HIMUNC VII BACKGROUND GUIDE

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Engine Produced Pollutants

Dear Delegates,

Welcome to the seventh iteration of the Henrico Invitational Model United Nations conference. We would like to thank you for choosing to take part within our committee of the General Assembly, as delegates of the United Nations Committee on Engine Produced Pollutants. As a newly introduced committee within our conference, the Engine Produced Pollutants committee will provide delegates the unique opportunity to explore the effect of electric and gas cars on the world's environment. As delegates, it is your responsibility to think critically and creatively to develop the most effective resolutions to these issues.

The two principal issues that this committee will be focusing on include finding efficient methods to decrease pollutants from Engine and Electric cars as well as finding new methods to produce electric cars with alternate materials to minimize pollution. There is much to discuss regarding the effect of pollutants created by vehicles and how the environment is being affected by this on a global level. Furthermore, car pollution is a global conflict that has continued to exist, but one that is more evidently beginning to rear its ugly head. A particular increase in car pollution has stimulated a variety of additional environmental problems. The purpose of this committee is to develop comprehensive and innovative resolutions to benefit all involved parties, and as delegates, you are highly encouraged to work collaboratively to satisfy this necessity.

To learn more about the Engine Produced Pollutants, as well as the specific issues we will be addressing, make sure to refer to the background guide to gain a better understanding of how to develop your position. Any questions regarding the committee can be directed through email to either of the chairs or to the Undersecretary-General of General Assemblies. Those who actively participate and communicate with others, and demonstrate their thorough understanding of these issues will be awarded for their performance as a delegate of our committee. We wish you the best of luck!

Regards,

Engine Produced Pollutants

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Background

One Hundred Years of Very Rich History

Being invented over 100 years ago now, electric cars have been in the limelight compared to that of gas cars.[1] While at their introduction, all the rage, electric cars quickly turned from a viable transportation option to more of an inconvenience.[2] With the first electrical vehicle (EV) being simple, not rechargeable, and under 4 horsepower, they quickly advanced to something further. They started being used in competitions, started to gain popularity among well-off housewives, and EVs looked like they were going to be the vehicle of the future. But gas-powered vehicles, in the early-to-mid 20th century shattered that belief.

An Unexpected Comeback

And so the story goes. Gas-powered vehicles took over the market, took over the general population's garages, and EVs vanished. Nonetheless, EV producers didn't stop working. And suddenly, they had a breakthrough. The Toyota Prius, released in 1997 Japan, caused electric cars to become the revolutionized, chic, and trim versions of their ancestors from just about 60 years before. Ever since, they have slowly taken back some of their well-deserved spotlight. Celebrities and environmentalists alike increased the profile and demand of these cars, for different reasons, but the effects all the same. However, their popularity and demand have increased exponentially as people try to find the best ways to be environmentally friendly, cheap, and avoid the unpredictable changes of gas costs.

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[1] Matulka, Rebecca. "The History of the Electric Car." ENERGY.GOV. Last modified September 15, 2014. Accessed September 11, 2023. https://www.energy.gov/articles/history-electric-car.

[2] Wilson, Kevin A. "Worth the Watt: A Brief History of the Electric Car, 1830 to Present." Car and Driver. Last modified March 31, 2023. Accessed September 11, 2023. https://www.caranddriver.com/features/g43480930/history-of-electric-cars/.

The Cons of The Unconventional Car

Nevertheless, now that they're in the spotlight, criticism has come with that popularity. Although their cost to run per year is cheaper, they're more expensive at up-front purchase.[3] And even though they do a lot to help our struggling environment through carbon reduction, they can do their own damage to the environment due to their lithium-ion batteries.[4] The raw materials needed for these batteries are expensive, hard to access, and bring a lot of human rights issues into discussion when the production of these batteries can cause harm to young children.

[3] Capparella, Joey. "Electric Cars vs. Gas Cars: Everything You Need to Know." Car and Drive. Accessed September 11, 2023. https://www.caranddriver.com/research/a32781943/electric-cars-vs-gas-cars/.

[4] Tabuchi, Hiroko, and Brad Plumer. "How Green Are Electric Vehicles?" The New York Times. Last modified June 23, 2023. Accessed September 11, 2023. https://www.nytimes.com/2021/03/02/climate/electric-vehicles-environment.html#:~:text=Raw%20materials%20can%20be%20problematic,Cobalt%20has%20been%20especially%20problematic.

<u>Topic One: Finding Efficient Methods to Decrease Pollutants from Engine and Electric Cars</u>

Engines Just Aren't Worth It

One of the biggest issues with gas-powered vehicles are their engines. Internal combustion engines that release carbon monoxide, nitrogen oxides, and hydrocarbons.[5] These pollutants in engine emissions from gas-powered vehicles cause damage to lung tissue and can lead to and aggravate respiratory diseases, such as asthma. Motor vehicle pollution also contributes to the formation of acid rain. The pollution also emits greenhouse gasses that worsen climate change.

Ways to Alleviate the Big Bad

There are three ways to help fix the issues that gas-powered engines give us.

[5] "Controlling Air Pollution from Motor Vehicles." Department of Environmental Conservation. Accessed September 11, 2023. https://www.dec.ny.gov/chemical/8394.html#:~:text=Carbon%20monoxide%2C%20nitrogen%20oxides%2C%20and,in%20an%20internal%20combustion%20engine.

Catalytic converters, modified fuels, and Zero-Emission Vehicles.

Catalytic Converters

A catalytic converter is an exhaust emission control device that reduces toxic gasses and pollutants in exhaust gas from motor vehicle engines into less-toxic pollutants by catalyzing a redox reaction (an oxidation and a reduction reaction).[6] These catalytic converters are used with gasoline and diesel-powered engines, and they take excess harmful chemicals and decrease the amount of them being released into the atmosphere. That means significantly less smog, harmful ozone, and the like.

Modified Fuels

Modified fuels, or more typically, biofuels, come from biological materials that are concentrated into something that can be processed by a car's engine for fuel.[7] These biofuels can come from any sort of organic products, from corn starch to animal fats and oils. Replacing fossil fuels with biofuels reduces some of that "big bad" mentioned earlier. They decrease the production and use of fossil fuels, and by doing that, also help get rid of a lot of greenhouse gas emissions. Outside of just environmental impacts, they also reduce the dependency that economies have developed on unstable foreign suppliers by using biological products from the same country that the cars are being used in.

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[6] "What is a Catalytic Converter, and How Does it Work?" Synchrony. Last modified October 26, 2022. Accessed September 11, 2023. https://www.mysynchrony.com/blog/automotive/what-is-a-catalytic-converter-and-why-do-we-need-it.html#:~:text=Essentially%2C%20a%20catalytic%20converter%20filters,also%20improves%20your%20car's%20efficiency.

[7] "Biofuels and the Environment." United States Environmental Protection Agency. Last modified February 21, 2023. Accessed September 11, 2023. https://www.epa.gov/risk/biofuels-and-environment#:~:text=Replacing%20fossil%20fuels%20with%20biofuels,dependence%20on%20unstable%20foreign%20suppliers.

Zero-Emission Vehicles (ZEVs)

ZEVs are any vehicle that has… Well, zero engine emissions. Examples of this type of vehicle include battery electric vehicles, hybrid vehicles, hydrogen fuel-cell-electric vehicles.[8] This is a result of a lack of tailpipe as well as different fuel than "normal" cars.[9] Because they have no tailpipe, they cannot release carbon monoxide, nitrogen oxides, hydrocarbons, and other harmful chemicals found in fuel. Also, as a result of relying on electricity rather than fuel, the chemicals typically found in gasoline cannot be burned to produce the harmful chemicals aforementioned.

Questions To Consider

1. In the context of combating climate change, how can we promote EV adoption and sustainability in a modern way? Especially when considering the historic rise and fall of EVs?
2. What can be done internationally and collaboratively to address the public health challenges faced by gas-powered engine emissions? Specifically considering the youth?
3. How can the United Nations encourage the global adoption and promotion of Zero Emission Vehicles (ZEVs) in poverty-stricken areas?
4. How can countries work together to make catalytic converters much more effective, affordable, and sustainable?
5. What practices can be implemented to make biofuels more easily produced without compromising the

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[8] "Controlling Air Pollution from Motor Vehicles." Department of Environmental Conservation. Accessed September 11, 2023. https://www.dec.ny.gov/chemical/8394.html#ZEV.

[9] "Benefits of Electric Cars on the Environment." EDF Energy. Accessed September 11, 2023. https://www.edfenergy.com/energywise/electric-cars-and-environment#:~:text=The%20major%20benefit%20of%20electric,This%20reduces%20air%20pollution%20considerably.

economy and environment simultaneously?

Topic 2: Finding New Methods of Using Alternate Materials to Produce electrical Cars

Introduction

Electric cars have gained popularity as a sustainable alternative to traditional internal combustion engine vehicles. However, their production of EVs relies on materials such as lithium-ion batteries, rare earth metals, and other components that can be environmentally damaging to extract and process.[10]

Additionally, there are concerns about the ethical aspects of mining practices and supply chain management. Finding new methods of using alternative materials in the production of electric cars is crucial for achieving sustainable and climate-friendly transportation. But we haven't gotten there yet.

Resource Availability

The demand for materials like lithium, cobalt, and rare earth metals for EV batteries is increasing rapidly. This committee must address the challenges of resource availability and potential geopolitical tensions arising from the competition for these materials. Looking past the socioeconomic impact, at a more basic level, EVs have an environmental impact as well. The mining and processing of materials for electric car production can have significant environmental consequences, including habitat destruction, water pollution, and carbon emissions.[11]

[10] "ADDRESSING CONCERNS about ELECTRIC VEHICLE BATTERIES." 2019. Coltura.org. 2019. https://coltura.org/evbatteries/#:~:text=If%20EV%20batteries%20continue%20to,from%20disposal%20of%20used%20batteries..

[11] "What Are Diesel Emissions." 2023. Dieselnet.com. 2023. https://dieselnet.com/tech/emissions.php#:~:text=Common%20pollutants%20include%20unburned%20hydrocarbons,schematically%20illustrated%20in%20Figure%201.

Ethical Considerations

Human rights violations and unethical practices, such as child labor and unsafe working conditions, are associated with the mining of the materials required for EVs. Now that people are aware of their environmental impact, they've started to become aware of their ethical impact as well. Children in other countries, or even in their country, are being affected negatively by the companies seen as the, "good guys", and the populace is not happy. So, we have to start pursuing new, ethical production practices to stay afloat.

People Don't Know The "New" Kid In Town

Investment in research and development of alternative materials, such as solid-state batteries or innovative composites, is essential to reduce the environmental and ethical footprint of electric cars.[12] Since electric cars are just recently becoming more popular, companies don't have a lot of incentive to invest. They see these electric cars as a slippery slope considering their history. Without investment, though, there's no way to pursue the innovation needed in the research and development of EVs. And even so, the innovativeness of EVs means new funding mechanisms and partnerships.

Reaching Past Borders to Look to A Better Future

EV producers rely too heavily on the same resources. If even a single one of their outlets goes under, or has some issue, the production can be delayed dramatically. So, resource diversification has started to become a topic of discussion. International relationships need to be established to develop and explore alternative materials for EV batteries and other necessary

[12] "U.S. Department of Energy Announces New Vehicle Technologies Funding and Future Partnerships with Battery Industry." 2021. Energy.gov. 2021. https://www.energy.gov/eere/articles/us-department-energy-announces-new-vehicle-technologies-funding-and-future.

components. However, these international relationships haven't been established just yet.[13] Developing those relationships comes with a myriad of policies and standards that need to be developed for environment friendly and ethical practices. These include environmental impact assessments, responsible mining practices, safe processing of critical materials, and such.

Supply Chain Transparency

Traceability and transparency in supply chains are imperative for a lot of EV producers. Companies need to learn how to promote transparency and traceability in supply chains so customers feel ensured that materials used in electric cars are sourced ethically. Nonetheless, companies still aren't completely transparent. This provides issues for both the companies and the customers.

[13] Lee Ying Shan. 2023. "Australia and Indonesia Have Signed a 'Win-Win' EV Battery Deal, Analyst Says." CNBC. CNBC. July 5, 2023. https://www.cnbc.com/2023/07/05/australia-and-indonesia-have-signed-a-win-win-ev-battery-deal-analyst-says.html.

Questions To Consider

6. How would you create and implement innovative mining practices that are sustainable and clean for the environment?
7. The next step in producing electric cars is using recycled materials and developing a circular economy. What ideas would you pitch to an EV company to convince them to increase their recycled material use and promote a circular economy?
8. Should ethical supply chains and transparency be pursued by EV producers? If not, why? If so, what steps would you take to ensure ethical supply chains and near-complete transparency for EV production?
9. What incentives, if any, would you provide to Member States to adopt responsible sourcing practices? If

you feel those practices are not practical, what is your reasoning?

10. Present innovative and creative ways to reuse, reduce, and recycle. How would you go about it, as an EV producer? Would you even want to? Why?

Bibliography

Matulka, Rebecca. "The History of the Electric Car." ENERGY.GOV. Last modified September 15, 2014. Accessed September 11, 2023. https://www.energy.gov/articles/history-electric-car.

Wilson, Kevin A. "Worth the Watt: A Brief History of the Electric Car, 1830 to Present." Car and Driver. Last modified March 31, 2023. Accessed September 11, 2023. https://www.caranddriver.com/features/g43480930/history-of-electric-cars/.

Capparella, Joey. "Electric Cars vs. Gas Cars: Everything You Need to Know." Car and Drive. Accessed September 11, 2023. https://www.caranddriver.com/research/a32781943/electric-cars-vs-gas-cars/.

Tabuchi, Hiroko, and Brad Plumer. "How Green Are Electric Vehicles?" The New York Times. Last modified June 23, 2023. Accessed September 11, 2023. https://www.nytimes.com/2021/03/02/climate/electric-vehicles-environment.html#:~:text=Raw%20materials%20can%20be%20problematic,Cobalt%20has%20been%20especially%20problematic.

"Controlling Air Pollution from Motor Vehicles." Department of Environmental Conservation. Accessed September 11, 2023. https://www.dec.ny.gov/chemical/8394.html#:~:text=Carbon%20monoxide%2C%20nitrogen%20oxides%2C%20and,in%20an%20internal%20combustion%20engine.

"What is a Catalytic Converter, and How Does it Work?" Synchrony. Last modified October 26, 2022. Accessed September 11, 2023. https://www.mysynchrony.com/blog/automotive/what-is-a-catalytic-converter-and-why-do-we-need-it.html#:~:text=Essentially%2C%20a%20catalytic%20converter%20filters,als

o%20improves%20your%20car's%20efficiency.https://www.epa.gov/risk/biofuels-and-environment#:~:text=Replacing%20fossil%20fuels%20with%20biofuels,dependence%20on%20unstable%20foreign%20suppliers.

"Biofuels and the Environment." United States Environmental Protection Agency. Last modified February 21, 2023. Accessed September 11, 2023. https://www.epa.gov/risk/biofuels-and-environment#:~:text=Replacing%20fossil%20fuels%20with%20biofuels,dependence%20on%20unstable%20foreign%20suppliers.

"Controlling Air Pollution from Motor Vehicles." Department of Environmental Conservation. Accessed September 11, 2023. https://www.dec.ny.gov/chemical/8394.html#ZEV.

"Benefits of Electric Cars on the Environment." EDF Energy. Accessed September 11, 2023. https://www.edfenergy.com/energywise/electric-cars-and-environment#:~:text=The%20major%20benefit%20of%20electric,This%20reduces%20air%20pollution%20considerably.

“ADDRESSING CONCERNS about ELECTRIC VEHICLE BATTERIES.” 2019. Coltura.org. 2019. https://coltura.org/evbatteries/#:~:text=If%20EV%20batteries%20continue%20to,from%20disposal%20of%20used%20batteries..

“What Are Diesel Emissions.” 2023. Dieselnet.com. 2023. https://dieselnet.com/tech/emissions.php#:~:text=Common%20pollutants%20include%20unburned%20hydrocarbons,schematically%20illustrated%20in%20Figure%201.

“U.S. Department of Energy Announces New Vehicle Technologies Funding and Future Partnerships with Battery Industry.” 2021.

Energy.gov.2021.https://www.energy.gov/eere/articles/us-department-energy-announces-new-vehicle-technologies-funding-and-future.

Lee Ying Shan. 2023. “Australia and Indonesia Have Signed a ‘Win-Win’ EV Battery Deal, Analyst Says.” CNBC. CNBC. July 5, 2023. https://www.cnbc.com/2023/07/05/australia-and-indonesia-have-signed-a-win-win-ev-battery-deal-analyst-says.html.