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Sunday, April 19, 2009

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**DOT EARTH****Nine Billion People. One Planet.**

March 7, 2008, 4:23 pm

Fun With Mirrors and Dust - a Climate Fix?By [Andrew C. Revkin](#)

The trajectories for emissions of carbon dioxide as the world's industrial and industrializing countries boost coal burning are clearly going to be tough to turn around, whether through caps on emissions or efforts to improve non-polluting energy technologies. And big hurdles remain before there will be any large-scale capturing of carbon dioxide to pump it underground or elsewhere for safekeeping.

That's why a growing number of scientists, including Nobel Prize winners and Ralph J. Cicerone, the president of the National Academy of

Sciences, have pushed for intensified study of [ways to artificially nudge the planet's thermostat](#) downward — at the very least as a “Plan C” should warming kick into high gear.

Now an enterprising crew of young filmmakers has done an educational video in a goofy retro style and posted it on YouTube. It's well worth a look, if only to provide a chuckle in a realm that is chockablock with unfunny rhetoric ranging from “woe is me” to “shame on you.”

Brief introduction to Geoengineering

...nytimes.com/.../fun-with-mirrors-an...

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Fun With Mirrors and Dust - a Climate...

curious to know what you'd propose as a backup plan if the climate's sensitivity to CO2 turns out to be higher than you think?

A question for climate [campaigners opposed to geo-engineering](#) (by any name): Why not at least explore (and test on reasonable scales) such options. If you take the threats of global warming as seriously as you say, why not at least pursue some work on this kind of backstop even as work on mitigating emissions continues?

Keep in mind that I personally foresee a huge barrier to this ever being done in the real world outside of some absolutely cataclysmic disruption of climate — the barrier being the likely [diplomatic standoff over who gets to set the thermostat](#). As I've written before, I imagine Russia, Maldives, Australia, and Ohio would have completely divergent views of the optimal planetary temperature.

An addendum. When Alex Steffen of Worldchanging.com posted [a thoughtful critique of geo-engineering](#) there recently, I added the following comment:

Dear Alex,

As you know, I admire your forward-thinking positive approach and, like you, reject "woe is me, shame on you" rhetoric on climate and energy.

But there's a potential problem with the rejection of any work on climate engineering above.

We are already [engineering the Earth at planet scale](#), and have been for a century or more. We just didn't fully realize it until the last decade or so, and still haven't really integrated the idea that Earth, from here on in, is increasingly what we choose to make it (including the bioscape and atmosphere/climate).

The dilemmas predicted above already exist.

The big impediment right now to global action to limit emissions of CO2 is the same as the huge roadblock (rightly mentioned above) to coming up with some mutually-agreed upper limit on the global thermostat — the variegated status and interests of different states worldwide.

Those with heaps of coal (led by the U.S. and China) want to use it. Those with big vulnerabilities to climate or coastal risks, and little history of emitting (Maldives, e.g.), want the rich emitters to protect and compensate them, and limit the risk imposed by rising temperatures or seas.

In the meantime, the [rich emitters have insulated themselves from risk](#) with their wealth and technology (for decades to come, at least, according to [IPCC AR4](#)), as we reported last year in the "Climate Divide" series.

So, presuming one accepts the I.P.C.C. findings (which all the world's nations — ostensibly at least — say they do) we're already in the climate management (or conscious mismanagement) game.

Who gets to choose how fast to cut the 27-billion-tons-a-year-and-rising CO2 flow: Europe with its 2-degree-C threshold? China and the U.S. in their "You first" Alphonse & Gaston routine? Malawi?

For the moment, Alphonse & Gaston are winning, it seems. That's why a lot of scientists see the need for cobbling together a long-term insurance policy (or at least explore whether one is even available.)

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For plan B I would assume we can't get multiple states to work together well enough to come up with global solutions, and I have little faith so far in any carbon sequestration schemes I've seen. I'd be more inclined to look at terraforming to reduce the impact of global warming for specific areas - removing part of the rockies to redirect the jetstream more directly across north america, creating mountains in central australia to increase cloud systems and rainfall, etc.

I wish it were all as simple as dispersing reflectants in the upper atmosphere of the polar regions. That seems like something we could test on a sufficient scale at a reasonable cost to find out whether it's a pipe dream like my plan B terraforming dreams.

— *Duncan*

3. 3. March 7, 2008 4:58 pm [Link](#)

Hi Mr. Revkin,

I hope Russell Seitz will drop by, he's probably talked this over with Paul Crutzen.

Re: "engineering the earth for over 100 years", I know you're talking about 'scale' but the terraforming by agriculture over the last 5,000 years is mind-boggling.

Just a simple (recent) example:

I read last year that "night-time corn sweats" in Iowa has noticeably raised humidity levels in Minnesota.

Climos just banked some venture capital money for their for-profit carbon-credit scheme.

— *Climateer*

4. 4. March 7, 2008 5:01 pm [Link](#)

I am a skeptic waiting to be convinced otherwise. Regardless, I do not believe in burning fossil fuel for a number of reasons. We need to develop nuclear now to meet base load requirements. After that we can play around with solar, wind, hydro, tidal, ect. as long as they are economically viable when measured against nuclear. If they are viable, they will thrive.

Elery

— *EleryFudge*

5. 5. March 7, 2008 5:02 pm [Link](#)

How about we say that energy from space be sent where it is needed to reduce carbon emissions in general?

How about using mirrors selectively to shade areas on the ground that would like to be cooler while reflecting more light into regions that would benefit from more light.

There is no reason to say the planet has to be treated in such a way that every nation has to agree on everything. The real issue is that of ownership of space and its applications. I'll leave that for someone else to expound upon.

As soon as the U.S. and China start getting energy which costs less than using their own coal, that issue goes away.

Admittedly, there will be major problems to solve, but the problems we are facing right now might just be worse.

— *frank farrar*

6. 6. March 7, 2008 5:35 pm [Link](#)

Ray Pierrehumbert has had some interesting things to say regarding a session on this subject at the recent AGU meeting.

<http://www.realclimate.org/index.php/archives/2007/12/rolling-up-the-circus-tent-dispatch-7/>

Gavin Schmidt had another RealClimate feature on it.

<http://www.realclimate.org/index.php/archives/2006/06/geo-engineering-in-vogue/>

In short, if the main problem were the mean temperature of the earth, this might work, but if the main problem is accelerating climate change in various places, it really doesn't.

Recent results given at the AGU session (I was there too) show that this form of geoengineering mostly cools the tropics, by the way. So to first order it wouldn't help at all with melting ice caps.

It's wishful thinking, that's all.

— *Michael Tobis*

7. 7. March 7, 2008 6:14 pm [Link](#)

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Fun With Mirrors and Dust - a Climate...

This doesn't mean you have absolute certainty, or know everything there is to know about the problem. But you need to have a reasonable understanding before mucking things up.

I have nothing against gaining knowledge through modeling and experimentation. We must pursue every avenue to understand both the nature of the problems we face and what sorts of tools we can bring to the solution once we do understand. An old saw has it that facing an uncertain future means you should keep all options open.

But with efforts like climate engineering (whatever that really means) I can see the danger of expending colossal resources on a solution to one symptom only to find we've wasted our efforts on the wrong problem. Or only part of the problem.

Additionally, it is hard to contemplate what an appropriate scaled experiment might be in this endeavor. All in all, I say seek understanding of the 'real' problem(s) and from that understanding will come insights into solutions.

Choose wisely.

[George Mobus](#)

— *George Mobus*

10. 10. March 7, 2008 6:48 pm [Link](#)

My first vote is for stronger campaigns for individual and corporate energy efficiency in cost-effective manners which would include education, public service ad campaigns, access to energy savings efficiencies, and management of these efficiencies, e.g., recycling fluorescent bulbs, more re-use and recycling of petroleum based plastics. This can be done in a relatively short time and with relatively little financing, but many are unlikely to get on the wagon even if it saves them money.

My second vote is for reducing the urban/peri-urban heat sink by putting reflective rather than absorptive roofing on buildings and houses. I see this as counteracting some of the lost albedo affect of losing ice caps etc. This would be a lot less costly and could be done much sooner than launching mirrors into space. It would require regulations for new buildings and incentives for existing buildings, but maybe it wouldn't accomplish enough to make it worthwhile.

My third vote goes for increasing renewable energy since that will take more time to implement and is more costly than the measures stated above. Still, it is likely to be less costly and controversial than launching mirrors into space.

And finally, I am open to some of these "cooling" ideas, as long as they will work and are adopted only after very careful evaluation that ensures we are not creating a new problem while attempting to solve another.

— *swatter0*

11. 11. March 7, 2008 7:18 pm [Link](#)

I am reminded of the song which begins

"I know an old lady who swallowed a fly..."

— *David B. Benson*

12. 12. March 7, 2008 7:31 pm [Link](#)

We need all the creative ideas we can get regarding fixes and mitigation strategies. Maybe one day, some of these fixes will "fix" the problem. We must put our hopes there.

However, if none of these geo-fixes work, then it will be time — and that time MIGHT be NOW — to start thinking realistically and creatively about ADAPTATION strategies for when the shite hits the fan, proverbially speaking that is.

Here's one far-out idea and image, so far off the radar that most MSM won't touch it with a ten foot pole, but we might need them someday: Maybe.

http://images.google.com/imgres?imgurl=http://bp1.blogger.com/_vZEkdINbbAo/Rzk9-cEF7MI/AAAAAAAAACs/VfsRxul1efg/s320/12.jpg&imgrefurl=http://pcillu101.blogspot.com/2007/11/model-polar-city-blueprints.html&h=235&w=320&sz=18&hl=en&start=2&sig2=jkEwphNRnJHKz2Whxx1eA&tbid=LMEZmvTo2fmuM:&tbnh=87&tbnw=118&ei=fEbPR6SKDKnYr

— *Danny Bloom*

13. 13. March 7, 2008 8:03 pm [Link](#)

The Word of the Day is Mizcolci. Check out his derivation for climate sensitivity to CO2. Big equations, heh, heh.