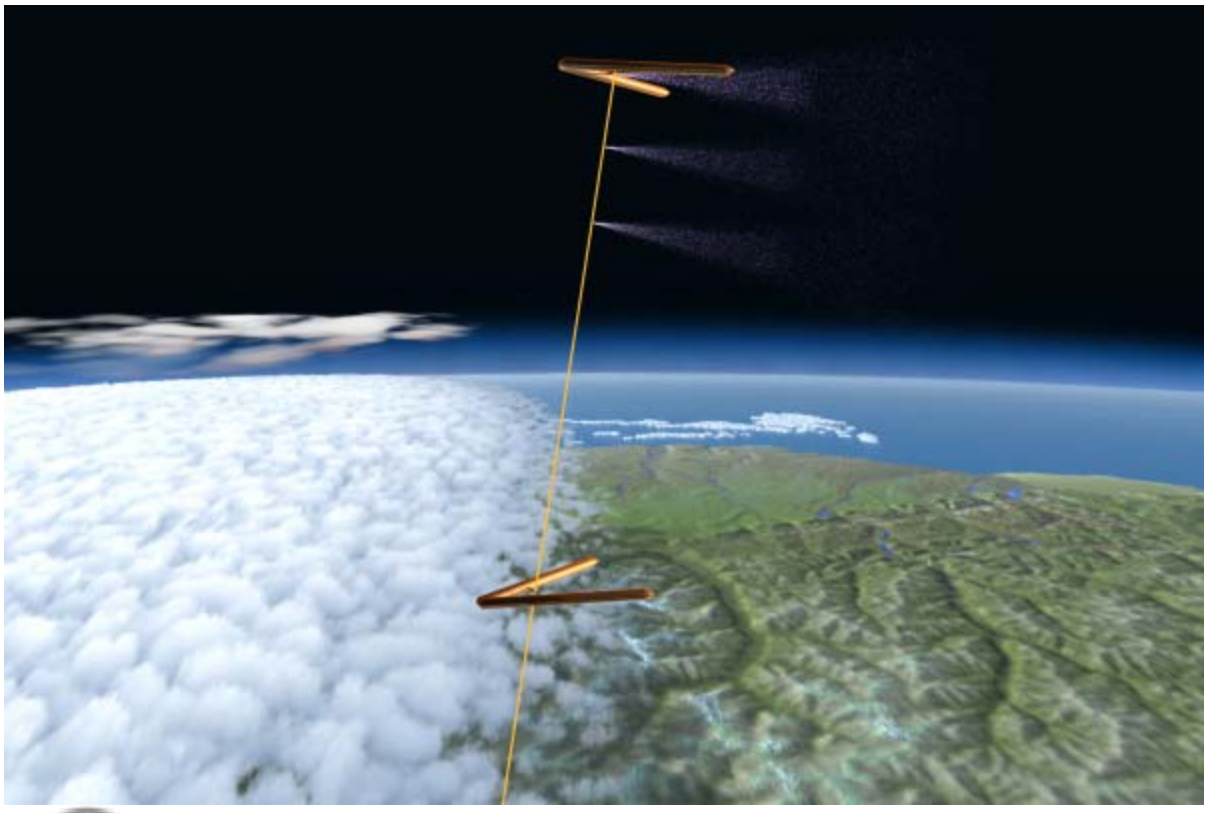
Intellectual Ventures Lab

To invent, you need a good imagination & a pile of junk. – Thomas Edison

Introducing the StratoShield

October 21st, 2009 Pablos Leave a comment Go to comments

We've been working on some ideas related to climate change, as a kind of backup plan in case human effort to curb emissions don't succeed fast enough to prevent devastating ecological damage. One of the ideas that has captured our imagination is replicating the way volcanoes have at times brought down the temperature of the planet by erupting sulfur dioxide particles up into the stratosphere. We've invented a "hose to the sky" we call the StratoShield, which is a comparatively cost effective way to do this. The invention is profiled in SuperFreakonomics and we're hoping to have some scientific discussion about its potential.



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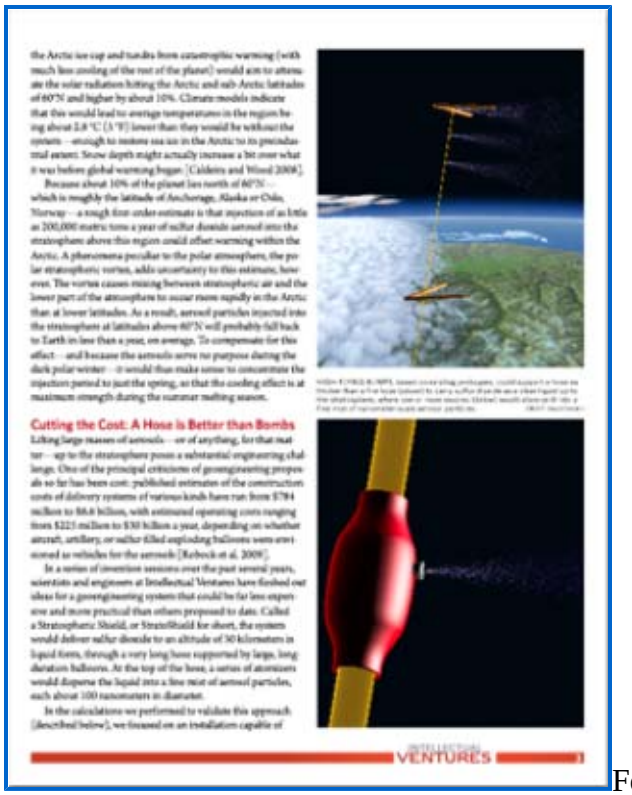
Cutting the Cost: A Hose is Better than Bombs
VENTURES

For the first time we've got some technical details to share publicly. Please take a look at this StratoShield White Paper if you'd like to know more.

Tags: Climate Science, StratoShield
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1. Phillip
   October 26th, 2009 at 13:47 | #1
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   I was impressed with this simple solution… but in all the data presented… it mentions nothing about how much ice will form if this works too well. As I understand it there is already 1 to 2 miles of ice collecting on the poles. By cooling the pole it would form more ice and stay there! I know your simulation shows the cooling effect but add to those permitters an ice accumulation factor of 1 inch each year that doesn't go away – then what happens? If this is implemented then would this change the depth of the ice and might cause a magnet change of the poles pre-maturely literally turning the world upside down? I don't recall this being part of that simulation?

   As an alternative why not use this system to also re-seed the "Ozone Layer"? Then again who would pay for it? Unless you had every country contributing to this effort – we're all in this together or we die together!

2. Thomas
   November 6th, 2009 at 20:49 | #2
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   Will this degree of solar block'age have any negative impacts on plants and other organisms that depend on the sun for energy? Clearly this is just a temporizing solution because if we don't simultaneously significantly reduce carbon emissions then as time passes we'll need to pump

more sulfur dioxide into the stratosphere to block out more sun like…where does that eventually lead us?

3. David Van Keuren
November 7th, 2009 at 12:56 | #3
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I was fascinated by the interview with Nathan Myhrvold that I listened to on public radio yesterday. However, I was wondering, why bother with trying to have a long tube lined up with a industrial smoke stack when there may be an even simpler solution. Why not take a large balloon, coat the outside of the balloon with sulphur dioxide and a binder that would react with ultraviolet radiation that would allow for a gradual release into the atmosphere (silver chloride?), Then all you would have to do is send the balloon up and allow the sun to react with the coating on the balloon and disperse the sulphur dioxide through photo-oxidation.

4. Jerry Toman
November 9th, 2009 at 22:08 | #4
Reply | Quote

We, the Canadians and the Europeans fly a lot of commercial aircraft farther north than 45 degrees at or near the stratosphere. I trust there is a plan underway to use these aircraft in a pilot study to test some of IVs cloud-formation and cooling theories, either by spraying SO2 from them or by using fuels with higher levels of sulfur compounds. Should the NW passage open up, we could also use commercial steamships.

Some day we may have to rely on this proven mechanism should some unexpected glitches arise in the Stratoshield plan which relies on high-flying hoses, pumps and blimps.

Alternatively, we could develop a local plan to raise additional water vapor to cloud-forming altitude and create reflective cloud cover without (necessarily) relying on sulfur compounds.
Ref: http://vortexengine.ca

5. Crust
November 12th, 2009 at 13:35 | #5
Reply | Quote

According to Gavin Schmidt, Pinatubo put around 20 million tons of SO2 into the stratosphere. The chart “Volcanic SO2 loading” here seems to confirm that (at least assuming most of it went into the stratosphere rather than staying in the troposphere). You’re talking about an annual number (100,000 tons) that is a factor of 200 less. Why do you think that would be enough?

6. John
December 1st, 2009 at 11:21 | #6
Reply | Quote

I finished reading Freakonomics yesterday and have marked up the margins of my book on the IV pages! I saw a similar comment to my idea by Jerry Toman. It appears we can increase the sulfur dioxide levels by a change in the fuel composition and re-tuning of jet aircraft engines.

This way the various high flying commercial and military aircraft fleets automatically distribute it

at the 35000-45000 foot level. Is this high enough to have impact?

It would also be easy to monitor how much gets distributed, and make adjustments to the fuel composition as fine tuning is required.

I love the idea of the lab without boundaries. I have been filling my poor overflowing garage with the type of (smaller scale) machines to enable the prototyping of ideas.

7. John
December 1st, 2009 at 11:23 | #7
Reply | Quote

I was also wondering if some kind of peristaltic pump could be used in which the hose itself is a pump. Pressure lines and control electronics/valves could push the contents skyward.

8. Sarat
December 19th, 2009 at 07:05 | #8
Reply | Quote

As you pump more and more CO2 to atmosphere and less light (and heat), Following things would happen

Water cycle : Less heat, less light , less evaporation, less rain and snow fall
Air : More CO2 in the atmosphere, plants can use it but water shortage and heat and light shortage
As we gather more CO2, sea surface would absorb more and what it does with the conveyor belt is anybody's guess

I would request the IV team to think about how capturing CO2, Methane from atmosphere can help. Do plants generate electricity by absorbing sunlight ? they do generate chemical energy (hydrocarbons) but then…what lies beyond ?

9. Bahram
December 22nd, 2009 at 03:00 | #9
Reply | Quote

The V shaped balloons for bouyancy appears to have a cylindrical cross section.
Perhaps it would be better to have an aerofoil cross section, so as to generate lift from the jet stream and reduce the load on the helium balloons.

10. Paul Coelho
February 15th, 2010 at 15:33 | #10
Reply | Quote

Is this currently a "live" programme with funding or just interesting conceptual discussions. I would be keen to get involved in moving this forward if this is the stage we are at.

1. No trackbacks yet.

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