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Technology Can Fight Global Warming

Marine cloud whitening, and other ideas.

By BJØRN LOMBORG

We have precious little to show for nearly 20 years of efforts to prevent global warming. Promises in Rio de Janeiro in 1992 to cut carbon emissions went unfulfilled. Stronger pledges in Kyoto five years later failed to keep emissions in check. The only possible lesson is that agreements to reduce carbon emissions are costly, politically arduous and ultimately ineffective.

But this is a lesson many are hell-bent on ignoring, as politicians plan to gather again—this time in Copenhagen, Denmark, in December—to negotiate a new carbon-emissions treaty. Even if they manage to bridge their differences and sign a deal, there is a strong likelihood that tomorrow's politicians will fail to deliver.

Global warming does not just require action; it requires effective action. Otherwise we are just squandering time.

To inform the debate, the Copenhagen Consensus Center has commissioned research looking at the costs and benefits of all the policy options. For example, internationally renowned climate economist Richard Tol of Ireland's Economic and Social Research Institute finds that a low carbon tax of $2 a metric ton (1.2 tons U.S.) is the only carbon reduction policy that would make economic sense. But his research demonstrates the futility of trying to use carbon cuts to keep temperature increases under 2 degrees Celsius (3.6 degrees Fahrenheit), which many argue would avoid the worst of climate change's impacts.

Some economic models find that target impossible to reach without drastic action, like cutting the world population by a third. Other models show that achieving the target by a high CO_2 tax would reduce world GDP a staggering 12.9% in 2100—the equivalent of $40 trillion a year.

Some may claim that global warming will be so terrible that a 12.9% reduction in GDP is a small price to pay. But consider that the majority of economic models show that unconstrained global warming would cost rich nations around 2% of GDP and poor countries around 5% by 2100.

Even those figures are an overstatement. A group of climate economists at the University of Venice led by Carlo Carraro looked closely at how people will adapt to climate change. Their research for the Copenhagen Consensus Center showed that farmers in areas with less water for agriculture could use more drip irrigation, for example, while those with more water will grow more crops.

Taking a variety of natural, so-called market adaptations into account, the Carraro research shows we will acclimatize to the negative impacts of global warming and exploit the positive changes, actually creating 0.1% increase in GDP in 2100 among the member countries of the Organization for Economic Cooperation and Development. In poor countries, market adaptation will reduce climate change-related losses to 2.9% of GDP. This remains a significant, negative effect. The real challenge of global warming lies in tackling its impact on the Third World. Yet adaptation has other positive

benefits. If we prepare societies for more ferocious hurricanes in the future, we also help them to cope better with today's extreme weather.

This does not mean, however, that we should ignore rising greenhouse-gas emissions. Research for the Copenhagen Consensus Center by Claudia Kemfert of German Institute for Economic Research in Berlin shows that in terms of reducing climate damage, reducing methane emissions is cheaper than reducing CO_2 emissions, and—because methane is a much shorter-living gas—its mitigation could do a lot to prevent some of the worst of short-term warming. Other research papers highlight the advantages of planting more trees and protecting the forests we have to absorb CO_2 and cut greenhouse gases.

Other more speculative approaches deserve consideration. In groundbreaking research, J. Eric Bickel, an economist and engineer at the University of Texas, and Lee Lane, a researcher at the American Enterprise Institute, study the costs and benefits of climate engineering. One proposal would have boats spray seawater droplets into clouds above the sea to make them reflect more sunlight back into space—augmenting the natural process where evaporating ocean sea salt helps to provide tiny particles for clouds to form around.

Remarkably, Mr. Bickel finds that about $9 billion spent developing this so-called marine cloud whitening technology might be able to cancel out this century's global warming. The benefits—from preventing the temperature increase—would add up to about $20 trillion.

Climate engineering raises ethical concerns. But if we care most about avoiding warmer temperatures, we cannot avoid considering a simple, cost-effective approach that shows so much promise.

Nothing short of a technological revolution is required to end our reliance on fossil fuel—and we are not even close to getting this revolution started. Economists Chris Green and Isabel Galiana from McGill University point out that nonfossil sources like nuclear, wind, solar and geothermal energy will—based on today's availability—get us less than halfway toward a path of stable carbon emissions by 2050, and only a tiny fraction of the way towards stabilization by 2100.

A high carbon tax will simply hurt growth if alternative technology is not ready, making us all worse off. Mr. Green proposes that policy makers abandon carbon-reduction negotiations and make agreements to seriously invest in research and development. Mr. Green's research suggests that investing about $100 billion annually in noncarbon based energy research could result in essentially stopping global warming within a century or so.

A technology-led effort would have a much greater chance of actually tackling climate change. It would also have a much greater chance of political success, since countries that fear signing on to costly emission targets are more likely to embrace the cheaper, smarter path of innovation.

Cutting emissions of greenhouse gases is not the only answer to global warming. Next week, a group of Nobel Laureate economists will gather at Georgetown University to consider all of the new research and identify the solutions that are most effective. Hopefully, their results will influence debate and help shift decision makers away from a narrow focus on one, deeply flawed response to global warming.

Our generation will not be judged on the brilliance of our rhetoric about global warming, or on the depth of our concern. We will be judged on whether or not we stop the suffering that global warming will cause. Politicians need to stop promising the moon, and start looking at the most effective ways to help planet Earth.

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