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Bill McKibben. (photo: Wolfgang Schmidt)

A Very Grim Forecast

By Bill McKibben, The New York Review of Books, 24 November 18

Though it was published at the beginning of October, *Global Warming of 1.5°C*, a report by the Intergovernmental Panel on Climate Change (IPCC), is a document with its origins in another era, one not so distant from ours but politically an age apart. To read it makes you weep not just for our future but for our present.

The report was prepared at the request of the United Nations Framework Convention on Climate Change at the end of the Paris climate talks in December 2015. The agreement reached in Paris pledged the signatories to

holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.

The mention of 1.5 degrees Celsius was unexpected; that number had first surfaced six years earlier at the unsuccessful Copenhagen climate talks, when representatives of low-lying island and coastal nations began using the slogan "1.5 to Stay Alive," arguing that the long-standing red line of a two-degree increase in temperature likely doomed them to disappear under rising seas. Other highly vulnerable nations made the same case about droughts and floods and storms, because it was becoming clear that scientists had been underestimating how broad and deadly the effects of climate change would be. (So far we've raised the global average temperature just one degree, which has already brought about changes now readily observable.)

The pledges made by nations at the Paris conference were not enough to meet even the two-degree target. If every nation fulfills those pledges, the global temperature will still rise by about 3.5 degrees Celsius, which everyone acknowledged goes far beyond any definition of safety. But the hope was that the focus and goodwill resulting from the Paris agreement would help get the transition to alternative energy sources underway, and that once nations began installing solar panels and wind turbines they'd find it easier and cheaper than they had expected. They could then make stronger pledges as the process continued. "Impossible isn't a fact; it's an attitude,"

said Christiana Figueres, the Costa Rican diplomat who deserves much of the credit for putting together the agreement. "Ideally," said Philip A. Wallach, a Brookings Institution fellow, the Paris agreement would create "a virtuous cycle of ambitious commitments, honestly reported progress to match, and further commitments following on those successes."

To some extent this is precisely what has happened. The engineers have continued to make remarkable advances, and the price of a kilowatt generated by the sun or wind has continued to plunge—so much so that these are now the cheapest sources of power across much of the globe. Battery storage technology has progressed too; the fact that the sun goes down at night is no longer the obstacle to solar power many once presumed. And so vast quantities of renewable technology have been deployed, most notably in China and India. Representatives of cities and states from around the world gathered in San Francisco in September for a miniature version of the Paris summit and made their own pledges: California, the planet's fifth-largest economy, promised to be carbon-neutral by 2045. Electric cars are now being produced in significant numbers, and the Chinese have deployed a vast fleet of electric buses.

But those are bright spots against a very dark background. In retrospect, Paris in December 2015 may represent a high-water mark for the idea of an interconnected human civilization. Within nine weeks of the conference Donald Trump had won his first primary; within seven months the UK had voted for Brexit, both weakening and distracting the EU, which has been the most consistent global champion of climate action. Since then the US, the largest carbon emitter since the start of the Industrial Revolution, has withdrawn from the Paris agreement, and the president's cabinet members are busy trying to revive the coal industry and eliminate effective oversight and regulation of the oil and gas business. The prime minister of Australia, the world's biggest coal exporter, is now Scott Morrison, a man famous for bringing a chunk of anthracite into Parliament and passing it around so everyone could marvel at its greatness. Canada—though led by a progressive prime minister, Justin Trudeau, who was crucial in getting the 1.5-degree target included in the Paris agreement—has nationalized a pipeline in an effort to spur more production from its extremely polluting Alberta oil sands. Brazil seems set to elect a man who has promised not only to withdraw from the Paris agreement but to remove protections from the Amazon and open the rainforest to cattle ranchers. It is no wonder that the planet's carbon emissions, which had seemed to plateau in mid-decade, are again on the rise: preliminary figures indicate that a new record will be set in 2018.

This is the backdrop against which the IPCC report arrives, written by ninety-one scientists from forty countries. It is a long and technical document—five hundred pages, drawing on six thousand studies—and as badly written as all the other IPCC grand summaries over the years, thanks in no small part to the required vetting of each sentence of the executive summary by representatives of the participating countries. (Saudi Arabia apparently tried to block some of the most important passages at the last moment during a review meeting, particularly, according to reports, the statement emphasizing "the need for sharp reductions in the use of fossil fuels." The rest of the conclave threatened to record the objection in a footnote; "it was a game of chicken, and the Saudis blinked first," one participant said.) For most readers, the thirty-page "Summary for Policymakers" will be sufficiently dense and informative.

The takeaway messages are simple enough: to keep warming under 1.5 degrees, global carbon dioxide emissions will have to fall by 45 percent by 2030, and reach net zero by 2050. We should do our best to meet this challenge, the report warns, because allowing the temperature to rise two degrees (much less than the 3.5 we're currently on pace for) would cause far more damage than 1.5. At the lower number, for instance, we'd lose 70 to 90 percent of coral reefs. Half a degree higher and that loss rises to 99 percent. The burden of climate change falls first and heaviest on the poorest nations, who of course have done the least to cause the crisis. At two degrees, the report contends, there will be a "disproportionately rapid evacuation" of people from the tropics. As one of its authors told *The New York Times*, "in some parts of the world, national borders will become irrelevant. You can set up a wall to try to contain 10,000 and 20,000 and one million people, but not 10 million."

The report provides few truly new insights for those who have been paying attention to the issue. In fact,

because the IPCC is such a slave to consensus, and because its slow process means that the most recent science is never included in its reports, this one almost certainly understates the extent of the problem. Its estimates of sea-level rise are on the low end—researchers are increasingly convinced that melting in Greenland and the Antarctic is proceeding much faster than expected—and it downplays fears, bolstered by recent research, that the system of currents bringing warm water to the North Atlantic has begun to break down. As the chemist Mario Molina, who shared the Nobel Prize in 1995 for discovering the threat posed by chlorofluorocarbon gases to the ozone layer, put it, "the IPCC understates a key risk: that self-reinforcing feedback loops could push the climate system into chaos before we have time to tame our energy system."

All in all, though, the world continues to owe the IPCC a great debt: scientists have once again shown that they can agree on a broad and workable summary of our peril and deliver it in language that, while clunky, is clear enough that headline writers can make sense of it. (Those who try, anyway. An analysis of the fifty biggest US newspapers showed that only twenty-two of them bothered to put a story about the report on the homepages of their websites.)

The problem is that action never follows: the scientists do their job, but even the politicians not controlled by the fossil fuel industry tend to punt or to propose small-bore changes too slow and cautious to make much difference. By far the most important change between this and the last big IPCC report, in 2014, is simply that four years have passed, meaning that the curve we'd need to follow to cut our emissions sufficiently has grown considerably steeper. Instead of the relatively gentle trajectory that would have been required if we had paid attention in 1995, the first time the IPCC warned us that global warming was real and dangerous, we're at the point where even an all-out effort would probably be too slow. As the new report concedes, there is "no documented historical precedent" for change at the speed that the science requires.

There's one paramount reason we didn't heed those earlier warnings, and that's the power of the fossil fuel industry. Since the last IPCC report, a series of newspaper exposés has made it clear that the big oil companies knew all about climate change even before it became a public issue in the late 1980s, and that, instead of owning up to that knowledge, they sponsored an enormously expensive campaign to obfuscate the science. That campaign is increasingly untenable. In a world where floods, fires, and storms set new records almost weekly, the industry now concentrates on trying to slow the inevitable move to renewable energy and preserve its current business model as long as possible.

After the release of the IPCC report, for instance, Exxon pledged $1 million to work toward a carbon tax. That's risible—Exxon made $280 billion in the last decade, and it has donated huge sums to elect a Congress that won't pass a carbon tax anytime soon; oil companies are spending many millions of dollars to defeat a carbon tax on the ballot in Washington State and to beat back bans on fracking in Colorado. Even if a carbon tax somehow made it past the GOP, the amount Exxon says it wants—$40 a ton—is tiny compared to what the IPCC's analysts say would be required to make a real dent in the problem. And in return the proposed legislation would relieve the oil companies of all liability for the havoc they've caused. A bargain that might have made sense a generation ago no longer counts for much.

Given the grim science, it's a fair question whether *anything* can be done to slow the planet's rapid warming. (One *Washington Post* columnist went further, asking, "Why bother to bear children in a world wracked by climate change?") The phrase used most since the report's release was "political will," usually invoked earnestly as the missing ingredient that must somehow be conjured up. Summoning sufficient political will to blunt the power of Exxon and Shell seems unlikely. As the energy analyst David Roberts predicted recently on Twitter, "the increasing severity of climate impacts will not serve as impetus to international cooperation, but the opposite. It will empower nationalists, isolationists, & reactionaries." Anyone wondering what he's talking about need merely look at the Western reaction to the wave of Syrian refugees fleeing a civil war sparked in part by the worst drought ever measured in that region.

The stakes are so high, though, that we must still try to do what we can to change those odds. And it's not an entirely impossible task. Nature is a good organizer: the relentless floods and storms and fires

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have gotten Americans' attention, and the percentage of voters who acknowledge that global warming is a threat is higher than ever before, and the support for solutions is remarkably nonpartisan: 93 percent of Democrats want more solar farms; so do 84 percent of Republicans. The next Democratic primary season might allow a real climate champion to emerge who would back what the rising progressive star Alexandria Ocasio-Cortez called a "Green New Deal"; in turn a revitalized America could theoretically help lead the planet back to sanity. But for any of that to happen, we need a major shift in our thinking, strong enough to make the climate crisis a center of our political life rather than a peripheral question easily avoided. (There were no questions at all about climate change in the 2016 presidential debates.)

The past year has offered a few signs that such large-scale changes are coming. In October, the attorney general for New York State filed suit against ExxonMobil, claiming the company defrauded shareholders by downplaying the risks of climate change. In January New York City joined the growing fossil fuel divestment campaign, pledging to sell off the oil and gas shares in its huge pension portfolio; Mayor Bill de Blasio is working with London's mayor, Sadiq Khan, to convince their colleagues around the world to do likewise. In July Ireland became the first nation to join the campaign, helping to take the total funds involved to over $6 trillion. This kind of pressure on investors needs to continue: as the IPCC report says, if the current flows of capital into fossil fuel projects were diverted to solar and wind power, we'd be closing in on the sums required to transform the world's energy systems.

It's natural following devastating reports like this one to turn to our political leaders for a response. But in an era when politics seems at least temporarily broken, and with a crisis that has a time limit, civil society may need to pressure the business community at least as heavily to divest their oil company shares, to stop underwriting and insuring new fossil fuel projects, and to dramatically increase the money available for clean energy. We're running out of options, and we're running out of decades. Over and over we've gotten scientific wake-up calls, and over and over we've hit the snooze button. If we keep doing that, climate change will no longer be a problem, because calling something a problem implies there's still a solution.