Renewable Energy VS Fossil Fuel For Future Use

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Aim of the Project

The Aim of the project was to conduct an intensive research and detailed analysis, of attentively examining both the positive aspects and potential negatives of renewable energy in comparison to the conventional technique of using fossil fuels.

Objectives

- Report on a comprehensive literature assessment on both fossil fuels and renewable energy sources.
- Execute case studies on various forms of renewable energy.
- Execute case studies on various forms of fossil fuels.
- Evaluate the advantages and disadvantages of fossil fuels and renewable energy.
- Explore the feasibility of transitioning to sustainable energy sources in the current or upcoming periods.

Methodology

- To achieve the goal of this dissertation, the following technique will be employed. In order to initiate this study project, it is important to identify the background information pertaining to the key feature of the benefits and drawbacks associated with renewable energy and fossil fuel.
- This will entail doing a comprehensive literature assessment on the merits and drawbacks of renewable energy and fossil fuel. The literature selection criteria will be restricted to peer-reviewed works published in English within a certain time frame.
- The examination of the case studies entails a methodical evaluation of the data to discern significant trends and patterns, along with an appraisal of the merits and limitations of each study.
- Upon completion of the required research, an assessment will be made of all the findings. Recommendations will then be given regarding the benefits and drawbacks of renewable energy and fossil fuel.

Renewable Energy

The concept of "energy" can be understood from two perspectives, firstly it can be conceptualized as the quantity of force or power applied to an object, enabling its displacement from one location to another and secondly, it can be perceived as the ability of a system to perform the necessary tasks, both of these conceptions of the term "energy" are considered valid in the academic context.

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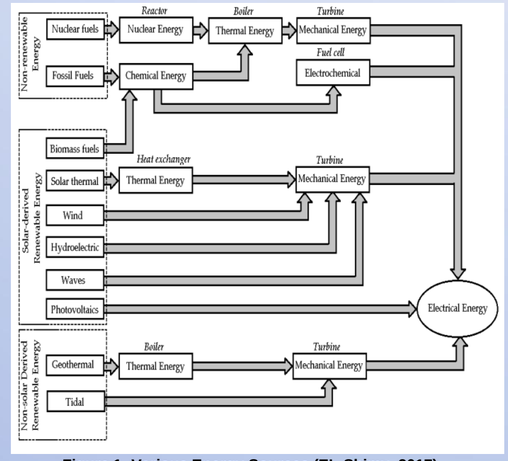

Figure 1: Various Energy Sources (EL-Shimy, 2017)

Case Study

The Lightyear Zero is outfitted with a lithium-ion battery that has a capacity of sixty kilowatt-hours and is constructed from cylindrical cells that have a high energy density. The compact battery layout of the Lightyear Solar Electric Car contributes to the vehicle's high level of output efficiency.

Photo of: Lightyear 0 (Lightyear, 2024)

Fossil Fuel

The world's energy resources primarily consist of three major categories of fossil fuels, namely oil, gas, and coal. the global distribution of fossil fuel reserves has been changed due to improvements in theoretical knowledge and significant progress in exploration methodologies. The combined quantity of conventional oil and gas that can be taken from the Earth is estimated to be 4,878 x 108 tons and 471 x 1012 cubic meters, respectively.

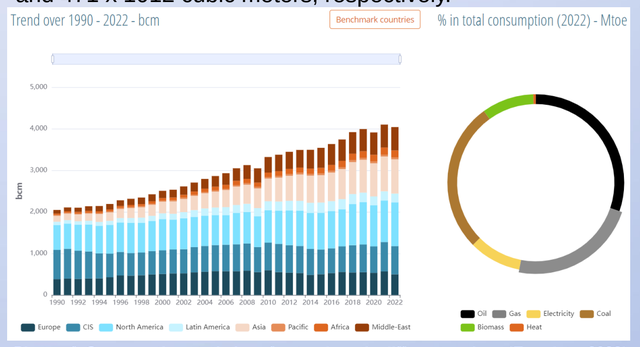

Photo of: Consumption statistics of natural gas in different regions (Enerdata, 2023)

Case Study

Coal fired power plants, sometimes referred to as coal fired power stations, are establishments that generate electricity through the combustion of coal; this process results in the production of steam. When compared to the majority of countries, China consumes a significant quantity of coal. South Africa generates 94% of its electricity from coal, while China and India generate 70-75% of their electricity from coal. South Africa is the only country in the world that relies on coal. Although coal makes it possible for people who do not have access to power to improve their quality of life and lessen their poverty, the use of coal also results in the production of vast quantities of pollutants that contribute to climate change and harm the quality of the air we breathe.

Photo of: A Coal Power Plant in England (Energy Education, 2024)

Conclusion

- Within the scope of the literature review, the historical features of fossil fuels and renewable energy were the primary focus. Energy can be understood in two different ways: first, as the amount of force or power that is utilised to move an object from one location to another; second, as the capacity of a system to carry out tasks. There is consensus among academics that both readings are correct.
- There are three key categories of fossil fuels that make up the majority of the world's energy resources. These are coal, gas, and oil. There has been a shift in the global distribution of fossil fuel reserves as a consequence of developments in theoretical understanding as well as major improvements in exploration techniques.Concerns about the environment have surfaced in recent decades as a result of the costs that are connected with fossil fuels, despite the fact that these fuels have enormous economic advantages.
- The findings of the study made it abundantly clear that there is widespread acceptance of viewpoints about both renewable and non-renewable sources of energy.

References

- EL-Shimy, M. (2017). *Economics of Variable Renewable Sources for Electric Power Production*.
- Enerdata. (2023). *World Energy & Climate Statistics Yearbook 2023*. Enerdata. https://yearbook.enerdata.net/natural-gas/gas-consumption-data.html
- Lightyear. (2024, February 24). *Lightyear*. Lightyear. https://lightyear.one/
- Energy Education. (2024, February 25). *Energy Education*. Energy Education. https://energyeducation.ca/encyclopedia/Coal_fired_power_plant#:~:text=Coal%20fired%20power%20plants%20also,40%25%20of%20the%20world's%20electricity.

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