

## **Climate Change Solution Modeling**

Simulating Climate Futures in En-ROADS, a Climate Change Solution Simulator  
built by Sloan Sustainability Initiative at the Massachusetts Institute of Technology

Learn about the climate crisis and the choices we have to make by running simulations. Illuminate the conversation with information. Model the situation to provide context and remove sloppy thinking, illogical thinking, and poor understanding of basic science. Do not worry about defending your point, just use the model as a basis for discussion. It is not your job to argue for a climate scenario – it hasn't worked for climatologists and activists for the past 40 years! Arguing will not change the minds of others. Engage the hearts of others with logic and compassion.

You will not have to explain everything in the model, nor are you tasked with converting the minds of those who live in climate denial. I would like you to use this tool to build a conversation grounded in physics and the biogeochemistry. As Greta Thunberg stated so clearly:

The climate and ecological crisis is beyond party politics. And our main enemy right now is not our political opponents. Our main enemy now is physics. And we cannot make 'deals' with physics.

Consider the following process: Learn → Decide → Act. Start by using the En-ROADS simulator to develop models, then make a decision about how you will act, and then, ask yourself, what am I going to do to address the climate crisis?

Watch an introductory video about the assumptions in the En-ROADS model, learn how to change the assumptions, and how the model works. It uses Kaya drivers, or the Kaya identity, as a representation of the total emission level of CO<sub>2</sub> expressed by the combination of four factors: population, GDP per capita, energy intensity, and carbon intensity. The model also uses Shared Socioeconomic Pathways (SSP) models. Learn more about SSPs at <https://www.carbonbrief.org/explainer-how-shared-socioeconomic-pathways-explore-future-climate-change>

## **Description of the Activity**

### **Step 1. Learn how to use this tool in the following ways:**

1. A 3-minute demonstration video of the En-ROADS model at [https://www.youtube.com/watch?v=Odhl7Vd\\_ZUU](https://www.youtube.com/watch?v=Odhl7Vd_ZUU)
2. A detailed, 19-minute video of the En-ROADS model at [https://www.youtube.com/watch?v=7Muh-eoPd3g&feature=emb\\_logoA](https://www.youtube.com/watch?v=7Muh-eoPd3g&feature=emb_logoA)
3. A Guide to the En-ROADS control panel at <https://www.climateinteractive.org/wp-content/uploads/2019/09/EnROADS-one-page-guide-to-control-panel-v9-new-layout.pdf>
4. Access and use the En-ROADS model at <https://en-roads.climateinteractive.org/scenario.html?v=2.7.15>

### **Step 2. Develop your own scenario.**

For example, define your vision of how to limit global warming by 2°C by the end of the century. Clearly and succinctly write down your climate vision for our common future.

### **Step 3. Submit a write-up (these questions were adapted from En-ROADS).**

1. Specify your scenario of how global warming could be limited to 2°C (or the value you chose in your vision) by the end of the century.
2. What are the three most important parts of your strategy (i.e. the three most important sliders in the En-ROADS model) that are needed to meet your vision?
3. Describe the positive and negative feedback loops that were captured in the simulation.
4. Describe the actions and priorities needed over the next two years by businesses, civil society (NGOs), government, and the public.
5. Who would be the biggest winners and losers, globally, in your proposed future?
6. What surprised you about the behavior of the energy and climate system as captured by the simulation based on your assumptions?
7. What present-day trends in the world give you hope that we could limit global warming by 2°C by the end of the century?
8. What will you do to help create the needed changes?