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## **Future Climate Policy and the Right to Sustainable Development**

This summer various regions throughout the globe were hit by record-breaking heat spells. Nine out of the ten warmest years ever recorded have come in the past decade, and everything indicates that this trend will continue into the future. And record heat isn't even the worst of it. Climate change is expected to (among other things) make dry regions dryer and wet regions wetter, increase the frequency and intensity of severe storms throughout the world, and engender ocean acidification and rising sea-levels.

Limiting warming to 2°C – or better yet, 1.5°C – is the internationally recognized goal (United Nations, 2015). But our current climate policy, as outlined in the Paris Agreement, is insufficient to reach such a goal. If all the pledges of the Paris Agreement were fully realized – something that seems doubtful given (a) our history regarding climate action and (b) President Trump's announcement of his intention to withdraw the United States from the Agreement – the world would still warm more than 3°C by the end of the century. With this being the case, it seems clear that we need to change course and we need to do so quickly.

But what should that change look like? That is, what should our climate policy be going forward? Prof. Darrel Moellendorf and I have recently argued that we should assess different climate policies with (at least) two

things in mind: (1) catastrophic climate change and (2) the right to sustainable development<sup>1</sup>.

Avoiding catastrophic climate consequences should be the primary goal of climate policy. But what do we mean by "catastrophic climate consequences?" Catastrophic climate consequences refer to events that are massively costly and outstrip our adaptive capacity. A paradigmatic example of a catastrophic climate consequence would be the complete or near-complete loss of the Greenland Ice-sheet. We know there is some temperature increase at which the Greenland Ice-sheet would fail, an event that would raise sea-levels by up to 7 meters. This would surely be catastrophic, inundating large coastal cities like New York, Shanghai, and Dhaka. But other events – such as severe droughts, floods, and intense storms – would also count as catastrophic. We'll want to make sure that our climate policy avoids the risks of catastrophic climate consequences, at least as much as possible other things considered.

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<sup>1</sup> There are, of course, other criteria that one should consider when assessing climate policies. Some of these other criteria are cost, procedural justice, and intergenerational justice. But we focus on catastrophic climate change and the right to sustainable development given their importance and general acceptance in the debate.

And what is meant by “the right to sustainable development?” The right to sustainable development was included in the very first agreement on climate change: the United Nations Framework Convention on Climate Change (1992). The right entails that climate policy needs to take the legitimate development priorities of developing economies into account<sup>2</sup>. For example, the right to sustainable develop would speak against any climate policy that required the Central Africa Republic, Niger, and Chad (three of the lowest HDI-ranked countries) to forgo or even curtail their development ambitions in order to help mitigate climate change. Any future climate policy will have to recognize the legitimate development claims of the world’s developing economies.

With these two constraints in mind, I want to look at four different policy responses that address the disconnect between the goal of limiting warming to 2°C and the means we have so far proposed to do so. Consider first the idea that we should revise the goal. If we are having so much trouble motivating the global community to curb greenhouse gas emissions sufficiently to limit warming to 2°C, perhaps we just aim for a different target. After all, there is nothing inherently special about 2°C – there will be climate change below 2°C and there will be climate change above 2°C as well. So why not revise our goal upwards?

The problem with revising our climate change goal upwards is two-fold. Revising the 2°C target upwards runs too high a risk of triggering catastrophic climate consequences and violating the right to sustain-

able development. First, we should recognize that we are already rolling the dice by aiming at 2°C. For instance, we know that the Greenland Ice-sheet is likely to collapse somewhere between 1°C - 4°C (IPCC, 2013). Revising the target upwards, for instance, to 3°C seems like too much of a gamble. But, second, revising the target upwards is likely to require the least-developed economies to forgo their development ambitions. This is because revising the target upwards will require us to invest much more in adaptation if we want to limit damages from climate change. Given our lackluster history in transferring adaptation funds to the developing economies, a large portion of the costs of adaptation would very likely fall on the developing countries themselves. These countries would have to divert resources away from development towards adaptation measures in order to protect their populations. This is exactly what the right to sustainable development forbids. Because of these two reasons, revising the 2°C target upwards should be off the table. Instead, we should aim for 2°C and do so while respecting the development ambitions of the Global South.

Another policy that has been put forward that recognizes the 2°C goal is a green policy of economic degrowth. It’s clear that, at our current level of technological development, economic growth and greenhouse gas emissions go hand in hand. The simple idea embedded in the degrowth policy is the thought that, if we want to limit the greenhouse gas emission that are causing climate change, we limit economic growth. Proponents of the degrowth strategy recognize the right to sustainable development, and generally recommend that the world’s developed economies – not the developing ones – should be the focus of negative growth.

The problem with the degrowth strategy is that it seems unlikely to remain strictly within the world’s developed economies. For example, economic growth rates in 2007

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<sup>2</sup> By “development priorities,” I mean to say that developing economies should consider poverty-eradicating development a priority over mitigating their greenhouse gas emissions. These priorities are legitimate or justified given that these are generally desperately poor regions that additionally have contributed relatively very little to climate change. For more on what the qualifier “sustainable” means, see (Moellendorf, 2011).

were 3.9% globally and 8.3% in developing economies. These rates dropped to -2.2% globally and 1.2% in developing economies at the height of the Great Recession. This unintentional degrowth experiment should cause us to worry whether in our global economy degrowth can really be limited to the wealthy countries of the world. And the World Bank (2010) has warned that for roughly every percentage point of lost growth in the developing economies, perhaps 20 million people are trapped in poverty. If the worry is well-placed, then the degrowth strategy runs a risk of violating the right to sustainable development.

The chance of degrowth negatively affecting the world's developing economies suggests that we should look for ways to limit climate change to 2°C while still pursuing poverty-eradicating economic growth. Perhaps the most widely endorsed path is that of ratcheting up emissions mitigation. While current mitigation pledges within the Paris Agreement put us on track for roughly 3°C of warming, the hope behind the thought of ratcheting up mitigation ambition is that we can, through emissions reductions only, limit warming to 2°C. Significant reductions in the emissions of developed economies will have to be the cornerstone of any justifiable climate policy. But there two worries associated with the plan to achieve the 2°C goal through emissions reductions only.

The first worry is borne out of the fact that international cooperation (especially on a problem of this scale) is extremely complex and difficult to enact. There are various hurdles to overcome with any international cooperation, and those hurdles are even higher when cooperation is as costly as it is with emissions reductions. Carbon Brief (2017) has put out a scenario under which we could potentially limit warming to 2°C through emissions reductions. But such a scenario requires massive reductions. For instance, the Carbon Brief scenario requires an immediate reduction in global emis-

sions. The rate at which emissions need to decrease starts out at 5% but soon reaches 9% per year. A 9% reduction in emissions year after year is indeed a high hurdle – one that, again given our history with respect to international cooperation on climate change, is risky to rely upon. The emissions reduction only strategy is leaving us open to a future in which we don't sufficiently mitigate climate change and could perhaps lead us towards catastrophe. The second worry with such a strategy is that it may be geo-physically impossible at this point. Had we started emissions reductions two decades ago, the situation might be different. But as it stands now, we may already be committed to 2°C of warming even if we were to halt all greenhouse gas emissions today. The IPCC (2013) predicts that in order to have a 50% chance of limiting warming to below 2°C, we have to stabilize atmospheric greenhouse gas concentrations at roughly 450 ppm. In 2018, the United States National Oceanographic and Atmospheric Administration (2018) measured atmospheric greenhouse gases to be at 493 ppm. This casts serious doubt upon the geo-physical possibility of limiting warming to 2°C through simply reducing our emissions, even if those reductions were made at a rate never before seen.

The worry that through previous inaction we may have already shut the door on limiting climate change to 2°C through emissions reductions only is what leads us to consider our fourth and final potential policy route – supplementing mitigation and adaptation with research into various geo-engineering technologies. Geoengineering technologies are often broken into two separate categories (Callies, 2016): negative emissions technologies (NETs), which suck greenhouse gases out of the atmosphere, and solar radiation management (SRM), which aims to reflect a small portion of incoming sunlight. Most climate models now incorporate some kind of NET, usually Bio-energy with Carbon Capture and Storage

(BECCS) or Direct Air Capture with Storage (DACs). NETs could be used to help us reach the 450 ppm target that the IPCC predicts will likely limit warming to 2°C. But even with significant investment in NETs, we may temporarily overshoot our temperature target due to the inertia in the climate system. This is one of the reasons that research into SRM technologies has continued. The thought is that with aggressive mitigation and adaptation, significant development of NETs, and perhaps the limited use of SRM technologies to mask any temporary overshoot, we may be able to avoid catastrophic climate consequences while respecting the right to sustainable development. This will require developed countries to take on the lion's share of the costs associated with mitigation, adaptation, and research and development of geoengineering technologies. But it is important to point out that there are troubling potential side-effects associated with geoengineering technologies (Robock, 2008). This should spur us to lean on them as little as possible and to instead opt for substantial mitigation to the extent possible.

What is clear that is that we are no longer left with perfect options when it comes to climate change. Nonetheless, some of the options still open to us are more preferable than others. Given the constraints of (1) avoiding catastrophic climate consequences and (2) respecting the right to sustainable development, it appears as if our future climate policy is going to have to be very broad indeed. Revising the warming target from, say, 2°C to 3°C is unacceptable given its likelihood to violate both of the above constraints. Achieving the 2°C target through degrowth also seems far too likely to violate the right to sustainable development. Ratcheting up mitigation will be central to any climate policy going forward. But emissions reductions only will (a) be very difficult to sufficiently enact on the international stage and (b) may be already be too late. For this reason, it seems that robust mitigation should be supplemented with research and development of NETs (financed by developed economies) and continued research into SRM. This final, broadest policy proposal is far from ideal. But it may be our best bet to curb the negative effects of climate change given where we find ourselves today.

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