

Game plan: what conservatives should do about global warming, by Jim Manzi

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It is no longer possible, scientifically or politically, to deny that human activities have very likely increased global temperatures; what remains in dispute is the precise magnitude of the human impact. Conservatives should accept this reality--and move on to the question of what we should do about it. This would put us in a much better position to prevent a massive, counterproductive intervention in the U.S. economy.

Let's start with the facts. Why should we believe that rising concentrations of CO₂ and other greenhouse gases are driving increases in global temperatures? Not because of liberal scaremongering, or the media's fixation on every unusual weather event that comes along, but simply because of the underlying physics.

CO₂ is a greenhouse gas, which is to say, it absorbs and redirects infrared radiation but not shorter-wavelength radiation. The sun constantly bombards our planet with a significant amount of high-energy radiation with short wavelengths. Some portion of this is temporarily absorbed by the land and oceans, where it does work moving electrons. This work consumes energy, so a significant portion of this radiation that is subsequently re-emitted by the Earth is lower-energy, longer-wavelength infrared radiation. As this reemitted radiation travels through the atmosphere on its way back to space, some of it is absorbed by CO₂ molecules and then redirected back toward the Earth. If you are skeptical of this, you are skeptical of the last 120 years of particle physics. All else equal, the more CO₂ molecules we have in the atmosphere, the hotter it gets.

The key question is how much hotter. In a simplified model of the planet in which I posit no complexities created by things like water vapor, convection, clouds, trees, polar ice caps, and so on, it is pretty straightforward to estimate. But here's the problem: The Earth is nothing like that planet. Any change, including pumping out more CO₂, kicks off an incredibly complicated set of feedback effects. Some of these will tend to magnify the greenhouse-warming impact, and others will tend to reduce it. Famously, as the atmosphere heats up, polar ice caps tend to melt; this in turn causes further heating. On the other hand, more CO₂ should lead to faster plant growth; this pulls CO₂ out of the atmosphere and therefore reduces warming. The list of such potential effects is very long, and many of these feedback effects interact with one another. This is what makes forecasting the climate an excruciatingly difficult scientific problem. It is also why we should be very wary of any silver-bullet alternative theories (such as the one involving variations in solar radiation) that claim to account for the recent run-up in global temperatures.

The most important scientific debate is really about these feedback effects. Feedbacks are not merely details to be cleaned up in a picture that is fairly clear. The base impact of a doubling of CO₂ in the atmosphere with no feedback effects is on the order of 1 degrees C, while the United Nations Intergovernmental Panel on Climate Change (IPCC) consensus estimate of the impact of doubling CO₂ is about 3 degrees C. The feedback effects

dominate the prediction. As we've seen, however, feedback effects run in both directions. Feedback could easily dampen the net impact so it ends up being less than 1degreesC. In fact, the raw relationship between temperature increases and CO2 over the past century supports that idea.

Over the past several decades, teams in multiple countries have launched ongoing projects to develop large computer models that simulate the behavior of the global climate in order to account for feedback effects. While these models are complex, they are still extremely simplistic as compared with the actual phenomenon of global climate. Models have successfully replicated historical climates, but no model has ever demonstrated that it can accurately predict the climate impact of CO2 emissions over a period of many years or decades.

Climate models generate useful projections for us to consider, but the reality is that nobody knows with meaningful precision how much warming we will experience under any emissions scenario. Global warming is a real risk, but its impact over the next century could plausibly range from negligible to severe.

HOW BIG A DEAL?

Global warming, of course, has been a partisan issue rather than a purely scientific discussion for a long time, and conservatives have painted themselves into a corner. Based on the reasonable expectation that admitting a problem would lead to a huge government power grab, those conservatives with access to the biggest megaphones have used scientific uncertainty to avoid the issue. That game is just about up, and they suddenly find themselves walking unprepared into the middle of a sophisticated scientific and economic conversation about how to deal with the problem. While some conservative think tanks have considered these issues seriously for some time, the public discussion has been conducted up until now largely among various liberal factions and has turned into a technical debate about the most efficient tax scheme for reducing carbon emissions.

Prior engagement on the topic would have enabled conservatives to have made more persuasively the case that a policy of rapid, aggressive emissions abatement would be a terrible idea. Even if we assume that current climate models are perfectly accurate, and we further ignore the gigantic practical problem that China and India--the dominant emitters of the 21st century--will almost certainly not go along, the core issue remains that the benefits are not remotely worth the costs.

The current IPCC consensus forecast is that, under fairly reasonable assumptions for world population and economic growth, global temperatures will rise by 2.8degreesC by the year 2100. According to a decades-long modeling project by the Yale School of Forestry & Environmental Studies and Department of Economics, this amount of warming should result in zero to very mild net average global economic costs through 2100. Importantly, these models predict large negative impacts in poorer areas closer to

the equator. Russia, Canada, and much of Europe are projected to benefit. The U.S. and China are projected to experience roughly break-even net impacts.

Only if temperatures continued to grow well beyond this level would truly costly net-negative U.S. and global impacts begin to be felt in the 22nd and 23rd centuries. According to the most recent IPCC Summary for Policymakers, a 4degreesC increase in temperatures would cause total economic losses of 1 to 5 percent of global GDP. That's a lot of money, but it's hardly Armageddon.

COMPETING SCENARIOS

The most frequently discussed methods for forcing the reduction of carbon emissions, and thereby reducing projected global warming, involve a direct or indirect tax on carbon. The theory is that we will sacrifice wealth today by forcing the economy to make less efficient use of resources, but in return enjoy future benefits because we avoid some of the costs that would have been created by ongoing global warming. The problem for the advocates of rapid reduction of carbon emissions is that the projected benefit is not the avoidance of global destruction, but rather the avoidance of costs of about 3 percent of global GDP--and even this benefit will be enjoyed only hundreds of years in the future, by a much wealthier world. These benefits, even if we accepted them as certain, would justify only very mild abatement of carbon emissions today, which can much more productively be accomplished by technological improvements than by a new worldwide tax regime.

Precisely because this broad case for immediate, aggressive abatement of carbon emissions doesn't withstand scrutiny, advocates have now begun to focus on the possibility of more specific climate catastrophes, such as the shutdown of the Gulf Stream or the loss of the Greenland Ice Sheet. If we were to accept that any one of these events was imminent, it would be rational to make huge sacrifices right now in a last-ditch effort to avoid it or soften its impact.

Fortunately, no mainstream science makes any such prediction of impending disaster; worry about them amounts to no more than informed speculation. The current IPCC report is explicit about this when it says: "Abrupt climate changes, such as the collapse of the West Antarctic Ice Sheet, rapid loss of the Greenland Ice Sheet, or large-scale changes in ocean circulation systems, are not considered likely to occur in the 21st century, based on currently available model results." That said, the same humility that leads us to a sensible skepticism about the ability of climate models to predict the temperature centuries into the future must also logically lead us to accept that some of these more extreme negative scenarios are not impossible. It is not a "scientific fact" that any of these things will occur; it is not even a quantifiable probability; but there is some currently unquantifiable but (crudely speaking) very low chance that one of these will happen.

Advocates have developed rationales for rapid carbon abatement that are really more or less sophisticated restatements of the idea that these downside risks are so bad that we

should pay almost any price to avoid almost any chance of their occurrence. This concept has been called, somewhat grandiosely, the Precautionary Principle. Once you get past all of the table-pounding, this is the crux of the argument for emissions abatement. It is an emotionally appealing political position, as it is easy to argue that we should avoid some consumption now to head off even a low-odds possibility of a disaster.

But this is to get lost in the world of single-issue advocates and become myopic about risk. We face lots of other unquantifiable threats of at least comparable realism and severity. A regional nuclear war in Central Asia, a global pandemic triggered by a modified version of the HIV virus, or a rogue state weaponizing genetic-engineering technology all come immediately to mind. Any of these could kill hundreds of millions of people. Scare stories are meant to be frightening, but we shouldn't become paralyzed by them.

THE SMART WAY

In the face of massive uncertainty on multiple fronts, the best strategy is almost always to hedge your bets and keep your options open. Wealth and technology are raw materials for options. The loss of economic and technological development that would be required to eliminate literally all theorized climate-change risk would cripple our ability to deal with virtually every other foreseeable and unforeseeable risk, not to mention our ability to lead productive and interesting lives in the meantime. The Precautionary Principle is a bottomless well of anxieties, but our resources are finite. It's possible to buy so much flood insurance that you can't afford fire insurance.

In fact, a much more sensible strategy to deal with climate risk would emphasize technology rather than taxes. A science-based approach would hedge by providing support for prediction, mitigation, and adaptation technologies.

Prediction. We should start with the development of better climate-prediction tools. The climate-modeling community has made real progress, but needs to mature rapidly if we are to use climate models as the basis for trillion-dollar decisions. Today, climate modeling shows all the classic symptoms of poor supervision of smart analysts, including: excessive analytical complexity driven by researcher interest rather than focus on task-at-hand; lack of rigorous validation studies; software-engineering quality standards more appropriate for exploratory research than for reliable predictions; lack of transparent data standards; and an over-weighting of investment in analysis, as opposed to data collection and validation. The federal government should redirect funding in this area to develop a better software-modeling process, in combination with networks of physical sensors that can provide early-warning systems for the most plausible of the potential catastrophic climate scenarios.

Mitigation. Our economy is on a long-term trajectory of decarbonization as it becomes less energy-intensive and as the relative prices of alternative energy sources continue to drop compared with the price of fossil fuels. Accelerating this process is valuable for many reasons other than those involving climate change. Development of tactical

technologies, such as carbon sequestration and cleaner-burning engines, would enable us to invent lower emissions production facilities, automobiles, and so forth in the U.S., and export this technology to countries like China and India, where it would make the biggest difference (as these countries build up basic infrastructure). Using U.S. or European technology to increase the energy-conversion efficiency of coal-fired Chinese power plants as they come on line over the next few decades is a decidedly non-sexy measure; but it's probably the single most important action we can take to reduce carbon emissions over the next century.

Adaptation. Adaptation should take center stage, as it is by far the most cost-effective means of addressing climate risk. We can reduce the climate impact of carbon that is emitted, often using such simple techniques as planting more trees or using more reflective paint. Prosaic efforts--such as developing strains of crops that grow better in slightly warmer temperatures, better buttresses for buildings, and more intelligent zoning codes for coastal areas--can dramatically reduce losses from temperature swings, hurricanes, and floods today, and also reduce vulnerability to any potential future problems caused by climate change.

The government can catalyze improvements in the relevant technologies, but it's absolutely essential that we avoid turning this into yet another huge corporate-welfare program: The last thing we need is a repeat of shale-oil subsidies to Exxon or the multi-billion-dollar fiasco of funding the development of a totally uneconomic wind turbine by Boeing. The agency for funding any government-sponsored research should be explicitly modeled on the Defense Advanced Research Projects Agency (DARPA)--an agency with highly intelligent staff, who have wide flexibility in providing small grants for demonstrated progress in closing crucial technological gaps. We also need to place a strong emphasis on large prizes for accomplishing measurable and audacious goals. The British entrepreneur Richard Branson has offered a \$25 million prize to anyone who demonstrates a device that removes carbon from the atmosphere; what if the U.S. government upped the ante to \$1 billion and pledged to make any resulting technology freely available to the world? That would hold the potential for solving any global-warming problem that might develop--for a one-time cost of less than 0.01 percent of U.S. GDP.

The incremental cost of this approach could be single-digit billions per year, possibly with partially offsetting spin-off benefits. DARPA's total annual budget is about \$3 billion, and--unlike Al Gore--it really did invent the Internet (original name: ARPANET). In fact, it's important that the honeypot be kept small enough, and be doled out in small enough increments, that it's not worthwhile for either Congress or Fortune 100 companies to try to direct the spending politically.

HOT POLITICS OF GLOBAL WARMING

Global warming is a manageable risk, not an existential crisis, and we should get on with the job of managing it. Conservatives should propose policies that are appropriately optimistic, science-based, and low-cost. This should be an attractive political program: It

is an often-caricatured, but very healthy, reality that Americans usually respond well to the conversion of political issues into technical problems. After all, we're very good at solving the latter.

It sometimes feels as if there is unstoppable momentum behind a quasi-messianic program of aggressive emissions reductions. In this kind of debate, however, appearances can be deceiving. As usual, Tocqueville put it best. He described in eerily accurate, if not completely flattering, terms how the American people react to radical plans put forth by a revolutionary leader: "They do not combat him energetically, they sometimes even applaud him. To his impetuosity they secretly oppose their inertia; to his revolutionary instincts, their conservative instincts; their homebody tastes to his adventurous passions; their good sense to the leaps of his genius; to his poetry, their prose. He arouses them for a moment with a thousand efforts, but soon after they get away from him, and, as if dragged down by their own weight, they fall back."

No matter how often activists feel as if they'd won all the debates in think-tank meetings, editorial pages, and faculty lounges, it is still going to be a tough battle to convince 51 percent of voters to make huge sacrifices based on the evidence that we have now. After all, Wharton Econometric Forecasting Associates has estimated that implementing even the limited emissions abatement envisioned for the U.S. under the proposed Kyoto Protocol would cost the average U.S. family about \$225 per month. Ongoing polling conducted by researchers at MIT indicates that the median U.S. family would be willing to pay \$21 per month to "solve global warming." That's quite a bid-ask spread.

The electorate, like all markets, is pretty unsentimental in pursuing its own interests. This drives the activists crazy, and if conservatives keep their cool, will ultimately lead the activists to commit serious blunders that alienate public opinion. They are already starting to attack the consensus science of the IPCC as too timid because it does not support predictions of imminent global catastrophe.

We also shouldn't forget that, in national politics, global warming remains a tactical issue. American presidential elections almost always turn on the questions of war and the economy. Unless Al Gore wins the Democratic nomination, in which case an all-out effort to demonstrate the folly of his proposals will presumably be a centerpiece of the campaign, 2008 is unlikely to be an exception. A CBS poll in March asked adults the open-ended question of "What do you think is the most important problem facing this country today?" Not surprisingly, Iraq was named first and the economy second. Global warming did not even break 3 percent.

A key political question is therefore which side could more effectively use its position on carbon taxes to peel off 1 percent of relevant votes from the opposing coalition. In a presidential election the key attributes of these targeted voters are that they are persuadable--that they could conceivably change their votes--and that they are in battleground states. It seems pretty easy to find the names and addresses for lots of people who are potentially persuadable because they have a huge perceived loss and no more than an average benefit from a carbon tax. You could start with every member of the

Teamsters and the UAW. Together they represent almost 2 million people, not counting dependents. Now try to find people on the other end. I guess you could look for owners of homes within a mile of the beach, and even that's not an obvious winner.

The contemporary battleground for U.S. presidential elections is consistently the Midwest. The states with at least ten electoral votes and a 2004 presidential-election margin of less than 5 points are Pennsylvania, Ohio, Michigan, and Wisconsin. Imagine what a competent phone-bank and direct-mail effort could do in these states by contacting employees in carbon-sensitive industries (such as auto manufacturing and truck transport) with some version of this message: "My opponent wants you to pay thousands of dollars per year, and maybe lose your job, to help avoid a problem that might occur in sub-Saharan Africa a hundred years from now. I oppose this policy. I think we should invest in American technology and ingenuity to protect ourselves from any climate risk that might threaten us."

Tellingly, the most obvious examples of persuadable voters are old-line industrial-union members alienated by an elite policy that imposes huge penalties on them. They used to be called Reagan Democrats.

This is why the spectacle of Al Gore and assorted members of the Hollywood and political smart set soulfully asking all of us how we're ready to change our lives--while themselves living in 20,000-square-foot houses and traveling on private jets--is so politically resonant. Just as with the original limousine liberals, it's not the hypocrisy per se that rankles the persuadable voters, as much as the observation that those who advocate this policy don't really have to feel its effects. Gore doesn't seem to get that the response that he buys carbon offsets only adds fuel to the fire. It emphasizes that \$225 per month, or \$2,250 per month, of extra expense to Al Gore means that some digits in the monthly statements sent to him by his private banker are slightly different. For a typical Teamsters or UAW member, \$225 per month is the cost of a new car.

Global warming can feel like a loser political issue to conservatives--one in which the only objective is to minimize both political and economic damage. But by getting past denial and taking a science-based approach to the issue, a clever candidate could take a principled stand that pays major tactical dividends. Global warming can be the first wedge issue of the 21st century.

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