

Carnegie Council Lesson Plan for Ethical Issues in Solar Geoengineering (50-60 minutes)

Overview

Solar geoengineering—specifically stratospheric aerosol injection (SAI)—is gaining significant attention as a solution to the climate crisis. But it is an idea fraught with ethical as well as practical quandaries. In this lesson, students will learn the basics of solar radiation management and then consider the ethics of its use.

Learning Outcomes

1. Articulate the concept of climate ethics.
2. Understand the concept of stratospheric aerosol injection.
3. Reflect on the ethical trade-offs of using this technology.

Carnegie Council principles that the lesson addresses:

- **The commitment to international cooperation** is a moral proposition because it goes to the essence of ethics—recognizing what is common for all, while managing the intrinsic and inevitable differences between and among people.
- **The defense of democracy in the U.S. and globally** requires confronting autocrats who discriminate based on ethnicity, gender, and religion, and who deny basic freedoms to their citizens.
- **Fidelity** means honesty, integrity, and a good-faith effort at serving the truth. Rhetoric certainly matters, and in an age of disinformation, leaders must fight against lies, willful deception, and deliberate misrepresentation of facts.
- **The humanitarian imperative** is the duty to save lives and alleviate suffering through humane and equal treatment. As violence and cruelty abound in conflict zones around the world, mounting effective humanitarian responses remains the essential moral imperative of our time.

1. Lesson Plan (40 minutes, discussion or lecture)

- What is stratospheric aerosol injection?
- Who are the potential winners and losers of stratospheric aerosol injection?
- What are the ethical issues around stratospheric aerosol injection?
- Is there an ethical way forward to using SAI or is it ethically untenable?

Divide students into seven groups. The instructor should write each question below on the board. Assign each group one question. Students should discuss the question amongst themselves and then write an answer on the board.

- Who is harmed—and who benefits—from solar geoengineering?
- What are the ethical obligations of states? Private entities? Citizens?
- What norms are at stake—truth, trust, dignity, sovereignty? Norms around science?
- How can international cooperation help manage the effects of solar geoengineering that cross state borders? What challenges arise when countries have different norms and preferences on solar geoengineering?
- How might solar geoengineering undermine democratic processes? What (if any) duties do the leaders and citizens of democratic states have to counter solar geoengineering?
- What (if any) humanitarian responsibilities are violated by solar geoengineering?
- Which human rights norms (if any) are most endangered by solar geoengineering?
- Why does internationalism matter vis-a-vis solar geoengineering, and how can states balance sovereignty with global responsibility?

2. Reconvene to Discuss (10-15 minutes)

- Under what conditions, if any, would you support SAI?
- Would you support less aggressive forms of solar geoengineering, such as cloud brightening?
- What additional questions might you want (or need) to know the answers before deciding?
- In what ways should Indigenous and Global South perspectives be incorporated into ongoing discussions of SAI?

Additional Resources

- [Climate Ethics](#), Carnegie Council Key Terms page
- [Solar Radiation Modification Primer](#), Mitch Poulin, American Academy of Arts and Sciences, May 2026
- [The Ministry for the Future](#), Kim Stanley Robinson, Orbit Books, 2020 (Chapter 1-10)
- [“How can the world put justice at the heart of governing climate-altering technologies?”](#) Mark Turner & Kumi Naidoo, *C2G Talk*, Carnegie Council, May 31, 2023
- Recommended: [Season 2 of How We Survive](#) (podcast from NPR’s *Planet Money*). Note that as a follow-on lesson, instructors could assign students to listen to an episode using the jigsaw strategy.