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**FASTER THAN EXPECTED: THE IPCC'S ROLE IN
EXACERBATING CLIMATE CHANGE**

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I hereby declare that I have compiled the thesis independently and all works, important standpoints and data by other authors have been properly referenced and the same paper has not been previously presented for grading. The document length is 9647 words from the introduction to the end of conclusion.

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ABSTRACT

As the most common phrase associated with the velocity and impact of climate change is now “faster than expected” it is immediately important that we as a species craft a response predicated on the most accurate assessment of this looming crisis as possible. To that end, the Intergovernmental Panel on Climate Change (IPCC) was established by the United Nations in 1988 with the purpose of being a global leader on evaluating both present and future climate conditions and to serve as a universal resource for policymakers. Unfortunately, it has become apparent that there exists a gap between the realities of our world and the assessment reports provided by the IPCC. This paper will ascertain whether the IPCC can be trusted as the preeminent global climate change information and policy recommendation outlet while testing the argument that the IPCC has been instrumental in perpetuating a narrative downplaying climate change. The primary research method is pluralistic as well as observational, conducting a comprehensive literature review on the theme and making it being dualistically issue-specific: a) the methodology employed by the IPCC to analyze and present data and b) the implications of said methodology on empirical policy examples which we can use to benchmark the utility of IPCC data. Ultimately, we have found that there exists a schism in the IPCC between scientists and the economists who have, since the IPCC’s inception, dominated the narratives provided to policymakers and dramatically underrepresented the true speed and concomitant implications of climate change.

KEYWORDS: IPCC, climate change, neoclassical, IAM

INTRODUCTION

On 28 February 2022 the Intergovernmental Panel on Climate Change released their 6th Assessment Report, a nearly 4000-page document 8 years in the making. That same day United Nations (UN) Secretary General António Guterres spoke to press stating: “Today’s IPCC report is an atlas of human suffering and a damning indictment of failed climate leadership...The abdication of leadership is criminal.”¹ That this would be his response should come as no surprise; 4 months prior the UN Environment Program published their emissions gap report illustrating that even if the participants of extant climate abatement agreements adhered to their promises, we would still be on track for a 2.7c rise in global temperature over pre-industrial levels². What is most interesting about the UN Secretary General’s speech is not his assessment of the global response to climate change but the curious exclusion of UN responsibility. After all, the IPCC was created in 1988 and has since their first assessment report in 1990 been the world’s primary resource on the scope, velocity, and outcomes of anthropogenic climate change while providing policy recommendations disseminated to governments worldwide. Given that present climate agreements are predicated on the data and recommendations produced by the IPCC it is fair to interrogate the continued viability of the IPCC as a global resource for climate information. This paper will determine whether this organization can be relied upon as the world leader in climate research and if the IPCC has played an active role in minimizing the existential catastrophe which threatens to extinguish most life on this planet.

¹ United Nations "António Guterres (UN Secretary-General) To The Press Conference Launch Of IPCC Report | UN Web TV". *Media.Un.Org*, 2022, <https://media.un.org/en/asset/k1x/k1xcijxjhp>.

² Kuramochi, Takeshi, Michel, and Elzen, Taryn, Fransen, et al. UNEP Emissions Gap Report 2021 Chap. 2 Trends in global emissions, new pledges for 2030 and G20 status and outlook, 2021.

1.IPCC METHODOLOGY

Any discussion of the credibility of the Intergovernmental Panel on Climate Change (IPCC) must center on their methodology. Formally established in 1988, the IPCC produces assessments on climate change and the socioeconomic effects thereof which are in turn used by states and NGOs to determine optimal course of action predicated on various scenarios. These scenarios are themselves built on top of Integrated Assessment Models (IAMs), multi-disciplinary frameworks which seek to describe the relationship between human behaviors and climate change as explicated by the Coupled Model Intercomparison Project (CMIP)³. As with any complex predictive framework there are assumptions inherent to both the function and formulation of those used by the IPCC. As this chapter will elucidate, the IPCC has long relied on models which consistently fail to describe the realities of our changing climate and downplay the escalating severity of what this planet will experience.

1.1 BASELINE SCIENTIFIC CHOICES

An open system such as global climate is undeniably complex; new variables present themselves in unpredictable ways with myriad effects on systems which are poorly understood. While we cannot hold unavoidable omissions against the IPCC, there are several areas where the science itself has consistently been suspect at best and hobbled at worst. We will discuss the specifics of the IAMs used in a separate chapter and here instead focus on defining parameters and choice of data sets. First, when answering the question “how hot is our planet”, the IPCC relies on a concept called global mean surface temperature⁴. By name alone this makes sense; you take an average of temperatures around the globe and in the aggregate can determine what the mean surface temperature, telling us how quickly the temperature is rising. Unfortunately, there are a number of well researched flaws with this method, amongst them being that GMST a) does not actually calculate total global coverage, b) does not begin at a truly pre-industrial stage instead beginning in the late 19th century, and c) neglects to incorporate surface air temperatures globally in favor of a

³ IPCC, 2013: Annex II: Climate System Scenario Tables [Prather, M., G. Flato, P. Friedlingstein, C. Jones, J.-F. Lamarque, H. Liao and P. Rasch (eds.)]. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

⁴ Stocker, T. (Ed.). (2014). Climate change 2013: the physical science basis: Working Group I contribution to the Fifth assessment report of the Intergovernmental Panel on Climate Change. Cambridge university press.

blend of sea surface and surface air temperatures⁵. The primary reason this method is still used is because of complexity; more comprehensive systems require more data points, more maintenance, and more processing power. There is however a tremendous cost in terms of accurate data that this choice entails in that it causes a “[...]significant overestimation of allowable emissions”, with at least a 40% decrease from the carbon budget the IPCC shares with policymakers⁶. Worse is that this isn’t new; the 5th Assessment Report reported that from the years 1998 to 2012 there was a “hiatus” in warming, citing a model which has long been the basis for GMST calculations (HadCRUT4)⁷. This was obviously not the case, and the reason for this error was that the data has “incomplete spatial coverage” which doesn’t account for Arctic temperatures, temperatures we know are rising 4 times faster than anywhere else on the planet⁸ despite AR 6 reporting a 2x rate of increase. This however was not a new phenomenon. Since 2006 the HadCRUT4 GMST calculation was known to be inadequate⁹ with further studies explaining that this anomaly was predicated entirely on gaps in sampling coverage¹⁰, so to continue using a method which consistently and dramatically underestimates the rate and intensity of warming appears intentional. This is far from the only method which produces inaccurate data. The CMIP also relies on Equilibrium Climate Sensitivity, “...defined as the global mean surface air temperature increase that follows a doubling of atmospheric carbon dioxide”¹¹. We’ve discussed GMST, but EQS has independent pitfalls. In their book “What Lies Beneath: The Scientific Understatement of Climate Risks”, Ian Dunlop and David Spratt revealed that the focus on EQS omits feedback loops such as “[...]the permafrost feedback and other changes in the terrestrial carbon cycle, a decrease in the ocean’s carbon-sink efficiency, and the melting of polar ice sheets creating a cold ocean-surface layer underneath that accelerates the melting of ice shelves and hastens the rate of ice-mass loss”¹². Furthermore, the IPCC relies on the raw output of models independent of observation e.g. how things are changing in ways not described by simulation which are observable. A reliance on pure

⁵ Schurer, AP, Cowtan, K, Hawkins, E, Mann, ME, Scott, V & Tett, SFB 2018, ‘Interpretations of the Paris climate target’, *Nature Geoscience*, vol 11, pp. 220.

⁶ Ibid.

⁷ Kevin Cowtan, Peter Jacobs, Peter Thorne, Richard Wilkinson, Statistical analysis of coverage error in simple global temperature estimators, *Dynamics and Statistics of the Climate System*, Volume 3, Issue 1, 2018, dzy003, <https://doi.org/10.1093/climsys/dzy003>

⁸ Voosen, P, “The Arctic is Warming Four Times Faster than the Rest of the World,” *Science*, 21-12-21, DOI 10.1126/science.acz9830

⁹ Hansen, J., Sato, M., Ruedy, R., Lo, K., Lea, D. W., & Medina-Elizade, M. (2006). Global temperature change. *Proceedings of the National Academy of Sciences*, 103(39), 14288-14293.

¹⁰ Simmons, A. J., Willett, K. M., Jones, P. D., Thorne, P. W., & Dee, D. P. (2010). Low-frequency variations in surface atmospheric humidity, temperature, and precipitation: Inferences from reanalyses and monthly gridded observational data sets. *Journal of Geophysical Research: Atmospheres*, 115(D1).

¹¹ Bjordal, J., Storelvmo, T., Alterskjær, K. et al. Equilibrium climate sensitivity above 5 °C plausible due to state-dependent cloud feedback. *Nat. Geosci.* **13**, 718–721 (2020). <https://doi.org/10.1038/s41561-020-00649-1>

¹² Spratt, David & Dunlop, Ian. (2017). *What Lies Beneath: The scientific understatement of climate risks.*

data without adaptation to global entropy has dramatic implications on the scenarios we are told we can expect; this lack of validation by outside observation means that at best we can expect a 15% increase in warming by 2100 over the scenarios outlined in AR5 and that “emissions associated with the RCP 4.5 scenario are likely to produce global warming more in line with that previously associated with the RCP 6.0 scenario”¹³. It is important to note that all of these choices have continued with the most recent Assessment Report released 28 February 2022 and that the misrepresentation of climate reality pursuant to these choices is inherent to said report.

1.2 DATA SET SELECTION

Compounding the above foundational issues are the often-suspect exclusion of data sets which detail a far more disastrous future than current assessment reports indicate. Two examples illustrate this phenomenon plainly. In 2007, the runaway melting of Arctic ice began at rates now accelerating logarithmically. 7 years later the IPCC released their 5th Assessment Report, which, when discussing the rate of melt, curiously neglected to include models which described this brewing catastrophe in earnest and instead chose to use a historical model which simply ended in 2005¹⁴. More curious is that the 4th AR was unable to predict these changes. This could potentially be understandable had there not been a study two years prior describing how extant melt levels had already surpassed what models suggested was possible¹⁵ which culminated in the near complete loss of Arctic summer ice cover in 2012. Despite this the IPCC continued to hold onto a data set which was clearly outdated and claimed in the 5th AR that a blue ocean event (complete absence of Arctic summer sea ice) was only possible in scenarios where the highest continued emissions rates were simulated.

In our second example, when discussing the effect climate change will have on global economies, Working Group 2 of the 5th AR asserted that ultimately our rapidly changing biosphere will have a negligible effect on economic activity¹⁶. This assumption is one informed by a 1991 paper from Dr

¹³ Brown, P & Caldeira, K 2017, ‘Greater future global warming inferred from Earth’s recent energy budget’, *Nature*, vol. 552, pp. 45-50.

¹⁴ Wadhams, P. ‘Farewell to Ice’. 1st ed, Oxford University Press, 2017

¹⁵ Serreze, MC, Holland, MM & Stroeve, J 2007, ‘Perspectives on the Arctic’s shrinking sea ice cover’, *Science*, vol. 315, no. 5818, pp. 1533-1536; Stroeve, J, Holland, MM, Meier, W, Scambos, T & Serreze, M 2007, ‘Arctic sea ice decline: Faster than forecast?’, *Geophysical Research Letters*, vol. 34, no. 9, L09501.

¹⁶ Arent, D. J., Tol, R. S. J., Faust, E., Hella, J. P., Kumar, S., Strzepek, K. M., Tóth, F. L., & Yan, D. (2014b). Key economic sectors and services. In C. B. Field, V. R. Barros, D. J. Dokken et al. (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of working Group II to the fifth assessment report of the intergovernmental panel on climate change.* (pp. 659–708). Cambridge University Press.

William Nordhaus, a 2018 recipient of the “Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel”¹⁷ for his work on developing the DICE (Dynamic Integrated Climate Change) model which serves as the foundation for much if not most of the IPCC’s work in simulating the effects of climate change on human economic activity¹⁸. In this paper, when describing the sensitivity of all American economic activity to rapidly accelerating climate change, Nordhaus writes that “[o]ur estimate is that approximately 3% of United States national output is produced in highly sensitive sectors, another 10% in moderately sensitive sectors, and about 87% in sectors that are negligibly affected by climate change.”¹⁹. A cursory inspection of Table 5 where Nordhaus details which sectors he considers to be relatively immune to the pressures of climate change show us that, according to him, climate change doesn’t effect any industry which takes place indoors or underground. As Steven Keen points out “All the intervening papers between Nordhaus in 1991 and the IPCC in 2014 maintain this assumption: neither manufacturing, nor mining, transportation, communication, finance, insurance and non-coastal real estate, retail and wholesale trade, nor government services, appear in the ‘enumerated’ industries... All these studies have simply assumed that these industries, which account for of the order of 90% of GDP, will be unaffected by climate change.”²⁰ Extending this logic allows economists to claim that any increase in temperature has a minimal effect on human economic activity. Of course, any layperson with no formal training in climate science or economics would see this claim as patently false; beyond simply keeping these environments habitable for humans which requires growing energy use for air conditioning and resource extraction, what of the cost of environmental catastrophes in disrupting supply chains? What of the cost of climate induced migration on the ability of these industries to sustain themselves? What happens when competition for resources such as food and water become the primary concern of our species? As one might anticipate a number of bewildered natural scientists took exception to this representation of their work, some taking to social media to press the Lead Coordinating Author of Working Group 2 Dr. William Tol on these assertions. In a Twitter exchange between Professor of Computational Astrophysics at the University of Edinburgh Ken Rice and Dr. William Tol, Ken asks “Are you actually suggesting a 10k rise [global mean warming of 7c] would be manageable?” Dr. Tol responds, “We’d move indoors, much like the

¹⁷ Mirowski, P. (2020). The neoliberal Ersatz Nobel Prize. In D. Plehwe, Q. Slobodian, & P. Mirowski (Eds.), *Nine lives of neoliberalism* (pp. 219–254). Verso.

¹⁸ Drouet, L., Bosetti, V., & Tavoni, M. (2015). Selection of climate policies under the uncertainties in the Fifth Assessment Report of the IPCC. *Nature climate change*, 5(10), 937-940.

¹⁹ Nordhaus, W. D. (1991). To slow or not to slow: The economics of the greenhouse effect. *The Economic Journal*, 101(407), 920–937. <https://doi.org/10.2307/2233864>

²⁰ Steve Keen (2020) The appallingly bad neoclassical economics of climate change, Globalizations, DOI: 10.1080/14747731.2020.1807856

Saudis have”²¹. It would be understandable for one to express surprise that such a conclusion would be made by someone trusted to be the Lead Coordinating Author for an entire IPCC working group until one digs into his background. Dr. William Tol (long a compatriot of Nordhaus in dramatically underestimating the effects of climate change with his own IPCC validated IAM) is a member of the Global Warming Policy Foundation²², an organization created by Lord Nigel Lawson to combat UK climate policy and proliferate the narrative that anthropogenic climate change is a myth. While we will discuss in greater specificity the impact of neoclassical economists on IPCC reporting later in this paper, it is already abundantly clear that there are foxes in the henhouse.

1.3 INTEGRATED ASSESSMENT MODELS

As previously discussed, Integrated Assessment Models form the backbone of IPCC research and represent an effort to provide a cohesive picture of the relationship between human activity and changes in global climate while also suggesting pathways to mitigate these changes while preserving economic growth. Unfortunately, as a large and growing number of researchers agree, “Climate and economy focused IAMs are...deeply unrealistic in how they represent Earth and Human systems and the relation between the two”²³. The primary reason for this is that IAMs are fundamentally centered on economics rather than science; as Working Group 3 of the IPCC’s 5th AR writes, “The models use economics as the basis for decision making. This may be implemented in a variety of ways, but it fundamentally implies that the models tend toward the goal of minimising aggregate economic costs of achieving mitigation outcomes...[The models also] typically assume fully functioning markets and competitive market behaviour.”²⁴ It does not take

²¹ Tol, R [@RichardTol], 2017-6-17, “We’d move indoors, much like the Saudis have”, <https://twitter.com/RichardTol/status/1140669525081415680?s=20>

²² Ward, B ““IPCC Corrects Claim Suggesting Climate Change Would Be Good For The Economy”. *The Guardian*, 2014, <https://www.theguardian.com/environment/2014/oct/17/ipcc-corrects-claim-suggesting-climate-change-would-be-good-for-the-economy>. Accessed 26 Apr 2021.

²³ Salvi Asefi-Najafabady, Laura Villegas-Ortiz & Jamie Morgan (2021) The failure of Integrated Assessment Models as a response to ‘climate emergency’ and ecological breakdown: the Emperor has no clothes, *Globalizations*, 18:7, 1178-1188, DOI: [10.1080/14747731.2020.1853958](https://doi.org/10.1080/14747731.2020.1853958)

²⁴ Clarke L., K. Jiang, K. Akimoto, M. Babiker, G. Blanford, K. Fisher-Vanden, J.-C. Hourcade, V. Krey, E. Kriegler, A. Löschel, D. McCollum, S. Paltsev, S. Rose, P.R. Shukla, M. Tavoni, B.C.C. van der Zwaan, and D.P. van Vuuren, 2014: Assessing Transformation Pathways. In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

an expert to understand that when it comes to ascertaining the velocity of climate change it should be scientists behind the steering wheel, not individuals whose entire professional career focuses on preserving infinite and uninterrupted growth. In this section we will first discuss the ways a primary IAM used by the IPCC misrepresents available climate science and move on to how more broadly the focus on economics as a foundation for evaluating climate change separates IPCC findings from reality.

1.3.1 ROLLING THE DICE

The Dynamic Integrated Climate Change IAM developed by Dr. William Nordhaus in 1991 and continuously updated since is one of the primary IAMs used by the IPCC to evaluate the velocity and impact of climate change predicated on different mitigation scenarios e.g. what actions would be required to ensure that by 2100 we do not see a 4c rise in GMST over pre-industrial temperatures. Given Dr. Nordhaus' position of seniority in the climate economics community it is no surprise his model has enjoyed a position of prominence. Unfortunately, this model operates on a number of assumptions which ultimately seek to preserve economic equilibrium over all else with disastrous consequences for continued life on this planet. First, as Nordhaus writes in the manual for DICE, “[t]he current version assumes that damages are a quadratic function of temperature change and does not include sharp thresholds or tipping points, but this is consistent with the survey by Lenton et al”²⁵. What this means is that the quadratic equation tells you how a rise in temperature effects GDP when compared to what he estimates GDP would have been absent stated rise in temperature without regard for “tipping points”, and what’s important is how he validates the exclusion by referencing the work of Dr. Lenton. This would be perfectly reasonable had he not intentionally misrepresented Lenton’s findings on tipping points (positive feedback loops triggered by a given rise in average GMST). Of this research Nordhaus states “...their review finds no critical tipping elements with a time horizon less than 300 years until global temperatures have increased by at least 3°C”²⁶. In fact, they found quite the opposite, and instead excluded all scenarios wherein a tipping point would not be activated within this century²⁷. What’s worse, Dr. Lenton’s paper concludes that “Society may be lulled into a false sense of security by smooth projections of global change. Our synthesis of present knowledge suggests that a variety of tipping

²⁵ Nordhaus, W. D., & Moffat, A. (2017). A survey of global impacts of climate change: Replication, survey methods, and a statistical analysis (Discussion Paper No. 2096). Cowles Foundation.

²⁶ Nordhaus, W. (2013). *The climate Casino: Risk, uncertainty, and economics for a warming world*. Yale University Press.

²⁷ Lenton, T. M., Held, H., Kriegler, E., Hall, J. W., Lucht, W., Rahmstorf, S., & Schellnhuber, H. J. (2008). Supplement to tipping elements in the earth's climate system. *Proceedings of the National Academy of Sciences*, 105(6), 1786–1793. <https://doi.org/10.1073/pnas.0705414105>

elements could reach their critical point within this century under anthropogenic climate change. The greatest threats are tipping the Arctic sea-ice and the Greenland ice sheet, and at least five other elements could surprise us by exhibiting a nearby tipping point.”²⁸ Not only does their research specifically indict the kind of simplistic equation Nordhaus uses in the DICE model, Nordhaus seemingly with intention misquotes and mischaracterizes the paper to justify the model. This model is also symmetrical in that “...it predicts the same damages from a fall in temperature as for an equivalent rise. It therefore predicts that a 6°C *fall* in global temperature would also reduce GDP by just 7.9%”²⁹ The last time the Earth was 6c cooler than pre-20th century levels? The Ice Age, when North America and Europe were almost entirely a glacial sheet³⁰. There is also a failure to account for costs of economic activity on natural capital, ironic given that the model’s purpose is to chart the cost of climate change as a consequence of human economic activity. What does this mean? One example might be the contribution of economic activity towards feedback loops; economic activity runs on labor and raw materials, the extraction of which frequently damages ecosystem services such as a forest’s role as carbon sink or the ocean’s ability to cool the planet. Degradation of these resources contributes to the velocity of warming which DICE doesn’t take into account. As a result, when compared to a model which is a carbon copy in every way save for the accounting of natural capital’s degradation by both climatic AND non-climatic activity, we find a far more urgent recommendation for the complete cessation of emission productions than that offered by DICE³¹. The policy recommendations made by DICE have themselves come under fire and are further indication of its inadequacy. While DICE predicts a 4c rise in GMST by 2100 should we maintain our current path, what the model considers as an optimal balance between temperature and continued economic growth would allow a 3.5c rise in the same period³². The last time the Earth sat at 3.5c GMST was during the Pliocene era 3.2 million years ago when sea levels were anywhere from 6-20 meters higher than they are currently³³. Vast swaths of the globe would be completely uninhabitable either by virtue of wet bulb temperature, sea level coverage, the poisoning of

²⁸ Ibid.

²⁹ Keen, S “Economic Failures of the IPCC Process”, 12-1-21, <https://profstevekeen.medium.com/economic-failures-of-the-ipcc-process-e1fd6060092e>

³⁰ TIERNEY, J. E., ZHU, J., KING, J., MALEVICH, S. B., HAKIM, G. J. & POULSEN, C. J. 2020. Glacial cooling and climate sensitivity revisited. *Nature (London)*, 584, 569–573.

³¹ Hackett, S. B., & Moxnes, E. (2015). Natural capital in integrated assessment models of climate change. *Ecological Economics*, 116, 354-361.

³² Belle-Larant, F., Mauron, H., & Da Costa, P. (2021). *Climate Change and Degrowth: a Nordhaus' DICE Model Set of Simulations based on Endogenous Discounting* (No. hal-03146625).

³³ Boyce, James & Bradley, Raymond. (2018). 3.5C in 2100?.

freshwater resources with saltwater, and unpredictable weather events³⁴. Obviously this would engender the death of billions of humans (not to mention non-human) lives and yet to this day the IPCC is still couching our species' response to climate change in this context. This of course is far from an exhaustive list of the flaws in the DICE methodology; its calculations on social cost of inaction in the Global South are dismissive at best³⁵, it massively underestimates the social cost of carbon³⁶, it undervalues the risks and impacts of climate related catastrophes³⁷, etc. What we hope to illustrate here is that there are fundamental errors in the way a primary model used by the IPCC to create climate policy recommendations functions, errors which substitute a far rosier future for the grim realities we face.

1.3.2 NEOCLASSICAL ECONOMICS AS A FOUNDATION

While the issues with DICE are significant it is important to remember that this is still only one of the models used by the IPCC to evaluate the costs and effects of climate change. More insidious than the failings of a single model are the assumptions implicit in an entire school of thought which form the basis of every model currently in use. It is no secret that neoclassical economists such as Dr. Nordhaus and Dr. Tol have been running the show at the IPCC since its inception, and as Dr. Nordhaus wrote in 1994 “An economist explains that in his view energy and brain power are the only limits to growth in the long run, and with sufficient quantities of these it is possible to adapt or develop new technologies so as to prevent any significant economic costs”³⁸. Indeed, the current Chairperson of the IPCC is one Hoesung Lee, a PhD in Economics whose first post-graduate work experience was with ExxonMobil³⁹. There are significant issues with this framework especially in the context of climate change. The response of neoclassical economists to climate change springs from the idea of general equilibrium theory, wherein a model is developed which ostensibly takes into account inputs and feedbacks of an economic system to illustrate what may occur should a given action be pursued. As Dr. Stephen DiCanio writes in “Economic Models of Climate Change: A Critique”, “...the application of general equilibrium analysis to climate policy has produced a

³⁴ Chandran, D. and Peltier, W.R., 2018. On the mechanisms of warming the mid-Pliocene and the inference of a hierarchy of climate sensitivities with relevance to the understanding of climate futures. *Climate of the Past Discussions*, <https://doi.org/10.5194/cp-2018-18>

³⁵ Stern, N. *The Economics of Climate Change: The Stern Review* (Cambridge Univ. Press, 2007).

³⁶ Howard, P. H. & Sterner, T. Few and not so far between: a meta-analysis of climate damage estimates. *Environ. Resour. Econ.* **68**, 197–225 (2017).

³⁷ Millner, A. On welfare frameworks and catastrophic climate risks. *J. Environ. Econ. Manag.* **65**, 310–325 (2013).

³⁸ Nordhaus, W. D. (1994a). Expert opinion on climatic change. *American Scientist*, 82(1), 45–51. <https://www.jstor.org/stable/29775100>

³⁹ Lee, Hoesung. Curriculum Vitae, https://web.archive.org/web/20151010070508/http://www.ipcc.ch/nominations/cv/cv_hoesung_lee.pdf

kind of specious precision, a situation in which the assumptions of the analysts masquerade as results that are solidly grounded in theory and the data. This leads to a tremendous amount of confusion and mischief, not least of which is the notion that although the physical science of the climate is plagued by uncertainties, it is possible to know with a high degree of certainty just what the economic consequences of alternative policy actions will be⁴⁰. One consequence of this thought process is that every model developed to measure the balance between climate response and economic activity fails to account for catastrophic outcomes as their inherent damage functions only measure minute increases in temperature. This matters because "...even if a large temperature outcome has low probability, if the economic impact of that change is very large, it can push up the SCC [social cost of carbon] considerably...the problem is that the possibility of a catastrophic outcome is an essential driver of the SCC...IAMs cannot tell us anything about catastrophic outcomes, and thus cannot provide meaningful estimates of the SCC"⁴¹. Given that all 3 of the major IAMs used by the IPCC involve social utility calculations of carbon cost to weigh the risks of inaction against economic growth; failing to consider the increasingly likely scenario that our biosphere will be largely uninhabitable far sooner than expected ensures that policy recommendations borne of these models will always fall short of ensuring species survival. Designed then as these models are to be oriented around mitigation rather than solvency, it is no surprise that in order to meet arbitrary parameters such as avoiding a 1.5c rise in global temperature by 2100 they allow for overshoot of these goals assuming the development of technology which disappears carbon from our environment⁴². This is largely because the focus of any cost-benefit model is not as above the actual climate implications of policy but instead indexes towards monetary impacts⁴³. Furthermore, the calculation of what those monetary impacts even are consistently ignore the scale of impact on the global south⁴⁴. This is a common feature of western economic analysis wherein as a result of their status as a source of raw materials and cheap labor, countries kept poor by the global north for the purpose of continued expropriation of resources do not factor into consideration of the human and environmental cost of policies designed by and large for the protection and preservation of western wealth⁴⁵. A secondary explanation is that these models simply don't account for human mortality. It follows that with rising temperatures the

⁴⁰ Decanio, S.J. 2003. *Economic models of climate change : a critique*, New York, Palgrave Macmillan

⁴¹ Pindyck, Robert S. 2013. "Climate Change Policy: What Do the Models Tell Us?" *Journal of Economic Literature*, 51 (3): 860-72.

⁴² Drouet, L., Bosetti, V., Padoan, S.A. *et al.* Net zero-emission pathways reduce the physical and economic risks of climate change. *Nat. Clim. Chang.* **11**, 1070–1076 (2021). <https://doi.org/10.1038/s41558-021-01218-z>

⁴³ Pezzey, J. C. V. Why the social cost of carbon will always be disputed. *WIREs Clim. Change* **10**, e558 (2019).

⁴⁴ Gazzotti, P. *et al.* Persistent inequality in economically optimal climate policies. *Nat. Commun.* **12**, 3421 (2021).

⁴⁵ Hickel, J., Dorninger, C., Wieland, H., & Suwandi, I. (2022). Imperialist appropriation in the world economy: Drain from the global South through unequal exchange, 1990–2015. *Global Environmental Change*, 73, 102467.

stress of resource competition and proliferation of uninhabitable environs will cause countless humans to die and die younger than expected. There is an economic cost to these deaths; the disposable labor upon which the Global North relies will be in shorter supply, meaning a rising cost of goods as the human capital necessary to extract resources and produce goods dwindles. And yet, despite this obvious implication of rising global temperatures, models developed in the spirit of neoclassical economics barely account for mortality as a growing cost center⁴⁶. The DICE-2016 IAM attributes under 5% of net damages to mortality, while Dr. Tol's FUND model sees only 3% of net cost as a result human death⁴⁷.

The general mission of policy recommendations provided by the IPCC are and have always been the preservation of economic growth based on the assumption that growth is a determining factor of civilization's stability⁴⁸; the mere idea of approaching the problem from an alternate perspective is anathema. This has several implications on policy. First, as per the overshoot assumptions detailed earlier, there is a reliance on the unproven and energy intensive process of carbon removal. The IPCC Special Report 1.5 released 2018 assumes across every scenario that up to 2100, developments in carbon capture and sequestration technology will account for the removal of between 100 and 1000 billion tons of CO₂⁴⁹. Furthermore, as a 2016 study surveying all possible types of carbon capture technologies shows, "...there is no NET [negative emissions technology] (or combination of NETs) currently available that could be implemented to meet the <2 °C target without significant impact on either land, energy, water, nutrient, albedo or cost"⁵⁰. Even if this technology eventually becomes feasible, banking on its rapid development and deployment while conditions worsen leaves us without other options should this technology fail or prove insufficient to meet the demands of rising emissions, not to mention the complete lack of consideration for a host of tipping points which would render the use of NET too late to make a difference. This illustrates another underlying feature of economist driven policy recommendations: adapt or die. At the core of every model is the conceit that we as a species possess near infinite adaptability regardless of our environment. While the case can certainly be made that humans have generally found ways to survive inhospitable environments, there is a marked difference between an

⁴⁶ Bressler, R. D. (2021). The mortality cost of carbon. *Nature communications*, 12(1), 1-12.

⁴⁷ Diaz, D. & Moore, F. Quantifying the economic risks of climate change. *Nat. Clim. Change* **7**, 774–782 (2017).

⁴⁸ Kuhnhenh, K. Economic growth in mitigation scenarios: a blind spot in climate science. Heinrich Böll Stiftung 25 https://www.boell.de/sites/default/files/endlf2_kuhnhenh_growth_in_mitigation_scenarios.pdf (2018).

⁴⁹ IPCC. 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. (Intergovernmental Panel on Climate Change (IPCC), 2018).

⁵⁰ Smith, P., Davis, S. J., Creutzig, F., Fuss, S., Minx, J., Gabrielle, B., ... & Yongsung, C. (2016). Biophysical and economic limits to negative CO₂ emissions. *Nature climate change*, 6(1), 42-50.

environment that is inhospitable versus entirely uninhabitable. Despite economist's optimism natural scientists the world over are aware that "...even ambitious adaptation efforts globally do not have the potential to offset the substantial increase in risk associated with each additional 0.5 °C of global warming..." and "...The finding that ambitious adaptation cannot fully control the continuous increase in residual risks when mitigation fails suggests the existence of hard adaptation limits at the global scale. In contrast to 'soft' limits for which options to avoid intolerable risks may exist but are currently not available, hard limits cannot be overcome."⁵¹ Last but not least is the failure to consider options which do not serve the ideology of economic progress. There is much lip service paid to the concept of green growth, wherein economists insist there can be synergy between endless economic expansion and an inhabitable biosphere. The United Nations Environmental Program parroted these claims in their 2011 publication "Toward a Green Economy: Pathways to Sustainable Development and Poverty Eradication", and while they clarify that "The central challenge ... is to decouple growth absolutely from material and energy intensity"⁵² in the same piece the authors acknowledge that "Resource efficiency alone is not enough. Productivity gains in today's linear production system are likely to lead to increased material demand through a combination of economic growth and rebound effects." There is no empirical basis to suggest that the decoupling of resource use from GDP is even faintly possible, and that "While some models show that absolute decoupling may be achieved in high-income nations under highly optimistic conditions, they indicate that it is not possible to sustain this trajectory in the long term. Green growth also requires that we achieve permanent absolute decoupling of carbon emissions from GDP, and at a rate rapid enough to prevent us from exceeding the carbon budget for 1.5°C or 2°C...empirical projections show that this is unlikely to be achieved, even under highly optimistic conditions."⁵³ It is thus an inevitability that, should we decide against relying on the unproven outcome of technological developments, a decrease in consumption of energy will naturally cause a decrease in GDP⁵⁴. This is a positive; research indicates that degrowth provides us the opportunity to more equitably distribute resources between the Global North and the Global South⁵⁵, that wealthy nations could easily decrease their energy

⁵¹ Magnan, A. K., Pörtner, H. O., Duvat, V. K., Garschagen, M., Guinder, V. A., Zommers, Z., ... & Gattuso, J. P. (2021). Estimating the global risk of anthropogenic climate change. *Nature Climate Change*, 11(10), 879-885.

⁵² United Nations Environment Programme (UNEP), 2011. *Towards a green economy: pathways to sustainable development and poverty eradication – a synthesis for policy makers*. Nairobi: UNEP

⁵³ Jason Hickel & Giorgos Kallis (2019): *Is Green Growth Possible?*, *New Political Economy*, DOI: 10.1080/13563467.2019.1598964

⁵⁴ Parrique, T. et al. *Decoupling debunked: evidence and arguments against green growth as a sole strategy for sustainability*. www.eeb.org/library/decoupling-debunked (2019)

⁵⁵ Hickel, J. *Degrowth: a theory of radical abundance*. *Real-world Economics. Rev.* 19, 54–68 (2019)

consumption and still maintain a high quality of life⁵⁶, and that degrowth is an optimal pathway in terms of sustainability and feasibility especially when compared to the extinction scenarios proffered by traditional IAMs⁵⁷. What is clear is that the policy recommendations provided by the IAMs which form the foundation of IPCC discourse are intrinsically exclusive of the only mitigation pathways which are possible in the status quo and that immediately work to address the inescapable gravity of climate change. This blindness to a world of opportunity is not only willful but endemic to IPCC methodology; should we as a species agree that extinction is a sub-optimal outcome then new climate leadership is required.

⁵⁶ Millward-Hopkins, J., Steinberger, J. K., Rao, N. D. & Oswald, Y. Providing decent living with minimum energy: a global scenario. *Glob. Environ. Change* **65**, 102168 (2020).

⁵⁷ Keyßer, L. T., & Lenzen, M. (2021). 1.5 C degrowth scenarios suggest the need for new mitigation pathways. *Nature communications*, 12(1), 1-16.

2. REPRESENTATION

As we seek to ascertain the present and future viability of the IPCC as guiding beacon with regards to climate change we would be remiss not to at least touch on structural challenges specific to the internal composition and public representation of research. While we have covered cracks in the scientific foundation upon which the institution rests, there are other contributing factors to the trustworthiness thereof which, while not necessarily causal, do correlate to many of the previous concerns. The issue of representation in the IPCC is twofold: first, it is an undeniable fact that the voices included are predominantly white, male, and western. Second, data and conclusions are presented in a fashion that lend themselves to misinterpretation and facilitate conservative policy responses. Both of these realities produce difficulties not only in comprehension but transmissibility.

2.1 COMPOSITION AND KNOWLEDGE HIERARCHY

With regards to the former it is clear that “the assessment and content of [IPCC 2018 Reports] are not neutral but, rather, reflect the authorship, attitudes to knowledges and pressures of the IPCC”⁵⁸. This begs the question: what *is* that authorship? Since its inception the number of selected representatives from OECD versus non-OECD countries has remained largely unchanged; for the Second, Third, and Fourth Assessment Reports the representation of authors and reviewers from non-OECD countries sat at only 18-20%⁵⁹. When we include the first AR, 45% of all countries have not a single participant, Europeans and North Americans represent 75% of all contributors, and that the primary indicators of inclusion are an author’s/reviewers English speaking status and their home nation’s GDP⁶⁰. While an argument can be made that there are simply fewer potential contributors from these geographies the process by which selections are made is inherently exclusive; scientists in underrepresented regions are “[...]less likely to be ‘plugged-in’ to global networks and may have a lower publishing profile than their Annex 1 counterparts”⁶¹. This can have significant consequences for the perceived legitimacy of IPCC findings especially in under- or unrepresented nations; as IPCC Chairman Bert Bolin stated as far back as 1991, “Right now, many countries, especially developing countries, simply do not trust assessments in which their scientists

⁵⁸ Maia Germano (2022): ‘Neutral’ Representations of Pacific Islands in the IPCC Special Report of 1.5°C Global Warming, *Australian Geographer*, DOI: 10.1080/00049182.2022.2037179

⁵⁹ Hulme, M. & Mahoney, M. What do we know about the IPCC? *Prog. Phys. Geogr.* **34**, 705–718 (2010).

⁶⁰ Ho-Lem, C., Zerriffi, H. & Kandlikar, M. *Glob. Environ. Chang.* **21**, 1308–1317 (2011).

⁶¹ *Ibid*

and policymakers have not participated. Don't you think credibility demands global representation?"⁶². While covered elsewhere in this paper it is also worth noting that a primary IAM used by the IPCC (Nordhaus' DICE model) fundamentally relies on a logic which privileges the Global North's ability to withstand climate change and proscribes "economically optimal" mitigation pathways which guarantee inequalities in the felt experience thereof. What DICE sees as the most economically advantageous way forward does not take into account the non-linearity of temperature rise and subsequent impact on the southern hemisphere, nor does it acknowledge the ensuing rise in already horrific income inequality between the Global North and Global South. There is also significant underrepresentation of women's voices of which the IPCC has long been aware. In 2018 the Task Group on Gender was created to ascertain the extent and severity of gender bias and in 2019 presented their findings. While from AR1 to AR6 the participation of women grew from 8% to ~30%, over half of respondents stated they had seen a woman being ignored while a full third of women reported that at least once it was implied they were only included because of their gender⁶³. These figures are alarming not only because we know that a diversity of voices lead to higher quality science⁶⁴ but that IPCC selection procedures represent an institutional barrier towards resolving the problem as in the earth sciences, women are less likely to be a) nominated for awards and b) placed in leadership positions⁶⁵, constraining their access to the community. Compounding these errors is a persistent bias in knowledge hierarchy. Diversity doesn't stop with nationality or gender but must also include a variety of professional backgrounds, an area in which the IPCC has long fallen short. In the most comprehensive study of its kind, Andreas Bjurstrom and Merrit Polk grouped the 14000 works cited in the 3rd AR into disciplinary "buckets". 62% of them were from peer-reviewed journals, 12% from social sciences, and once economics was removed less than 8% of the total references hailed from the "soft" sciences⁶⁶. There is an assumption in the IPCC that social sciences are subsidiary of physical sciences and as such discounts the value they bring towards assessing complex systems⁶⁷ (provided of course they are not rooted in economics). As sociologist Steven Yearley wrote, "The institutional assumption

⁶² Biermann, F. (2002). Institutions for Scientific Advice: Global Environmental Assessments and Their Influence in Developing Countries. *Global Governance*, 8(2), 195–219.

⁶³ Liverman, Diana, et al. "Survey of gender bias in the IPCC." (2022): 30-32.

⁶⁴ Nielsen, M. W. *et al. Proc. Natl Acad. Sci. USA* **114**, 1740–1742 (2017)

⁶⁵ Popp, A. L., Lutz, S. R., Khatami, S., van Emmerik, T. H. M. & Knoben, W. J. M. *Earth Space Sci.* **6**, 1460–1468 (2019)

⁶⁶ Bjurstrom A, Polk M (2010) Physical and economic bias in climate change research: a scientometric study of IPCC Third Assessment Report. *Climatic Change*, in press

⁶⁷ Godal O (2003) The IPCC's assessment of multidisciplinary issues: the case of greenhouse gas indices. *Climatic Change* 58(3): 243–249

of the IPCC is that the most relevant social science is economics”⁶⁸. This has a material impact on the way policy is created; a myopic focus on “growth” ensures strategies of degrowth offered by alternate disciplines⁶⁹ are entirely ignored. This has the tendency to become a self-fulfilling prophecy in that authors and reviewers become part of a select community that tends to draw from itself, reinforcing extant biases and further closing out on the possibility of lateral problem solving. Indeed, the limitation to specific disciplines wherein consensus is a primary goal actively produces conservative estimates of what we can expect from climate change⁷⁰ which shape our regulatory and policy landscapes.

2.2 SELF-REPRESENTATION

As previously acknowledged the issue of representation is not specific to the nationality of authors, their gender, or the disciplines they represent. There are also significant issues with how the IPCC publicly represents its findings and, more importantly, policy makers with the capacity to effect change in the mitigation of climate catastrophe. These issues are exacerbated by the way humans interpret statements of probability; how we do so largely depends on context⁷¹, our own internal understanding of associated terms⁷², and our bias towards less severe interpretations of verbal statements thereof⁷³. Currently the IPCC presents probability with verbal descriptions (likely, unlikely, etc.) referencing an attached translation table correlating these terms to specific numeric ranges⁷⁴. This method has been indicted since 2009 as both inefficient⁷⁵ and significantly inferior to alternative systems wherein verbal descriptions are immediately paired with their correlating probability range⁷⁶. There is an assumption that these terms are universal, puzzling for a body

⁶⁸ Yearley S (2009) Sociology and climate change after Kyoto: what roles for social science in understanding climate change? *Current Sociology* 57(3): 389–405.

⁶⁹ Hiramatsu, A., Mimura, N., & Sumi, A. (2010). A mapping of global warming research based on IPCC AR4. In *Adaptation and Mitigation Strategies for Climate Change* (pp. 167-186). Springer, Tokyo.

⁷⁰ HERRANDO-PÉREZ, S., BRADSHAW, C. J. A., LEWANDOWSKY, S. & VIEITES, D. R. 2019. Statistical Language Backs Conservatism in Climate-Change Assessments. *Bioscience*, 69, 209–219.

⁷¹ Fischer, K. & Jungermann, H. Rarely occurring headaches and rarely occurring blindness: Is rarely = rarely? The meaning of verbal frequentistic labels in specific medical contexts. *J. Behav. Decis. Mak.* **9**, 153–172 (1996)

⁷² Piercey, M. D. Motivated reasoning and verbal versus numerical probability assessment: Evidence from an accounting context. *Organ. Behav. Hum. Dec.* **108**, 330–341 (2009).

⁷³ Fillenbaum, S., Wallsten, T. S., Cohen, B. L. & Cox, J. A. Some effects of vocabulary and communication task on the understanding and use of vague probability expressions. *Am. J. Psychol.* **104**, 35–60 (1991).

⁷⁴ Ha-Duong, M., Swart, R., Bernstein, L. & Petersen, R. Uncertainty management in the IPCC: agreeing to disagree. *Glob. Environ. Change* **17**, 8–11 (2007)

⁷⁵ Budescu, D. V., Broomell, S. B. & Por, H. H. Improving communication of uncertainty in the reports of the Intergovernmental Panel on Climate Change. *Psych. Sci.* **20**, 299–308 (2009)

⁷⁶ Budescu, D. V., Por, H. & Broomell, S. B. Effective communication of uncertainty in the IPCC reports: A nationally representative survey. *Climatic Change* **113**, 181–200 (2012)

composed of 193 countries. Even within strictly defined culturally and linguistically homogenous groups interpretation of these terms will differ on an individual basis, so to hope that advisors of state and media functionaries would perceive likelihood of given outcomes similarly is to leave interpretation to the winds. Further, the summaries provided to policymakers (SPMs) have since 1990 featured consistently low “readability”, a measure of a given text’s ease of comprehension⁷⁷. A linguistic analysis of SPMs from 1990 to 2014 by Ralf Barkmeyer and team found that a procedural mechanism (plenary sessions) significantly impact readability. In these sessions a confidential copy of the report is provided to government representatives and, in a time limited fashion, covered line by line with IPCC authors. Unsurprisingly this aspect facilitates the distortion of the underlying science⁷⁸ with concomitant effects on state and media communication which in turn can build support for or against more aggressive mitigation pathways. While there do exist ways to ameliorate these impacts the fact that these pitfalls have been acknowledged for over 30 years does not inspire confidence.

⁷⁷ Barkmeyer, R., Dessai, S., Monge-Sanz, B. *et al.* Linguistic analysis of IPCC summaries for policymakers and associated coverage. *Nature Clim Change* **6**, 311–316 (2016)

⁷⁸ Petersen, A. C. *Simulating Nature: A Philosophical Study of Computer-Simulation Uncertainties and their Role in Climate Science and Policy Advice* (CRC Press, 2012).

3.THE IPCC AS INTEGRAL TO CLIMATE POLICY FAILURE

It is at this point undeniable that the IPCC plays a significant role in the hobbling of climate policy in favor of recommendations which fundamentally change nothing about how we as a species interact with the biosphere. Not only do the internal machinations prioritize infinite growth, the reporting process itself is susceptible to the pressures of government/private sector interest; prior to the release of AR6 over 32,000 comments were submitted, most decrying any sort of action which would meaningfully change the consumption of fossil fuels⁷⁹. Corporate Observatory Europe noted that at COP26 “If the fossil fuel lobby were a country delegation...it would be the largest with 503 delegates – two dozen more than the largest country delegation”⁸⁰. Corporations and governments wouldn’t spend the resources on lobbying efforts of this magnitude if they were unsuccessful and given what we know about those in positions of authority within the Working Groups we can safely conclude that some percentage of lobbyists are received warmly. In this chapter we will elucidate how the work of the IPCC is codified into policy the world over with disastrous implications for the future of life on this planet.

3.1 PARIS AGREEMENT

In December of 2015 at COP21 a new “legally binding” international treaty on climate change was adopted by 196 countries: the Paris Agreement. The stated goal was to ensure that global warming was kept to no more than 2c over pre-industrial levels by 2100 through a series of promises that signatories agreed to keep absent an enforcement mechanism. At the time of release then UN Secretary General Ban Ki Moon spoke of its transformative potential: “The Paris Agreement is a triumph for people, the planet, and for multilateralism. For the first time, every country in the world has pledged to curb their emissions, strengthen resilience and act internationally and domestically to address climate change.”⁸¹ Now ~6 years later with not a single G20 country meeting their commitments it is clear the Paris Agreement has been an abject failure⁸². Many of these broken

⁷⁹ Rowlett J and Gerken T, “COP26: Document leak reveals nations lobbying to change key climate report,” 21-10-21, BBC News, <https://www.bbc.com/news/science-environment-58982445>

⁸⁰ Corporate Observatory Europe, “Hundreds of fossil fuel lobbyists flooding COP26 climate talks”, 8-11-21, <https://corporateeurope.org/en/2021/11/hundreds-fossil-fuel-lobbyists-flooding-cop26-climate-talks>

⁸¹ UN News Centre, “Sustainable Development Goals kick off with start of new year,” 30-12-15, <https://www.un.org/sustainabledevelopment/blog/2015/12/sustainable-development-goals-kick-off-with-start-of-new-year/>

⁸² Milman, O “Governments falling woefully short of Paris climate pledges, study finds”, 15-9-21, The Guardian, <https://www.theguardian.com/science/2021/sep/15/governments-falling-short-paris-climate-pledges-study>

promises are not themselves indicative of IPCC culpability; it was agreed at COP16 that wealthy nations of the Global North would collectively provide \$100b/yr to those of the Global South to facilitate a transition away from fossil fuel based economies; that has not only failed to materialize but “creative accounting” ensures that many nations simply use this as a means of avoiding their own carbon mitigation obligations⁸³. Where the IPCC’s influence becomes apparent is in the structuring of carbon abatement goals and recommendations for doing so. This is of course by design; Article 4 Paragraph 2 of the Paris Agreement requires signatories to create and adhere to nationally determined contributions (NDCs) which are themselves promises to develop “domestic mitigation measures”⁸⁴ and are shared with the UNFCCC Secretariat every 5 years. What guidelines must they follow in doing so? As per Section 3 Paragraph 31a of the Addendum to the Conference of Parties (COP) on its 21st Session, “Parties account for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the Intergovernmental Panel on Climate Change...” and as per Paragraph 32 they are required to “apply the guidance” to their second and all subsequent NDC submissions⁸⁵. Adherence to IPCC methodology was previously codified within Article 9 of the United Nations Framework Convention on Climate Change; here was established the Subsidiary Body for Scientific and Technological Advice whose purview is to provide information to members of the Conference of Parties which shall come from “...existing competent international bodies”⁸⁶ The UNFCCC was drafted in 1992; the only “competent international body” at the time? The IPCC. Is it any surprise then that even if the Paris Agreement NDCs were met we would still be on a 2.7c temperature rise over pre-industrial levels?⁸⁷ Or that in the text itself the word “adaptation” occurs 81 times but there isn’t a single reference to humans as the cause of climate change, nor are there any references to correlated words such as “coal”, “oil”, “fracking”, “ban”, “prohibit”, “stop”, “carbon dioxide”, etc?⁸⁸ Article 7 of the Paris Agreement explicitly centers on adaptation⁸⁹. Worse still, even if there was a viable enforcement mechanism written into the Paris Agreement the goals being enforced would still be wildly insufficient to mitigate climate change to a level that won’t cause mass

⁸³ Timperley, J. (2021). The broken \$100-billion promise of climate finance—And how to fix it. *Nature*, 598(7881), 400-402.

⁸⁴ UNFCCC (2015), Nationally Determined Contributions, <https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs#eq-1>

⁸⁵ UNFCCC. (2015). Adoption of the Paris Agreement, Decision 1/CP. 21 of FCCC/CP/2015/10/Add. 1.

⁸⁶ United Nations Framework Convention on Climate Change. New York: United Nations, General Assembly, 1992.

⁸⁷ UNEP, Emissions Gap Report 2021

⁸⁸ Spratt, David & Dunlop, Ian. (2017). What Lies Beneath: The scientific understatement of climate risks.

⁸⁹ Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104

migrations and the death of billions. This again is precisely because the IPCC methodology signatories are constrained by has been wholly captured by the agenda of neoclassical economists.

3.2 SUSTAINABLE DEVELOPMENT GOALS

In 2015 concomitant with the Paris Agreement the United Nations General Assembly adopted 17 Sustainable Development Goals intended to address a broad suite of global pain points many being directly correlated with global warming. How has progress been thus far? As Secretary General Antonio Guterres wrote in the SDG Report 2020, “The Sustainable Development Goals Report 2020 brings together the latest data to show us that, before the COVID-19 pandemic, progress remained uneven and we were not on track to meet the Goals by 2030.”⁹⁰ We cannot say the goals weren’t ambitious, itself potentially a contributing factor towards their general failure to be met; of the 17 goals only putting children into primary schools and eliminating preventable infant mortality were anywhere close to being realized⁹¹. Even absent a legitimate interest of signatories in meeting their obligations many of these goals were doomed to fail from the outset precisely because of IPCC methodology. This may seem a bold claim; after all, of the 17 goals only the 13th specifically targets climate change: “Goal 13. Take urgent action to combat climate change and its impacts*”⁹² The affixed asterisk leads you to the following statement: “Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.”⁹³ As previously detailed the UNFCCC is driven by the findings and recommendations of the IPCC and forms the backbone of the COP’s efforts since 1992. We also know that as a result of the negligence (if not active malfeasance) implicit in IPCC methodology that any “urgent action” taken was never going to be truly urgent enough, but what of the impact on the other 16 goals? Despite the presentation of these goals as siloed benchmarks the majority function as an interconnected web with climate change being a primary contributor to success or failure. This should be intuitive; for example, “climate change negatively affects poverty and health, which worsens gender and income inequality, so mitigating climate change will help reduce poverty and inequality and improve health, but these points are not

⁹⁰ Guterres, Antonio, and Z. Liu. "The Sustainable Development Goals Report 2020." United Nations Intergovernmental Organization: New York, NY, USA (2020).

⁹¹ Nature. "Time to revise the sustainable development goals." *Nature* 583.7816 (2020): 331-332.

⁹² Desai, U. N. "Transforming our world: The 2030 agenda for sustainable development." (2016).

⁹³ Ibid

directly addressed under their respective SDGs...⁹⁴ The lack of networking can partly be explained by the process leading climate change to be a goal in the first place. The SDG deliberations occurred prior to the Paris Agreement and while arguments were made for the issue to be woven into the 16 other areas it was ultimately decided that, while it would be included as a standalone goal, it would not “pre-empt the UNFCCC process” and would not adhere to strong targets⁹⁵. Even acknowledging this late addition does not explain away the imperative to describe the relationship between climate change and each goal independently/as an interconnected web and is indicative of a myopia plaguing the entire enterprise. Ultimately “[...]a silo approach which maximises sectoral interests by artificially breaking up the inherent connections between sectors and among various actors has been demonstrated as inappropriate, particularly when dealing with the relations between economic growth and preservation of the environment.”⁹⁶ The chain of causality is simple: the SDGs are informed by the UNFCCC, itself informed by the IPCC. When IPCC science is hamstrung by growth focused economists, the predictions of what should be done and the timeline to do it fall apart.

⁹⁴ Elder, Mark, and Simon Høiberg Olsen. "The Design of Environmental Priorities in the SDG s." *Global Policy* 10 (2019): 70-82.

⁹⁵ Dodds, F., Donoghue, D. and Leiva-Roesch, J. (2016) *Negotiating the Sustainable Development Goals*. Abingdon: Routledge.

⁹⁶ Zhou, X. and Moinuddin, M. (2017) *Sustainable Development Goals Interlinkages and Network Analysis: A practical tool for SDG integration and policy coherence*. Hayama, Japan: Institute for Global Environmental Strategies.

4.CONCLUSION

This paper set out to answer two questions: first, if the IPCC can be relied upon as the leading source for climate change knowledge/policy recommendations. Second, whether the IPCC has been instrumental in actively minimizing the scale of climate change while perpetuating a narrative which serves to protect the interests of capital. In both cases the answer is an emphatic yes. By affirming these questions we must not derogate the work of the contributing authors who have spent their lives studying the relationship between human behavior and our impact on this planet; indeed, many of the 233 living IPCC authors express dismay at what they rightly see as a parade of empty promises⁹⁷. As IPCC author Mouhamadou Sylla says, “Right now, governments are just at the stage of providing green promises, but so far we have not seen any actions to curb greenhouse-gas emissions.” It is valid to ask whether the IPCC is beyond saving in the same way it is valid to ask if the continued survival of our species is beyond saving. The damage has been done, the rot is deep, and there clearly exists no impetus by states or corporate bodies to voluntarily pass on profit opportunities nor would that resistance mean anything in a world where those who dare frustrate capital are simply replaced with more cooperative mouthpieces. What we are witnessing via the IPCC is what Noam Chomsky described as the manufacturing of consent; by intentionally hobbling the methods and presentation of climate data those who stand the most to gain from a growing crisis can mollify an increasingly desperate public and continue with business as usual. This is capitalism working exactly as intended; regulatory capture is just another mechanism used by capital to self-perpetuate. While I will not proscribe a solution to the problem of casting off a pervasive ideology, I will close with a quote from American folk singer Utah Phillips: “The planet isn’t dying, it is being killed, and the people doing the killing have names and addresses.”

⁹⁷ Tollefson, Jeff. "Top climate scientists are sceptical that nations will rein in global warming." *Nature* 599.7883 (2021): 22-24.

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