

Environmental Benefits of Using Hydrogen Fuels



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Abstract

The purpose of our research presentation is to inform you about the environmental benefits of using hydrogen fuel as an alternative fuel to traditional fuels. We received the task of doing this research project in August of 2022. The report will include the benefits of using hydrogen fuel. Our presentation will go through some of the benefits to using this alternative fuel. The benefits include but are not limited to, renewability and emissions. Our group has done research through books, assisting professors, and websites to bring to you this presentation.

OBJECTIVES

- Determine emissions of hydrogen fuels versus traditional fuels
- Research the renewability of hydrogen fuels
- Research the production and costs to the consumers

METHODS

- Internet research
- Research from news
- Discussing validity of sources

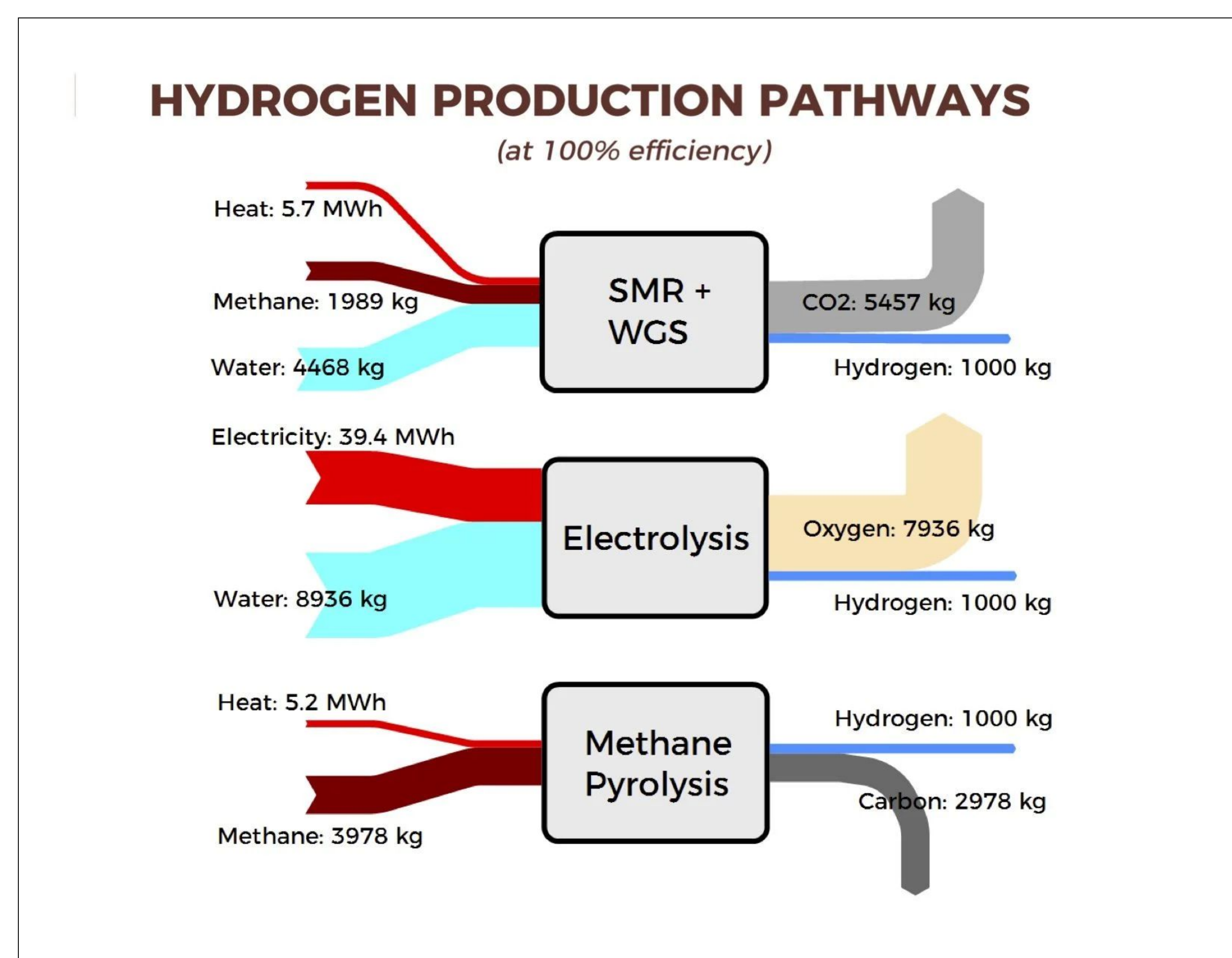


Figure 1. Hydrogen Production Process (3)

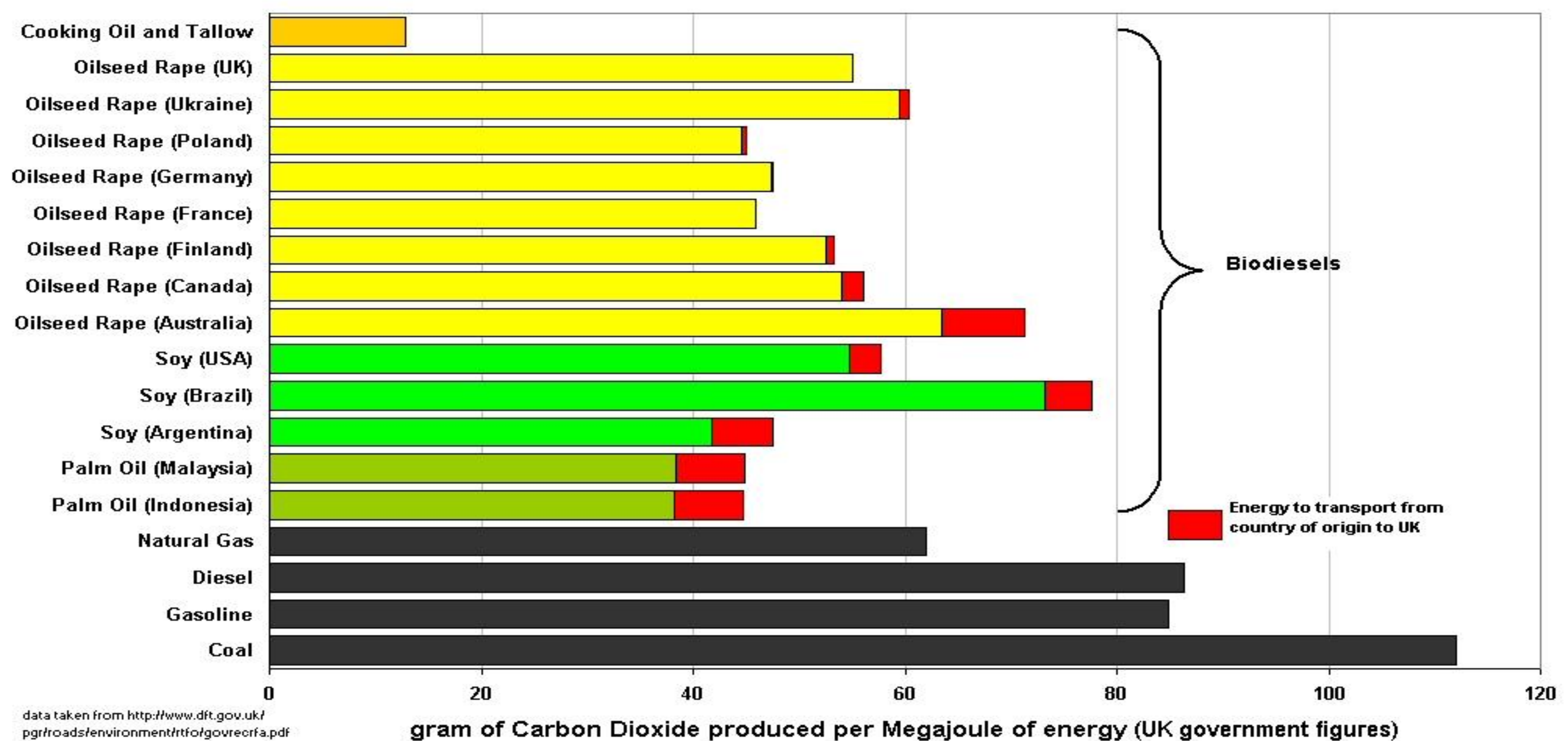


Figure 2. CO₂ Produced per Megajoule of Energy (4)

RESULTS

- Hydrogen has the following characteristics:
 - Produces 0 grams of CO₂ when combusted
 - When combusted, the hydrogen produces H₂O
 - Can be made from renewable energies sources (Wind, Solar, Hydropower, etc)
 - Blue hydrogen- hydrogen produced by natural gas, and has some methane lost during production process
 - Grey hydrogen- hydrogen produced by natural gas and produces CO₂ during production process
 - Pink hydrogen- hydrogen produced by nuclear energy powering electrolysis and has nuclear waste
 - Yellow hydrogen- made from the power grid and can produce carbon if not from renewable energy source
 - Turquoise hydrogen- hydrogen made from splitting methane into solid carbon and hydrogen through pyrolysis
 - Hydrogen made from natural gas costs \$1.50 per kg while clean hydrogen methods cost around \$5.00 per kg

FUTURE WORK

- Further research to help bring down the cost of producing clean energy
- Improved experimentation to verify how efficient and clean production processes are

CONCLUSIONS

Hydrogen fuel can be a very beneficial clean form of energy producing a H₂O waste product when combusted, but this all depends on how the hydrogen is produced. We need to focus on the clean ways of making hydrogen whether that be through splitting methane through pyrolysis, or making the power grid convert renewable or clean energy systems such as wind, solar, and hydropower in order to bring down the cost of this fuel to make it so consumers are able to afford it. It is also important to look into the nonrenewable sources in order to make them have less emissions.

References

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- 2 Smoot, G. (n.d.). What Is the Carbon Footprint of Hydrogen Fuel? A Life-Cycle Assessment [web log]. Retrieved April 1, 2023, from [https://impactful.ninja/the-carbon-footprint-of-hydrogen-fuel/#:~:text=Hydrogen%20\(H2\)%20has%20the,and%20has%20various%20environmental%20benefits](https://impactful.ninja/the-carbon-footprint-of-hydrogen-fuel/#:~:text=Hydrogen%20(H2)%20has%20the,and%20has%20various%20environmental%20benefits)
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Acknowledgments

Dr. Nolan Holland, Choose Ohio First