

“The Latest IPCC Synthesis Report: What We Learned About Climate Science, and What We Learned About Ourselves”

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First published in ‘Environment: Science and Policy for Sustainable Development’, Volume 65, 2023, Issue 5. DOI: 10.1080/00139157.2023.2225407

Online for subscribers: <https://www.tandfonline.com/doi/abs/10.1080/00139157.2023.2225407>

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The Latest IPCC Synthesis Report: What We Learned About Climate Science, and What We Learned About Ourselves

by Lindsey Fielder Cook

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 to inform our governments of the latest climate science – what is happening, why, and what we humans can do about it. The IPCC recently completed its adoption process of the Synthesis Report¹, the final section of the 6th Assessment Report (AR6) which took over seven years to prepare and involved hundreds of scientists, nearly all working voluntarily, to collate thousands of the latest science findings. IPCC Reports are invaluable, feeding accountability into the wider UN international climate change negotiations that are too often dominated by money and power.

The AR6 is separated into the following sections, ‘The Physical Science’², ‘Impacts, Adaptation and Vulnerability’³, ‘Mitigation’⁴, and the final ‘Synthesis Report’ recently adopted in March. While each section often totals over 1,000 pages, each section also includes a Summary for Policy Makers (SPM)⁵ that is officially ‘adopted’ by UN Member States. Government representatives and observers may comment on incoming drafts, and debate the SPM floor draft sentence by sentence with the IPCC authors.

IPCC scientist authors have the right to refuse government suggestions if they challenge the integrity of scientific findings. Yet in the exhausting marathon SPM adoption sessions, sentences can be strengthened, weakened or - caught in the room’s political sensitivities - dropped from the draft. As a result, the SPM adoption process teaches us not only the latest science, but also reflects the political and psychological dynamics challenging wider global efforts to transform human activities driving existential rates of global warming, species extinction, ocean acidification, land and water degradation, and other related planetary crises.

¹ <https://www.ipcc.ch/report/ar6/syr/> (accessed May 23, 2023)

² <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/> (accessed May 23, 2023)

³ <https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/> (accessed May 23, 2023)

⁴ <https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/> (accessed May 23, 2023)

⁵ E.g. the Summary for Policymakers of the Synthesis Report of the IPCC Sixth Assessment Report (AR6) is available at https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_SPM.pdf. (accessed May 23, 2023) Each separate working group report also contains a Summary for Policymakers available online using the URLs listed above.

Yet first, what did we learn from the recently approved AR6 Synthesis Report?⁶ What can we do, and what can we save? We learned that global action to reduce greenhouse gas (GHG) emissions has been lower than predicted, and that under current rates, emissions are projected to rise.

We learned that we have available sufficient knowledge and technology for the needed transformations. And we learned that urgent, rapid, deep, and sustained GHG emission reductions in this decade are essential for a chance to limit global warming to 1.5 °C (above pre-industrial levels) with no or limited overshoot. Overshoot is when global surface temperatures go higher than the target, but somehow, we ‘draw down’ the CO₂ emissions over time to influence temperature reductions. Yet after an ‘overshoot’, we cannot return the dead. Pursuing a 1.5 °C limit with no or limited overshoot could save countless lives, livelihoods, livable regions, species, social stability, and in turn avert profound and irreversible tipping points to glaciers, the Greenland ice sheet, more extensive sea level rise, GHG release from additional permafrost melt, and higher chances for an abrupt collapse of critical ocean currents.

As the AR6 continually tells us, every fraction of a degree counts. Yet the AR6 tells us that the current rate of greenhouse gas emissions could lead us to a 3.5°C global temperature rise by 2100 (or higher if climate sensitivity⁷ or carbon cycle feedbacks⁸ are higher than the best estimate). This would change human civilization as we know it.

The recently adopted AR6 Synthesis Report Summary for Policymakers lists the main root causes driving current rates of climate change as “*unsustainable energy use, land use and land-use change, lifestyles and patterns of consumption and production across regions, between and within countries, and among individuals*”.⁹

How then do we transform root causes? We start by prioritizing, in all our climate policies, the ‘how’ and the ‘what’ together. The AR6 finds that adopting intertwined policies which promote equity and

⁶ https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf (accessed May 23, 2023)

⁷ The definition of climate sensitivity in the IPCC glossary is “Climate sensitivity refers to the change in the annual *global mean surface temperature* in response to a change in the atmospheric CO₂ concentration or other *radiative forcing*.” IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 541-562, doi:[10.1017/9781009157940.008](https://doi.org/10.1017/9781009157940.008).

⁸ The definition of climate feedback in the IPCC glossary is “An interaction in which a perturbation in one *climate* quantity causes a change in a second and the change in the second quantity ultimately leads to an additional change in the first. A negative feedback is one in which the initial perturbation is weakened by the changes it causes; a positive feedback is one in which the initial perturbation is enhanced. The initial perturbation can either be externally forced or arise as part of internal variability.” In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 541-562, doi:[10.1017/9781009157940.008](https://doi.org/10.1017/9781009157940.008).

⁹ https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf (page 4) (accessed May 23, 2023)

fairness, social justice, and climate justice, “lead to more sustainable outcomes, reduce trade-offs, support transformative change and advance climate resilient development”.¹⁰ This relates to the integration of rights-based approaches, which include meaningful public participation in decision making, gender equality, just transitions, biodiversity protection, human rights, the rights of Indigenous Peoples, and the rights of people with disabilities. Climate policies that are experienced as fair, in turn are more supported by the public, and are therefore more effective.

The AR6 identifies essential transformations in sustainable energy, agriculture and economic systems, consumption and behavior patterns. The most urgent, rapid and effective energy transformations target substantial reduction in fossil fuel use, rapid increase in renewable energies (RE) especially solar and wind energy, alongside energy efficiency improvements, energy demand-side measures, and methane emissions reductions (coal mining, oil and gas, waste). Energy transformations trigger low-emission changes in industry and transport, with electrification through renewable energy as key.

Sustainable and just economic system transformations are critical. The previous (2014) AR5 Report identified economic growth as a top driver of increases in CO₂ emissions from fossil fuel combustion.¹¹ The AR6 goes deeper into unsustainable and unjust production and consumption, finding that “10% of households with the highest per capita emissions contribute 34–45% of global consumption-based household GHG emissions, while the bottom 50% contribute 13–15%.”¹² Current economic systems still rely primarily on extraction and exploitation and, as the AR6 identifies, historical and ongoing patterns of inequity such as colonialism. The AR6 strengthens engagement on transformational approaches, including ‘sufficiency’ approaches, ‘demand-side measures’, “compact urban form, co-location of jobs and housing; widespread public transport and active mobility infrastructure (e.g., walking and cycling)”¹³, circular material flows, behavior changes and climate resilient development.

Sustainable agriculture transformations are grounded in “sustainable land management approaches, use of agroecological principles and practices and other approaches that work with natural processes”¹⁴. Transformations help address unsustainable food systems, food waste and diet. Changes to more plant based diets help with both mitigation and adaptation, but the phrase ‘plant-based’ hits political sensitivities in the SPM adoption process, and is shunted to footnote 53¹⁵. Acceptable to SPM language is “balanced, sustainable, healthy diets”.¹⁶ The words ‘meat’ or ‘dairy’ need to be found in underlying chapters, but a small range of States remain deeply uncomfortable with scientific findings on diet. These voices reflect economies reliant on intensive livestock farming, but also a few least developed countries concerned that singling out meat and dairy could threaten small-scale livestock dependent farming

Yet we also learned from the IPCC that global action since the last, AR5 Report has been significantly lower than predicted; political will is often the greatest challenge facing us.

¹⁰ Ibid. (page 33)

¹¹ https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf (page 5) (accessed May 23, 2023)

¹² https://report.ipcc.ch/ar6syrr/pdf/IPCC_AR6_SYR_SPM.pdf (page 5) (accessed May 23, 2023)

¹³ Ibid. (page 31)

¹⁴ Ibid. (page 8)

¹⁵ Ibid. (page 31)

¹⁶ Ibid. (Page 32)

A particularly painful moment in the Synthesis SPM adoption process was when a most inspiring, clear and ‘high confidence’ scientific sentence was dropped from the earlier Final Government SPM Draft. This sentence concluded that urgent, feasible, and equitable near-term options are available at scale to address climate change and improve human well-being and planetary health.

Movingly, a significant range of Government and Observer voices called to retain this inspiring sentence. Yet after hours of discussion, political impasse remained. The findings were embedded throughout the report, but a clear, concise sentence was lost. ‘Urgent’, ‘equitable’ and ‘available at scale’ were dropped and governments agreed to “*feasible, effective and low-cost options for mitigation and adaptation are already available*”.¹⁷ What was so scary to our decision makers?

There is anger and fear in these rooms. Anger at countries with historical responsibility not doing their fair share. Anger over centuries of resource-grab colonialism. Fear over ‘urgent’ when Paris Agreement commitments to finance and technology transfer remain significantly underdelivered. Fears over accountability on ‘available at scale’, since the reality in most countries is insufficient climate action even when it is remarkably simple to implement. Scars from powerful lobbyists, poor governance, and citizen backlash at policies experienced as unfair because they avoided targeting real polluters or failed to incorporate a rights-based approach.

According to the AR6, concentrations of methane and nitrous oxide have increased to levels unprecedented in at least 800,000 years, and current CO₂ concentrations are higher than at any time over at least the past two million years¹⁸. Observed warming since the second half of the 19th century can be unequivocally explained principally through the burning of fossil fuels. Deep, real and sustained reductions of GHG emissions, but predominantly CO₂, are essential to limit global heating to a safer rise. And yet we humans struggle to say this plainly, currently framing reduction as ‘net-zero’.

In 2014, the AR5 used the term ‘near-zero’ in relation to reduction of CO₂ emissions. The 2015 Paris Agreement refers to a balance of sources and sinks, but not ‘net-zero’. The term ‘net zero’ came after Paris and the difference, and danger, lies in our comprehension of what really needs to happen.

‘Net-zero’ can mislead one into thinking a balance, or ‘net’, is achievable with our levels of GHG emissions today. It is not; to avoid catastrophic climate change we must first rapidly reduce GHG emissions at source, before any set of actions to achieve a ‘net’ is even possible. The AR6 seeks to articulate this message, but is restricted by the politically acceptable phrase ‘net-zero CO₂’, or ‘net-zero GHG emissions’. This increases the risk of policy makers embracing false ‘solutions’ where we can magically plant trees, pump emissions down holes, and carry on as we are without addressing root causes through transformational climate policy.

The AR6 underlying chapters, Technical Summaries, and the Synthesis Longer Report are not subject to a sentence-by-sentence debate. The Summary for Policy Makers (SPM) is, and most people just read these 40+ pages. IPCC authors can, as mentioned, refuse suggestions that compromise the integrity of scientific findings, yet the SPM adoption process can be brutal, and vulnerable to dominating personalities during sentence-by-sentence debates. These voices include, for example, fossil fuel extraction wealthy economies which fear energy transformations, even if transition is critical for humanity’s long-term survival.

¹⁷ Ibid. (page 30)

¹⁸ https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_LongerReport.pdf (page 6) (accessed May 31, 2023)

In the recent Synthesis adoption process there were attempts to weaken draft SPM language relating to ‘rapid reduction of fossil fuels’, ‘rapid increase in renewable energy’, or cost-efficiency details of renewable energy. It is important to note that decentralized renewable energy ownership financially benefits the many, while fossil fuel extraction and production financially benefit the few.

As mentioned earlier, the AR6 made clear that global mitigation action between the last (AR5) report and this AR6, was below predictions. As the IPCC is mandated to be ‘policy relevant but not policy prescriptive’, it includes both safer and more risky mitigation options. As a result, the AR6 outlines geo-engineering approaches which have greater risks yet fail to transform root causes.

For example, carbon capture and storage (CCS) is popular with fossil fuel interests, yet CCS is not proven-to-scale, maintains fossil fuel dependence, is more expensive, and is both less effective in reducing GHG emissions and less equitable in ownership than renewable energy transformations. Reliance on CCS would leave storage and leakage costs to our children. Yet in the floor draft of the Synthesis SPM, risks were not included. This resulted in a range of concerned government and observer voices calling for clarification of risks to best inform policy makers. The result was merely a footnote, which nonetheless finished with the foreboding *‘currently, global rates of CCS deployment are far below those in modelled pathways limiting global warming to 1.5°C to 2°C.’*¹⁹

The AR6 also includes a political compromise that categorized ‘fossil fuels’ in mitigation scenarios as ‘abated’ or ‘unabated’ fossil fuel. Unfortunately, this leaves language vulnerable to wider policy misuse. There is no definition of ‘abated’ in the IPCC Glossary, and the only accountability language we have is a footnote of an example (*‘unabated fossil fuels’ refers to fossil fuels produced and used without interventions that substantially reduce the amount of GHG emitted throughout the life cycle; for example, capturing 90% or more CO₂ from power plants, or 50–80% of fugitive methane emissions from energy supply*).²⁰

Another geo-engineering approach highlighted in the AR6 is carbon dioxide removal (CDR), normally suggested for ‘hard to abate’ emissions’. CDR includes a range of actions, such as reforestation, afforestation, bioenergy and carbon capture storage (BECCS) and ocean fertilization. Yet increasingly, high-emission countries failing to sufficiently reduce their GHG emissions are looking at CDR methods as substitutes. This misses the chance to transform root causes and reduce real emissions at source. The AR6 warns that large scale reliance of CDR comes with serious risks, including increases in food and water insecurity, biodiversity loss, and slow pace of mitigation at a time when ‘deep and sustained’ reductions are essential for a safer world. And as global temperatures rise, reliance on CDR land based approaches are vulnerable to ecosystem collapse and increased wildfires, in both circumstances land increasingly moves from emission sink to source.

Finally, there is the Russian roulette of options, Solar Radiation Modification (SRM). The AR6 is clear that SRM is not a mitigation option as it does not reduce GHG emissions. The Synthesis Long Report concluded that SRM approaches, ‘if they were to be implemented, introduce a widespread range of new risks to people and ecosystems, which are not well understood’.²¹ The AR6 Impacts, Adaptation and Vulnerability section’s Technical Summary found that ‘large negative impacts are projected from rapid warming for a sudden and sustained termination of SRM in a high-CO₂ scenario. SRM would not stop CO₂ from increasing in the atmosphere or reduce resulting ocean acidification under

¹⁹ https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_SPM.pdf (page 22, footnote 47) (accessed May 31, 2023)

²⁰ Ibid. (page 30, footnote 51)

²¹ https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_LongerReport.pdf (page 37) (accessed May 23, 2023)

continued anthropogenic emissions'.²² These connected planetary crises are often hard for readers to comprehend – our GHG emissions not only threaten a safer climate, they threaten the collapse of oceanic ecosystems. Meanwhile, the voices pressing for SRM primarily live in high emission, highly unsustainable societies

Our youth often wisely carry a banner 'system change, not climate change'. The IPCC gives us a roadmap for urgent, feasible, and equitable near-term options available at scale to address climate change and improve human well-being and planetary health knowledge. Sufficient political will is essential.²³ So is honesty with our citizens about what is happening, and why. Let us move beyond fear and into courage, and leave a legacy for our children that we acted when we knew.



*Author Lindsey Fielder Cook makes an intervention at a Synthesis Report plenary.
Photo by IISD/ENB | Anastasia Rodopoulou*

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²² https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_TechnicalSummary.pdf (page 69) (accessed May 23, 2023)

²³ Cook, LF and Carlson, AM (editors) A Government Official's Toolkit Inspiring Urgent, Real, and Equitable climate action (2023) Quaker United Nations Office (28 pages) https://quno.org/sites/default/files/resources/Government_Officials_Toolkit_6_June_2023.pdf (accessed 6 June, 2023)