

Topic: Renewable Energy vs. Fossil Fuels: Which source is better for the long-term health of the planet?

Position: Renewable energy is better for the long-term health of the planet.

1. Introduction

1.1. Brief definition of renewable energy and fossil fuels

1.2. Thesis statement: In the pursuit of sustainable energy solutions, renewable energy and fossil fuels present contrasting approaches to powering our planet. While renewable energy focuses on harnessing natural, inexhaustible sources like wind, solar, and hydro, fossil fuels rely on finite resources such as coal, oil, and natural gas. This essay will argue in favor of renewable energy as the superior choice for the long-term health of the planet, as it significantly reduces greenhouse gas emissions, minimizes environmental pollution, and conserves essential natural resources, ultimately fostering a cleaner, more sustainable future for generations to come.

2. Reducing Greenhouse Gasses: Renewable energy is the superior choice for the long-term health of the planet because it will help reduce greenhouse gas emissions.

2.1. Defining Greenhouse Gas Emissions

2.1.1. What is it?

2.1.2. What are the negative effects?

2.2. Renewable energy

2.2.1. Solar, wind, hydro, and geothermal power generate little to no greenhouse gases

2.2.2. Helps mitigate climate change by reducing carbon footprint

2.3. Fossil fuels

2.3.1. Combustion of coal, oil, and natural gas releases significant amounts of CO₂ and methane

2.3.2. Major contributor to global warming and climate change

3. Minimizing Pollution: Another reason renewable energy will benefit the long-term health of the planet is that its use will significantly reduce pollution.

3.1. Defining Pollution

3.1.1. What is it?

3.1.2. What are the negative effects?

3.2. Renewable energy

3.2.1. Produces minimal air and water pollution compared to fossil fuels

3.2.2. Cleaner energy production leads to better public health outcomes

3.3. Fossil fuels

3.3.1. Extraction and burning lead to air, water, and soil pollution

3.3.2. Associated with respiratory diseases, water contamination, and environmental degradation

4. Conserving Natural Resources: Finally, moving away from fossil fuels and focussing on renewable sources will help to conserve our planet's rapidly disappearing natural resources.

4.1. Defining Natural Resource Conservation

4.1.1. What is it?

4.1.2. Why is it important?

4.2. Renewable energy

4.2.1. Utilizes abundant and sustainable resources like sunlight, wind, and water

4.2.2. Reduces dependence on finite resources and promotes energy security

4.3. Fossil fuels

4.3.1. Dependence on finite resources like coal, oil, and natural gas

4.3.2. Depletion of these resources leads to energy crises and geopolitical conflicts

5. Conclusion

- 5.1. Recap of the main points supporting renewable energy as a better option for the planet
- 5.2. Restate thesis: Renewable energy is more sustainable and environmentally friendly due to its reduction of greenhouse gases, minimization of pollution, and conservation of natural resources
- 5.3. Implications for energy policy and future research

In 2022 the level of Carbon Dioxide in the atmosphere passed an important and shocking milestone: Global averaged concentrations of carbon dioxide (CO₂), the most important greenhouse gas, were a full 50% above the pre-industrial era for the first time (Nullis, 2023). As the world grapples with the escalating impacts of climate change, the urgent need to transition from fossil fuels to renewable energy sources becomes ever more apparent. Renewable energy technologies, such as wind, solar, and hydroelectric power, not only promise a substantial reduction in greenhouse gas emissions but also offer a pathway to sustainable development and environmental stewardship. This essay will argue in favor of renewable energy as the superior choice for the long-term health of the planet, as it significantly reduces greenhouse gas emissions, minimizes environmental pollution, and conserves essential natural resources, ultimately fostering a cleaner, more sustainable future for generations to come.

One reason renewable energy is better for the long-term health of the planet than fossil fuels is because of the need to reduce greenhouse gas emissions. Reducing greenhouse gas emissions is crucial for mitigating the adverse effects of climate change. According to the United States Environmental Protection Agency, Greenhouse gas emissions primarily consist of carbon dioxide (CO₂) and methane (CH₄), which are released into the atmosphere through various human activities, including industrial processes, transportation, and agriculture (US EPA, 2015). These gasses trap heat, leading to global warming and climate change, with the Intergovernmental Panel on Climate Change (IPCC) reporting that global temperatures have already risen by approximately 1.1°C since pre-industrial times. The IPCC climate change report stated that “the likely range of total human-caused global surface temperature increase from 1850–1900 to 2010–2019 is 0.8°C to 1.3°C, with a best estimate of 1.07°C” (Masson-Delmotte et al., 2021, p. 5). Renewable energy sources such as solar, wind, hydro, and geothermal power generate little to no greenhouse gasses. For instance, solar and wind energy have lifecycle emissions of about 20-40 grams of CO₂ equivalent per kilowatt-hour, compared to coal's 820 grams per kilowatt-hour (Nugent & Sovacool, 2014). Adopting these clean energy technologies can significantly reduce our carbon footprint, with studies indicating that a full transition to renewable energy could reduce global CO₂ emissions by up to 56% by 2050 (World Energy Transitions Outlook, 2023). In contrast, the combustion of fossil fuels like coal, oil, and natural gas releases substantial amounts of CO₂ and methane, with fossil fuel combustion accounting for approximately 75% of global greenhouse gas emissions (US EPA, 2024). This makes fossil fuels a major contributor to global warming,

which in turn causes severe weather events, rising sea levels, and widespread ecological disruptions. Transitioning from fossil fuels to renewable energy is, therefore, a key strategy in reducing greenhouse gas emissions and promoting environmental sustainability. The shift not only addresses climate change but also reduces air pollution, improves public health, and creates economic opportunities in the burgeoning green energy sector.

Another reason renewable energy will benefit the long-term health of the planet is that its use will significantly reduce pollution. Pollution refers to the introduction of harmful substances into the environment, which can contaminate air, water, and soil, leading to adverse health and ecological effects. The negative impacts of pollution are vast, including respiratory diseases in humans, contamination of drinking water sources, and the degradation of natural habitats (Manisalidis et al., 2020). Renewable energy sources produce minimal air and water pollution compared to fossil fuels. For example, solar panels and wind turbines generate electricity without emitting pollutants that degrade air quality. Similarly, hydroelectric and geothermal power produce energy with negligible emissions. A study has shown that reducing air pollution through the use of cleaner energy sources can lead to significant public health benefits. For instance, transitioning to 100% renewable energy by 2050 could prevent an estimated 97% of the premature deaths annually caused by air pollution-related diseases such as lung cancer, heart disease, and chronic respiratory illnesses (Galimova et al., 2022). In contrast, the extraction and burning of fossil fuels lead to substantial air, water, and soil pollution. The combustion of coal, oil, and natural gas releases harmful pollutants, including sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM), and volatile organic compounds (VOCs) (Manisalidis et al., 2020). These substances contribute to smog, acid rain, and respiratory problems. According to the Environmental Protection Agency (EPA), power plants burning fossil fuels are the largest source of SO₂ emissions and the second-largest source of NO_x emissions in the United States, both of which are major contributors to air pollution (US EPA, 2016). Moreover, fossil fuel extraction processes such as fracking and oil drilling can lead to water contamination. Chemicals used in these processes can seep into groundwater, making it unsafe for drinking and harming aquatic ecosystems (Ridley, 2024). The Deepwater Horizon oil spill in 2010 is a stark example of the environmental degradation caused by fossil fuels, resulting in extensive damage to marine life and coastal ecosystems (US Department of Commerce, 2024). In summary, renewable energy is superior for the long-term health of the planet as it significantly reduces pollution. By adopting cleaner energy production methods, we can improve air and water quality, enhance public health outcomes, and protect the environment from the detrimental effects of fossil fuel pollution. This transition is essential for fostering a healthier, more sustainable future for all living beings on the planet.

Finally, moving away from fossil fuels and focusing on renewable sources will help to conserve our planet's rapidly disappearing natural resources. Natural resource conservation involves the responsible management and use of natural resources to ensure their availability for future generations. This is crucial for maintaining ecological balance, supporting economic stability, and ensuring long-term energy security. Renewable energy utilizes abundant and sustainable resources such as sunlight, wind, and water. Unlike fossil fuels, these resources are inexhaustible and widely available across the globe. For instance, the sun provides an immense amount of energy daily, enough to meet global energy needs many times over. Wind power, too, can be harnessed indefinitely without depleting the resource. According to the International Renewable Energy Agency (IRENA), harnessing just a fraction of the available renewable resources could supply more than 100 times the current global energy demand (World Energy Transitions Outlook, 2023). This shift reduces dependence on finite resources and promotes energy security by diversifying the energy supply and reducing the risks associated with resource scarcity. In contrast, fossil fuels rely on finite resources like coal, oil, and natural gas. These resources are being depleted at an alarming rate due to overconsumption. The World Energy Outlook 2021 by the International Energy Agency (IEA) highlights that proven oil reserves could be exhausted within 50 years at the current rate of consumption (World Energy Outlook, 2022). This depletion not only leads to energy crises but also exacerbates geopolitical conflicts over access to remaining reserves. For example, many conflicts in the Middle East have been driven by the strategic importance of oil resources, leading to instability and suffering (Hafner et al., 2023). Additionally, the extraction of fossil fuels often involves environmentally destructive practices such as strip mining, deep-sea drilling, and hydraulic fracturing, which further degrade the natural landscape and ecosystems (The Hidden Costs of Fossil Fuels | Union of Concerned Scientists, 2024). The conservation of these resources through the adoption of renewable energy technologies can mitigate these environmental impacts. For example, wind and solar farms have a much smaller ecological footprint compared to coal mines or oil rigs. In summary, focusing on renewable energy is essential for conserving our planet's natural resources. By utilizing abundant and sustainable sources like sunlight, wind, and water, we can reduce our dependence on finite resources, ensure long-term energy security, and avoid the ecological and geopolitical issues associated with fossil fuel depletion. This transition is crucial for fostering a sustainable future and preserving the planet for future generations.

References

- Galimova, T., Ram, M., & Breyer, C. (2022). Mitigation of air pollution and corresponding impacts during a global energy transition towards 100% renewable energy system by 2050. *Energy Reports*, 8, 14124–14143. <https://doi.org/10.1016/j.egyr.2022.10.343>
- Hafner, M., Raimondi, P. P., & Bonometti, B. (2023). Geopolitics of oil and gas in the mena region. In M. Hafner, P. P. Raimondi, & B. Bonometti, *The Energy Sector and Energy Geopolitics in the MENA Region at a Crossroad* (pp. 265–339). Springer International Publishing. https://doi.org/10.1007/978-3-031-30705-8_5
- Manisalidis, I., Stavropoulou, E., Stavropoulos, A., & Bezirtzoglou, E. (2020a). Environmental and health impacts of air pollution: A review. *Frontiers in Public Health*, 8, 14. <https://doi.org/10.3389/fpubh.2020.00014>
- Manisalidis, I., Stavropoulou, E., Stavropoulos, A., & Bezirtzoglou, E. (2020b). Environmental and health impacts of air pollution: A review. *Frontiers in Public Health*, 8, 14. <https://doi.org/10.3389/fpubh.2020.00014>
- Masson-Delmotte, V., Zhai, P., Pirani, A., Connors, S. L., Péan, C., Berger, S., Caud, N., Chen, Y., Goldfarb, L., Gomis, M. I., Huang, M., Leitzell, K., Lonnoy, E., Matthews, J. B. R., Maycock, T. K., Waterfield, T., Yelekçi, Ö., Yu, R., & Zhou, B. (Eds.). (2021). Summary for policymakers. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 3–32). Cambridge University Press.
- Nugent, D., & Sovacool, B. K. (2014). Assessing the lifecycle greenhouse gas emissions from solar PV and wind energy: A critical meta-survey. *Energy Policy*, 65, 229–244. <https://doi.org/10.1016/j.enpol.2013.10.048>
- Nullis, C. (2023, November 14). *Greenhouse Gas concentrations hit record high. Again.* World Meteorological Organization. <https://wmo.int/news/media-centre/greenhouse-gas-concentrations-hit-record-high-again>
- Ridley, C. (2024). *Hydraulic fracturing for oil and gas: Impacts from the hydraulic fracturing water cycle on drinking water resources in the united states(Final report)* [Reports & Assessments]. <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990>
- The hidden costs of fossil fuels | union of concerned scientists.* (2024). <https://www.ucsusa.org/resources/hidden-costs-fossil-fuels>
- US Department of Commerce. (2024). *Deepwater horizon: Effect on marine mammals and sea turtles.* <https://oceanservice.noaa.gov/news/apr17/dwh-protected-species.html>

US EPA. (2015, December 23). *Overview of greenhouse gases* [Overviews and Factsheets].

<https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

US EPA. (2016, June 2). *Sulfur dioxide basics* [Overviews and Factsheets].

<https://www.epa.gov/so2-pollution/sulfur-dioxide-basics>

US EPA. (2024, February 8). *Inventory of u. S. Greenhouse gas emissions and sinks: 1990-2022* [Reports and

Assessments]. <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022>

World energy outlook 2022 – analysis. (2022, October 27). IEA.

<https://www.iea.org/reports/world-energy-outlook-2022>

World energy transitions outlook 2023. (n.d.). Retrieved May 24, 2024, from

<https://www.irena.org/Digital-Report/World-Energy-Transitions-Outlook-2023>