



This is the print version of the [Skeptical Science](http://sks.to/costs) article '[Climate change solutions are too expensive](http://sks.to/costs)', which can be found at <http://sks.to/costs>.

What's more costly, climate action or inaction?

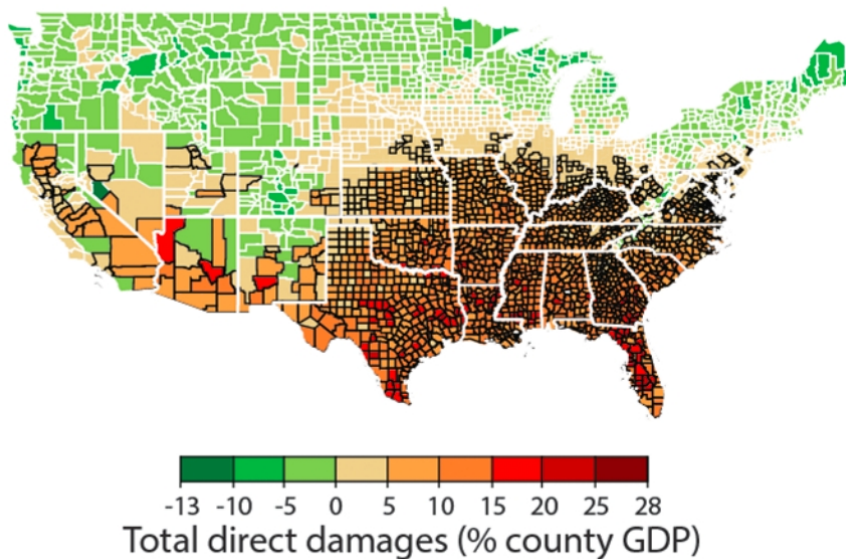
What The Science Says:

Many climate solutions are cheaper than the alternatives before even accounting for the trillions of dollars saved by reducing climate and air pollution.

Climate Myth: Climate change solutions are too expensive

"If we don't do anything, the damages caused by climate change will cost less than 2 per cent of GDP in about 2070. Yet the cost of doing something will likely be higher than 6 per cent of GDP" ([Bjorn Lomborg](#))

Those opposing actions to confront climate change point to the costs of implementing solutions even as a large body of economics research documents the far greater costs of climate change damages.



Total direct climate damages to each U.S. county (expressed in percent of gross domestic product) for a worst-case high fossil fuel consumption scenario (RCP8.5) compared to a no climate change scenario. Reprinted with permission of [Hsiang et al. \(2017\)](#).

Focusing specifically on the U.S., a [2017 study](#) in *Science* estimated that for each increase of 1 degree Celsius (1.8 degrees Fahrenheit) in global warming, the country's gross domestic product (GDP) will decline by 1.2%. To put that in dollar figures, if the world's countries were to take sufficient steps to meet the Paris climate target (limiting warming to less than 2°C (3.6°F) above pre-industrial temperatures), the U.S. would avoid about \$1 trillion in climate damages by 2050, and \$8 trillion by 2100 as compared to a continuing "business-as-usual" approach that would lead to about 3°C (5.4°F) warming by 2100. Moreover, as the figure above from the paper illustrates, most of those damages would center on the southern states, which would be battered by stronger hurricanes and sweltering summer heat.

But this is a conservative estimate and may represent only the tip of the iceberg. There is a debate in the climate economics community on whether climate change will just reduce GDP, or whether it will slow GDP growth. To illustrate the importance of this question, consider a [2018 working paper](#) by economists at

the Federal Reserve of Richmond, which estimated that a 1°F increase in summer temperatures would reduce state-level economic growth by about 0.2%. That may sound small, but the cumulative cost would be immense due to compounding over time. If the Federal Reserve paper is accurate, business-as-usual would cost the U.S. over \$2 trillion more than meeting the Paris targets by 2050, and a staggering \$50 trillion more by 2100.

Climate policy solutions save money

Phasing out fossil fuels would also reduce air pollution and its adverse health effects. In June 2020, the House Select Committee on the Climate Crisis published its "[Climate Crisis Action Plan](#)," including a [modeling assessment](#) of its efficacy by independent consulting group Energy Innovation Policy & Technology. That evaluation estimated that implementing the plan would put the U.S. on track to reach net-zero carbon emissions by 2050 (consistent with the Paris targets), and in the process would avoid approximately 870,000 premature deaths from fossil fuel air pollution over the next 30 years, saving an estimated \$4.5 trillion.

But what about the cost of deploying these climate solutions? In a [2020 review](#), the respected climate and energy research group Project Drawdown estimated that deploying the technologies and changes necessary to meet the Paris climate targets would cost about \$25 trillion, globally. However, most of those individual solutions save money as compared to the alternatives as a result of factors like lower operational and maintenance costs. For example, wind turbines and solar panels have zero fuel costs and thus, as the Drawdown team concluded, achieve substantial lifetime operation and maintenance savings compared to fossil fuel alternatives that require constant mining and drilling.

The financial advisory and asset management firm Lazard recently published its annual [levelized cost of energy analysis](#), providing an apples-to-apples comparison of lifetime energy costs from various sources, excluding government subsidies. Lazard concluded that solar and wind farms are currently the cheapest sources of new electricity, and in fact on average are cheaper than continuing to run existing coal power plants. Solar and wind farms save about 37% over their operational lifetimes as compared to new gas plants, and 66% compared to new coal plants.

Based on these sorts of cost efficiencies, the Drawdown team estimated that implementing the solutions to meet the Paris targets would save around \$140 trillion globally over their operational lifetimes. In short, investments in climate solutions pay for themselves many times over, even before accounting for the trillions of dollars in resulting climate and health benefits.

The overwhelming case for climate action

Adding up all the economic benefits of curbing climate damages, reducing air and water pollution, and limiting climate risks, achieving the Paris targets would save the U.S. alone \$5-10 trillion by 2050, and over \$20 trillion by 2100; potentially well over \$50 trillion if climate change slows economic growth, as many experts project will be the case. The cleaner air from phasing out fossil fuels would also avoid nearly a million associated premature American deaths by 2050.

Aggressively deploying climate solutions requires large immediate investments for the sake of benefits that will mostly accrue only several decades in the future. Most of the avoided climate damages will be realized in the second half of the century. The health benefits of cleaner air and water will happen sooner, as fossil fuel infrastructure is phased out over the next few decades. The operational savings of many individual climate solutions will likewise accrue over a few decades: Home energy efficiency upgrades, for example, pay for themselves [in about 10 to 30 years](#)

Like any smart long-term investment, climate solutions will require patience and forward thinking, and in this case also involve overcoming intransigence from fossil fuel interests and sympathetic policymakers. But if successfully deployed, those investments will pay for themselves many times over and create a far more prosperous world.

This rebuttal was updated by Marty West in September 2021 to replace broken links. The updates are a result of [our call for help](#) published in May 2021.



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