9-27-2022

A Climate Policy Primer

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2022

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Introduction and Overview

The following learning module provides instructors with the materials to introduce students to a top-level overview of climate change solutions and their costs/benefits through the lens of market-based policy interventions. The core of the module is a 75-minute class plan designed to be plugged-in to a single class period by any instructor; that said, individual pieces of it can be adapted to a shorter class session or combined with the additional resources provided to span more class time.

The module features two **engaging** and **interactive** tools: the En-ROADS Climate Simulator and the YouTube video "How We Fix the Climate**"** by "vlogbrother," author, and TikTok personality Hank Green.

Instructors will find this Climate Policy Primer well-situated to help them articulate the relationship between climate change and the business world. Responsible leaders must understand that creating policies at a scale sufficient to mitigate the worst impacts of climate change will almost certainly require coming to terms with some form of market-based intervention.

About the En-ROADS Climate Simulator

The En-ROADS Climate Simulator introduces key climate policy concepts, like carbon pricing and energy systems, while offering students a chance to input their own "plan" to reduce greenhouse gas emissions and level-off rising global temperatures. Based on the latest climate science, the En-ROADS simulator is a deeply engaging tool that has been used to brief politicians and policy makers at the highest levels.

The simulator works well in classroom settings with little preparation because it is super-interactive: students can simply begin sliding inputs up and down and see the results immediately. As they complete the "puzzle" of the simulator, they learn specifically about the outsize influence that business and policy based interventions such as investing in renewables and taxing coal have on the global climate system, which helps to move students deeper into the details of climate policy and beyond consumer-based and demand-side solutions.

Beyond its ease of use and immediate pedagogical value, the En-ROADS Simulator offers two additional benefits: (1) students can quickly share and compare their solutions with each other and their instructor, which fosters discussion and an interactive class session; (2) instructors can easily guide students deeper into a specific topic of relevance to their discipline or learning goals, for En-ROADS features multiple ways to tweak individual inputs in finer detail as well as clear explanations of each aspect of the scenario.

About Hank Green

The YouTube video "How We Fix the Climate" features Hank Green, who many students may be familiar with from his popular YouTube and TikTok content. vlogbrothers has nearly 3.5 million subscribers on YouTube; Hank Green has 6.3M TikTok followers and over 420M likes on that platform. "How We Fix the Climate," published in August of 2021, compellingly and powerfully summarizes the current state of climate policy in the United States. It makes a convincing case for the necessity of better educating ourselves about climate policy as it defines and frames the vocabulary, current debates, and future outlook for carbon pricing in the US in a colorful and engaging way. Few better encapsulations of climate policy basics for students exist.

"How We Fix the Climate'' covers climate policy comprehensively and dynamically in a mere 16 minutes, and is pitched at a level and speed that is appropriate for undergraduate students. The video also prompts several avenues of further discussion, leaves students feeling educated and energized, and encourages further research.

Alignment with Sustainable Development Goals (SDGs)

The learning module aligns most directly with SDG 13, **Climate Action**, with overlap into 8 (Economic Growth) and 12 (Responsible Consumption and Production). Climate policy is highly significant to each of these SDGs, but it intersects most completely with Target 13.2, which focuses on integrating "climate change measures into national policies, strategies and planning."

Learning Goals

1. Students will emerge from the lesson with a deeper understanding of the range of mechanisms and solutions available to mitigate climate change.
2. Students will be introduced to a variety of future climate change scenarios and the cause / effect relationship between the supply and demand sides of efforts to mitigate the worst impacts of climate change.
3. Students will develop the capacity to speak more effectively about climate policy.

How to Use this Primer

Before using the materials in this primer during a class session, instructors may wish to familiarize themselves with the En-ROADS user-interface, the slidedeck that accompanies the lesson, and the Hank Green video. This prep time should take less than 1 hour if

instructors wish to prepare in advance; but the session should run smoothly even without this prep.

Lesson Plan (75 minutes)

Preparation

To prepare for the lesson, open the following resources and prepare to present each one during the course of the lesson:

1. En-ROADS simulator site
2. Climate Policy Primer Slidedeck
3. "How We Fix the Climate" on YouTube

Ensure that students also have access to the En-ROADS simulator site by sharing the link with them. Not every student needs to have a computer, but it would be helpful if each group of students had access to at least one in order to collaborate.

Students should sit together in groups of 3-4. (If students have groups they've been working with, they can work together with those groups).

Plan and Pacing

5-10 minutes - Introduction

1. Begin by framing the En-ROADS simulation activity using Slides 2-14 from the slidedeck, which lay the groundwork for the significance of mitigating climate change. Feel free to use or adapt the script included with the slidedeck notes.
2. To transition from the science to the simulator, stress to students the importance of finding ways to meet the goal of no more than 2.0 celsius warming by 2100.

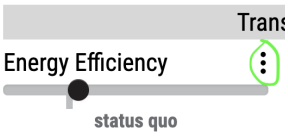
15-20 minutes - Using En-ROADS

3. Using slides 15-16, direct students to open the En-ROADS website and briefly demonstrate how it works. There are three key points to convey:
    a. Explain the "Main Graphs View and the Baseline future" graphs at the top. You can use this script if it's helpful:
        i. *"On the left is a graph of the global sources of energy from the year 2000 out to 2100. At the bottom in brown is coal, then oil in red, natural gas in blue. On our current path, you can see that coal, oil, and gas continue to grow throughout the remainder of the century. Renewables, such as wind and solar (in green), are growing very quickly, especially approaching*

2100, but still they must compete with fossil fuel energy sources. Bioenergy is in pink and nuclear is in light blue, at the top."

ii. *"If we take minimal additional action, we expect that greenhouse gas emissions will continue rising throughout the century. This will then lead to global temperature increasing dramatically by the year 2100. We have already heated up the planet by over 1˚C from preindustrial times, and are headed for even more dangerous warming by the end of the century. Our goal is to limit warming well below 2 °C, and aim for 1.5 °C.*

b. Demonstrate how the "Control Panel" works by sliding a few different inputs up and down. You can use this script if you wish:
   i. *Using the En-ROADS climate simulator model, you have 18 types of actions that can be proposed to affect future warming.*
c. Demonstrate that students can click on the three vertical dots next to each action to learn more about it. (See right).



   i. For example, revealing more information about "Energy Efficiency," students can read the following description of this input: "Increase or decrease the energy efficiency of vehicles, shipping, air travel, and transportation systems. Energy efficiency includes things like hybrid cars, expanded public transport, and ways that people can get around using less energy. Adopting more energy efficient practices can improve public health and save money."

4. Instruct students to work with their group to create a scenario that limits warming below 2 °C, and challenge them to aim for 1.5 °C. (At this point, it is best to let students "drive" the simulation on their own, with little additional guidance). Give them no more than 15 minutes to create a successful scenario.
   a. You may wish to circulate in the room, checking in on students to see if they have questions.

10 minutes - Students Share Scenarios

5. Ask 2-3 student groups to share their scenarios and explain how they accomplished their mitigation goals. (Slide 17 will prompt this). There are two ways students can share their scenarios:
   a. Students can create a unique URL using the "Share Your Scenario" button and either emailing or copying it. (See right).

   b. Invite students to drive the classroom computer to demonstrate their scenario

5-10 minutes - Discussion and Takeaways

6. Using slides 18-19, ask students to share what surprised them about the activity and what feelings it prompted. Here are some additional and/or follow-up questions:
    a. How was energy consumption, greenhouse gas emissions or other key parameters, affected by your proposals? Can you imagine humans living in that kind of world?
    b. Did it feel difficult or easy to get to the goal of less than 2˚C of warming?
7. Using slide 20, summarize the key takeaways from the En-ROADS simulation.

3 minutes - What to Do?

8. Transition to slide 21, direct the conversation toward the question that will likely be on the minds of the students: but what do we do now? Here's one helpful way to phrase it: "*It's pretty easy to move a slider, isn't it, but not so easy to pass policies and change spending*"
9. Introduce Hank Green video by explaining how helpfully it lays out the best path forward and answers this very question

17 minutes - How We Fix the Climate

10. Play "How We the Climate Video," asking students to take notes on two things:
    a. Points in the video that intersect with the En-ROADS climate scenario
    b. Key terminology

5-10 minutes - How We Fix the Climate

11. End the class session by asking students to discuss two things:
    a. Points of connection between the simulator and the video
    b. Their overall takeaways from the exercise

Suggestions for Further Reading / Research

If you wish to continue the themes introduced in this lesson plan, here are three excellent direct ways to do that:

1. An **excellent Twitter thread**, with lots of links, by Hank Green about the recent Inflation Reduction Act (2022) and its potential impacts
2. **The Biggest Climate Bill of Your Life - But What does it DO!?**. YouTube video by Hank Green that discusses the IRA
3. The full **En-ROADS Climate Workshop** has a bevy of resources.