



EN-ROADS

Climate Action Simulation

Facilitator's Guide

Andrew P. Jones, Ellie Johnston, Linda Cheung,
Yasmeen Zahar, Florian Kapmeier, Bindu Bhandari,
John Sterman, Juliette Rooney-Varga, Caroline Reed

December 2019



Welcome

This guide is intended to support your facilitation of the *Climate Action Simulation*, a group roleplaying mock UN summit that promotes greater understanding of the causes of climate change and the solutions essential to mitigating it. The game is framed by the En-ROADS computer simulation model, which allows participants to explore and rapidly assess the impacts of different solutions to address climate change during the event.

Similar activities:

- **World Climate Simulation** – A roleplaying game where participants play diplomats at a UN climate summit, like with the *Climate Action Simulation*. The primary difference is that *Climate Action Simulation* is paired with the En-ROADS simulation model and focuses on how sectors of activity like energy supply, energy use, and land use affect climate change; while *World Climate Simulation* is paired with the C-ROADS model and focuses on when and how much nations must reduce their emissions to reach the international climate goals. Since the *Climate Action Simulation* focuses on more specific solutions, it can be a nice follow-up event for groups who have played the *World Climate Simulation*.
- **En-ROADS Climate Workshop** – A non-roleplaying workshop format that is also paired with the En-ROADS simulation model. Compared to the game, the workshop can be run within a shorter amount of time or used with groups not interested in roleplaying.

Materials for all of Climate Interactive's group activities are available for free and can be found at climateinteractive.org.



Table of Contents

Welcome	2
Game Overview	4
Purposes	4
Preparation and Setup	5
Facilitation Roles	5
Event Registration	5
Room Setup	5
Dividing Participants	6
Time Required	7
Game Facilitation	9
1. Introduction	9
2. Group Assignments	9
3. UN Summit Opening Presentation	10
4. Round 1 Team Meetings	16
5. Round 1 Plenary Presentations	17
6. Round 2 Team Meetings & Negotiations	20
7. Round 2 Plenary Presentations and 8. Additional Rounds of Play	20
9. Debriefing Discussion	23
Appendix: Variations	27
Larger Groups (Over 60 people)	27
Younger Participants (under 18)	28
Short Amount of Time	29
Splitting into 8 Teams	29
Following a <i>World Climate Simulation</i>	30

Game Overview

The *Climate Action Simulation* game is premised on a fictitious climate summit organized by the United Nations Secretary-General to urgently address climate change. Influential stakeholder groups have been convened at the summit, and their directive is to work together to create a plan to limit global warming to well below 2°C and aim for 1.5°C above pre-industrial levels, the international goals formally recognized in the Paris climate agreement.

- The game is run by a trained facilitator acting as the UN Secretary-General who has convened the summit. The facilitator may be assisted by co-facilitators.
- Participants are divided into six teams that represent different global stakeholders of business, government, and civil society who can influence climate solutions. The typical groups to include are: Clean Tech; Conventional Energy; Industry & Commerce; Land, Agriculture & Forestry; World Governments; and Climate Justice Hawks. However, you may choose to change the groups to suit your audience.
- The game is run in multiple rounds as directed by the facilitator. During the team meeting period, teams discuss their climate solution strategies with each other. Then during the plenary presentations, each team proposes one action to be implemented or removed.
- Teams' actions are analyzed in real-time with the En-ROADS simulator to determine their effects on the climate.
- The game is played until a scenario under 2°C warming is reached, or time is up.
- The game is ideal for groups of 20 to 50 people. It is designed to be played by a wide range of audiences, from high school students and community members to industry professionals and policymakers.
- The game normally runs for 2 to 4 hours. Groups with less familiarity in these topics require more time to understand the information.

Purposes

The *Climate Action Simulation* was developed to address three important purposes:

1. **Insights and Understanding** – Enables participants to gain insights into the factors that affect climate change and what the solutions and possible paths are for equitably and effectively addressing climate change and achieving the international climate goals.
2. **Interactive Learning** – Create a participant-centered, interactive learning experience to explore the best available science on climate impacts and solutions. Participants drive their own learning, so they are more engaged and gain much more

than they would through a lecture format. They also learn from each other as they work together to create a new climate scenario for our global future.

3. **Follow-up Action and Diffusion** – Participants gain a meaningful climate leadership perspective and lasting impression through the game experience that can translate into change in the real world. They learn which types of climate policies and solutions make a difference and can advocate for them. They think and explore for themselves about their own role in addressing climate change. They can share about their game experience or become facilitators themselves.

Preparation and Setup

Facilitation Roles

The *Climate Action Simulation* can be facilitated by one person, but the ideal facilitation team includes two people – one person more focused on running the En-ROADS simulator and explaining its dynamics and the second person more focused on group dynamics and learning.

It can be helpful to co-facilitate with someone who has knowledge and skills that complement your own. For example, a scientist or science educator may want to co-facilitate with someone who is more familiar with policy, economics, or business. Enlisting co-facilitators also gives them an opportunity to learn how to facilitate. If you are the primary (or sole) facilitator, you will be playing the role of the UN Secretary-General.

In addition, the game works best when facilitators and participants actively play their roles, so lead by example and have fun with it!

Event Registration

An enormous amount of work has gone into developing En-ROADS and the materials for this game. We ask that you register your event, so we can evaluate the impact of our work and continue to receive funding for it. (climateinteractive.org/tools/en-roads/register-event/)

Room Setup

The room should be set up with:

- A projector and computer that has access to En-ROADS and the PowerPoint slides accompanying this game. The projected image should be large enough and positioned so that all participants can see it clearly.
- Chairs and tables for the groups. Each table should have a table tent sign with the group's name along with the handouts (see below for materials for each participant).
- Phone or stopwatch to keep track of time during the event.

- Somewhere out of sight, such as outside the room or in the back, store your formal clothes or accessories for acting as the UN Secretary-General during the roleplay period, e.g., a suit jacket, tie, or scarf.
- (optional) A white board or flip chart.
- (optional) Internet access for participants to do quick research or test out their proposals.

Materials for each participant:

- Briefing Statement (specific to their group).
- En-ROADS Control Panel Guide printed double-sided. (See Figure 1)
- (optional) Climate Change Fact Sheet.
- (optional) Name tags.

Write on board (optional):

- Sketch of possible temperature outcomes that you will use to ask participants to estimate the impact of their actions before inputting into En-ROADS. (See Figure 2)

Dividing Participants

Participants are divided into groups and given briefing statements describing their respective group. Groups can be divided up and given their briefing statements in advance or during the event. Each group is comprised of roles for influential decision-makers from their sector such as CEOs, government leaders and other important representatives.

The typical six groups are:

1. **Conventional Energy** – coal, oil, natural gas and nuclear energy producers who deliver 95% of the world's energy supply; and the utilities and firms that deliver this energy to consumers and provide equipment to these industries.
2. **Clean Tech** – renewable energy producers (solar, wind, hydropower, geothermal); bioenergy producers); and the growing clean tech industries including energy storage, electric vehicles, energy efficiency, green buildings and yet-to-be-commercialized zero-carbon energy and carbon capture technologies.
3. **Industry and Commerce** – the major industries that drive energy consumption including automakers, airlines, shipping and freight companies, public transit

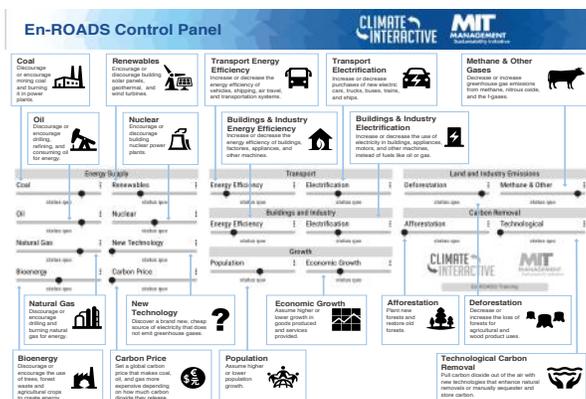


Figure 1: Control Panel Guide front

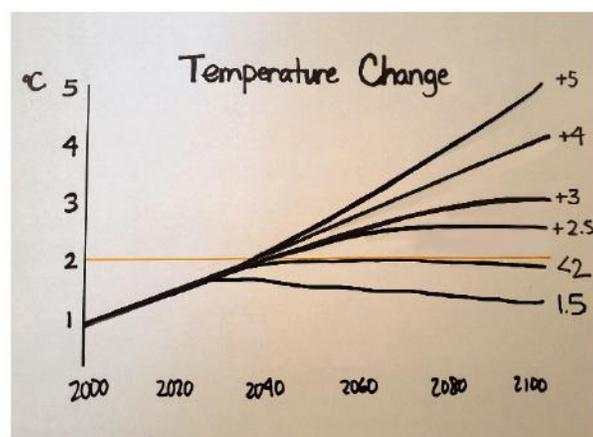


Figure 2: Temperature paths until 2100

authorities, industrial machinery, construction, real estate, consumer goods (clothes, electronics, furniture, etc.), information technology, and other large corporations.

4. **Land, Agriculture & Forestry** – agricultural, food, and logging companies; the largest landowners, government ministries of forests and agriculture; and land conservation agencies.
5. **World Governments** – government leaders from developed and developing nations who represents their countries at international bodies like the United Nations.
6. **Climate Justice Hawks** – leaders of the growing climate, social justice, and environmental justice movements; representatives from developing nations and vulnerable communities on the frontlines of climate impacts seeking ambitious climate action that limits warming to 1.5°C.

If applicable, place participants in the groups most unlike their real-world role in the climate policy dialogue (e.g., put environmentalists in the conventional energy group).

Facilitators can add or remove groups to fit their setting of interest. For example, a group in Brazil might substitute in a group representing the Brazilian government. Feel free to write your own briefing sheets and share them with our team at Climate Interactive. In the Appendix, we have also suggested a variation of the game with 8 total teams when World Governments is split into three teams: Developed Nations, Rapidly Emerging Nations and Developing Nations.

If you change the groups, one consideration is to be aware of the balance of groups actively supporting climate action and those that might hold it back. Roleplay varies from group to group, but it will generally be more engaging with some tensions within and between groups. A two-to-one ratio of groups strongly pushing for reducing emissions versus groups holding back progress has worked well.

Time Required

Typically, two to four hours are recommended for the entire session; allow more time for audiences who are new to the topics so they can better develop their game strategies. Ideally you would have about two hours for the initial presentation and roleplaying, and about one hour for the debrief. However, many variations are possible, from making it into a multi-day event to holding an abbreviated version in an online webinar.

Here is the estimated schedule of events:

1. Introduction	5 - 10 min
2. Group Assignments	10 - 15 min
3. UN Summit Opening Presentation (roleplay game begins)	10 - 15 min
4. Round 1 Team Meetings	10 - 15 min

5. Round 1 Plenary Presentations	15 - 20 min
6. Round 2 Team Meetings & Negotiations	15 - 20 min
7. Round 2 Plenary Presentations	10 - 15 min
8. Additional Rounds of Play	10 - 15 min
9. Debriefing Discussion	30 - 60 min
Total	2 - 3 hours

1. **Introduction** – Facilitator delivers informal introductory presentation before officially opening the mock UN summit (in step 3), providing background information on climate change, an introduction to the game play and goals, and a quick look at the En-ROADS simulation model. (5 - 10 minutes)
2. **Group Assignments** – Participants are divided into 6 roughly evenly sized groups and given a briefing sheet that describes who they represent and what their group's assignment is (this can also be done in advance). Participants take time to read their briefing sheet. Group members can talk within their groups to exchange views and develop a common understanding of their group. During this time the facilitator or co-facilitators can go around and check in with the groups individually. (10 - 15 minutes)
3. **UN Summit Opening Presentation (roleplay game begins)** – Facilitator takes on the role of the UN Secretary-General and begins the roleplay game by delivering a passionate speech about why the summit has been convened — reinforcing the stakes of climate change, the role each group has in addressing it, and the goal for the summit, which is to limit global temperature rise to well below 2°C and aim for 1.5°C. (10 - 15 minutes)
4. **Round 1 Team Meetings** – Participants take a little time to individually consider the actions their group should propose versus oppose. Then group members discuss with each other to align on their team strategies and proposed action for Round 1. (10 - 15 minutes)
5. **Round 1 Plenary Presentations** – Each group makes a short presentation to the plenary, laying out one proposed action to add or remove from the climate plan that has been created so far. Each proposal is entered (or removed) in En-ROADS to test its impact, and the action is briefly discussed by the whole group. After every group has put forward an action, Round 1 ends with a short discussion about results from the round. (15 - 20 minutes)
6. **Round 2 Team Meetings and Negotiations** – Teams have time to discuss additional strategies for follow-up actions; and this time the floor is also opened for negotiations. Groups are encouraged to reach out to other groups, seek to understand their positions, and affect their proposals. (15 - 20 minutes)

7. **Round 2 Plenary Presentations** – Following negotiations, each group gets another chance to lay out a proposed action to be inputted into En-ROADS. (10 - 15 minutes)
8. **Additional Rounds of Play** – Teams continue to make plenary presentations and enter the actions into En-ROADS together. The game is played until participants either reach the goal or run out of time. (10 - 15 minutes)
9. **Debriefing Discussion** – After the mock summit concludes, the facilitator asks everyone to step out of their roles and reflect on the experience, focusing on feelings, hope, and call to action. (30 – 60 minutes)

Game Facilitation

1. Introduction (5 - 10 minutes)

Dress more casually than you will dress later, when you are playing the role of a UN official. Begin by welcoming the participants as themselves, not in the roles they will soon play. Briefly introduce the background and motivation for the event, the urgency of addressing climate change (sometimes this is included later with the Secretary-General's Opening speech), the use of the En-ROADS simulator, and the event agenda. There are presentation slides available on the Climate Interactive website to support this introduction, however select what suits your audience and needs. Limit this segment to about 5-10 minutes; you want participants interacting with the model and each other as soon as possible, instead of sitting and listening.

2. Group Assignments (10 - 15 minutes)

After you have made your introductory speech, finalize the group assignments. Group assignment can be made in advance, if you know all the participants ahead of time. Here are three approaches to group assignments:

- Let participants randomly sort themselves into the available seats around each table as they enter the room in the beginning.
- Pre-assign the group members if you have some information about the participants prior to the event that you want to use for assigning them to their roles.
- Let participants choose their seats themselves e.g., “Choose the group with which you would most identify with”; and afterwards, you redistribute them to the groups unlike their preferred choice. Adjust as necessary to ensure groups are roughly evenly sized

Once all the participants are in their groups, turn their attention to the briefing sheets which describe their group's goals. Give participants some time to read them. Group members can talk within their groups to exchange views and develop a common understanding of their group. The facilitator can go around and check in with the groups individually.

While participants finish reading over their briefing statements, step away into another room and put on your official dress as Secretary-General—e.g., tie/scarf and suit jacket.

Sample Script: "Take a couple minutes to read the briefing sheet about your group, then discuss with your team to develop a common view of your group's identity and goals. When the summit starts in a few minutes, you will not be yourselves – you will be leaders and important representatives from different stakeholder groups. Please play your roles."

3. UN Summit Opening Presentation (10 - 15 minutes)

When you are ready to begin the roleplay game, ask someone on your team to introduce you by pounding a gavel or calling the room's attention and announcing:

"Ladies and Gentlemen. May I have your attention please. Please rise and welcome the Secretary-General of the United Nations!"

Stride in. Do not smile. Formally but graciously welcome the group of world leaders (participants) to the climate action summit to address the climate crisis.

The essential features of the opening speech as the Secretary-General include:

- A. Welcome and introduction of groups
- B. Summit goals
- C. Urgency and historical precedent
- D. Game mechanics
- E. En-ROADS overview

Example of facilitator's opening comments:

A. Welcome and introduction of groups

Welcome participants and describe who is in the room.

"Welcome to the Climate Action Summit. Thank you for taking time out of your busy schedules to attend on such short notice. You are gathered here today as key global stakeholders who must work together to determine the best way to address climate change. I would like to start by recognizing the groups in the room. We have six sectors (point at each group and name the six sectors around the room with a brief

description of who they are).”

B. Summit Goals

State that the goal of the summit is to create a scenario that limits warming to well below 2°C and aims to get as close to 1.5°C as possible. For example:

“The Paris Agreement, signed by the nations of the world in 2015, outlined a goal of limiting global warming to well below 2°C and aims to get as close to 1.5°C above pre-industrial levels as possible. While this event was pivotal, it was just the start of our journey to solving the climate crisis together. Analysis by Climate Interactive shows that the pledges that countries made, even if fully implemented, are only enough to limit global warming to 3.2°C, far short of 2°C.

Therefore, I have brought you together to work within and across our spheres of influence to solve the climate crisis together.

The mission of our summit today is to create a feasible roadmap to stay well below 2°C and aim to 1.5°C of warming.

Avoiding the worst impacts is still possible, but only if we act immediately. You must balance the need for climate action with that of your own and your stakeholders’ needs. I have the utmost confidence in our ability to succeed today. In fact, we need to succeed, because we are running out of time to take meaningful action and everything is at stake.”

C. Urgency & Historical Precedent

Build urgency by using vivid details to describe some of the impacts already happening due to climate change, perhaps citing a recent climate-related natural disaster from the regional news. After making the case for urgency, provide a historical example of bold action as proof of humanity’s ingenuity to solve big problems and to remind people that change can happen quickly.

To build urgency:

“We are meeting at a difficult time in human history. Recent analysis from the IPCC (Intergovernmental Panel on Climate Change) shows that we only have about ten years left to enact sweeping solutions in order to limit warming to 2°C and as close to 1.5°C as possible. Warming above these levels will yield catastrophic and irreversible impacts to the economy and human welfare of all nations. Even going from 1.5°C to 2°C of global warming would expose several hundred million more people to potentially life-threatening climate impacts and poverty.

It is also important to understand that the climate crisis doesn’t start at 1.5 or 2°C. It is already here today. Greenhouse gases emitted by human activity have already

increased global temperature by 1.1°C. Higher temperatures are already dragging out droughts and wiping out crops. Himalayan glaciers that provide water to some 240 million people are already melting. Storms like Hurricanes Harvey, Irma, and Marie are already getting stronger due to climate change. The list goes on.”

To add a fictional personal touch:

“Last week I received a call from you, Mrs. [or Mr.] CEO of Fossil Fuel Multinational, Inc. (or insert other name). I was sad to learn that you lost somebody close in the recent forest fires in California, leading you to advocate for this meeting today—a meeting I’ve been requesting for three years now.”

To provide historical precedence:

“While we face an enormous challenge, I am here to remind you that we have what it takes to solve the climate crisis. The decision makers who can catalyze the solutions are here in this room today. Furthermore, humanity has come together and proven our courage and willpower to solve many problems and crises by acting swiftly in other times in history.”

Tell the story of an example for when people have risen together swiftly to face a great challenge. Here are a few, or choose your own:

- Example for U.S. audience – “I’m reminded of another time in history when our nation took swift and bold action after a horrible event. On December 9, 1941, the United States was bombed at Pearl Harbor. President Franklin D. Roosevelt immediately invited the Chairman of General Motors, the United States’ largest automobile manufacturer, to Washington DC. The Chairman proposed modest decreases to the building of civilian vehicles and modest increases of military equipment such as tanks. Two days later, President Roosevelt had convinced him to eliminate production of civilian vehicles to shift factories to support the war effort. Other programs in metal recycling, rationing of meat, increasing “Victory Gardens,” and other public efforts followed.”
- U.S. example – In 2019, the U.S. celebrated its 50th Anniversary of the moon landing, which had been considered an extraordinary achievement and engineering feat.
- International example – After the Fukushima nuclear accident caused by an earthquake in 2011, Japan replaced half of its nuclear power capacity with energy efficiency. Japan was in a seemingly impossible situation. A tremendous amount of conventional generation capacity was unavailable, including its entire nuclear fleet, and the country faced the risk of blackouts during summer consumption peaks. Miraculously, in just a few short weeks Japan managed to avert the rolling power

cuts through energy efficiency and conservation actions. Moreover, they turned these emergency measures into lasting solutions.

- International example – The 2015 Nepal Earthquake is an example of resilience and solidarity. The 7.8 magnitude earthquake that hit the country on April 25, 2015 followed by a 7.3 magnitude aftershock two weeks after led to more than 8,000 human fatalities and about 600,000 settlements destroyed and several thousand people displaced. Rising above the tragedy, respondents near and far including civil societies, humanitarian agencies, independent volunteers, private sectors, local governments, and foreign countries joined hands to provide emergency response and recovery immediately. A noteworthy example of quick and tremendous partnerships across local, national and global levels.

Link the historical example to today:

“We are in a similar moment that demands the best optimism, cooperation and solutions that humanity can create. In this Climate Action Summit, we have a very limited amount of time to determine a global plan to address global warming and prevent the worst-case scenarios for climate disruption.”

D. Game Mechanics

Before launching the first round of negotiations, take a few minutes to explain the key game mechanics and orient participants to the En-ROADS control panel.

“Here is the agenda for today’s meeting. You will have some time to discuss strategy with your team and others during a negotiation round. Then we will proceed into a round of plenary presentations, where each team will take turn proposing actions – choosing from the available levers as shown on your one-page Guide to the En-ROADS Control Panel <lift a guide for participants to see>. I will invite the first team to propose one policy or investment by sending up a delegate to give a short speech to the whole group about their proposed action. We will input that action in the En-ROADS simulator to examine its impact on global temperature increase as a group. Each team will be invited to propose another action, or they can choose to undo a prior action. After every group has a chance to go, we will go into a second round of negotiations and plenary presentations to propose more actions. We will continue until we reach our goal or run out of time. Good luck!”

E. En-ROADS Overview

This could be a continuation of the Secretary-General’s opening speech or an opportunity for a co-facilitator to step in and orient people to the En-ROADS simulator and control panel.

“We are about to begin the first round of Negotiations. Before we do that, let’s take a moment to orient you to the En-ROADS simulator <point to screen> and the set of levers you can choose from by referring to your Guide to the En-ROADS Control Panel <lift guide>.”

First, show the temperature graph and “business as usual” future:

“If we take no additional action, we expect that <point at temperature graph> global temperature will increase dramatically from today out to year 2100. This is a graph of global temperature change from the year 2000 to 2100. We have already heated up the planet by 1.1°C <point>. If nothing changes, we are headed well beyond 2°C, to over 4°C by the end of the century <point>. Our goal is to limit warming well below 2°C, and aim for 1.5°C, which are the dotted lines <point> here.” (See figure 3)

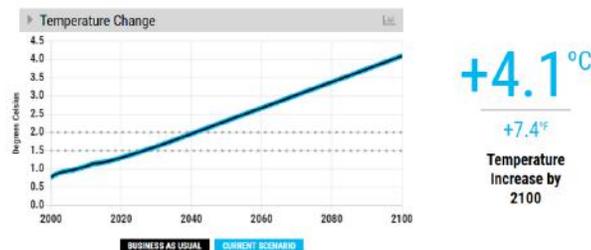


Figure 3: Temperature Change graph

In the US, some facilitators prefer to use the Fahrenheit temperature scale. You can switch the units in En-ROADS under the ‘view’ menu and change the goals in your presentation accordingly.

Second, orient participants to the Control Panel:

“Using the En-ROADS climate simulator model, you have 18 types of solutions that can be proposed to affect future warming. <point at levers on screen and guide> Your Guide to the Control Panel <wave guide> is a handy reference to the solutions you can propose during the summit.”

For a brief and simple set-up, you could conclude your introduction here and move into Round 1 Team Meetings.

For a longer and more advanced introduction, continue below:

Third, describe the drivers of greenhouse gases from energy consumption by switching to the Kaya Graphs view in En-ROADS [from Dropdown Menu on top > View> Kaya Graphs]:

“These five graphs show the drivers of carbon dioxide (CO₂) emissions through our global energy consumption, which reflects about 2/3 of all greenhouse gas emissions. The other third of emissions are from land use changes and other gases such as methane (CH₄) and nitrous oxide (N₂O).”

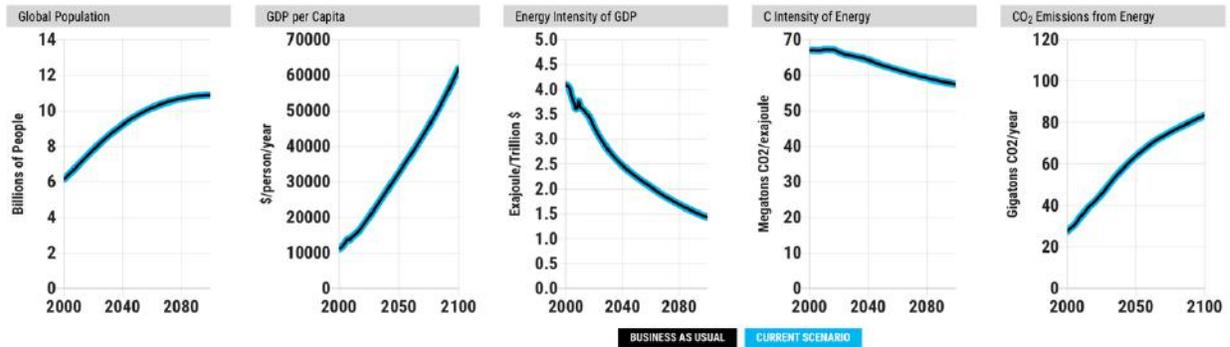


Figure 4: Kaya graphs

1. “**Global Population** is growing — we are at about 7.7 billion people right now—and anticipate growth to roughly 11 billion by the end of the century, according to UN projections. The rate of population growth is slowing over time as people have smaller families.”
2. “**GDP per Capita** is growing steadily per year, mostly as people in rapidly developing countries such as China, India, South Africa, Mexico, Brazil, and Indonesia attain higher standards of living.”
3. “Simultaneously, the world economy is becoming more energy efficient, or using less energy per unit of economic output – as shown by the **Energy Intensity of GDP** decreasing over time. Technologies are improving—more efficient cars, buildings, machines and so on—and economies are shifting from manufacturing to service.”
 - “The product of the first three — Global Population, GDP per Capita, and the Energy Intensity of GDP — is equal to the total amount of energy used by the global economy.”
4. “**Carbon Intensity of Primary Energy** – the amount of carbon dioxide emitted by energy use is expected to slightly decline over time. Overall, this downward trend in carbon intensity is attributed to the gradual shifting away from fossil fuels and towards low-carbon energy sources.”
5. “Multiply all four factors together, and you can see that overall **Carbon Dioxide Emissions from Energy** is growing each year, leading to the increase in temperature.”
 - “These factors explain in simple terms, why emissions are going up: the improvements in energy efficiency and decarbonization are not keeping up with the strong growth in population and energy consumption.”

One way to use these graphs: if someone asks what can be done to reduce carbon dioxide emissions from energy, there are four choices: fewer people, less consumption, more energy efficiency, and less energy from fossil fuels.

Fourth, go back to the Main Graphs View and show the Sources of Primary Energy:

“What are the sources of energy? We can see on this graph: Burning coal in brown, oil in red, and natural gas in blue. You can see oil and gas leveling out here in the second half of the century as we reach supply limits and prices rise, but there is lots of abundant cheap coal, so it just grows. Renewables, such as wind and solar, are in green. They are growing very quickly but still make up the minority of our energy supply in the future if we don’t make any changes from business as usual. Nuclear is in light blue, and bioenergy is in pink.” (See figure 5)

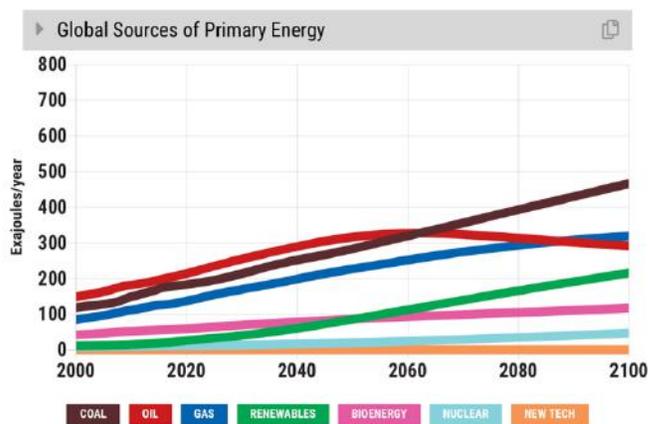


Figure 5: Sources of Primary Energy

Finally, pause for questions before moving into the team meetings:

“So this is the En-ROADS simulator and business as usual future at a glance. Any questions about the basic mechanics before we move into Round 1 Team Meetings?”

4. Round 1 Team Meetings (10 - 15 minutes)

Teams have time for to meet and prepare proposals for Round 1 Plenary Presentations. In their team meetings, groups should internally discuss their game strategies and align on their proposal for Round 1. Note that it can take some time for groups to build consensus, but there is a lot to cover so be aware of how much time you have. You can start by prompting participants to individually mark their proposals before discussing as a group.

For example:

“On your Guide to the En-ROADS Control Panel <lift guide>, each of you should circle the 2-3 actions you think your team would most want to implement, and the 2-3 actions you think your team would oppose. Then talk as a group about your ideas. Align as a group your one proposed action for Round 1, and your strategies for the summit. Each action can include one step in either direction (left or right) on one of

the 18 levers, as detailed on the back of your Control Panel guide. You will have 2 minutes to explain to everyone why your group is choosing the action. Make your cases as compelling as possible. You have ten minutes for your meeting.”

You and your co-facilitators should go around and check in on each group and coach them on their goals and strategies. When time is up, close the team meetings by calling everyone back.

5. Round 1 Plenary Presentations (15 - 20 minutes)

Open the Plenary Presentations. Tell teams that they should appoint a representative to deliver a less than two-minute presentation of their proposal.

The order of teams you call on does not matter significantly. However, the teams from Conventional Energy and Climate Justice Hawks may have more extreme views, so you may want to have them go after another group or two takes a turn.

Available Variation: Ask groups to also mention in their presentation:

- A near-term co-benefit from their proposed action. Find information on co-benefits in the En-ROADS User Guide or explore case studies featured in Climate Interactive’s Multisolving program at climateinteractive.org/programs/multisolving.
- What should be done during implementation of the action to ensure that vulnerable people are not adversely affected by the policy.

Invite a representative from the first team to present their action, why they chose it, and perhaps what they want others to do – within a two-minute speech. If you have a timer you could hold it up to emphasize the time limit.

Listen closely to their speech, demonstrating the sort of focus you want others to employ. Amidst all the rhetoric, note the specific action that is being proposed. You may need to clarify or correct their proposal. For example:

- Don’t allow two actions in Round 1 (many will attempt this). There will be time for additional actions in later rounds. This enables you to discuss one action at a time and pace the gameplay accordingly.
- If they propose a conditional action (i.e., we will do this if they do that) encourage them to make the deal either right on the spot or later in the next team meeting and negotiation period. Conditional actions that are not clearly satisfied are not entered into the model.
- Details about the actions that are outside the scope of the model are welcome, but make sure there is some actionable item to test out in the proposal.

At the end of the speech, call for brief applause and thank the delegate.

Then you will enter the action into En-ROADS.

Assume for the following example that someone proposes to “Increase Energy Efficiency in Buildings and Industry.” You can skip or breeze through some of these steps as the game advances, but for the first time, do a **comprehensive overview of the action**:

1. **Restate what the participant said** – *“The Clean Tech team has proposed improving energy efficiency in buildings and industry.”*
2. **Before moving the slider, ask participants to mentally simulate the impact** – *“How much of a difference do you think this will make? Would temperature increase drop to 4°C? 3? 3.8? 2? Think of a number in your head.”*

Use the temperature paths drawing if you have one (see Figure 2.) Encourage participants to call out their predictions. This is the time when you are helping people surface their assumptions about how the system works.

3. **Input the action into En-ROADS and explain where it fits** – *“This moves the lever called ‘Energy Efficiency – Buildings and Industry’ which you can see here <point> (See Figure 6). Let’s assume the whole world takes this action starting next year and continuing through the century. This would also include improving the efficiency of commercial and industrial buildings and motors and....” <Possibly open the “Advanced” pane of the slider to show what is being changed more specifically.> “Efficiency was improving at 1.2% per year. Now we increase it from Status Quo to Increased, which is about 3% per year. That means all new capital for buildings & industry entering the economy will improve their energy efficiency by 3% every year into the future.” (See Figure 7)*

Note: Each action can include either a single leap or a drop in the slider descriptor e.g. from “status quo” to “increased” OR “status quo” to “discouraged”. This moderates the amount of change for each proposed action.

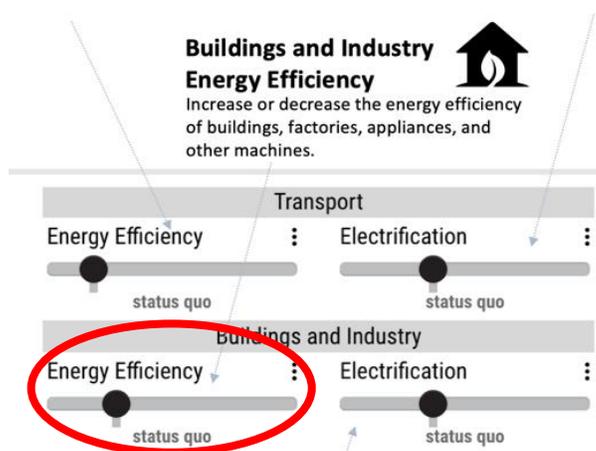


Figure 6: Energy efficiency B&I lever

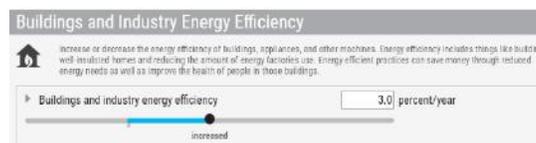


Figure 7: Advanced detail

Find detailed explanations of slider and model dynamics in the complete En-ROADS User Guide found at: <https://docs.climateinteractive.org/projects/en-roads>

4. **Show the graph that shows the most direct impact in question and replay the action** – In this case, pull up the ‘Energy Intensity of GDP’ graph under ‘Population & GDP’. Restate the base assumption. *“See the blue line? We’ve assumed that energy efficiency is going to keep improving on its own.”* (See Figure 8)

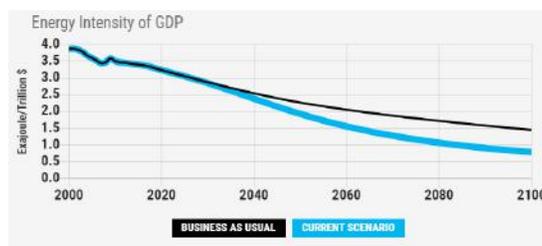


Figure 8: Energy Intensity of GDP graph

“Watch the blue line as I replay the action, turning on and off the proposed action in the model. The blue line departs from the black line (business as usual) as the overall energy intensity of the economy improves even faster.”

Move it back and forth 2-3 times <using the Undo and Redo buttons or the Replay Last Change button on the top toolbar of En-ROADS>.

5. **Direct participants’ eyes to the graphs that show more distant impacts** – In this case, you would go back to the Default Graphs <using the Default Graphs function as shown with a house icon on the top toolbar of En-ROADS> and show the lines for coal and natural gas shifting down (left graph) and then the temperature impact (right graph). (See Figure 9)

Again, replay the action several times. *“The world is more and more efficient, so energy demand goes down relative to what it would have been otherwise, so we burn fewer fossil fuels and emissions go down, so temperatures go down.”*

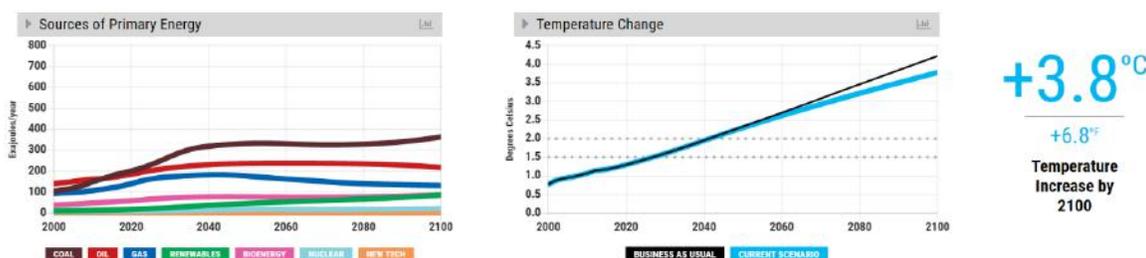


Figure 9: Default Graphs

6. **Explain model behavior** – Explain briefly why the action has the result it does in the model. When possible, cite reasons involving the structure of the system; for example, the long delays in energy transition, the “rebound effect” via energy price and demand, the reinforcing “learning” feedback loop and so on, as described in the En-ROADS User Guide: <https://docs.climateinteractive.org/projects/en-roads>.

- 7. Summarize** – *“If the whole buildings & industry sector improved its energy efficiency every year, then we’d burn less coal and gas, reducing emissions and temperature.” Then ask, “Did it solve the whole problem?” (No!) “Did it help?” (Yes!) “This action is not a silver bullet. It could be part of a suite of actions that, together, could help meet climate goals.”*

You shouldn't go through all these steps with each proposal for the sake of time. After the first proposal, move on to the next group. Keep the proposals moving along.

Discuss results from Round 1 proposals (if there is time):

After each group has had a turn, summarize where the plan that has been proposed gets us and take a little time for reflection on the results. Encourage participants to talk about the insights and implications of their actions so far in order to support their strategy and actions in the next round.

6. Round 2 Team Meetings & Negotiations (15 - 20 minutes)

Open the Round 2 Team Meeting & Negotiations period, giving teams time to consider additional actions or reconsider already proposed actions in light of the results so far. With the floor now open for negotiations, encourage groups to reach out to other groups to discover their positions and lobby them to change their strategies if necessary.

“Now that we’ve inputted our first round of actions, we have a second period of team discussions. This time, I encourage negotiations between groups. You may go to other groups to learn about their strategies and lobby them to change their strategy as necessary. Take a few minutes to align within your groups about how to approach this negotiations round. We suggest keeping a couple representatives at your table and sending the rest to talk to other groups. You have 15 minutes for Team Meetings & Negotiations, starting now.”

7. Round 2 Plenary Presentations and...

8. Additional Rounds of Play (15 - 30 minutes)

Enter the final rounds of plenary presentations where groups once again propose actions that are tested in *En-ROADS*. Continue allowing the teams to take turns with proposals until the group feels that their summit goal has been met or time is up. If you want to speed up the game, you may enable teams to propose up to two actions per turn after Round 1.

Available Variation: You may decide to make access to the En-ROADS simulator available to participants after Round 1, so people can use the simulator in their discussions to come up with proposals. It is better to restrict access to the model in the first round as the learning experience is enhanced when leaving the results of the actions a surprise.

As you continue through the rounds of play, remind everyone of the game's top insights about climate strategy:

- **There is no “silver bullet” to address climate change as many people may say or hope.** Many actions in many sectors are required. Some actions may be much lower leverage than people think, while others like carbon pricing and energy efficiency might be higher leverage than people expect.
- **We can do it.** Avoiding the worst-case future is still possible. If participants express frustration that the game is hard to “win”, remind them that En-ROADS is grounded in the best available science, so this is representative of how enormous the challenge is that we really face. You can discuss this more in the debrief.

En-ROADS Model Insights & Dynamics:

Along the way, you will likely mention several or many of the top insights about the dynamics of the energy-land-agricultural-economic-climate system in order to answer questions about why the model is behaving as it does. It is important that you have reviewed the training webinars on the Climate Interactive website and the En-ROADS User Guide (see <https://docs.climateinteractive.org/projects/en-roads>) in order to understand the En-ROADS model dynamics before running a game.

As the game advances, the dynamics of the multiple levers interacting in the model may become more difficult to predict or explain. You may run into unexpected twists and combinations of policies that you aren't familiar with because of the ability to propose actions and take them away. Since En-ROADS is a nonlinear model that incorporates the interactions between many levers, policies will have less impact if other policies impacting the same part of the system have already been put in place. It's okay if you can't predict what the result of an action will be, and don't feel like you need to have an explanation for everything. In fact, it is better to be honest and say that you don't know an answer and will look into it. The [En-ROADS User Guide](#) will be your best resource for finding answers about model dynamics, or you may email our team if you cannot find an answer.

If your group's scenario does not meet the goal of less than 2°C rise:

You could emphasize the consequences and refer to our presentation slides for supporting information. For example, if they reach 3.2°C, show the impacts at 3-4°C, then step back to allow the participants to quickly propose ideas for better results outside of their roles.

Note that it can be difficult to lower future temperature from, say, 2.4°C down below 2°C with what participants think are realistic proposals. This is a feature of the world and the limited time we have remaining to take serious actions, not a flaw of your facilitation, the game, or the model – since 1.1°C of temperature rise has already occurred.

You may need to direct the group toward graphs that reveal what is pushing temperature up. The two best candidates are:

- **Greenhouse Gas Net Emissions by Gas – Area** – This graph shows greenhouse gas emissions by type. For example, in the 2.5°C scenario, you can see (in Figure 10) the brown area of Energy CO₂ has been reduced but little progress has been made on the blue area of methane.
- **Sources of Final Energy Consumption by Source – Area** – This graph shows the amount of energy consumed by type of energy. For example, in the same 2.5°C scenario, you can see from this graph (in Figure 11), that most of the energy is being supplied by renewables (green area) and natural gas (blue area) by 2100. Since natural gas is a source of methane and CO₂ when burned, it should be targeted if the group wants to reduce emissions more.

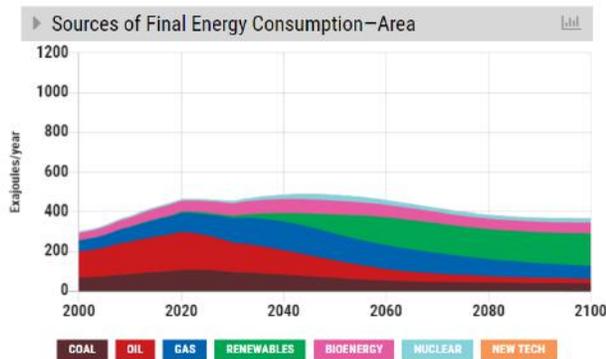


Figure 11: Sources of Final Energy

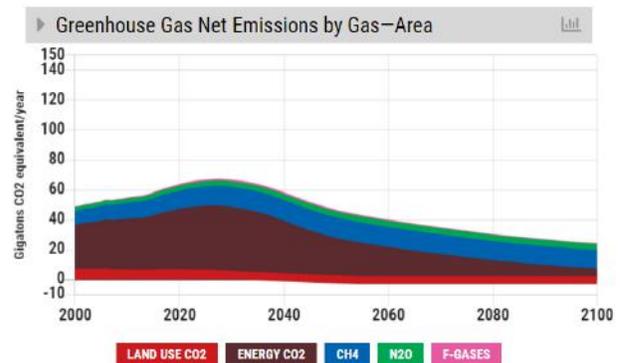


Figure 10: Greenhouse Gas Net Emissions

Closing the Summit

Eventually the group will either create a scenario in En-ROADS that could limit warming to 2°C or 1.5°C, or the group will run out of time. When the participants are successful, congratulate and lead them in a huge applause for their accomplishment, acknowledging the possibility of this future. If they are not successful, state the progress they made and that “we still have crucial work to do”. Recap the major inputs and outputs of the group’s scenario.

For example:

“Delegates. Our proposals today successfully limit warming to 1.7°C. We will get there by investing in energy efficiency, reducing deforestation, etc. <Summarize the elements of the plan>. According to the En-ROADS simulator, this future is technically possible. Now we must figure out how to make it a reality. We have taken a huge step forward today by working together across key stakeholder groups to create a vision for a future that avoids the worst of climate change. Yes, the journey will be tough, but now we are equipped with a plan. We can and we must do it!”

9. Debriefing Discussion (30 - 60 minutes)

Once the roleplaying period ends, it is important that you take participants through a discussion to reflect on the experience and draw out insights from it before they leave the event. Even if it is short, the debrief will help ensure participants take the most away from the experience.

Begin Debrief and Explore Feelings

Remove your tie and/or blazer and scarf. Tell your participants to re-arrange their chairs into a large circle for the debriefing discussion and step out of their roles.

“Hands up if you thought that was an intense experience. <wait for hands> I just asked you to play a role you’ve never played, one that is perhaps quite different from your actual role in the world. How are you feeling? For example, mad, sad, glad, scared, or confused. Note that I’m not asking what you think about the model or the scenario. I’m asking for feelings.”

Ask participants to stand and go to a part of the room that best describes their feelings at this point. Designate different parts of the room for anger, sadness, hope, mixed feelings. After participants sort themselves accordingly ask for comments on why they chose the place they are in.

One reason that we ask people to talk about their feelings is that people often have strong experiences and develop strong emotions in the game. Maybe they didn’t know climate change demands so much change or maybe the gameplay got particularly intense. Because this is a group activity, it helps for people to name these emotions in the group and process some of them before they leave the room.

Moment of Silence

Next, invite your participants to take a moment of silence to reflect on future possibilities. You could say:

“When we talk about future scenarios for our climate, we spend most of the time focused on how bad the worst-case future looks or how difficult change will be. Instead, I’d like for us to spend just one minute silently considering the possibility that we could create this better future.”

Start a timer, stop talking, and don’t speak for a full 60 seconds. This is a very important moment of the workshop and initiates a period of increasing hope and possibility. Participants may be invisibly prepping themselves to find resolve, a vision of a better future, and commitment to do something about it. Treat the moment with respect.

If you want, you can follow up with a second question:

“Think of something you would love about being part of this sort of future.”

Ask participants to turn to the person next to them and tell them to briefly share their answer. Perhaps ask if a few want to share what they said with the whole group.

Building or Rebuilding Hope

Now help participants recognize that although the challenge is big, there is much that can be done, and we are in it together. Three approaches you could take to build hope:

Your Own Hopefulness – Explain why you are personally hopeful. Some approaches include:

- **Use a personal story** – maybe you have a story about overcoming great odds that you or someone you know was a part of. Perhaps a time when you thought the path ahead looked very hard and you were able to overcome great odds to succeed.
- **Humans have addressed “impossibility” before** – We can look to human history for evidence of success and adopt the approach of addressing climate change. (Read this [New York Times Op-Ed](#) by Climate Interactive’s Co-Director Drew Jones for more on this).
- **Hope is a choice, not an assessment** – You could say:

“Hope is a choice, not hinged upon an assessment of the likelihood of future success. Being hopeful is about choosing to prevent this huge problem every day because it is the right thing to do, not because you know that we are going to win.”

Highlight good news trends – You can cite evidence or tell stories of significant recent progress. Examples include:

- Falling cost of wind and solar coupled with peaking emissions of carbon dioxide from coal.
- Increasing public awareness of climate change and support for climate action from polling.

- More companies, cities and states pledging to go 100% renewable or take other climate actions.
- The increasing number of young people demonstrating for more ambitious action against climate change.

Emphasize co-benefits to climate action (multisolving) – Emphasize the many co-benefits beyond the direct impacts to the climate, which may make successful adoption of climate solutions all the more possible. Common examples include:

- Shutting down a coal power plant also improves local air quality which reduces health impacts like asthma that come from local air pollution.
- The clean tech industries, including renewables and energy efficiency, can be a major source of new (and often more rewarding and healthier) jobs.
- More examples of co-benefits can be found throughout the En-ROADS user guide: <https://docs.climateinteractive.org/projects/en-roads/>

Their Hope – Often participants will have their own stories that inspire hope and possibility. Give people space to share their experience.

- Give them a few minutes to write down why they are hopeful.
- Have them reflect in pairs.
- Ask them to share with the group.

The Call to Action (Don't Skip This!)

The purpose of this workshop is to motivate effective action in the real world, so now is the time to make it happen. Helping people see what they can do to channel their emotions (both positive and negative) into constructive ends. Approaches vary from very simple to quite elaborate. At the simplest level, just say:

“Turn to the person next to you and tell them one thing that you feel called to do after this experience.”

Give people time to talk and process. There is a broad range of possible actions, from changing one's personal impact on climate change, to participating in collective action with others, to learning more and talking with others. Sometimes this might just mean going home and talking about the event with those they live with. Then have a few people share their plans with the group.

From here you can wrap up the exercise and thank everyone for their participation and engagement—or include some of the additional activities below.

Additional Discussion (optional)

- Depending on the time available and your goals for the game, you could facilitate a discussion by asking some of these questions:
- What surprised you about the results you achieved and the difficulty (or ease/possibility) of achieving them?
- To what extent did your proposals taken together produce the result you expected, or hoped for? Why or why not?
- 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?
- (If $<2^{\circ}\text{C}$ goal was not ultimately reached) What might you have proposed that could have helped us to achieve our goal. You may use the model for a couple of rounds of speculation.
- If time allows, run sensitivity tests in En-ROADS, in which all levers are reset, and individual levers are adjusted one by one to see their individual impact. This exercise is helpful for learning about the leverage of different individual actions, which can be difficult to see amongst the many other levers that are changed during the game.
- What impact do you envision the result you achieved will have on the interests you were representing in the roleplay?
- To what extent is the result you achieved feasible? From an economic standpoint? A political standpoint? A social, technical or cultural standpoint?

Optional Treaty Signing

If you have time at the end the event, you may choose to hold a mock treaty signing to honor the group's commitments from the experience. Choose how you want to manage this process. Delegates may file in a line to sign the treaty that is located on a central podium or table to give it a feeling of importance. A good way to multitask during this process is to ask delegates to quietly help put the tables and chairs back, while you call one group at a time up to sign the treaty. As each group finishes signing the treaty, they get into place for the group photo.



Group Photo

Gather everyone around the projector screen with the final scenario in En-ROADS to take a group photo to share. Have someone in the front hold the signed treaty if there is one. We also encourage you (or your co-facilitators) to take photos during the event.

If possible, quickly distribute the group photo (or photos) to participants for them to share on social media, tag us on Twitter @climateinteract, or send us an email:

info@climateinteractive.org.



Please register your event at: <http://climateinteractive.org/tools/en-roads/register-event/>

And do not hesitate to reach out to us and share your experience and feedback:
info@climateinteractive.org

Appendix: Variations

The approach described in this Facilitator's Guide fits many of the conditions that a facilitator will encounter, but we strongly encourage you to adapt it to match other settings. Some common variations are described below.

Larger Groups (Over 60 people)

Here are some suggestions for how to adjust the game for larger groups:

1. **Consider using less time** – It is difficult to manage enough depth in the team meetings with lots of people, so one approach is to limit the amount of discussion within and between groups. This could cut the whole event to 1 hour.
2. **Abandon plenary presentations** – This is the most important modification. Without plenary presentations, teams do not need to achieve consensus on proposals beforehand. After an initial period of individual brainstorming, lead the group into proposals. Ask participants to turn to one or two others and talk about what action

they want to propose. After 5-10 minutes, ask someone from one group to call out their preferred action. Say, "Raise your hand if you had the same proposal." Ask for someone who had a different proposal. Ask for another raise of hands. Choose the one that got more votes. When it is time for people to estimate the effect of that action on temperature, have people talk in groups of two or three before inputting into En-ROADS for everyone to see. Move to the next group and continue getting actions that way. To limit the amount of time it takes even further, you can just call on a person with each group to propose an action and then implement it and discuss the result.

3. **Modify negotiations** – After six actions (the first round of actions from each group), ask the teams to send several delegates to visit the other groups to lobby them on what actions they should be proposing. Welcome the chaos that ensues for five minutes and then end the negotiation period by asking everyone to return to their original seats. To further condense the amount of time you might leave out this part entirely.
4. **Take charge** – You will need to facilitate the crowd quite assertively. This will mean interrupting people and calling the group back to attention.
5. **Debrief** – Ask people to turn to the person next to them and engage them on topics like how the simulation made them feel, how we can take action, and other important questions you want to choose for the debrief.

Younger Participants (under 18)

Here are some suggestions for how to adjust the game for younger participants:

1. **Just do it** – The *Climate Action Simulation* works well with this age group, because young people just turn on and engage with their roles and with each other.
2. **Bring the drama** – Start the session casual – no scarf, no tie, no jacket. Act warm and friendly. After the set-up, return fully in character as a UN leader. You can do this with a simple costume and UN gravitas. One time, a young delegate asked Climate Interactive's Co-Director Drew Jones when he played the UN Secretary-General, "Are you a different guy?"
3. **Minimize the introduction** – Ten minutes maximum. Five is better. Really. No more than two minutes introduction to climate science and the UN. They won't be listening until the game starts anyway. Hand out the briefing sheets beforehand to give students some time to identify with their roles.
4. **Teach when they are confused** – Lecture on climate science, the UN, and energy solutions as needed, during game play. Explain only on an as-needed basis.
5. **Use less time** – If you have less than an hour, follow the tips above for big groups.

6. **Or spread out the event across multiple days** – If you have the time to go more in depth with one group of students, you can choose to break up the exercise into multiple parts and days.
7. **End with hope** – Ask participants to take off their roles and in your closing speech, as yourself, not the Secretary-General, talk about why we should be hopeful.

Short Amount of Time

Here are some suggestions for how to adjust the game when you have less time:

1. **Abandon the handouts and PPT slides** – Just display the En-ROADS interface.
2. **Adjust the groups and introduce them verbally** – Three teams, four, six, it doesn't matter as long as you have somewhat conflicting views. When in doubt, include the Conventional Energy, the Climate Justice Hawks, and Land/Ag/Forests groups. The table tent signs will help people remember the groups.
3. **Just ask any person in a team to propose an action** – No time for group discussion nor consensus-building.
4. **Be sure to land the main insights (as you won't have time for much more)** – There's no silver bullet. It takes silver buckshot, i.e. important solutions across many sectors. It's possible.
5. **Remind them that a deeper dive in the model is needed.**

Splitting into 8 Teams

If you have a larger group or more time to play, you may choose to play with a game variation that splits the World Governments team into three groups so they can better represent the complicated dynamics of these different types of nations. Thus, instead of the typical six groups you would play with the following eight teams. We have briefing sheets available for this variation.

- Conventional Energy
- Clean Tech
- Industry & Commerce
- Land, Agriculture & Forestry
- Developed Nations Governments
- Rapidly Emerging Nations Governments
- Developing Nations Governments
- Climate Justice Hawks

Following a World Climate Simulation

Facilitators may play the *Climate Action Simulation* (based on En-ROADS) directly after the *World Climate Simulation* (based on C-ROADS). Moving into En-ROADS from C-ROADS is a way of enhancing the audience's knowledge of how to achieve the enormity of the Paris climate goals through specific policies and solutions:

Group Assignments

To reduce confusion, participants can stay in their roles from the *World Climate Simulation*. Here, the delegates of the UN Climate Summit represent their countries and blocs, which in the 6-Region version would include:

- US
- EU
- Other Developed Countries
- China
- India
- Other Developing Countries

There are also lobbying groups (optional), including:

- Fossil Fuel lobbyists
- Climate activists
- US Cities and States

How to Transition Games

We have identified two options on how to continue into the *Climate Action Simulation* following the *World Climate Simulation*.

1. Directly after the delegates in *World Climate Simulation* have reached the goal of limiting global warming to below 2 °C.
 - Pro: Delegates are still in their role.
 - Con: *World Climate Simulation* has already taken time and a lot of energy. It might be challenging to keep up the energy level with the audience.
2. With a break after playing the full *World Climate Simulation* game with a debriefing discussion. The second game could occur on the same day, next day, or the following week in a class.
 - Pro: Audience feels fresh and has had time to reflect on their findings from the *World Climate Simulation*.
 - Con: Participants will need to get back into their roles after taking a break.

Game Sequence

1. Say, in your role as the UN Secretary-General:

“Dear Delegates, I congratulate you on having reached the Paris climate goal with your pledges. You have realized that we need to act now, act with great ambition, and act all together. Now, the challenge for our world is to identify the right policies and solutions with which we will achieve your pledges. We will be using another climate simulation model, En-ROADS, to support our second round of negotiations.”

2. Introduction to En-ROADS simulator after handing out the guide to control panel.
3. Conduct a simplified opening presentation to minimize duplication from your prior speech for the *World Climate Simulation*.
4. Run the Negotiations and Plenary Presentations Rounds as you would except with the *World Climate Simulation* teams.
 - Sequence of presentations: US, EU, Other Developed, China, India, Other Developing, Fossil Fuel Lobbyists, Climate Activists, US Cities & States. The rest as described above.
5. If the *World Climate Simulation* didn't get its own debrief, conduct a debriefing discussion that encompasses both experiences.