



**Innovation in the
Fight Against
Climate Change**

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Letter from the Chair

Dear Delegates,

Welcome to ClarkMUN's Online General Assembly! My name is Valeria Chavez and I'm a graduate student in the MS GIS program here at Clark University. Some of you might vaguely remember me from last year when I was chair of the CEDAW committee or the year prior to that when I was Secretary General of ClarkMUN X. MUN at Clark University was a really special part of my college experience that I will dearly remember once I graduate so I am very excited to be participating in this year's high school conference! In my time at Clark I've attended more than 10 conferences in the North American collegiate circuit but this is only my third time Chairing a committee. As a GIS professional, I am very interested in the role technology and innovation plays in the formulation of sound and effective policy and so I am very excited to be chairing this committee!

Regardless if this is your first MUN committee or the first time you hear about the role of technology and innovation in the fight against climate change, I hope that this committee contributes to the way you think about the climate crisis. I am confident that this committee will spark in you a new interest in debate and international politics as well as the importance of constantly learning more about how we can create a more sustainable future. I encourage you to use this guide only as a starting point. The DAIS will be looking for delegates who can further *substantive* proposals while remaining diplomatic and trying to work toward achieving feasible solutions to the climate crisis.

Feel free to email me if you have any questions regarding the committee or the topic in general. I can't wait to meet you all this March!

All the best,

Valeria

Valeria Chavez
Chair, Online GA
ClarkMUN XII

Contextual Background

There is no denying that climate change is the single most urgent crisis of our time. Unfortunately, self-interested actors have stood in the way of action from the very beginning. Scientists in the United States first brought the issue forward in 1979, when the data clearly showed that human beings were altering Earth's atmosphere through the indiscriminate burning of fossil fuels (Rich, 2018). What followed was a period of time when the world's largest corporations funded research to discredit science, spread disinformation, and, most importantly, create doubt (Oreskes and Conway, 2010). Governments hid behind the allegedly contending opinions within the scientific community to avoid taking action and corporations continued with their harmful practices. By the early 2000s, corporations realized doubt was no longer enough and became even more sophisticated in their messaging. Instead of organized government action to regulate the practices of the largest contributors to climate change, corporations pushed a narrative of "personal responsibility," redirecting the blame away from themselves and toward the consumer (Leber, 2021). It was up to the *individual* to reduce, reuse, recycle; it was up to each *household* to use less water, heat and electricity.

Despite these attempts at distorting the facts, the scientific community has continued innovating and trying to find solutions to what they know is an impending crisis. Thinking about solutions to climate change can be very daunting due to the wide reach of the issue. We often hear about how a radical change in our economic and socio-political structures would be immediately needed to have the least bit of success against it. However, we rarely hear about what this restructured world would actually look like. We need to be able to envision what needs to be changed in order to enact policy to address it. Today, we have technological advancements that, if adopted at a large enough scale, could allow us to stop the worst consequences of climate change. However, these technological advancements have different implications in developing and developed economies. Below we will consider some of these innovations and their potential impact in different contexts.

Current Situation

Transportation

The efficient transportation of goods and people is one of the most important aspects of any economy and is closely tied to economic development. The economic growth of developed countries in the 19th and 20th centuries was strongly linked to investments in roads, railways, etc. However, these developments in transportation relied heavily on fossil fuels, particularly oil and coal. Today, this is the sector with the “highest reliance on fossil fuels of any sector and accounts for 37% of CO2 emissions from end users” (IEA, 2020). Thanks to innovation, we have alternatives that can help reduce this reliance on fossil fuels. One of the most popular ones is electric cars. Governments around the world “are promoting electric vehicles as a key technology to curb oil use and fight climate change” (Tabuchi and Plumer, 2021).

While it is true that the transition from gas to electric cars is one of the most effective ways to curb carbon emissions at the individual level, it is important to keep the issue of accessibility in mind. The price difference between fossil fuel reliant cars and electric cars remains a barrier for *most* people around the world. This is particularly true in the developing world. As the population grows, so does the demand for means of transportation which makes it appealing to follow the environmentally damaging paths taken by developed nations (Sperling and Salon, 2002). Similar considerations need to be made when considering investments in sustainable public transportation initiatives. All policies that encourage the transition to electric vehicles should keep in mind purchasing power disparities and envision ways in which they can be made accessible in an equitable way.

Another aspect to consider is aviation, particularly commercial planes. While road transport accounts for the majority of emissions in the transport sector, aviation still plays a substantial role in global carbon emissions. An interesting innovation in this area are hydrogen planes. These would be able to fly as fast as traditional planes but emit only water thus allowing the industry to continue without much disruption but effectively getting rid of its contribution to carbon emissions (O’Callaghan, 2020). It is estimated that these planes will only enter the market in 2035 (FCH, 2020), but incentives from governments and international organizations might be able to accelerate this process.

Questions to Consider:

- 1. How can the international community guarantee equitable access to electric vehicle technology around the world? What role do developed countries play in assisting developing ones in the transition away from fossil fuel dependent cars to electric cars?*

2. *How can the international community prioritize investments in sustainable means of public transportation? What role do developed countries play in assisting developing ones in these?*
3. *How can the international community encourage the development and implementation of hydrogen plane technology by the private sector?*
4. *What special considerations should the international community make about freight transport?*
5. *How can the international community encourage the research, development, and innovation of other technologies in the transport sector?*

Food and Agriculture

The food and agriculture sector is deeply vulnerable to the changing climate. Ironically, global food production contributes to 17 billion metric tons of carbon emissions every year with animal-based foods contributing to 57% of these emissions (Thompson, 2021). Of that percentage, 25% was produced by the beef industry followed closely by cow-milk and pork (idem). The carbon emissions associated with the meat industry have driven an increase in people following vegetarian diets around the world. However, the expectation should not be placed on the consumer to stop consuming meat altogether, but rather on the meat industry to develop more sustainable practices. In addition, further research in the feasibility of lab grown meat as an alternative is crucial. Lab grown meat is real meat grown in a laboratory setting derived from a single cell and is an area of research that has been gathering lots of attention in recent years (Rogers 2022). As it is not dependent on livestock, this alternative is both green and humane and has been gaining traction in Singapore (Lucas 2020), Israel (Lavars 2021), and the Netherlands (Baker 2021).

Plant-based food, on the other hand, contributes 29% of total emissions associated with global food production (Thompson, 2021). These contributions are mainly related to farmland management and the deforestation associated with it. More research needs to go into sustainable methods of agriculture and land management as well as how to curb world hunger while reducing waste as much as possible. Initiatives such as the World Bank's Climate-Smart Agriculture program are already making a difference in countries such as Bangladesh, China, Philippines, Uruguay, Brazil, Colombia, Mexico, Morocco, North Macedonia, Uzbekistan, among others (World Bank, 2021) but much more is needed. Like in the transport sector, we see a divide between the developed and developing world, where the temptation to adopt environmentally damaging practices in the name of curbing poverty and hunger is almost too big to pass. Macro-level economic disparities have to be taken into account when coming up with policies to tackle the contributions to climate change on the food and agriculture sector.

Questions to Consider

1. *How can the international community encourage public-private sector cooperation to research, innovate, and develop technological advancements in the food and agriculture sector?*
2. *How can we increase accessibility to environmentally friendly foods equitably around the world?*

3. *How can the international community balance the urgency to combat climate change with the need to curb/end poverty and hunger around the world?*
4. *How can the international community encourage the adoption of climate-smart agricultural practices?*
5. *How can the international community encourage the stop of deforestation caused by the agricultural sector around the world?*

Energy

In order to limit the catastrophic impacts of climate change, the world must reduce its energy dependence on fossil fuels (New York Times 2020). In recent years, the renewable energy sector has seen tremendous growth around the world. In 2020, renewables (i.e. wind, solar, hydropower) made up 29% of electricity generation globally (Center for Climate and Energy Solutions 2020). However, due to the nature of these sources of energy, they are not as reliable as they would need to be in order for the world to be fully dependent on them. Take solar for example: the sun is up only for a portion of the day and the peaks of solar power generation do not match with the peaks of energy consumption (early morning and evening, before and after work hours). Thanks to batteries this energy (and that generated by other renewable sources) can be stored and saved for later use. However, the mining of lithium necessary for the production of batteries is not only an environmental hazard but also a non-renewable resource. To fill this gap, and assist in the transition away from fossil fuels, we have nuclear energy.

Nuclear energy is a low-carbon energy source that can supply the world with clean, reliable, and affordable electricity (World Nuclear Association 2020, Office of Nuclear Energy 2021). The conversation about nuclear energy is a controversial one due to concerns about safety. This narrative has been fueled by the natural gas industry, which understands the nuclear energy sector is its largest competitor (Conca 2017). In terms of safety, nuclear energy is responsible for only 90 deaths/trillionkWhr around the world as compared to coal with 100,000 deaths/trillionkWhr, oil with 36,000 deaths/trillionkWhr, and natural gas with 4,000 deaths/trillionkWhr (Conca 2012). In order to be able to provide energy through nuclear sources, technological advancements are needed, particularly when it comes to the development of modular nuclear reactors. Research on fusion has evolved quite significantly in the past year making the prospect of an energy revolution much more likely (Chandler 2021). However, more research and innovation is needed in order to commercialize this energy source.

Questions to Consider

1. *How can the international community challenge the misconceptions about nuclear energy?*
2. *How can the international community find a balance between the adoption of renewables, nuclear energy, and fusion?*
3. *How can public-private partnerships maximize the development of technology needed to transition away from fossil fuels?*

4. *How can the international community ensure equitable access to alternative sources of energy around the world?*

Committee Composition

CANZUK, East Asia, Europe, and the United States

Developed nations such as those in CANZUK, East Asia (with the exception of China), Europe and the United States will have the technology and the funds to make research, development, and innovation happen. Countries in this block will be hesitant to agree to provide subsidies to the developing world as this would require them to admit responsibility for the damage they've done to the planet. Countries with more progressive policies such as Canada, New Zealand, Denmark, Sweden, etc might be more open to discussing subsidies to developing nations than more centrist countries such as the United Kingdom and the United States. The interests of the private sector, particularly those of large transnational corporations and the oil industry will certainly influence the policies this block is willing to endorse. This block will also be less likely to endorse policies pertaining to climate migration.

Africa, Latin America, South Asia, and SouthEast Asia

Developing nations such as those in Africa, Latin America, South Asia, and SouthEast Asia lack the technology and the funds to make research, development, and innovation available. They are the group of countries most impacted by the unequal effects of climate change and are struggling to grow their economies even without the additional burden of sustainability considerations. These countries will be interested in policies that provide them with subsidies to implement climate friendly infrastructure and practices. They will also be interested in policies related to climate migration and asylum.

Middle East, Russia, China, and Central Asia

This block of countries falls somewhat in between of the previous two with the important consideration of being large oil producers. As such, this block will be hesitant to enact policies to curb reliance on fossil fuels and or the development of any technology that might replace it effectively. However, most of these are also developing economies that would require large subsidies in order to transition to more sustainable practices and infrastructure.

References

- Oreskes, N., and Conway, E. (2010). *Merchants of Doubt*. Bloomsbury Press.
- Leber, R. (2021). *ExxonMobil wants you to feel responsible for climate change so it doesn't have to*. <https://www.vox.com/22429551/climate-change-crisis-exxonmobil-harvard-study>
- Rich, N. (2018). *Losing Earth: The Decade We Almost Stopped Climate Change*. <https://www.nytimes.com/interactive/2018/08/01/magazine/climate-change-losing-earth.html>
- Tabuchi, H., and Plumer, B. (2021). *How Green are Electric Vehicles?* <https://www.nytimes.com/2021/03/02/climate/electric-vehicles-environment.html>
- Sperling, D., and Salon, D. (2002). *Transportation in Developing Countries: An Overview of Greenhouse Gas Reduction Strategies*. <https://www.c2es.org/document/transportation-in-developing-countries-an-overview-of-greenhouse-gas-reduction-strategies/>
- IEA. (2020). *Transport: Improving the Sustainability of passenger and freight transport*. <https://www.iea.org/topics/transport>
- O'Callaghan, J. (2020). *Quiet and green: Why hydrogen planes could be the future of aviation*. <https://ec.europa.eu/research-and-innovation/en/horizon-magazine/quiet-and-green-why-hydrogen-planes-could-be-future-aviation>
- FCH. (2020). *Hydrogen Powered Aviation*. <https://www.fch.europa.eu/publications/hydrogen-powered-aviation>
- World Bank. (2021). *Climate-Smart Agriculture*. <https://www.worldbank.org/en/topic/climate-smart-agriculture>
- Thompson, A. (2021). *Here's How Much Food Contributes to Climate Change*. <https://www.scientificamerican.com/article/heres-how-much-food-contributes-to-climate-change/#:~:text=Soil%20tillage%2C%20crop%20and%20livestock,on%20Monday%20in%20Nature%20Food>
- Rogers, K. (2022). *Lab-grown meat could make strides in 2022 as start-ups push for U.S. approval*. <https://www.cnbc.com/2022/01/23/lab-grown-meat-start-ups-hope-to-make-strides-in-2022.html>
- Baker, A. (2021). *The Cow That Could Feed the Planet*. <https://time.com/6109450/sustainable-lab-grown-mosa-meat/>
- Lavars, N. (2021). *World's first lab-grown-meat factory opens in Israel*. <https://newatlas.com/science/worlds-first-industrial-lab-grown-meat-facility-israel/>
- Lucas, A. (2021). *Singapore issues first regulatory approval for lab-grown meat to Eat Just*. <https://www.cnbc.com/2020/12/01/singapore-issues-first-regulatory-approval-for-lab-grown-meat-to-eat-just.html>

- Center for Climate and Energy Solutions. (2020). *Renewable Energy*.
<https://www.c2es.org/content/renewable-energy/>
- World Nuclear Association. (2020). *How can nuclear combat climate change?*
<https://world-nuclear.org/nuclear-essentials/how-can-nuclear-combat-climate-change.aspx>
- Office of Nuclear Energy. (2021). *Nuclear Power is the Most Reliable Energy Source and It's Not Even Close*.
<https://www.energy.gov/ne/articles/nuclear-power-most-reliable-energy-source-and-its-not-even-close>
- Conca, J. (2017). *Natural Gas Industry Blasts Nuclear Power With Fake News*.
<https://www.forbes.com/sites/jamesconca/2017/06/15/natural-gas-industry-blasts-nuclear-power-with-fake-news/?sh=6f1d1889133b>
- Conca, J. (2012). *How Deadly Is Your Kilowatt? We Rank The Killer Energy Sources*.
<https://www.forbes.com/sites/jamesconca/2012/06/10/energys-deathprint-a-price-always-paid/?sh=10d12c8c709b>
- Chandler, D. (2021). *MIT-designed project achieves major advance toward fusion energy*.
<https://news.mit.edu/2021/MIT-CFS-major-advance-toward-fusion-energy-0908>

Sources for Further Research

- New York Times. *A crash course on climate change, 50 years after the first Earth Day*.
<https://www.nytimes.com/interactive/2020/04/19/climate/climate-crash-course-4.html>
- Fountain, H. (2021). *5 takeaways from the major new U.N. climate report*.
<https://www.nytimes.com/2021/08/09/climate/un-climate-report-takeaways.html>
- Rubin, E. (2011). *Innovation and Climate Change*.
<https://www.bbvaopenmind.com/en/articles/innovation-and-climate-change/>
- Sierra, G. (2021). *The Climate for Nuclear Energy in CFR: Why It Matters?*
<https://www.cfr.org/podcasts/the-climate-for-nuclear-energy>
- Kurzgesagt – In a Nutshell. (2020). *Who Is Responsible For Climate Change? – Who Needs To Fix It?* <https://www.youtube.com/watch?v=ipVxxxqwBQw>
- Kurzgesagt – In a Nutshell. (2021). *Do we Need Nuclear Energy to Stop Climate Change?*
<https://www.youtube.com/watch?v=EhAemzlv7dQ>