



Bill McKibben. (photo: [rightlivelikelihood.org](http://rightlivelikelihood.org))

## Winning Slowly Is the Same as Losing

By Bill McKibben, Rolling Stone, 04 December 17

***The technology exists to combat climate change – what will it take to get our leaders to act?***

If we don't win very quickly on climate change, then we will never win. That's the core truth about global warming. It's what makes it different from every other problem our political systems have faced. I wrote the first book for a general audience about climate change in 1989 – back when one had to search for examples to help people understand what the "greenhouse effect" would feel like. We knew it was coming, but not how fast or how hard. And because no one wanted to overestimate – because scientists by their nature are conservative – each of the changes we've observed has taken us somewhat by surprise. The surreal keeps becoming the commonplace: For instance, after Hurricane Harvey set a record for American rainstorms, and Hurricane Irma set a record for sustained wind speeds, and Hurricane Maria knocked Puerto Rico back a quarter-century, something even weirder happened. Hurricane Ophelia formed much farther to the east than any hurricane on record, and proceeded to blow past Southern Europe (whipping up winds that fanned record forest fires in Portugal) before crashing into Ireland. Along the way, it produced an artifact for

our age: The warning chart that the National Oceanic and Atmospheric Agency issued shows Ophelia ending in a straight line at 60 degrees north latitude, because the computer program never imagined you'd see a hurricane up there. "When you set up a grid, you define boundaries of that grid," a slightly red-faced NOAA programmer explained. "That's a pretty unusual place to have a tropical cyclone." The agency, he added, might have to "revisit" its mapping software.

In fact, that's the problem with climate change. It won't stand still. Health care is a grave problem in the U.S. right now too, one that Donald Trump seems set on making steadily worse. If his administration manages to defund Obamacare, millions of people will suffer. But if, in three years' time, some new administration takes over with a different resolve, it won't have become exponentially harder to deal with our health care issues. That suffering in the interim wouldn't have changed the fundamental equation. But with global warming, the fundamental equation is precisely what's shifting. And the remarkable changes we've seen so far – the thawed Arctic

that makes the Earth look profoundly different from outer space; the planet's seawater turning 30 percent more acidic – are just the beginning. "We're inching ever closer to committing to the melting of the West Antarctic and Greenland ice sheets, which will guarantee 20 feet of sea-level rise," says Penn State's Michael Mann, one of the planet's foremost climatologists. "We don't know where the ice-sheet collapse tipping point is, but we are dangerously close." The latest models show that with very rapid cuts in emissions, Antarctic ice might remain largely intact for centuries; without them, we might see 11 feet of sea-level rise by century's end, enough to wipe cities like Shanghai and Mumbai "off the map."

There are plenty of tipping points like this: The Amazon, for instance, appears to be drying out and starting to burn as temperatures rise and drought deepens, and without a giant rainforest in South America, the world would function very differently. In the North Atlantic, says Mann, "we're ahead of schedule with the slowdown and potential collapse" of the giant conveyor belt that circulates warm water toward the North Pole, keeping Western Europe temperate. It's tipping points like these that make climate change such a distinct problem: If we don't act quickly, and on a global scale, then the problem will literally become insoluble. We'll simply move into a dramatically different climate regime, and on to a planet abruptly and disastrously altered from the one that underwrote the rise of human civilization. "Every bit of additional warming at this point is perilous," says Mann.

Another way of saying this: By 2075 the world will be powered by solar panels and windmills – free energy is a hard business proposition to beat. But on current trajectories, they'll light up a busted planet. The decisions we make in 2075 won't matter; indeed, the decisions we make in 2025 will matter much less than the ones we make in the next few years. The leverage is now.

**Trump, oddly, is not the central problem here,** or at least not the only problem. Yes, he's abrogated the Paris agreements; true, he's doing his best to revive the coal mines of Kentucky; of course it's insane that he thinks climate change is a Chinese hoax.

But we weren't moving fast enough to catch up with physics before Trump. In fact, it's even possible that Trump – by jumping the climate shark so spectacularly – may run some small risk of disrupting the fossil-fuel industry's careful strategy. That strategy, we now know, began in the late 1970s. The oil giants, led by Exxon, knew about climate change before almost anyone else. One of Exxon's chief scientists told senior management in 1978 that the temperature would rise at least four degrees Fahrenheit and that it would be a disaster. Management believed the findings – as the *Los Angeles Times* reported, companies like Exxon and Shell began redesigning drill rigs and pipelines to cope with the sea-level rise and tundra thaw.

Yet, year after year, the industry used the review process of the Intergovernmental Panel on Climate Change to stress "uncertainty," which became Big Oil's byword. In 1997, just as the Kyoto climate treaty was being negotiated, Exxon CEO Lee Raymond told the World Petroleum Congress meeting in Beijing, "It is highly unlikely that the temperature in the middle of the next century will be significantly affected whether policies are enacted now or 20 years from now." In other words: Delay. Go slowly. Do nothing dramatic. As the company put it in a secret 1998 memo helping establish one of the innumerable front groups that spread climate disinformation, "Victory will be achieved when average citizens 'understand' (recognize) uncertainties in climate science," and when "recognition of uncertainty becomes part of the 'conventional wisdom.' "

And it's not just the oil companies. As America's electric utilities began to understand that solar

and wind power could undercut their traditional business, they began engaging in the same kind of behavior. In Arizona, whose sole reason for existence is the sun, the local utility helped rig elections for the state's public-utility commission, which in turn allowed utilities to impose ruinous costs on homeowners who wanted to put solar panels on their roofs. As *The New York Times* reported in July, the booming U.S. market for new residential solar has come to "a shuddering stop" after "a concerted and well-funded lobbying campaign by traditional utilities, which have been working in state capitals across the country to reverse incentives for homeowners to install solar panels." It's not that they think they can keep solar panels at bay forever – every utility website, like every fossil-fuel industry annual report, has pictures of solar panels and spinning windmills. But as industry analyst Nancy LaPlaca says, "Keeping the current business model just another year is always key for utilities that have a monopoly and want to keep that going."

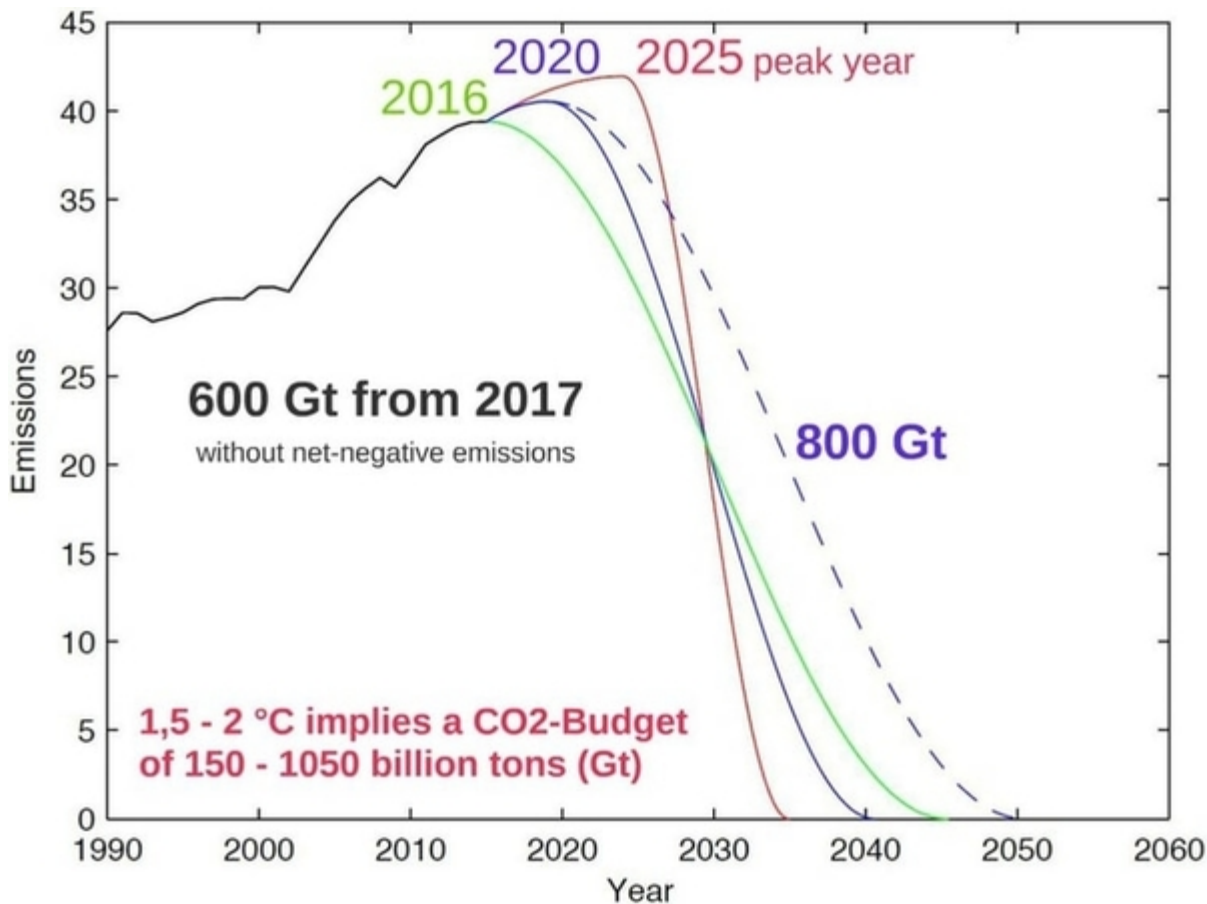
The planetary futurist Alex Steffen calls this tactic "predatory delay, the deliberate slowing of needed change to prolong a profitable but unsustainable status quo that will be paid by other people eventually." It's not confined to the moneybags at the oil companies and the utilities – he's written extensively about the otherwise-liberal urbanites in his home state of California. "A lot of cities are happy to talk about providing their power cleanly, but reducing cars, densifying, spending on bike paths, raising building standards – those things are all so contentious they're not even discussed." Ditto the folks who block windmills out of fear of chopping birds, thus helping lock in the next great mass extinction. Much of the labor movement has grown more outspoken on climate change. They know that a dollar invested in renewable energy generates three times as many jobs as one wasted on fossil fuel, but the union that builds pipelines has fought so tenaciously to

avoid change that the AFL-CIO came out for building the Dakota Access Pipeline, even after guards sicced German shepherds on native protesters. In careful language that might have been written by a team at Exxon, the union said it supported new pipelines "as part of a comprehensive energy policy that creates jobs, makes the United States more competitive and addresses the threat of climate change." "Comprehensive," "balanced," "measured" are the high cards in this rhetorical deck. "Realistic" is the ace in the hole.

There's a reason this kind of appeal is so persuasive. In almost every other political fight, a balanced and measured and "realistic" answer makes sense. I think billionaires should be taxed at 90 percent, and you think they contribute so much to society that they should pay no tax at all. We meet somewhere in the middle, and come back each election cycle to argue it again, depending on how the economy is doing or where the deficit lies. Humans and their societies do work best with gradual transitions – it gives everyone some time to adapt. But climate change, sadly, isn't a classic contest between two groups of people. It's a negotiation between people on the one hand and physics on the other. And physics doesn't do compromise. Precisely because we've waited so long to take any significant action, physics now demands we move much faster than we want to. Political realism and what you might call "reality realism" are in stark opposition. That's our dilemma. You could draw it on a graph. The planet's greenhouse-gas emissions are still rising, though more slowly – let's say we manage to top out by 2020. In that case, to meet the planet's goal of holding temperature increases under two degrees Celsius, we have to cut emissions 4.6 percent annually till they go to zero. If we wait till 2025, we have to cut them seven percent annually. If we wait till 2030 – well, it's not even worth putting on the chart. I have to sometimes restrain myself from pointing out how easy it would have

been if we'd acted back in the late 1980s, when I was first writing about this – a gradual half a

percent a year. A glide path, not a desperate rappel down a deadly cliff.



Yes, we've waited too long. But maybe, just maybe, our task is not yet an impossible one. That's because the engineers have been doing their jobs much more vigorously than the politicians. Over the past decade, the price of a solar panel has fallen 80 percent; across most of the U.S., wind is now the least expensive form of power. In early October, an auction in Saudi Arabia for new electric generation was won by a solar farm pledging to deliver electrons for less than three cents a kilowatt hour, the cheapest price ever paid for electricity from any source in any place. Danny Kennedy, a longtime solar pioneer who runs California's Clean Energy Fund, a nonprofit connecting investors and startups, says every day brings some new project: "Just this week I've had entrepreneurs in here

doing crowdfunding by Bitcoin to build microgrids in Southern Africa, and someone using lasers to cut silicon wafers to reduce the cost of solar cells by half." He'd just come back from a conference in Shanghai – "You should feel the buzz; the Chinese have really realized their self-interest lies in dominating the disruptive technologies."

That is to say, if we wanted to power the planet on sun and wind and water, we could. It would be extremely hard, at the outer edge of the possible, but it's mathematically achievable. Mark Jacobson, who heads Stanford's Atmosphere/Energy program, has worked to show precisely how it could happen in all 50 U.S. states and 139 foreign countries – how much wind, how much sun, how much hydro it would

take to produce 80 percent of our power renewably by 2030. If we did, he notes, we'd not only dramatically slow global warming, we'd also eliminate most of the air pollution that kills 7 million people a year and sickens hundreds of millions more, almost all of them in the poorest places on the planet (pollution now outweighs tuberculosis, malaria, AIDS, hunger and war as a killer). "There's no way you can be in Houston or Flint or Puerto Rico right now and not feel the urgency," says Elizabeth Yeampierre, one of America's leading climate-justice advocates. "Moving quickly can happen, but only if you uplift the work that's really innovative, that's already happening on the ground."

Even much of the money is in place. For \$50,000 in insulation, panels and appliances, Mosaic, the biggest solar lender in the country, can make a home run on 100 percent clean energy. "And we can make a zero-down loan, where people save money from Day One," says the company's CEO, Billy Parrish. Mosaic raised \$300 million for its last round of bond financing, but it was nearly six times oversubscribed – that is, investors were ready to pony up about \$1.8 billion. But even that amounts to small change: 36,000 homes in a nation of more than a hundred million dwellings. To go to scale, government is going to have to lead: loan guarantees for poor people, taking subsidies away from fossil fuels, making sure that when homeowners feed lowcarbon energy into the grid they get a good price from utilities. Even in California that kind of change comes hard: As Kennedy says, "The state legislature did not pass key legislation on clean energy this year despite a lot of hot air expended on it, and despite the fact that the Dems have a supermajority. I'm told to be patient and 'we'll get it done next year,' but I find it frightening that folks think we have another year to wait."

**And so the only real question is**, how do we suddenly make it happen fast? That's where politics comes in. I said earlier that Trump wasn't the whole problem – in fact, it's just possible that

in his know-nothing recklessness, he has upset the ever-so-patient apple cart. You could almost see the oil companies wincing when Trump pulled out of the Paris Agreement – for them, the agreement was a pathway to slow and managed change. The promises it contained didn't keep the planet from overheating – indeed, even if everyone had kept them, the Earth would still have gotten 3.5 degrees Celsius hotter, enough to collapse every ecosystem you'd like to name. The accords did ensure that we'd still be burning significant amounts of hydrocarbons by 2050, and that the Exxons of the world would be able to recover most of the reserves they've so carefully mapped and explored.

But now some of those bets are off. Around the rest of the world, most nations rejected Trump's pullout with diplomatically expressed rage. "To everyone for whom the future of our planet is important, I say let's continue going down this path," said Angela Merkel, the German chancellor. (The exception: petro baron Vladimir Putin, whose official remarks concluded, "Don't worry, be happy.") In this country, the polling showed that almost nothing Trump had done was less popular. Perhaps, if Trump continues to sink, this particular piece of nonsense will sink with him.

And with Washington effectively gridlocked, the fight has moved elsewhere. When Trump pulled out of the climate accords, for instance, he explained that he'd been elected to govern "Pittsburgh, not Paris." The next day the mayor of Pittsburgh said his town was now planning on 100 percent renewable energy, a pledge that's been made by places as diverse as Atlanta, San Diego and Salt Lake City. Next year, representatives of thousands of regions, provinces, cities, parishes, *arrondissements*, districts and counties will descend on San Francisco for a Paris-like gathering of subnational actors, summoned by California Gov. Jerry Brown. According to Brown (who is as sadly compromised as most other leaders – he

continues to allow wide-scale fracking and oil production across the state), Trump's decision to leave the path of gradualism "is a stimulus ... In a way, it's a rising of ... awareness."

The pressure has also increased on banks and corporations. In Australia, campaigners have forced the four major banks to refuse financing for what would have been one of the world's biggest coal mines; BNP Paribas, the world's eighth-largest lender, just announced it was out of the tar-sands and coal business. Several big California cities just announced they were suing the big oil companies for the damages caused by sea-level rise. The attorneys general of New York and Massachusetts have Exxon under investigation for pretending to take climate change seriously. All of that adds up to weaken the spreadsheet and the corporate resolve: "We're trying to persuade a dying industry to get out of the way," says Mark Campanale, the head of the NGO Carbon Tracker.

The best chance of forcing the future, of course, lies with movements – with people gathering in large enough numbers to concentrate the minds of CEOs and presidential candidates. Here, too, Trump seems to be upping the ante – nearly a quarter million Americans marched on D.C. for climate action in April, the largest such demonstration in Washington's history. That activism keeps ramping up: At 350.org, we're rolling out a vast Fossil Free campaign across the globe this winter, joining organizations like the Sierra Club to pressure governments to sign up for 100 percent renewable energy, blocking new pipelines and frack wells as fast as the industry can propose them, and calling out the banks and hedge funds that underwrite the past. It's working – just in the last few weeks Norway's sovereign wealth fund, the largest in the world, announced plans to divest from fossil fuels, and the Nebraska Public Service Commission threw yet more roadblocks in front of the Keystone pipeline.

But the question is, is it working fast enough? Paraphrasing the great abolitionist leader Theodore Parker, Martin Luther King Jr. used to regularly end his speeches with the phrase "the arc of the moral universe is long but it bends toward justice." The line was a favorite of Obama's too, and for all three men it meant the same thing: "This may take a while, but we're going to win." For most political fights, it is the simultaneously frustrating and inspiring truth. But not for climate change. The arc of the physical universe appears to be short, and it bends toward heat. Win soon or suffer the consequences.