

Geoengineering

Here is, perhaps, the most controversial option for dealing with climate change:

Geoengineering: The intentional manipulation of the environment on a global scale in order to counteract climate change.

How would we do this? (Good introductory video [here](#).) Here are some examples:

- **More vegetation:** (a) Fertilize or seed the oceans with plant life (to suck up carbon), (b) Massive reforestation projects.
- **Carbon-sequestration:** Capture carbon, and then bury or store it.
- **Solar deflection:** (a) Huge mirrors placed in space, (b) simply painting rooftops white, or (c) injecting aerosols into the upper atmosphere (to reflect sunlight).

This is not science fiction. Harvard is already researching it. ([here](#)) Climate experts are recommending it. ([source](#)) Even presidential candidates are suggesting it! ([here](#))

This is different than suggestions which would have us simply reduce emissions:

- **The stick:** Put a cap on emissions, enforced with penalties for non-compliance
- **The carrot:** Subsidize or give tax breaks to those who reduce emissions
- **Alternatives:** Research cleaner, renewable energy (e.g., solar, wind, water)

People are often far more comfortable with the latter suggestion (mitigation) than they are with geo-engineering. But, here is an argument for geoengineering:

The “Arming The Future” Argument for Geoengineering (AFA)

1. There is good reason to think that the worst emitters will fail to mitigate their emissions sufficiently to counteract climate change.
2. If the world fails to reduce emissions, then in the near future we will be faced with two terrible options: (a) Geoengineering, or (b) Global catastrophe.
3. When faced with 2 evils, we ought to choose the “lesser of the 2 evils”.
4. Though both of these options (a) and (b) are bad, a global catastrophe would be a greater evil, and a more probable threat, than the potentially bad consequences of geoengineering.
5. But, if we do not research methods of geoengineering NOW, we will not be able to do so (rather, we will be forced to suffer a global catastrophe).
6. Therefore, we ought to be presently pursuing research in order to “arm the future” with geoengineering, so that they have the option if they need it.

Objections: Here are some worries:

- (1) **Obscuring the Moral Issue:** The AFA is a cynical argument. Basically, it says that, given that we are not going to do anything to reduce our emissions to mitigate climate change, we should at least make some effort to research ways in which future generations can deal with the looming catastrophe that we will inevitably hand down to them. But, this obscures the issue. The catastrophe hasn't happened YET. As such, clearly the BEST solution is to try to help future generations avoid the catastrophe altogether. Imagine this case:

Toilet Plans Every time I flush, a little of the waste from my toilet presently flows directly into your house. In the near future, your home will be knee-deep with sewage. "But, fear not!" I tell you. "Knowing in advance that I plan to do nothing about my plumbing situation, I've researched lemons, and I've designed a lemon-scented aerosol spray that you can spray around your house, and that should mask the smell."

Have I taken the best course of action here? To most, it would seem like I have not fulfilled my moral obligations. If I am performing some action that is avoidable and harming someone, the right course of action is not to help them DEAL with the harm I am causing them—not to mention, it's only a PARTIAL fix, see below—rather, the right course of action is to NOT HARM THEM IN THE FIRST PLACE. As such, it seems like the proposal for geoengineering obscures the fact that:

"the potential crisis is to be brought about by our (the current generation's) failure to pursue better climate policies. ... [But] there seems to be an important moral difference between (on the one hand) preparing for an emergency and (on the other hand) preparing for an emergency that is *to be brought on by one's own moral failure.*"

In short, this proposal **does not require the present generation to take any responsibility for what we have done.**

Furthermore, if the cause of the future dilemma between the "2 evils" is a result of our own moral failure to fulfill our obligations, how can we make sense of the claim that we are morally obligated to research geoengineering? If we have not felt the strength of our prior obligations, why would we feel the strength of this new one? Gardiner: "Is there not a worrying moral schizophrenia underlying this proposal?"

- (2) **Masking The Symptoms Without Addressing the Cause:** Geoengineering does not really address the ROOT issue, which is overconsumption. As such, it is like the suggestion to “solve” a heroin addiction by giving the addict a lifetime supply of methodone. But, this seems wrong-headed.
- (3) **Only A Partial Solution:** Furthermore, on the most popular geoengineering proposals (e.g., solar deflection with sulfate aerosols), geoengineering would only constitute a PARTIAL solution. Reflecting sunlight would only prevent WARMING, but it would not reduce the amount of GHG’s in the atmosphere. As such, MANY of the negative effects of climate change would not be mitigated at all. For instance, the oceans would continue to acidify (by forming carbonic acid with CO₂), destroying most sea life. In addition, it would not solve the problems caused by rampant deforestation, massive extinction, overpopulation, and so on.
- (4) **Ignores Other Options:** Gardiner suggests that, even if we are NOT planning to reduce emissions, if we are going to be spending money on research for how to deal with the future problem of climate change, that research money would be better spent in other ways besides geoengineering. For instance:
- Alternative energy sources
 - A robust international climate assistant and refugee program, to help future victims of climate change when the time comes

The AFA does not make any mention of these alternatives, however.

- (5) **Self-Fulfilling Prophecy:** Researching geoengineering runs the risk of failing to provide the proper motivation to REDUCE emissions. If political leaders know that we have a “failsafe” in place, they are much more likely to continue with business as usual, and continue to over-emit.

Furthermore, it will not encourage FUTURE generations to reduce emissions either. If they emit more, they will be able to just put MORE sulfate aerosols into the atmosphere to counteract warming.

In short, geoengineering is a “get out of jail free” card which does not require to alter our behavior.

- (6) **Ignores Our Moral Relationship With Nature:** As we have seen, many environmental ethicists believe it is morally wrong to radically alter our environment. But, geoengineering just proposes MORE of that—we would be altering our planet on a global scale. So, geoengineering encourages complete and total environmental domination, where the planet becomes a man-made construct, without questioning whether or not it is morally permissible to do so.
- (7) **Potential Catastrophic Side-Effects:** In addition to all of these worries, there might be other unknown, negative side-effects of geoengineering. The planet is a delicately balanced system, and tinkering with that system quite possibly could lead to disastrous consequences.
- (8) **Forcing the “Lesser” Evil Upon Future Generations:** If we continue to emit, without reducing our consumption of resources, we will essentially be FORCING the choice between the “2 evils” upon future generations without their consent; and, because the choice of catastrophe will be such an awful alternative, they will have no choice but to geoengineer the planet. So, in effect, if our ONLY proposal is to research geoengineering without reducing emissions, then we are giving future generations no choice other than to implement our research—a few people will be making a decision which will affect how the lives of billions of others will go, without their consent. This seems like a serious injustice.
- (9) **Lesser Evils:** As Gardiner points out, it is not even clear that, when faced with 2 evils, choosing one of them is permissible just because it is the “lesser” evil. For instance, imagine that someone is about to murder 10 innocent people. “But!” they say to you. “I will NOT murder these 10 people if you go home and murder your parents.” Is it permissible to murder your parents? After all, it is the LESSER of 2 evils. But, many would conclude that it would NOT be permissible to do so. So, it is possible that the entire AFA argument is predicated upon a mistake in moral reasoning.

Other cases seem to indicate that choosing the lesser evil IS permissible, or even obligatory. For instance, Gardiner mentions “**Sophie’s Choice**”, where Sophie was given the option to either watch both of her children murdered by the Nazis, or else, personally pick ONE of them to be murdered instead. Sophie picked her daughter to die so that her son could be saved. This is a horrible choice, but most people seem to think that it was not wrong of her to make it. Even so, Gardiner explores the possibility that such choices between “the lesser of 2 evils” can be so **marring** to the person who is forced to decide, that it would be a very great evil to force that option upon them—and this is essentially what we would be doing if we research geoengineering without reducing emissions.