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October 2, 2009, 8:30 AM

The Economics of Climate Stabilization

By JOHN LORINC

A group of eight leading climate economists has a message for United States senators now considering a bill to cap emissions: don't think of long-term mitigation costs as a massive expenditure, but rather a form of reasonably-priced "planetary climate insurance."

According to a just-released analysis (PDF) by the Economics for Equity and the Environment Network, a group of economists advocating "active protection of human health and the natural environment," the projected economic effect of an ambitious and long-term emission reduction effort amounts to a 1 percent to 3 percent hit on gross domestic product:



The idea of getting atmospheric carbon down to 350 parts per million is gaining adherents — and a group of economists now says it can be done without severely hurting the economy.

Some economists have become known for advocating only slow and modest responses to climate change, lest the costs of mitigation become too large. This report demonstrates that such conclusions are incorrect. A number of economic analyses, informed by recent scientific findings and using reasonable assumptions, suggest that more ambitious targets and quicker action make good economic sense.

"The net cost to U.S. households and the economy looks to be pretty small," said Frank Ackerman, a professor at Tufts University and a senior economist with the Stockholm Environmental Institute, in a recent interview with Green Inc.

He suggested that the 1 percent to 3 percent estimate was akin to one year of foregone economic growth in the United States.

The premise of the assessment is that in order to prevent catastrophic warming, atmospheric carbon concentrations, now nudging toward 400 parts per million, need to be stabilized at the 350 p.p.m. level over the next two hundred years.

In the past year or so, the climate expert James Hansen, director of NASA's Goddard Institute for Space Studies in New York, has called for governments and their climate negotiators to aim for a 350 p.p.m. target, rather than the 450 p.p.m. level identified in earlier accords and expert assessments.

Other climate experts, including the British economist Nicholas Stern and the American environmentalist Bill McKibbin, have taken up Dr. Hansen's

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How will the pressures of climate change, limited fossil fuel resources and the mainstreaming of "green" consciousness reshape society? Follow the money. From renewable energy policy to carbon markets to dubious eco-advertising, our energy and environment reporters track the high-stakes pursuit of a greener globe.

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Green Inc. Staff

Tom Zeller Jr. EDITOR

After a year as an editor at large for National Geographic magazine, Tom returned to The New York Times in July 2008 to help expand the paper's coverage of sustainable energy development and green business. He has spent much of the last decade as a reporter and editor covering a



AMERICAN ENVIRONMENTALIST [DILL MCKIBBEN](#), have taken up DR. HANSEN'S message.

Dr. Hansen has said the 350 parts per million target is only attainable by eliminating the use of coal — or developing 100 percent carbon capture technology — as well as reversing deforestation on a broad scale and allowing gas prices to rise sharply as global oil supplies dwindle.

The study, which was financed by [Ecotrust](#), an environmental investment firm based in Portland, Ore., says the 350 p.p.m. goal could be reached by 2200 by taking three large steps: extensive reforestation, as Dr. Hansen recommends; the use of [biochar](#) as a fertilizer for carbon sequestration; and the development of carbon capture and storage techniques for biomass energy.

The authors also argue that near-term investments in renewable energy systems will yield unforeseen economic dividends, as happened with cold war military technologies that led to the development of the Internet.

That said, Prof. Ackerman is not casting his lot with backers of [geoengineering](#), or the use of technology to deliberately alter the earth's climate.

"To me, the question is, how sure are you that it works?"

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16 Comments

- October 2, 2009 9:26 am
Oh, so it looks like Bush had the right plan after all. Nevermind!

[Link](#)

— *Ochsucker*

- October 2, 2009 9:30 am
I work for Nick Stern at the Grantham Research Institute on Climate Change and the Environment, and I would like to point out that he has not endorsed a stabilisation target of 350 ppm carbon-dioxide-equivalent.

[Link](#)

The Stern Review in 2006 concluded that a target for stabilisation should be somewhere between 450 and 550 ppm. New evidence has led Nick recently to suggest that we should aim for stabilisation below 450

variety of topics for The Times — from technology and cyberfraud to culture and politics.

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Kate Galbraith

REPORTER

Ms. Galbraith joined The New York Times in June 2008 to write about renewable energy. She spent the previous year as a Nieman Fellow at Harvard University, and before that she was the Southwest correspondent for The Economist based in Austin, Tex. She is an avid runner and hiker, having grown up camping most summers in the Sierra Nevada.



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James Kanter

REPORTER

Mr. Kanter has been a staff correspondent for The International Herald Tribune in Paris and Brussels since 2005, covering European business affairs and the business of green. His previous experience includes four years in Southeast Asia, where he was the editor in chief of The Cambodia Daily in Phnom Penh. Mr. Kanter was the recipient of the Reporting Europe 2009 prize for his investigative feature on the European Emissions Trading System.



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ppm in the long-term. However, he also points out that levels are already at about 435 ppm and rising by 2.5 ppm per year, so we are likely to exceed 450 ppm within the next 10 years. Our immediate priority therefore is to prevent concentrations from reaching 500 ppm and then to reduce them to under 450 ppm.

I should also point out that the latest modelling suggests that global average temperature will probably not exceed two centigrade degrees if we follow this path. While it is desirable to reduce greenhouse gas levels by as much as is feasible and cost-effective, it is probably not necessary, based on the current evidence, to aim for 350 ppm to avoid a temperature rise of more than two centigrade degrees.

— Bob Ward

3. October 2, 2009
9:48 am

[Link](#)

There is an error in this. If oil prices are allowed to rise in response to using up the easy oil, then we will just tap the hard to get oil. And there is a lot of that. This figure from the World Energy Outlook 2008 shows about 7 trillion barrels of oil available at production costs above \$30 and below \$120/barrel.

http://www.theoil drum.com/files/long_term_oil_suppl

Since we willingly pay high prices, it is very important to stabilize the world price of oil below \$20/barrel to assure that these resources are not tapped.

<http://mdsolar.blogspot.com/2008/06/oil-is-too-expensive.html>

— Chris Dudley

4. October 2, 2009
10:08 am

[Link](#)

I think we'll need a few more studies. And, pray tell, how are we to get the Chinese who are building one high-sulfur coal-burning plant a week to stop? These plants last for 50 years! Oh, right, this is a 200 year plan, and how good are we at implementing 200 year plans? Politicians have such a short-term perspective.

— KenC

5. October 2, 2009
10:13 am

[Link](#)

With a ten percent unemployment rate already and rapidly growing, whatever legislation that is passed to affect the rate of climate change ought to seek first to reduce the level of unemployment by creating many "green" jobs.

— William O'Connor

6. October 2, 2009
11:19 am

[Link](#)

@KenC
And, pray tell, how are we to get the Chinese to follow if we don't lead?... Oh and by the way, they are also making massive investments in clean energy technology. So if we don't invest now, who do you think will be the next energy leaders? Not us.

— Jeff O

7. October 2, 2009
11:29 am

[Link](#)

Bob,
To clarify Sir Nicholas Stern's remarks on the 350ppm target, here is what he said to Daniel Boese, a Berlin reporter, when he was asked about the 350 target a few weeks ago

"I think it's a very sensible long-term target." He went

ORGANIZATIONS

- Climate Ark
- Green-e
- Greener Choices
- Grist
- Jambale Magazine
- MetroGreen+Business
- National Geographic Green Guide
- Solar Buzz
- The Daily Green
- Treehugger

INSTITUTIONS

- DOE: Office of Energy Efficiency and Renewable Energy
- Energy Star
- European and Chicago Climate Exchanges
- European Commission Directorate General for Environment
- European Federation for Transport and Environment
- International Energy Agency
- National Renewable Energy Laboratory
- United Nations Environment Program
- United Nations Framework Convention on Climate Change
- US Department of Energy
- World Meteorological Association

JOBS

- Bright Green Talent
- Clean Edge Jobs
- CleanTechies
- CleanTechRecruits.com
- EcoEmploy
- Green Career Central
- Green Dream Jobs
- GreenCareers from Monster
- GreenJobs from Treehugger
- Grist Jobs
- Renewable Energy Jobs

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- BBC News: Global Climate Change
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- CNet: Green Tech
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- Renewable Energy World
- The Environment Report
- Yale Environment 360

ORGANIZATIONS

- American Society of Landscape Architects
- American Wind Energy Association
- Association for the Study of Peak Oil
- Carbon Disclosure Project
- Climate Matters @Columbia
- Environmental Defense
- Friends of the Earth
- Independent Energy Producers Association
- Interstate Renewable Energy Council
- Johns Hopkins Center for a Livable Future
- National Biodiesel Board
- Rocky Mountain Institute
- Solar Energy Industries Association
- Sustainable Buildings Industry Council
- The Pew Center on Global Climate Change
- The Post Carbon Institute
- United States Energy Association

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on to explain: "People have to be aware that is a truly long-term target. We have already passed 350ppm, we are at 390 ppm of Co2 and at 435 ppm of Co2-equivalents right now. It is most important to stop the increase of flows of emissions short term and then start the decline of flows of annual emissions and get them down to levels which will move concentrations of CO2 back down towards 350ppm."

If that's not an endorsement of the 350ppm target, then I don't know what is.

Phil Aroneanu, 350.org

— *Phil Aroneanu*

8. October 2, 2009
12:04 pm

[Link](#)

Thanks for an excellent story about our report. I can confirm that I was quoted accurately throughout (although there is a lot more in our report than could be conveyed in such a short story.)

Unfortunately, the story contains a link to an early draft of the report, which was provided to Green Inc. only for pre-publication review, not for release.

Several ambiguities and typographical errors, and a mislabeling error affecting two graphs, which were present in that early draft, have now been corrected in the latest version. Please ignore the link to our report in the story above, and instead go to

http://www.e3network.org/papers/Economics_of_350.

for the newest, corrected, and better formatted version.

Frank Ackerman

— *Frank Ackerman*

9. October 2, 2009
1:01 pm

[Link](#)

I was part of early Energy Modeling Forum studies in the 1990s that led to long series of economic analyses, including DOE's own study of the impacts of a 3% drop in US emissions over 1990 by 2010 on the US Economy. All these (honest) studies gave the same result - one or two years of economic growth lost over 20-30 years. The scare stories from energy lobby and many right wing "think" (sic) tanks not withstanding, the result is logical for a simple reason. Carbon-laden fuel only makes up less than 8% of our GDP. Just stopping the supply hurts, but that's not what happens with a gradual carbon tax or a real cap and trade applied to ALL carbon entering the economy. Indeed, last week Krugman's own blog in the Times showed this elegantly.

Lets see. Right now I spent about 1.5% of my income for various forms of insurance, closer to 8% if we include all the health insurance I and my employers pay up front. By contrast, a 1-3% insurance premium on the future of the planet seems cheap.

Well, not cheap for the coal industry, but are we not smart enough to fix that? Not cheap for a few key industries for which energy costs are more than 20% of their costs (air travel, chlorine, raw steel and non ferrous metals, etc). Are they not smart enough to figure out how to become more efficient?

Lee Schipper
Stanford and Berkeley

— *mrmeter*

10. October 2, 2009
3:39 pm

[Link](#)

Bob (#2),

You should know that Hansen is proposing a carbon dioxide target and not a carbon dioxide-equivalent target. Bringing in the other measure without definition is confusing.

And there is a lot of agreement out there on 350 ppm of carbon dioxide including Stern as Phil pointed out in #7. David Archer, author of "The Long Thaw" is another
<http://www.realclimate.org/index.php/archives/2009/-degrees/#comment-130321>

— Chris Dudley

11. October 2, 2009
6:31 pm

[Link](#)

Lee Schipper - could you add a link to your study?
Thanks.

Great to see Green Inc present the facts on how little there is to fear in switching to renewable energy.

I write at cleantechnica of another study that came to the same conclusion; based on Europe's experience with cap and trade - that it got emissions down.

Found it was easier than thought, cost less, and it worked.

The German Marshall Fund study
<http://cleantechnica.com/2009/09/28/what-the-senate-should-know-about-cap-and-trade-in-europe/>

— Susan Kraemer

12. October 2, 2009
7:43 pm

[Link](#)

The environment is each and every individual and her/his relationship to their environment. The environment is not an issue. It is THE issue!
- Mike Morin

Post-Peak Oil, Climate Change and Green Jobs

PVs and Wind are somewhat of an illusion. Neither supplies the voltage and amperage needed to do the great majority of the electrical work that our society has grown accustomed to.

The key to a bountiful green building economy is the reversal of the thirty, fifty, one hundred year trend of sprawl development in the United States.

By rebuilding neighborhoods and reallocating goods and services to those renovated neighborhoods (made walkable, meaning that the great majority of Americans will be able to get what they need within walking distance of their homes), we can succeed.

Such a tremendous dedication of resources will be a boom to the building trades and will create the effect of reducing automobile usage by 80% in the next 20 to 40 years. Neighborhood commercial, community and work/telecommute centers will be centrally placed in what are now alienating, automobile dependent, strictly residential areas, alleviating the problems associated with post-peak oil and climate change and bringing with it the quality of life associated with communities and neighborhoods, that most individuals and families currently lack.

If we do this, we can take the opportunity to retrofit for weatherization, passive solar design (heating and cooling), electronic environmental controls, solar assisted hot water applications, limited PV and wind

applications, etc.

Also, if done correctly, we can make changes in ownership arrangements that are much more fair and just, and work towards an equitable distribution of wealth among neighborhoods.

It is important that we fundamentally reassess our economic system and replace the current economic/finance system with one that targets the needs of the current residents, and not, for-profit speculation.

Because of the terrible inflation of real and capital assets that is a product of the speculative modus operandi of the Capitalist system, it will be fundamentally necessary to reform our economic/financial system by consolidating private (while rededicating them as quasi-public) real and capital assets and equity and writing way down the “market value” of those assets.

After completing that awesome task, we could proceed with a “plan and implement” economy dedicated to meeting the needs of the indigenous populations of all communities: inclusion, humanity, equity, quality of life, environmental/public health and wellness, sustainability, and peace.

Mike Morin
Eugene, OR

—Mike Morin

13. October 2, 2009
9:02 pm

[Link](#)

Here is the EMF web site. Hope that helps:
<http://emf.stanford.edu/>

And I am not afraid to switch to renewable energy.

—lee schipper

14. October 3, 2009
7:40 am

[Link](#)

Great, we support 350.org with the Internet
Communication Wave.

Interested? Look here:
<http://www.350.org/024/action/4951>

—Erik van Erne, Milieunet Foundation

15. October 4, 2009
4:35 am

[Link](#)

Go biochar! And please don't forget the carbon footprint associated with agricultural nitrogen demand. Recent studies by NSW DPI in Australia show significant crop yield increases in biochar amended soils with reduced nitrogen requirements. To learn more please check out <http://www.outbackbiochar.com> a site dedicated to biochar information and research. Black is the new green!

—Jubal Hill

16. October 6, 2009
5:51 am

[Link](#)

The writer's comment “Dr. Hansen has said the 350 parts per million target is only attainable by eliminating the use of coal — or developing 100 percent carbon capture technology” is very miselading as it suggests that carbon capture and eliminating the combustion of fossil fuels has the same effect. Efficient combustion of fossil fuels requires atmospheric oxygen nevertheless and thus reduces its concentration in air which immediately results in a relative increase in CO₂. Lets face facts. Carboin capture and storage is a very short term fix. We should focus on technologies, natural or otherwise, that convert CO₂ back to O₂ and sequester the carbon only.

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