Forum: Environmental Committee (EC)

Issue: Coping with the effects of the return to the use of fossil fuels

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INTRODUCTION

In recent years, a worrying increase in the usage of fossil fuels has been detected, a fact that creates a significant drawback in worldwide attempts to transition into a more sustainable way of living. This, in turn, brings forth certain negative effects of fossil fuels on the climate that had been reduced prior. The resurfacing of fossil fuels is extremely concerning as the effects that it will have on the planet are fatal. Fossil fuels are widely used to produce energy by the burning of materials such as coal, natural gas, and oil. These resources produce fuels that are trapped in the earth's ozone resulting in many environmental and health precautions, including global warming, climate change, and overall air pollution. Having already seen the extent to which the above have impacted our planet, it is important to develop and invest in effective mechanisms to tackle the evermore-growing repercussions that the resurgence of fossil fuels has created. The reasons for the resurfacing of fossil fuels concern several aspects such as the constantly increasing population and the high prices of fossil fuel substitutes.

Although the environmental effects of such topics are of utmost importance to tackle seeing as they are the most prominent, implications can be detected in other fields of human life as well. The negative implications of such resurfacing also concern issues of healthcare and socioeconomic nature that have and will resurface with the return of fossil fuels in human activity. Hence, it is of great significance that the necessary resolutions are drawn to mitigate all effects that arise with the use of fossil fuels.

DEFINITION OF KEY-TERMS

Fossil fuels

"A fossil fuel is any of a class of hydrocarbon-containing materials of biological origin occurring within Earth's crust that can be used as a source of energy. Fossil fuels include coal, petroleum, natural gas, oil shales, bitumens, tar sands, and heavy oils." 1

¹ "Fossil Fuel." *Encyclopedia Britannica*, www.britannica.com/science/fossil-fuel

Mortality rate

"Mortality rate represents the ratio between deaths and individuals in a specified population and during a particular period"²

Surplus

"More than the amount that is needed: constituting a surplus"³

Energy density

"Energy density is the amount of energy that can be stored in each system, substance, or region of space. Energy density can be measured in energy per volume or per mass. The higher the energy density of a system or material, the greater the amount of energy it has stored."⁴

Solar Photovoltaic (PV) cells

"When light shines on a photovoltaic (PV) cell – also called a solar cell – that light may be reflected, absorbed, or pass right through the cell. The PV cell is composed of semiconductor material that can conduct electricity better than an insulator but not as well as a good conductor like a metal."⁵

Renewable energy sources

"Energy derived from natural sources that are replenished at a higher rate than they are consumed. Sunlight and wind are such sources that are constantly being replenished."

GDP

² "Definition of MORTALITY RATE." Dictionary by Merriam-Webster: America's Most-trusted Online Dictionary, www.merriam-webster.com/dictionary/mortality%20rate

³ *Definition of surplus*. (2023, 13). Merriam-Webster: America's Most Trusted Dictionary. https://www.merriam-webster.com/dictionary/surplus

⁴ Energy density. (n.d.). Energy Education. https://www.energyeducation.ca/encyclopedia/Energy density

⁵ Solar photovoltaic cell basics. (n.d.). Energy.gov. https://www.energy.gov/eere/solar/solar-photovoltaic-cell-basics

⁶"What Is Renewable Energy?" *United Nations*, Accessed 25 July 2023. https://www.un.org/en/climatechange/what-is-renewable-energy

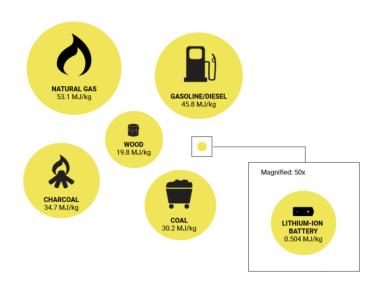
"The total monetary or market value of all the finished goods and services produced within a country's borders in a specific period, that functions as a comprehensive scorecard of a given country's economic health."⁷

BACKGROUND INFORMATION

The need for fossil fuels

To conduct a feasible solution to the issue of the resurgence of fossil fuels in human life it is first important to understand why fossil fuels are such a crucial part of the production and development of resources. In the past, there had been limited industrial production as the surplus was reliant on agriculture. Thus, there was no development in fields of production of goods further strengthening agricultural practices. Agriculture is an unstable form of production as harvesting seasons vary and do not always guarantee the production of sufficient surplus. In the case of a harvesting season with little surplus famines would often occur. In addition, transportation was inefficient as mobilization was done with horses. This even led to diseases being spread from the horses to humans resulting in major health issues that the public was unable to survive due to the lack of research on medicine. With the above, fossil fuels brought

forth improvements. There was rapid in industrial production, growth agriculture, and transportation. There was also an extreme improvement in human health and medicine research with the help of fossil fuels. This limited the mortality rate as diseases were now easier to overcome. There has also been a rise in economic activity and prosperity as fossil fuels are needed. The introduction of electricity is also a major contribution to the use of fossil fuels with 63% of coal produced being used for generating electricity⁸.



⁷ Fernando, Jason. "Gross Domestic Product (GDP): Formula and How to Use It." *Investopedia*, 30 May 2023, www.investopedia.com/terms/g/gdp.asp.

⁸ "Why Are Fossil Fuels So Hard to Quit?" *Brookings*, 16 June 2021, <u>www.brookings.edu/essay/why-are-fossil-fuels-so-hard-to-quit/</u>

Fossil fuels are more widely used as they are the most used sources of energy as they are the ones with the most amount of energy density resources such as gasoline, natural gas, coal, wood, and charcoal have the most energy density and thus are more efficient in producing energy. On the other hand, the use of materials such as lithium-ion battery is less preferred as they do not have the same efficiency. As seen in Figure 1, natural gas has 53.1 MJ/kg whereas, a lithium-ion battery, a rather better option for energy, only has 0.504 MJ/kg, making it a less efficient option.

Causes for the Return of fossil fuels

Politicians, activists for the environment, and proponents of alternative power sources are all concerned about the resurgence of fossil fuels in the global energy scene. After an extended period of decline, several factors have helped fossil fuels reappear as the primary energy source. Coal, oil, and natural gas—fossil fuels—have traditionally supported numerous international economies. There is a parallel rise in energy demand as economic expansion quickens. The economic Figure 1 The energy density of materials often used in the production of energy. justification for the revival of

fossil fuels includes expanding populations, greater transportation needs, and rapid industrial expansion. Energy consumption patterns are greatly influenced by changes in oil prices. Fossil fuels are more economically appealing than other forms of energy during periods of low oil prices. A return to fossil fuels is encouraged by fewer expenses for manufacturing and lower consumer and industry costs, particularly in areas where renewable energy sources might not be as accessible or cost-effective. The widespread implementation of alternative power sources is hampered by technological limits in some areas, especially developing countries or places with poor infrastructure. Fossil fuel use may become more appealing because of inadequate infrastructure investments in renewable energy, grid constraints, and a lack of experience deploying and managing sustainable energy alternatives. Moreover, causes for a resurface of the usage of fossil fuel include the rapid increase in population. The Earth is heavily populated and as the population rises more demand and need for resources surfaces leading companies to increase production of goods and services. This increase in production increases fossil fuel emissions respectively. Moreover, substitutes to fossil fuels that have been developed such as wind turbines and solar photovoltaic (PV) cells are greatly reliant on natural phenomena such as wind and sunlight respectively. This makes such substitutes an engineering challenge as the generation of energy varies according to weather. Lastly, the use of hydro cars or solar electric cars is limited. Since such vehicles have only recently been developed, they are expensive and hard to maintain, disincentivizing consumers from purchasing such.

Environmental effects

As mentioned, when fossil fuels are burned, carbon dioxide emissions are released into the air and trapped within the Earth's ozone. This leads to rising temperatures since heat is trapped in the atmosphere. Rising temperatures then result in issues such as climate change due to global warming and air pollution. With the above climate externalities, there are implications made to our planet such as ocean acidification. Fossil fuels are often absorbed by the ocean resulting in a change in their chemistry. This makes it harder for marine organisms like crabs to form shells and corals. More specifically, in the past 150 years ocean acidity has increased by 30%9. In addition, extreme weather conditions are constantly becoming more frequent. The overuse of fossil fuels creates a higher probability of the occurrence of severe weather events such as frequent wildfires, hurricanes, flooding, etc. The above lead to disasters in the well-being of people. An example of such is the impact that the wildfires in Canada had not only in Canada but also reaching New York City. Rising sea levels are also something that has recently been observed to occur due to climate change. Rising temperatures result in glaciers and land-based ice being melted and hence increasing sea levels. To be more specific, sea levels have increased by 9 inches since the late 1800s, further resulting in more frequent flooding 10. The extraction of fossil fuels with transportation can often lead to oil spills, increasing the possibility of wildfires, and destroying fields of land. For example, an oil spill of 134 million gallons of oil in 2010 into the Gulf of Mexico resulted in 11 human deaths and many animal deaths¹¹. Lastly, it is important to mention that with air pollution there are several damages made to forests and generally wildlife.

Healthcare implications

Due to air and water pollution, several healthcare implications occur due to the use of fossil fuels. With air pollution, there have reportedly been an increasing amount of healthcare issues such as asthma cancer, heart diseases, and premature deaths. Seeing as such fuels are trapped within the Earth's atmosphere, the air becomes increasingly more polluted, meaning that humans breathe polluted air, resulting in several healthcare issues. Approximately one in five deaths are caused by fossil fuel pollution while in the United States, 350 thousand premature

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⁹ Environmental and Energy Study Institute (EESI). "Fact Sheet | Climate, Environmental, and Health Impacts of Fossil Fuels (2021)." *Environmental and Energy Study Institute | Ideas. Insights. Sustainable Solutions*, 17 Dec. 2021, www.eesi.org/papers/view/fact-sheet-climate-environmental-and-health-impacts-of-fossil-fuels-2021

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¹¹ Oil spills. (n.d.). National Oceanic and Atmospheric Administration. https://www.noaa.gov/education/resource-collections/ocean-coasts/oil-

spills#:~:text=The%20largest%20marine%20oil%20spill,had%20spilled%20into%20the%20ocean

deaths occurred in 2018 due to such¹². Concerning water pollution occurs mainly due to oil spills and other related fluids in the water. These fluids are often toxic meaning that water becomes increasingly more polluted. Due to this pollution, swimming in the ocean becomes more dangerous as skin conditions become more often as well as increasing cases of skin cancer have been observed within the healthcare field.

Socio-economic effects

Social effects

One social issue that has been pinpointed in the past years is the disproportional harm of fossil fuels on communities. More specifically, the health impact that the use of fossil fuels has is different between communities. Black or Hispanic Americans have been exposed to 56%-63% more polluted environments due to the work done in such areas. Taking as an example the area of Louisiana, the cancer risk is 50 times higher than the national risk. Louisiana is a predominantly Black and low-income area. Hence, the effects of fossil fuels are increased or decreased following the nature of production in certain areas. Taking into account the racism that revolves around certain parts of the world, in certain areas that are dominated by high levels of industrial production and output minorities tend to be generally more affected by the implications.

Economic effects

Because of fossil fuels on the environment, certain economic issues concern the world. With air pollution, research has shown, it is expected that economic losses will reach \$2.9 trillion per year (3.3% of the global GDP)¹³. Furthermore, with the natural disasters that increasingly occur due to fossil fuel pollution comes property loss and damage. Disasters such as floods and wildfires lead to infrastructure, buildings, and landmarks being destroyed leading to several economic implications as they are now needed to be rebuilt, burdening the economy.

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¹² Environmental and Energy Study Institute (EESI). "Fact Sheet | Climate, Environmental, and Health Impacts of Fossil Fuels (2021)." *Environmental and Energy Study Institute | Ideas. Insights. Sustainable Solutions*, 17 Dec. 2021, www.eesi.org/papers/view/fact-sheet-climate-environmental-and-health-impacts-of-fossil-fuels-2021

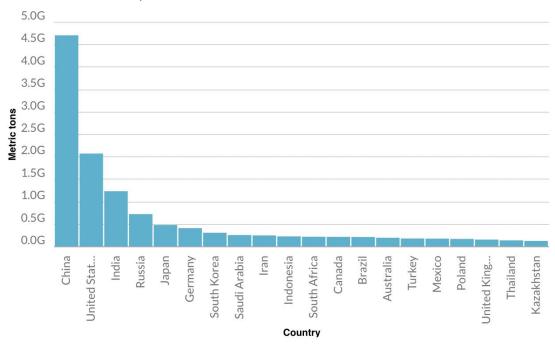
¹³ "New Research: Air Pollution from Fossil Fuels Costs the World \$8 Billion Every Day." *Greenpeace USA*, 12 Feb. 2020, <a href="https://www.greenpeace.org/usa/news/new-research-air-pollution-from-fossil-fuels-costs-the-world-8-billion-every-e

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MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

China

China is the most populated country in the world as of this time and hence majorly contributes to the global production of fossil fuel emissions. As mentioned, the increasing population demands that more supplies are produced in order to keep up with the demand and needs. Overpopulation in China has led to a number of challenges including limited resources, environmental degradation, economic challenges, and health and healthcare issues. Limited resources like land, water, and food in coordination with the increase in fossil fuel emissions have led to issues such as deforestation, water shortages, and food insecurity. Environmental degradation such as air and water pollution, soil erosion, and loss of biodiversity have also been caused by such. The country is also facing the negative effects of urbanization, as well as the impacts of climate change. Economic development programs have been implemented to help create jobs and improve living standards, environmental conservation programs have been implemented to help protect the country's natural resources and biodiversity. Overall, China has implemented several measures to address the challenges of increasing fossil fuel emissions, however, the problem is still persistent, and more efforts are needed to ensure sustainable environmental development.



UN Environment, Global Material Flows Databasee

Figure 2- Graph showing the fossil fuel emissions of each country

United States of America (USA)

The USA is also one of the greatest producers of fossil fuels in the world, as seen in the figure above. The US also has high levels of population; however, it is not the main reason for fossil fuels being so overused. Ever since the Industrial Revolution the US has been heavily reliant on fossil fuels in the production process of goods. They have also been the most prominent power in the production of goods and services meaning that when producing large amounts of products also comes the issue of mass fossil fuel emissions being exposed to the atmosphere. The US government in the past has invested in research and development of different sources of energy, namely solar energy. Although many buildings in the past decade have transitioned into more sustainable sources of energy, progress has yet to further improve, more so with the global pandemic that our world has undergone in the past years.

The United States Environmental Protection Agency (EPA)

The United States Environmental Protection Agency (EPA) is an agency that is US based and tackles issues of environmental nature to reduce the implications of human activity on the planet. Although it is US based, the agency carries out several cooperative programs with other countries around the world to globally improve issues of fossil fuel emissions. They mainly work by passing certain laws and regulations related to issues of environmental significance while also having a web page with articles being published to keep audiences informed on recent issues. Regarding fossil fuel emissions, they have published articles that describe the sources of such fuels being emitted as well as several precautions that can be taken by people and businesses that can help improve such.

TIMELINE OF EVENTS

DATE	DESCRIPTION OF EVENT
1970	The enactment of the Clean Air Act
2 December, 1970	The establishment of the United States Environmental Protection Agency

11 December 1997	The Kyoto Protocol was adopted by 84 nations
September 2015	The 17 Sustainable Development Goals were drafted
22 April 2016	The signing of the Paris Agreement
4 November 2016	The Paris Agreement is put into effect
21 July 2022	The Fossil Fuel Non-Proliferation Treaty was signed

RELEVANT UN RESOLUTIONS, TREATIES, AND EVENTS

The Paris Agreement

The Paris Agreement signed on 22 April 2016 and approved by the European Union on 5 October 2016 was an international treaty on climate change adopted by 196 parties and was put into effect on 4 November 2016. The agreement was created to improve and replace, eventually, the Kyoto Protocol. It was a legally binding agreement that hoped to result in zero emissions released into the atmosphere. The aim of the agreement was to limit the climate from rising temperatures by 2 degrees Celsius. All countries that signed must assess their progress every five years with the first being planned for 2023. Firstly, the Paris Agreement aims to reduce greenhouse gas emissions by encouraging countries to switch to clean energy sources, implementing carbon pricing mechanisms, and promoting energy efficiency. This will reduce the environmental impact of overpopulation by slowing down climate change. In addition, the Paris Agreement encourages countries to adopt sustainable development policies that take into account the social, economic, and environmental dimensions of development. This can help to address overpopulation by reducing poverty and improving living standards, which in turn can lead to lower birth rates.

Resolution A/RES/70/1

With this resolution, the United Nations General Assembly established the 17 Sustainable Development Goals in 2015 to be achieved by 2030 and focus on several aspects of human life.

The 7th Goal focuses on "affordable and clean energy". More specifically, it aims to "ensure access to affordable, reliable, sustainable, and modern energy for all". Countries such as Finland and Sweden have been successful in implementing the necessary policies to reach a relatively ecofriendly way of living; however, countries such as South Sudan and Afghanistan are having issues keeping up with the More Economically Developed Countries (MEDCs). From this, it can be inferred that perhaps further actions need to be taken within those LEDCs so as to keep up with more developed countries. Actions for such can include economic incentives and subsidies.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

Clean Air Act

The Clean Air Act is conducted by EPA and is a comprehensive federal law that regulates the amount of fossil fuel emissions produced. It overlooks that the National Ambient Air Quality Standards (NAAQS) are met in order to protect the climate and the well-being of people. The main aim of this act was that every US state would conquer all standards set by the NAAQS by 1975. This, however, was not met and hence an amendment was needed and made in 1977 and 1990 to set new goals.

Fuel Efficiency Standards for Vehicles

Many countries such as the US, Japan, and China have implemented Fuel Efficiency Standards for Vehicles as a way of decreasing the use of fossil fuel-powered automobiles. The standards are certain requirements that producers of vehicles must follow to limit fossil fuel emissions and meet fuel economy targets. This results in the encouragement of the development acquire more efficient and sustainable vehicles.

A Fossil Fuel Non-Proliferation Treaty

The Fossil Fuel Non-Proliferation Treaty was signed on July 21, 2022. It is a treaty that was endorsed by the Vatican and in October of the same year the World Health Organization and another 200 organizations took part in the signing of the treaty. It aims to complement the aforementioned Paris Agreement and thus decrease the amount of fossil fuel emissions being emitted. It promotes global cooperation between nations to form the effective regulations needed to tackle the issue. With respect to the Paris Agreement, after its signing, several leaders did not follow through with the targets set and instead approved several coal, oil, and gas projects. Hence, this treaty aims to hold such accountable and draw a new plan of procedure.

POSSIBLE SOLUTIONS

Implementing necessary laws and regulations

As seen with previous attempts to solve the issue, implementing the necessary laws and regulations is one way of approaching the issue of resurfacing fossil fuels. Laws can include restrictions on the amount of product that each factory is allowed to produce and or the number of emissions that they are allowed to emit during the production process. Furthermore, the government may also choose to increase taxes on certain resources needed for production, increasing the production cost of the product resulting in less product being produced at a higher price. Apart from taxation as a form of regulation, the government may want to subsidize households by providing certain benefits to ones that use renewable, eco-friendly energy to power their houses.

Provide incentives to companies developing eco-friendly cars

One more way to deal with the impacts of fossil fuels is to tackle the use of such in the production and usage of vehicles by reducing the gas emissions released into the atmosphere. A way to do this is to suggest that governments of all nations provide incentives to companies that are currently developing and researching eco-friendly cars. With such incentives production cost of companies would be reduced, prompting them to produce more and for a cheaper price, which is beneficial for consumers since more people would be willing to buy eco-friendly cars due to the reduction of their price. Fossil fuel emissions are one of the major contributors to the effects of climate change and are extremely harmful to the environment thus by reducing said emissions climate change would decrease and would not have such a negative impact on the environment.

Raising Awareness

Another effective approach to address the issue of the return of fossil fuels is through raising public awareness and education. By increasing understanding of the consequences of fossil fuels on the sustainability of our planet, individuals may be motivated to participate in the drive toward a more eco-friendly way of living and take further actions themselves. To achieve this objective, comprehensive public awareness campaigns can be launched through various platforms, including social media, to reach a wide audience. These campaigns could be funded by international organizations such as the World Bank and the United Nations, and aim to raise awareness, educate the public, and generate support for addressing the issue. By raising awareness, individuals who are willing to help address the issue will have the means to do so and contribute to a more sustainable future.

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