

# Documents

## Séance 1:

-Lettres de cadrage (briefing statements) disponibles en pdf sur le site Climate Interactive :  
<https://www.climateinteractive.org/tools/en-roads/cas-materials/>

Les versions en ligne possèdent des liens hypertexte intéressants vers d'autres ressources.

-Version papier du simulateur en ligne disponible en pdf sur le site :  
<https://img.climateinteractive.org/wp-content/uploads/2019/09/EnROADS-one-page-guide-to-control-panel-v10-dec-2020.pdf>

-Fiche de travail personnelle (personal worksheet)

# Climate Action Simulation: Clean Tech



**To:** Chief Negotiators for the Clean Tech Sector  
**Subject:** Preparation for the Climate Action Summit

Welcome to the Climate Action Summit. You and leaders from all relevant stakeholders have been invited by the UN Secretary-General to work together to successfully address climate change. In the invitation, the Secretary-General [noted](#) that: “The climate emergency is a race we are losing, but it is a race we can win...The best science...tells us that any temperature rise above 1.5°C will lead to major and irreversible damage to the ecosystems that support us...But science also tells us it is not too late. We can do it...But it will require fundamental transformations in all aspects of society—how we grow food, use land, fuel our transport and power our economies...By acting together, we will leave no one behind.”

The goal of the summit is to create a plan to limit global warming to less than 2°C [3.6°F] above pre-industrial levels and to strive for 1.5°C [2.7°F], the international targets formally recognized in the Paris Climate Agreement. The [scientific evidence](#) is clear: warming above this limit will yield catastrophic and irreversible impacts threatening the health, prosperity, and lives of people in all nations.

Your group includes chief executives, investors, policy experts, and scientists in the growing industries for renewable energy, clean tech, and technological carbon removal that are aimed at decarbonizing our world. These industries include: solar, wind, hydropower, geothermal, energy storage, fuel cells, electric vehicles, energy efficiency, sustainable materials and manufacturing, green buildings, and yet-to-be-developed zero-carbon energy and carbon capture technologies.

Your policy priorities are listed below. You can, however, propose, or block, any available policy.

- 1. Make fossil fuels pay their true costs through taxes and a high carbon price.** Fossil fuels still dominate the world energy system, and they are by far the biggest source of greenhouse gas (GHG) emissions that contribute to climate change. Market prices today do not include the environmental and social harms caused by fossil fuels (their “negative externalities”). Furthermore, governments globally provide \$775 billion to \$1 trillion annually in subsidies to the fossil fuel industry. Economists agree that a carbon price is the best way to reduce global greenhouse gas emissions. You want a high carbon price (well over \$50 per ton of CO<sub>2</sub>), perhaps phased in over time so the economy can adjust. The fossil fuel industry should be taxed to remediate the decades of harm and delay they’ve already caused. The tax revenues can help offset the costs for the world’s energy transition and aid vulnerable populations as they adapt to climate impacts that are already happening.
- 2. Subsidize renewable energy (e.g., solar, wind, geothermal, hydropower, and storage).** The renewable energy industry is growing rapidly, but still provides a small percentage of the world’s energy supply today. Subsidies will help your industry grow and develop the technology needed to replace more fossil fuels. Storage (e.g., batteries, thermal storage, pumped hydro) and “smart grid” technologies for electric power allow variable renewables like wind and solar to be integrated into the energy system while providing round-the-clock electric power.

3. **Promote energy efficiency and electrification of buildings and industry.** Energy efficiency means using less energy to provide the same service, such as heating, cooling, manufacturing, etc. Improving energy efficiency can dramatically reduce emissions and energy costs for energy intensive buildings and industries. Electrification means converting heating and cooling systems from fuels, such as oil and natural gas, to more efficient electric air and ground-source heat pumps, ideally powered by renewable energy.
4. **Promote energy efficiency and electrification of transportation.** About 15% of the world's greenhouse gas emissions come from transportation, currently powered almost exclusively by oil. Transportation demand is growing rapidly with economic development and greater affluence around the world. Greater efficiency in transportation would cut oil demand significantly. Electrification of vehicles would enable this important transport sector to shift from oil to renewably-powered energy.
5. **Decide whether to invest in research and development (R&D) for a new low-cost zero-carbon energy source.** Some scientists believe a new type of nuclear energy, such as thorium fission or nuclear fusion, would offer the best energy source for replacing fossil fuels, arguing that such technologies could provide low-cost, zero-carbon electricity at scale. Several prominent universities and companies are exploring promising new nuclear energy solutions. However, these new technologies are currently unavailable and would require substantial investment to become commercially viable.
6. **Decide whether significant developments can be made in carbon removal technology.** The emerging field of carbon dioxide removal (CDR) technology seeks methods to remove CO<sub>2</sub> already in the atmosphere. These technologies range from changes in agricultural practices that might be implemented today to speculative and unproven technologies like Direct Air Capture (DAC). Your group may decide to invest in these technologies.

### **Additional Considerations**

Cutting fossil fuel use is critical to reducing greenhouse gas emissions to mitigate global warming and other important public health concerns such as air and water quality. A transition to a low-carbon economy requires shifts in infrastructure, business models, resources, and investments. While these changes will impose some costs in the short run, the costs to society will be even higher if fossil fuel consumption isn't cut as soon as possible.

The costs of renewables like wind and solar, energy storage, efficiency and other technologies are falling rapidly through R&D, learning-by-doing, and economies of scale. The cheaper they get, the greater the demand, and the faster costs fall. Subsidies for clean tech will speed this virtuous cycle and speed the transition to a carbon-free, renewably powered, efficient and healthy world.

Advocate for policies to promote rapid growth of the emerging industries you represent, along with dramatic gains in end-use efficiency to provide the energy needed for economic development around the world. Remind others that people don't want tons of coal or barrels of oil—they want warm homes in winter and cool ones in summer. They want access to health care. They want good jobs, and opportunities for economic and cultural development. Energy efficiency, combined with clean, renewable, carbon-free energy, is the safest, cheapest, fastest way to provide people with the services and opportunities they need while reducing greenhouse gas emissions.

Although CO<sub>2</sub> from fossil fuel use contributes the most to climate change, other gases, including methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), are potent greenhouse gases, and their impact is growing. Global agriculture and forestry practices contribute greatly to emissions of these gases. Methane leakage also occurs in natural gas extraction and distribution. Policies that reduce emissions of other greenhouse gasses must also be enacted.



# Climate Action Simulation: Climate Justice Hawks



**To:** Chief Negotiators for Climate Justice Hawks  
**Subject:** Preparation for the Climate Action Summit

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Your group includes large established environmental organizations and newer youth-led movements, both of which have engaged millions of people worldwide. Your group also includes representatives from the most vulnerable communities, such as small island nations and indigenous peoples who are on the front lines of climate change and whose ability to thrive or even survive depends on limiting global warming to 1.5 °C above pre-industrial levels. You speak for the future, the poor, and the most vulnerable people in the world.

Your policy priorities are listed below. You can, however, propose, or block, any available policy.

1. **Limit warming to well below 2°C and as close to 1.5°C as possible.** A 2°C world will still deliver severe impacts for today’s young people and vulnerable populations, who have contributed the least to climate change but will suffer more from extreme weather disasters, increasing floods, droughts, heat waves and public health crises. Achieving the strongest possible agreement to reduce greenhouse gas (GHG) emissions as soon as possible will mitigate the impacts on those in developing nations, indigenous populations, the poor and young people.
2. **Get to 100% renewable energy as soon as possible through a high carbon price, subsidies for renewables, and taxes on fossil fuels.** Emissions from fossil fuels (coal, oil, natural gas) are the biggest contributor to climate change. The world needs to cut fossil fuel extraction immediately, and keep the carbon in the ground. Economists agree that pricing carbon dioxide (CO<sub>2</sub>) emissions to reflect their environmental and social costs (well over \$50 per ton of CO<sub>2</sub>) is the best way to reduce global emissions. You may also consider subsidizing renewables and/or taxing and regulating coal, oil, and gas.
3. **Reduce deforestation.** The world’s forests are in severe decline. Act to protect the remaining forests and the people who live in or rely on them, including indigenous populations. Protecting forests also protects freshwater supplies, natural resources, and biodiversity.

4. **Beware of efforts that threaten global food production and land rights.** Large scale implementation of policies such as afforestation, biofuels, and carbon removal methods such as bioenergy with carbon capture and storage (BECCS) will require large areas of land that could threaten food production and push indigenous and poor people from their homes. Consider the land required for any given policy.
5. **Lobby the other groups for strong action.** As independent activists, you are not beholden to vested interests. But you don't have much power compared to governments and the fossil fuel industry. The fossil fuel industry will try to marginalize you and the people you represent as naive and ill-informed. They will try to cast doubt on climate science by emphasizing uncertainty, following the same playbook the tobacco industry used successfully for many years to [confuse the public and delay action](#). Use whatever nonviolent tactics you feel are appropriate to get the attention of those in power. Consider peaceful demonstrations and passionate speeches. Take the moral high ground and remind people what you are fighting for—a world in which every child and every person can thrive.

### **Additional Considerations**

The climate movement is growing. The scientific consensus is clear: climate change is happening now, it is caused primarily by human activities, and if unchecked it will have devastating effects on our prosperity, health and lives. Young people today have the most to lose. They were born into a fossil fuel economy they didn't build but that threatens to leave them an impoverished and dangerous world, a world without the rich diversity of plant and animal life past generations enjoyed. Climate change is fundamentally an issue of justice. The sooner all businesses, consumers and nations cut emissions, the more likely we all are to succeed, and the easier the transition will be.

Reducing greenhouse gas emissions will bring public health and social benefits, including improved air and water quality, greener cities, energy and food security, better health, new jobs, and greater resilience. Limiting warming to 1.5 °C, rather than 2 °C, would save more than 100 million people from water shortages, up to 2 billion people from dangerous heat waves, and many plant and animal species from climate change extinction risk. Actions to achieve these climate outcomes would likely generate accumulated global benefits of more than \$20 trillion while alleviating global economic inequality. The Intergovernmental Panel on Climate Change (IPCC) makes it clear that such a transformation is "[possible within the laws of physics and chemistry](#)," and describes scenarios that can accomplish this goal with today's technologies (<https://www.ipcc.ch/sr15/>).

The effects of climate change will not be uniform. The great injustice is that the people who have contributed the least to global warming will suffer the most and have the fewest resources and infrastructure to adapt. The most vulnerable regions of the world include Sub-Saharan Africa, South and Southeast Asia, Latin America, and island nations in the Pacific and around the world. Many developing countries rely heavily on climate-sensitive sectors such as agriculture, forestry, and tourism. Even within developed nations, their poor, farmers, and other vulnerable populations bear the brunt of climate impacts.

The world faces a challenge of unparalleled magnitude. Good luck. The future depends on your success.



# Climate Action Simulation: Conventional Energy Supply



**To:** Chief Negotiators for the Conventional Energy Industry  
**Subject:** Preparation for the Climate Action Summit

Welcome to the Climate Action Summit. You and leaders from all relevant stakeholders have been invited by the UN Secretary-General to work together to successfully address climate change. In the invitation, the Secretary-General [noted](#) that: “The climate emergency is a race we are losing, but it is a race we can win...The best science...tells us that any temperature rise above 1.5°C will lead to major and irreversible damage to the ecosystems that support us...But science also tells us it is not too late. We can do it...But it will require fundamental transformations in all aspects of society—how we grow food, use land, fuel our transport and power our economies...By acting together, we will leave no one behind.”

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You represent the coal, oil, natural gas, nuclear, and electric utility industries that supply most of the world’s energy today. Your group includes publicly traded and national oil and gas (O&G) companies, coal companies, electric utilities reliant on fossil fuels, and firms that supply services and equipment to these industries.

Your policy priorities are listed below. You can, however, propose, or block, any available policy.

1. **Oppose a high carbon price.** Your economists acknowledge that raising fossil fuel prices to reflect the environmental and social costs of greenhouse gas (GHG) emissions with a carbon price could be the best way to reduce global emissions. However, a carbon price above \$25-30/ton of CO<sub>2</sub> would unacceptably harm the fossil fuel industry by raising costs and slashing demand, leading to stranded assets and loss of shareholder value. Although some oil companies publicly state that they favor a carbon price, your industry continues to fund politicians who oppose it and block action. You anticipate pressure from the other groups to enact a carbon price. Take a strong stance against this policy.
2. **Oppose taxes on fossil fuels.** Your industry wants neither to be regulated nor to pay the costs of mitigating climate change. Since you already anticipate significant business losses as the world transitions away from fossil fuels in the coming century, you cannot bear extra costs that unfairly punish your industry. In fact, you may ask for subsidies for natural gas, which you promote as a bridge fuel because it is less carbon intensive than coal and oil. If regulations are inevitable, it is better to restrict coal than oil and gas. Coal emits the most carbon when burned and is less profitable than oil and gas.
3. **Promote new technologies including technological carbon removal, CCS, and biofuels.** Your industry supports greater use of natural gas and biofuels, and research to develop carbon removal technology, which removes carbon from the atmosphere and stores it underground. Your expertise in large-scale engineering, geology, and fuel transport can be applied to these fuels and industries. You also support carbon capture and storage (CCS) for coal and other power plants, including biofuel with CCS. CCS could capture 90% of the CO<sub>2</sub> produced from

the combustion of fossil fuels in power plants and industrial processes. The CO<sub>2</sub> can then be liquified and pumped underground to enhance production of oil and gas, or, less profitably, pumped into what you assure will be stable geological reservoirs. Carbon removal technology, if it becomes feasible and cost competitive, would help your industry because CO<sub>2</sub> could then be removed from the atmosphere, offsetting the emissions from continued use of fossil fuels.

- 4. Encourage actions that don't directly affect your industry.** While you understand that climate change is dangerous, you also need to protect shareholder value. You therefore advocate policies that could reduce GHG emissions without reducing fossil fuel use. Although CO<sub>2</sub> from fossil fuel use contributes the most to climate change, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and other gases are potent GHGs, and their impact is growing. Global agriculture and forestry practices contribute greatly to emissions of these gases. You support policies to reduce these other GHGs, primarily emissions from land use, agriculture, and forestry. You support efforts to cut deforestation, and to afforest previously degraded and deforested lands

### **Additional Considerations**

Your own climate science experts agree with the Intergovernmental Panel on Climate Change (IPCC) assessment about the threat of climate change. However, you must balance the imperative to prevent dangerous climate change with the needs of your key stakeholders, including your shareholders, employees, the public (your customers), the policymakers who provide your license to operate, regulate your industry and affect your operating costs, and finally your personal financial interests as leaders of these companies.

Conventional energy sources including fossil fuels and nuclear currently supply the overwhelming majority of the global energy mix. Your industry is simply providing what consumers want and should not be blamed or punished for climate change. Cutting fossil fuel use may be costly to consumers and the economy in the short run. In much of the world, fossil fuel infrastructure is already in place, and in many developing nations new fossil energy capacity is still being rapidly developed. Renewables like wind and solar are intermittent and not yet capable of powering the world economy. Your stance is that fossil fuels are essential to eliminate “energy poverty” and drive economic growth, especially in the developing nations of the world. Don't allow environmental activists to paint you as people who don't care about social justice.

Fossil fuel producers, including firms in coal, oil, and gas, will endure severe financial hardship if policies are enacted to limit warming to anything close to 2°C. Firms dependent on fossil fuels will have to reinvent themselves or go out of business. Limiting warming to 2°C means a large fraction of known fossil fuel resources must remain in the ground and will become stranded assets, never generating profits for shareholders or governments. Many jobs will be lost.

At the same time, you know that global emissions must be curtailed to avoid the worst impacts of climate change. Rising sea levels, more extreme weather and the ensuing geopolitical dislocations pose serious risks to existing energy supply assets and the world economy. Increasing climate damage also increases the likelihood of extreme policies and regulations that would harm the fossil industry. While you act to forestall such policies and regulations, you must also explore how you might use your infrastructure, financial capital, and expertise to compete—and survive—in a warming world.



# Climate Action Simulation: Industry and Commerce



**To:** Chief Negotiators for Industry and Commerce  
**Subject:** Preparation for the Climate Action Summit

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Your group includes chief executives of the major industries and corporations of the world that drive energy consumption, including automakers, airlines, shipping and freight, manufacturers of industrial and consumer goods, construction, residential and commercial real estate, consumer products, information technology, and other large corporations.

Your policy priorities are listed below. You can, however, propose, or block, any available policy.

1. **Keep energy prices low.** Product costs will rise if energy prices rise, making people less likely to buy your products. Maintain low energy prices by working against energy taxes and high carbon prices, while promoting energy subsidies. Consider how policies you and other groups propose would affect the cost of energy.
2. **Boost the energy efficiency of transportation, buildings and industry.** Energy efficiency means using less energy to provide the same services or production of goods. Raising energy efficiency sometimes increases up-front costs but reduces operating costs, generating savings over the long term. Efficiency improvements can be an attractive option for reducing greenhouse gas (GHG) emissions. However, you oppose policies and regulations that would require dramatic increases in efficiency to avoid rapid and costly changes in your products and processes.
3. **Explore electrification of transportation, buildings and industry.** Today’s transportation industry depends overwhelmingly on oil to fuel our cars, trucks, ships, trains, and planes. In addition, GHG emissions from buildings arise primarily from fossil fuels burned for heat. If transport, heating and industrial processes are electrified, they could eventually be powered by renewable power, if these sources of electricity are reliable and cheaper than fossil power.
4. **Encourage actions that don’t directly affect your industries.** While you understand that climate change is dangerous, you also need to protect shareholder value. You therefore advocate



for policies that could reduce GHG emissions without harming your industries. Although CO<sub>2</sub> from fossil fuel use contributes the most to climate change, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and other gases are potent GHGs, and their impact is growing. Global agriculture and forestry practices contribute greatly to emissions of these gases. You support policies to reduce these other GHGs, including emissions from land use, agriculture, and forestry. You support efforts to cut deforestation, and to plant new forests (afforestation).

### **Additional Considerations**

The industries you represent developed in an era of inexpensive energy, and your business models assume fuel and electricity will remain cheap and plentiful. Dramatically increasing energy efficiency would require substantial cultural change and new capabilities. Some of your key stakeholders, including incumbent automakers; and the aviation, shipping, and freight industries; may be harmed by policies that raise fuel prices. Some may not survive. In other sectors, energy efficient products can be sold at a premium and generate profit. Energy efficiency not only reduces energy demand, but can also improve society's resilience to climate-related disasters. For example, a well-insulated home retains heat even if a storm knocks out power lines. The energy intensity of the economy (energy used per unit of real GDP) is falling at a rate of around 1.3% per year, a trend expected to continue in the coming decades. Some analysts conclude energy intensity could fall as much as 5-7%/year (at some cost, and not in all industries).

Leaders in your industry report that many energy efficiency projects have short payback periods and offer positive net present value, with little risk. Innovative financing mechanisms can reinvest savings from lower energy costs to fund new energy efficiency projects, making such projects financially attractive to stakeholders.

The global buildings sector is expanding at an unprecedented rate, driven by global population and economic growth. Over the next 40 years, the world is expected to build 230 billion square meters in new construction—adding the equivalent of the area of Paris to the planet every week. New policies and incentives are needed to accelerate energy efficiency and renewable power generation in the global buildings sector, and to retrofit existing structures. New buildings and energy retrofits of existing buildings can cut energy use by 25-80% or more, and “net zero” energy buildings are now both possible and profitable in many areas. Energy-intensive industries such as iron, steel, and cement have become more efficient by deploying new equipment and re-using waste heat. Efficient, correctly sized motors and drives can yield energy savings of 20–25%. However, the long life of buildings, vehicles and infrastructure limit the rate of improvement and highlight the importance of retrofits, not just new investment.

Despite the potential, you must be vigilant against policies that would impose new costs of doing business, including large hikes in the price of the energy you rely on. As a group that has always relied on innovation, you may find technological solutions to cut GHG emissions attractive and you support government subsidies that create new business opportunities.

You know that global GHG emissions must be curtailed to avoid the worst impacts of climate change. Rising sea levels, more extreme weather and the ensuing geopolitical dislocations pose serious risks to your supply chains, customers, and employees. Increasing climate damage also increases the likelihood of extreme policies and regulations that would raise energy costs and harm your industries. While you act to forestall policies and regulations that unfairly burden your industries, you must also seek to reduce greenhouse gas emissions and slow climate change so you can remain profitable, and survive, in a warming world. As Paul Polman, CEO of Unilever, is reported to have said, [“there is no profit on a dead planet.”](#)

# Climate Action Simulation: Land, Agriculture & Forestry



**To:** Chief Negotiators for the Land, Agriculture and Forestry Alliance  
**Subject:** Preparation for the Climate Action Summit

Welcome to the Climate Action Summit. You and leaders from all relevant stakeholders have been invited by the UN Secretary-General to work together to successfully address climate change. In the invitation, the Secretary-General [noted](#) that: “The climate emergency is a race we are losing, but it is a race we can win...The best science...tells us that any temperature rise above 1.5°C will lead to major and irreversible damage to the ecosystems that support us...But science also tells us it is not too late. We can do it...But it will require fundamental transformations in all aspects of society—how we grow food, use land, fuel our transport and power our economies...By acting together, we will leave no one behind.”

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Your group includes representatives of the largest agricultural, food and logging companies, the largest landowners, government ministries of forests and agriculture, and land conservation agencies. Your group is focused on how to feed people across the world, protect forests and address climate change, simultaneously.

Your policy priorities are listed below. You can, however, propose, or block, any available policy.

- 1. Manage deforestation.** Protecting forests can reduce emissions from deforestation while also preserving biodiversity and protecting water supplies. However, limiting deforestation also reduces potential use of those lands for logging, food production, bioenergy, and other highly profitable uses. Deforestation is caused by both small-hold farmers and rural populations who need wood for fuel, and by large businesses, who clear forest lands for logging and agribusiness, including, for example, converting tropical forests into palm oil plantations, or for livestock and crop production.
- 2. Consider afforestation.** Afforestation is the growth of new forests on land that doesn't have trees; sometimes this is land that was previously deforested or degraded. As a forest grows, it sequesters CO<sub>2</sub> from the atmosphere and stores it in biomass and soils. Forests help preserve habitat and biodiversity, slow erosion and land degradation, and protect against floods. If implemented on a large scale, afforestation could use land that is needed for crops or livestock, thereby increasing food prices through greater competition for land. Consider the land required for any given afforestation policy.
- 3. Consider emissions of methane, nitrous oxide, and other greenhouse gases.** CO<sub>2</sub> is the most prominent greenhouse gas (GHG), but other GHGs, especially methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), cause about a quarter of global warming today, and their concentrations in the atmosphere are growing. Over a hundred years, a molecule of CH<sub>4</sub> contributes about 25 times more to warming than a molecule of CO<sub>2</sub>; and N<sub>2</sub>O contributes nearly 300 times more than



CO<sub>2</sub>. Current farming practices and livestock production are major sources of CH<sub>4</sub>, and N<sub>2</sub>O is primarily generated by fertilizer use. Innovative technologies and practices can reduce these emissions at low cost, but many environmentalists also call for regulations (e.g., limitations on fertilizer use) or changes in people's lifestyles (e.g., reductions in meat consumption and food waste), that could harm the profitability of agricultural and livestock industries. You are reluctant to support such policies even if they might lead to large reductions in these emissions. A wide range of fluorocarbons and related compounds ("F-gases") also contribute to warming. F-gases are used in industrial processes and consumer products (e.g., refrigerants, solvents). Concentrations are low today, but many F-gases contribute thousands of times more to warming than CO<sub>2</sub>. You can support policies to reduce these as they would have little impact on you.

- 4. Support subsidies for renewable energy.** Fossil fuel emissions, not land use, are the biggest contributor to climate change. You support replacing fossil fuels with affordable clean energy to run your equipment and transport food. Ranchers and landowners can install solar and wind turbines while still using most of their land for crops and livestock, so you support subsidies for clean energy technologies. Large logging companies and big agribusinesses oppose policies like carbon prices on fossil fuels as these would raise operating costs, but land conservation groups support these policies to speed reductions in CO<sub>2</sub> emissions.

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### Additional Considerations

Current world population is nearing 8 billion people, and the UN projects it will reach more than 9 billion by 2050 and almost 11 billion by 2100. Growing populations and rising incomes are increasing demand for crops, meat, wood, fiber, and other land-intensive products. Today, about one billion people lack adequate food, causing malnutrition and starvation in many nations. Yet, according to the U.N. Food and Agriculture Organization, 30% of global food production is wasted, contributing 8% of global GHG emissions.

Reducing food waste, increasing crop yields, and encouraging healthy plant-based diets can meet growing food demand without requiring more land while reducing GHG emissions from the agricultural sector. However, there is only so much your industry can do before these policies force food prices up. High food costs mean those who need it most might go without. Promoting plant-based diets will also financially harm the large and growing livestock industry.

In much of the world, it will be challenging to change land use and agriculture methods. In many developing countries the potential benefits of climate-smart agriculture are high, but corruption and lack of oversight make it difficult to implement land use policies. Past efforts to reduce deforestation, primarily in Brazil and Indonesia, have been only partially successful. Illegal deforestation remains a significant problem. Some governments actively subsidize deforestation to promote logging and agribusiness, and to provide land for people.

Despite these challenges, climate change is a major threat to the members of your group. Intensifying floods, droughts, heat waves, wildfires, and sea level rise are already destroying arable land, reducing crop yields, damaging forests, and harming profits. The impacts of climate change and the geopolitical dislocations they are creating pose serious risks to your assets, labor force, supply chains, customers, and profitability. Although change will be difficult, and some will be financially harmed, your alliance can contribute to the solution by reducing its emissions through better land management and agricultural practices.



# Climate Action Simulation: World Governments



**To:** Chief Negotiators from World Governments  
**Subject:** Preparation for the Climate Action Summit

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Your group includes the combined public voice of the people of the world. This includes government ministries from the highest polluting regions – US, EU, China, and India – and representatives from other developing regions of the world in Africa, Asia, South America, and Oceania. There are also representatives from international government groups including the United Nations. This alliance is interested in preserving the economic welfare and geopolitical stability of all nations of the world through this period of great transition into the coming century.

Your policy priorities are listed below. You can, however, propose, or block, any available policy.

1. **Subsidize renewable energy (e.g., solar, wind, geothermal, hydropower, and storage).** The renewable energy industry is growing rapidly, but still makes up a small percentage of the world's energy supply. Subsidies will help these industries grow. Storage (e.g., batteries, thermal storage, pumped hydro), and smart grid technology allow variable renewables like wind and solar to be integrated into the energy system while providing round-the-clock power.
2. **Consider taxing fossil fuels and/or setting a world carbon price.** While the world must transition away from fossil fuels to limit greenhouse gas emissions, a large majority of the world's energy is supplied by fossil fuels today. It will be costly and difficult to change the world energy infrastructure. Market prices today do not include the environmental and social harms caused by fossil fuels (their “negative externalities”). Worse, governments around the world, including many of yours, provide \$775 billion to \$1 trillion annually in subsidies to the fossil fuel industry. Economists agree that a carbon price is the best way to reduce global greenhouse gas emissions. Consider putting a price on carbon, perhaps phased in over time to give industry and consumers time to adjust. The revenues could be rebated to the public, help offset the costs of other policies, or cut your fiscal deficits. However, you cannot afford to move too fast. A carbon price would increase the cost of energy in the short term, which can be a problem for people in developing countries. A carbon price would also bring capital and stimulate innovation into renewable industries. Many of your nations

# En-ROADS Control Panel

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**Coal**  
Discourage or encourage mining coal and burning it in power plants.

**Renewables**  
Encourage or discourage building solar panels, geothermal, and wind turbines.

**Transport Energy Efficiency**  
Increase or decrease the energy efficiency of vehicles, shipping, air travel, and transportation systems.

**Transport Electrification**  
Increase or decrease purchases of new electric cars, trucks, buses, trains, and ships.

**Methane & Other Gases**  
Decrease or increase greenhouse gas emissions from methane, nitrous oxide, and the F-gases.

**Oil**  
Discourage or encourage drilling, refining, and consuming oil for energy.

**Nuclear**  
Encourage or discourage building nuclear power plants.

**Buildings & Industry Energy Efficiency**  
Increase or decrease the energy efficiency of buildings, factories, appliances, and other machines.

**Buildings & Industry Electrification**  
Increase or decrease the use of electricity in buildings, appliances, motors, and other machines, instead of fuels like oil or gas.

**Coal**  
status quo

**Renewables**  
status quo

**Energy Efficiency**  
status quo

**Electrification**  
status quo

**Land and Industry Emissions**  
status quo

**Oil**  
status quo

**Nuclear**  
status quo

**Buildings and Industry Energy Efficiency**  
status quo

**Electrification**  
status quo

**Carbon Removal**  
status quo

**Natural Gas**  
status quo

**New Zero Carbon**  
status quo

**Population**  
status quo

**Economic Growth**  
status quo

**Technological**  
status quo

**Bioenergy**  
status quo

**Carbon Price**  
status quo

**Population**  
status quo

**Economic Growth**  
status quo

**Carbon Removal**  
status quo

**Natural Gas**  
Discourage or encourage drilling and burning natural gas for energy.

**New Zero Carbon**  
Discover a brand new, cheap source of electricity that does not emit greenhouse gases.

**Population**  
Assume higher or lower population growth.

**Economic Growth**  
Assume higher or lower growth in goods produced and services provided.

**Carbon Removal**  
Pull carbon dioxide out of the air with new technologies that enhance natural removals or manually sequester and store carbon.

**Bioenergy**  
Discourage or encourage the use of trees, forest waste and agricultural crops to create energy.

**Carbon Price**  
Set a global carbon price that makes coal, oil, and gas more expensive depending on how much carbon dioxide they release.

**Population**  
Assume higher or lower population growth.

**Economic Growth**  
Assume higher or lower growth in goods produced and services provided.

**Carbon Removal**  
Pull carbon dioxide out of the air with new technologies that enhance natural removals or manually sequester and store carbon.

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En-ROADS Climate Ambassador Training

## CLIMATE ACTION CHALLENGE

### PERSONAL WORKSHEET

Team :

Name (keep your real name) :

Function (fictional job or situation):

Rephrase your priorities and justifications in your own words, you can do some research to explain the difficult concepts or technologies:

1-

2-

3-

4-

5-

6-



Explain in your own words what potential difficulties or problems you might encounter or additional considerations you have to take into account (the arguments that can be given by other teams)  
The briefing pages for the other teams are attached on pronote/ available on the drive for inspiration!  
+your counter-arguments:

Difficulties/Additional considerations/Arguments of our opponents	Counter-arguments you could mention

# Séances 2 et 3:

- Lettres de résolution de groupe à remplir + document supplémentaire pour Land and Agriculture
- Liste de documents supplémentaires selon les groupes
- Un exemple de production écrite: lettre de résolution rédigée par un groupe (non personnalisée)
- Un exemple de mission secrète pour les Climate Hawks.
- Un exemple de mission supplémentaire : rédaction du discours d'ouverture.

## CLIMATE ACTION CHALLENGE

### CLEAN TECH RESOLUTION



Name (keep your real name) :

Function (fictional job or situation):

Priorities and justifications

1-

2-

Watch the following Youtube video about different types of renewable energy

Take some notes and then check them with the help of the script by clicking on “more” below the video.

7 Types of Renewable Energy 2020

<https://www.youtube.com/watch?v=44Wp3WE1AHs>

Explain what your (invented) company specializes in (Solar, wind, hydroelectric, geothermal, tidal energy, hydrogen or biomass) and give a few details about how your technology works, its benefits and limitations, using the notes you took from the video :

.....

.....

.....

.....

3-

4-



5-

6-

Here is a video which explains how Direct Air Capture works, if you are curious!

A New Tool In The CO<sub>2</sub> Reduction Toolkit: Direct Air Capture (DAC) 2020

<https://www.youtube.com/watch?v=vvtLosjpQac>

Potential difficulties or problems or additional considerations we have to take into account  
+ counter-arguments:

Difficulties/Additional considerations/Arguments of our opponents	Counter-arguments /Ideas you could mention

## CLIMATE ACTION CHALLENGE

### CLIMATE JUSTICE HAWKS RESOLUTION



Name (keep your real name) :

Function (fictional job or situation):

Priorities and justifications

We are the **spokespersons** for ...

1-

Some personal examples and justifications taken from your (invented) background or populations you have met (try to be as heartbreaking as possible!):

.....

.....

.....

.....

2-

3-

Some personal examples and justifications taken from your (invented) background:

.....

.....

.....

4-

Watch this video about Bioenergy with Carbon Capture and Storage to understand how it works and its potential problems. Take some notes.

<https://www.youtube.com/watch?v=uzJqxz4kMLI>

Notes:

Some personal examples and justifications taken from your (invented) background/populations you have met or are representing:

.....

.....

.....



Potential difficulties or problems or additional considerations we have to take into account  
+ counter-arguments:

Difficulties/Additional considerations/Arguments of opponents/ Questions	Counter-arguments or extra ideas

## CLIMATE ACTION CHALLENGE

### CONVENTIONAL ENERGY SUPPLY RESOLUTION



Name (keep your real name) :

Function (fictional job or situation):

Priorities and justifications

1-

Include a personal example based on your invented identity and the industry you represent (imagine the costs , consequences etc... Make it heartbreaking!)

.....  
.....  
.....  
.....

2-

Include a personal example based on your invented identity and the industry you represent ( consequences, losses due to the current impact of green energy etc... Make it heartbreaking!)

.....  
.....  
.....

We can offer a **compromise**: .....

3-

Here is a video to see Carbon Capture and Storage works!  
How does Carbon Capture & Storage work? 2010  
<https://www.youtube.com/watch?v=ROEFaHKVmSs> )

Include a personal example based on your invented identity and the industry you represent. Explain what you could put into place in your industry, what you would like to invest in, the innovations you would like to support

.....

.....

.....

4-

Potential difficulties or problems or additional considerations we have to take into account  
+ counter-arguments:

Difficulties/Additional considerations/Arguments of our opponents	Counter-arguments you could mention

## CLIMATE ACTION CHALLENGE

### INDUSTRY AND COMMERCE RESOLUTION



Name (keep your real name) :

Function (fictional job or situation):

Priorities and justifications

1-

(Imagine a personal example to justify based on your invented identity and the industry you represent. Explain what will happen to your industry if governments tax fossil fuel and set a high carbon price)

Ex: I am the head of .....(successful industrial company). We are based in.....  
(country) and specialize in..... (sector)

+ arguments:

.....

.....

.....

.....

2-

Watch the following video about how industries can become more energy efficient. Take some notes on solutions

Top 5 Ways to Improve Energy Efficiency in Manufacturing Plants 2020

<https://www.youtube.com/watch?v=WsUpNkMAJog>

Notes :



(Find personal examples)

In our industry, we could invest in .....  
.....  
.....

3-

(Imagine a personal example to explain how you could electrify your industry and what switching to electric energy could help your industry do)

In our industry, .....  
.....  
.....

4-

Potential difficulties or problems or additional considerations we have to take into account  
+ counter-arguments:

Difficulties/Additional considerations/Arguments of our opponents	Counter-arguments you could mention

## CLIMATE ACTION CHALLENGE

### LAND, AGRICULTURE AND FORESTRY RESOLUTION



Name (keep your real name) :

Function (fictional job or situation):

Priorities and justifications

1-

2-

Here is a You Tube video about the role of forests in the water cycle:

The Forest Water Relationship

<https://www.youtube.com/watch?v=gj3Tw33OwHY>

3-

4-

Use the practical guide : **TRANSFORMING AUSTRALIAN AGRICULTURE WITH CLEAN ENERGY** and other research to give a personal example: explain what you would like to install and the potential results: how much energy and money you would save, how this would decrease your carbon emissions.

I am the head of ..... (name of agricultural company) which is based in  
..... (English speaking country) and...

.....  
.....

.....

.....

Potential difficulties or problems or additional considerations we have to take into account  
+ counter-arguments:

Difficulties/Additional considerations/Arguments of our opponents	Counter-arguments you could mention

## TRANSFORMING AUSTRALIAN AGRICULTURE WITH CLEAN ENERGY

A practical guide to lowering on-farm energy use and carbon emissions

[https://www.cefc.com.au/media/402212/cefc\\_transform\\_aust\\_agriculture\\_w\\_clean\\_energy.pdf](https://www.cefc.com.au/media/402212/cefc_transform_aust_agriculture_w_clean_energy.pdf)

p 11 and 15

### CLEAN ENERGY FINANCE IN ACTION: ON-FARM ENERGY PRODUCTION



A produce farmer in Stanthorpe, Queensland installed a roof-mounted solar PV system which provides 38 per cent of daily electricity use, shaving approximately \$7,500 from the annual power bill.



A produce coolstore in Shepparton, Victoria installed a 100kW solar PV roof-mounted system which, along with other energy efficiency upgrade measures that reduced energy use by 25 per cent.

1

#### Conduct an Energy Audit

Energy audits are an important first step to getting a better understanding of current energy use and helping prioritise energy-related investment decisions.

2

#### Generate Your Own Energy

The farm sector is ideally suited to produce renewable energy and alternative fuels, including solar PV, small-scale wind and bioenergy, and to benefit from on-site energy storage solutions.

3

#### Upgrade Vehicles and Machinery

Clean energy solutions for tractors, ancillary equipment and vehicle upgrades are easily applied and can have relatively low capital expenditure. These technologies are particularly suited to cropping systems, with most savings coming from reduced fuel use and increased operational efficiency.

4

#### Improve Irrigation and Pumping

Energy efficient irrigation and water management practices can improve water use through the use of a range of technologies, including variable speed drives and solar-powered pumping.

5

#### Consider Buildings, Heating and Cooling

On farm building assets, processing technologies and heating and cooling equipment can be energy intensive, impacting energy costs farm-wide. New technologies and energy efficient equipment upgrades offer practical solutions.

6

#### Benefit from Precision Agriculture

Precision agriculture offers opportunities for improved energy efficiency and productivity, including technologies that calculate the optimal quantity, timing and location of farming inputs, reducing energy use and fertiliser application.

7

#### Consider Emerging Technologies

Future farm energy savings, from sensing to robotics and the use of autonomous vehicles.



**CLIMATE ACTION CHALLENGE**  
**WORLD GOVERNMENTS RESOLUTION**



Name (keep your real name) :  
Function (fictional job or situation):

Priorities and justifications:

1-

Watch the following You Tube video to understand the benefits of renewable energy for the country and population you represent. Make some notes. <https://www.youtube.com/watch?v=IW1KVCcu7kM>  
Benefits of Renewable Energy over Fossil Fuels | Why We Should Switch to Renewable Energy in 2021

Notes:

Give a personal example of how much your government is ready to invest in renewable energy, what you pledge (=promise) to subsidize etc. Give your reasons, explaining what positive consequences it could have for your population, using the notes from the video

As an ambassador for .....(country), I certify that my government ...

.....

.....

.....

.....

.....

.....

2-

3-

4-

5-

Potential difficulties or problems or additional considerations we have to take into account  
+ counter-arguments:

Difficulties/Additional considerations/Arguments of our opponents	Counter-arguments you could mention

## **Liste de documents et liens supplémentaires donnés aux groupes**

### **Land Forestry and Agriculture**

- Vidéo Youtube parlant du rôle des forêts dans la conservation de l'eau:

The Forest Water Relationship, 2019

<https://www.youtube.com/watch?v=gj3Tw33OwHY>

- Pages 11 et 15 du guide pratique pour la transformation de l'agriculture Australienne grâce à l'énergie renouvelable.

TRANSFORMING AUSTRALIAN AGRICULTURE WITH CLEAN ENERGY, a practical guide to lowering on-farm energy use and carbon emissions.

[https://www.cefc.com.au/media/402212/cefc\\_transform\\_aust\\_agriculture\\_w\\_clean\\_energy.pdf](https://www.cefc.com.au/media/402212/cefc_transform_aust_agriculture_w_clean_energy.pdf)

### **World governments**

Vidéo Youtube pour comprendre les bénéfices de l'énergie renouvelable pour un pays et une population (USA)

Benefits of Renewable Energy over Fossil Fuels | Why We Should Switch to Renewable Energy in 2021

<https://www.youtube.com/watch?v=IW1KVCcu7kM>

### **Clean Tech**

-Vidéo Youtube sur different types d'énergies renouvelables

Le script est accessible en cliquant sous la video.

7 Types of Renewable Energy 2020

<https://www.youtube.com/watch?v=44Wp3WE1AHs>

-Vidéo Youtube pour comprendre la capture de CO<sub>2</sub>

A New Tool In The CO2 Reduction Toolkit: Direct Air Capture (DAC) 2020

<https://www.youtube.com/watch?v=vvtLosjpQac>

### **Climate Justice Hawks**

Vidéo Youtube pour comprendre la technologie de capture et stockage de carbone à partir de la biomasse

Tyndall Centre research: Biomass Energy Carbon Capture and Storage (BECCS) 2018

<https://www.youtube.com/watch?v=uzJgxz4kMLI>

### **Conventional energy supply**

-Vidéo Youtube sur le fonctionnement du CCS, Carbon Capture and Storage

How does Carbon Capture & Storage work? 2010

<https://www.youtube.com/watch?v=ROEFaHKVmSs>

### **Industry and Commerce**

-Video Youtube à propos des solutions pour les industries afin de devenir plus efficace énergétiquement

Top 5 Ways to Improve Energy Efficiency in Manufacturing Plants 2020

<https://www.youtube.com/watch?v=WsUpNkMAJog>

# EXEMPLE DE PRODUCTION DE GROUPE

## CLIMATE ACTION CHALLENGE

### CONVENTIONAL ENERGY SUPPLY RESOLUTION



Name (keep your real name) :

Function (fictional job or situation):

Priorities and justifications

1- We **need to protect our sector** and therefore we are **against a high carbon price**.

We are **aware** (=we realize, we are conscious) that the **best way to reduce carbon emissions is to increase the price of fossil fuel** (oil, gas, coal etc.), proportionally to its destructive environmental and social impact.

However, we **cannot afford to raise carbon price above \$25-30 per ton of CO2** because it would be **detrimental** (=harmful, bad) **to our sector: costs would go up, demand would decrease**, it is a waste of resources!

Include a personal example based on your invented identity and the industry you represent (imagine the costs , consequences etc... Make it heartbreaking!)

.....  
.....  
.....  
.....

2- We **stand against taxes on fossil fuels**.

We are already starting to see the **negative impact of renewable energy on our sector**. We know that **we are going to suffer great losses** as the world gradually **switches to cleaner power** and **we do not want to be punished by taxes on top of that**. We consider it **unfair**.

Include a personal example based on your invented identity and the industry you represent ( consequences, losses due to the current impact of green energy etc... Make it heartbreaking!)

.....  
.....  
.....

We can offer a **compromise**: we are **willing to ask the governments to subsidize** (=financially support) **natural gas**, which we consider as a cleaner alternative to coal and oil.



If we really need to implement regulations, **we prefer to reduce coal mining** rather than oil or gas. Indeed, **coal is less profitable** (=financially advantageous) and it **generates more carbon emissions** when burnt.

### 3- We support innovations:

-**Biofuels and natural gas**

-**Carbon Capture and Storage (CCS)** to remove carbon from the atmosphere, and in power plants and store it underground. **CCS could capture up to 90% of the carbon emitted by industries!** The CO<sub>2</sub> can then be **turned into liquid and pumped into reservoirs** or, even better : pumped underground to improve the production of oil and gas. This would generate extra profits!

(Here is some research to see how it works!

How does Carbon Capture & Storage work? 2010

<https://www.youtube.com/watch?v=ROEFaHKVmSs> )

We are **experts in the fields of engineering, geology and fuel transport so we can apply our skills to this technology!** We really hope it can become **cost-effective** (=competitive) so that it can be generalized to the whole world and reduce our carbon footprint!

Include a personal example based on your invented identity and the industry you represent. Explain what you could put into place in your industry, what you would like to invest in, the innovations you would like to support

.....  
.....  
.....

4- We **support other policies that don't have any impact on our industry** because our primary concern is the viability of our companies !

We are fully aware that Carbon Dioxide (CO<sub>2</sub>) is not the only gas which contributes to climate change.

We **want to decrease other Greenhouse Gas emissions** (such as Methane CH<sub>4</sub> and Nitrous Oxide (N<sub>2</sub>O) ) by **reducing deforestation and supporting afforestation** (planting new trees)

Potential difficulties or problems or additional considerations we have to take into account  
+ counter-arguments:

Difficulties/Additional considerations/Arguments of our opponents	Counter-arguments you could mention
We must admit that even our own climate science experts recognize that climate change is a real threat.	However, we must also consider <b>the needs of our shareholders, employees, customers, law makers</b> and the <b>financial situation of our companies!</b> We need to avoid bankruptcy!
Some people suggest we should be ashamed of ourselves for polluting the earth.	We are currently the <b>lead suppliers</b> (=main source) of energy in the world and <b>we are just giving the public the power they require to live!</b> We <b>should not be blamed for climate change</b> because we are <b>not responsible for society's needs!</b>
It is generally accepted that we should stop using fossil fuel	<b>If we reduce fossil fuel, energy will be more expensive for customers</b> Wind turbines and solar panels are <b>not currently able to supply enough energy</b> for the entire planet.
The fossil fuel industry is said to only care about profits.	<b>We care about social justice</b> , in fact, we actively promote it by <b>reducing "energy poverty"</b> in developing parts of the world! <b>Providing these poorer countries with energy boosts their economic growth.</b> They are counting on us!
Decreasing global warming to less than 2°C is often thought to be the best solution for humanity	Many <b>companies will go out of business</b> if we must reduce global warming to under 2°C. This means a large amount of <b>unemployment.</b>
Global warming may have detrimental effects on rising sea levels and extreme weather which might affect our resources and assets. Populations might have to relocate to other, safer parts of the world which might be harmful to the world economy  If we don't take any gradual steps now, we will have to resort to drastic, extreme measures which will be even more harmful to the fossil fuel industry. Fossil fuel could be banned some day!	We <b>need to slow down the implementation of regulations</b> but also <b>use our skills and financial capital to find a way to be competitive and to keep existing!</b> This might involve reducing Greenhouse Gas Emissions to save our industry, customers and employees!

# SECRET MISSION

## **FOR CLIMATE HAWKS !!**

Some of you could prepare a short (2 min max), passionate demonstration speech (with banners, striking pictures and slogans!) for the beginning of this climate action challenge! This will surprise everyone and give you more weight in the negotiations!

Be creative! For inspiration, you can watch the following videos:

Young activist Vinisha Umashankar | World Leaders Summit #COP26

<https://www.youtube.com/watch?v=zvLD6waVlkk>

Greta Thunberg mocks world leaders in 'blah, blah, blah' speech - BBC News

<https://www.youtube.com/watch?v=ZwD1kG4PI0w>

## **EXTRA MISSION : OPENING SPEECH**

**The Secretary General thinks it is more significant if the opening speech comes from some of the guests!**

Prepare a brief opening speech for our Climate Action Challenge! (1 min- 1 min 30 sec)

You can use some of the ideas from the introduction of the briefing sheet and the following speech for help!

COP26 President Alok Sharma's Opening Speech at the UN Climate Change Conference

<https://www.youtube.com/watch?v=oew6OO9azys>

☺ BE CREATIVE AND HAVE FUN! ☺