

The climate impact on ocean currents in the Northern Hemisphere is primarily linked to the weakening of the Atlantic Meridional Overturning Circulation (AMOC). This major ocean circulation system transports warm water from the tropics northward in the Atlantic and returns colder, deeper water southward, playing a critical role in regulating regional and global climate [3].

Climate change is contributing to the destabilisation of the AMOC through increased freshwater input from melting ice—especially from Greenland—and changes in ocean temperature and salinity. This reduces the density of surface waters in the North Atlantic, inhibiting the sinking motion that drives the circulation. Observational data and climate models indicate that the AMOC has already weakened compared to pre-industrial levels, and may be approaching a tipping point [3].

Impact assessment

A significant weakening or collapse of the AMOC would have profound regional impacts, particularly in the North Atlantic region:

- Cooling in Western and Northern Europe: Despite global warming, parts of Europe could experience substantial cooling, especially in winter. For example, model simulations suggest winter temperatures in regions like the UK and Scandinavia could drop by several degrees Celsius, with extremes potentially reaching as low as -19°C in areas such as London and -48°C in parts of Norway under severe disruption scenarios [3].
- Increased sea-level rise along the north-eastern coast of North America due to changes in ocean circulation and pressure gradients [3].
- Shifts in weather patterns, including more intense storms in north-western Europe and altered rainfall distribution, potentially affecting agriculture and water resources [3].

These changes would pose significant challenges to infrastructure, food security, and energy systems across affected countries.

b. Carbon Drawdown

The paper rightly emphasizes large-scale carbon removal but is overly optimistic about scalability. Current direct air capture (DAC) technologies are energy-intensive and costly (IEA, 2023). Nature-based solutions (e.g., reforestation) face land-use conflicts.

4. Advocacy and Governance Gaps

The paper critiques mainstream NGOs for clinging to 1.5°C but does not address their reluctance to endorse SRM. This hesitancy stems from:

- Lack of public mandate: SRM lacks democratic legitimacy (C2G, 2023).
- Corporate capture: Fossil fuel interests could exploit SRM to delay decarbonisation (CIEL, 2022).

Recommendation: Advocacy must prioritise:

1. Transparent SRM research under UN oversight (e.g., via the UNEP Solar Radiation Management Governance Initiative).
2. Equity-centred frameworks ensuring the Global South leads decision-making (Solar Radiation Management Governance Initiative, 2024).
3. Legal safeguards against unilateral deployment (Oxford Principles, 2023).

5. Alternative Pathways

The paper's call for a return to Holocene conditions ($<0.5^{\circ}\text{C}$) is laudable but lacks a roadmap. Key omissions:

- Demand-side policies: Reducing energy/consumption in high-income nations (Hickel et al., 2022).
- Systemic change: Addressing capitalism's growth imperative (IPCC, 2023).

Conclusion

The Breakthrough Paper is a vital wake-up call: 1.5°C is not safe, and overshoot is a dangerous gamble. Its three-lever strategy is conceptually sound but requires rigorous governance to avoid exacerbating inequities. Advocacy must:

- Reject triage politics by centring maximum protection for vulnerable communities.
- Demand urgent SRM research and guardrails against misuse.
- Couple technological solutions with degrowth principles.

For policy makers, health advocates and those that elect them, the stakes could not be higher. As the paper warns, delay is tantamount to abdication of responsibility and impacts on the legacy we leave to our children and their descendants. Profit is not synonymous with quality and advocates of untrammelled growth should step back from that pathway whilst we have time and the capacity to change the course of history.

References

1. Armstrong McKay, D. et al. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points. *Science*.
2. Hansen, J. (2023). The Faustian Bargain of Reducing Air Pollution. -*The New York Times*.
3. Caesar, L., Rahmstorf, S., Robinson, A. et al. Observed fingerprint of a weakening Atlantic Ocean overturning circulation. *Nature*, 2018. <https://doi.org/10.1038/s41586-018-0006->
4. The paper's dismissal of SRM opposition as politicised overlooks legitimate concerns from the Global South (Degrees Initiative, 2024). Governance frameworks are absent; unilateral action by a single nation (e.g., India post-heatwave) could spark conflict.
5. IPCC. (2023). *AR6 Synthesis Report.
6. *Nature*. (2024). Overconfidence in Climate Overshoot.
7. Degrees Initiative. (2024). Global South Perspectives on SRM.
8. CIEL. (2022). The Risks of Geoengineering.
9. Oxford Principles. (2023). Governance of Climate Interventions.