

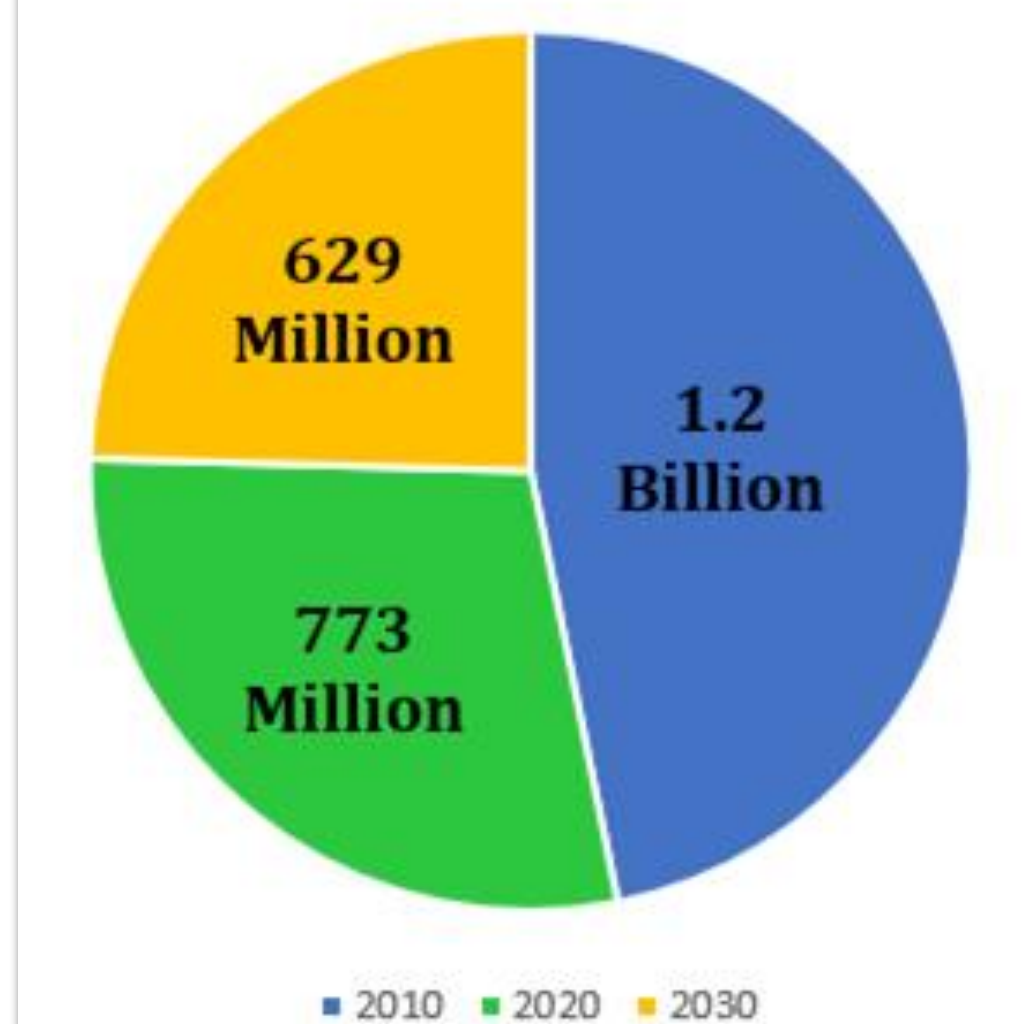
Social Impact



- SDG #7: "Ensure access to affordable, reliable, sustainable and modern energy for all".

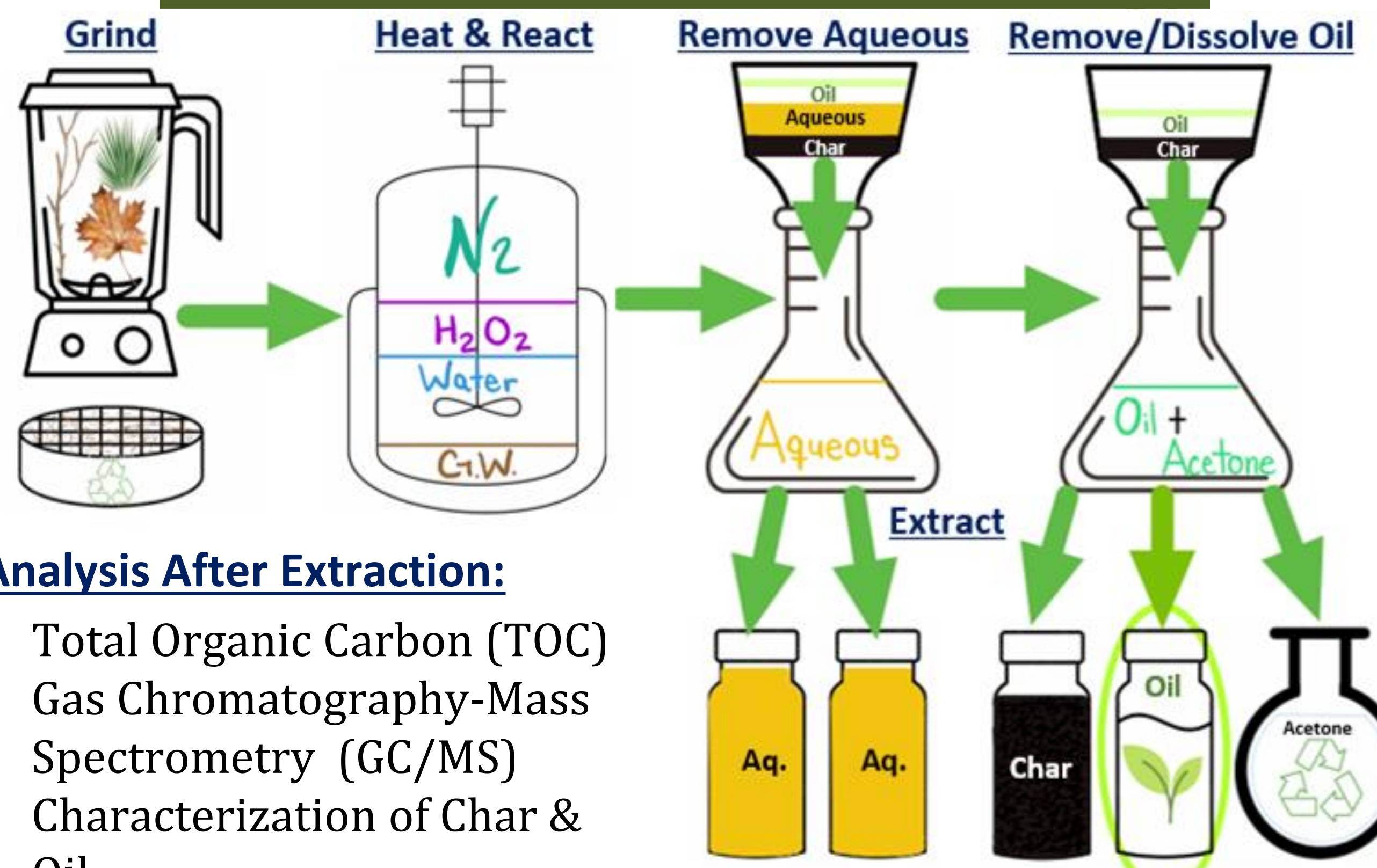
- The project will also shape high schoolers in chemistry as the lab experience was transformed into a **lesson plan for interactive learning**.

People Without Electricity (SDGs)



Yard trimmings 2018: 35,400,000 tons

Transformation of Energy



Discussion

Reactions	20min	60min
275°C	35.9%	N/A
300°C	33.1%	25.9%
325°C	24.5%	N/A
350°C	26.5%	N/A

The results demonstrate that the procedure can be carried out at a lower temperature, it will be more energy efficient, economic, and less time-consuming.

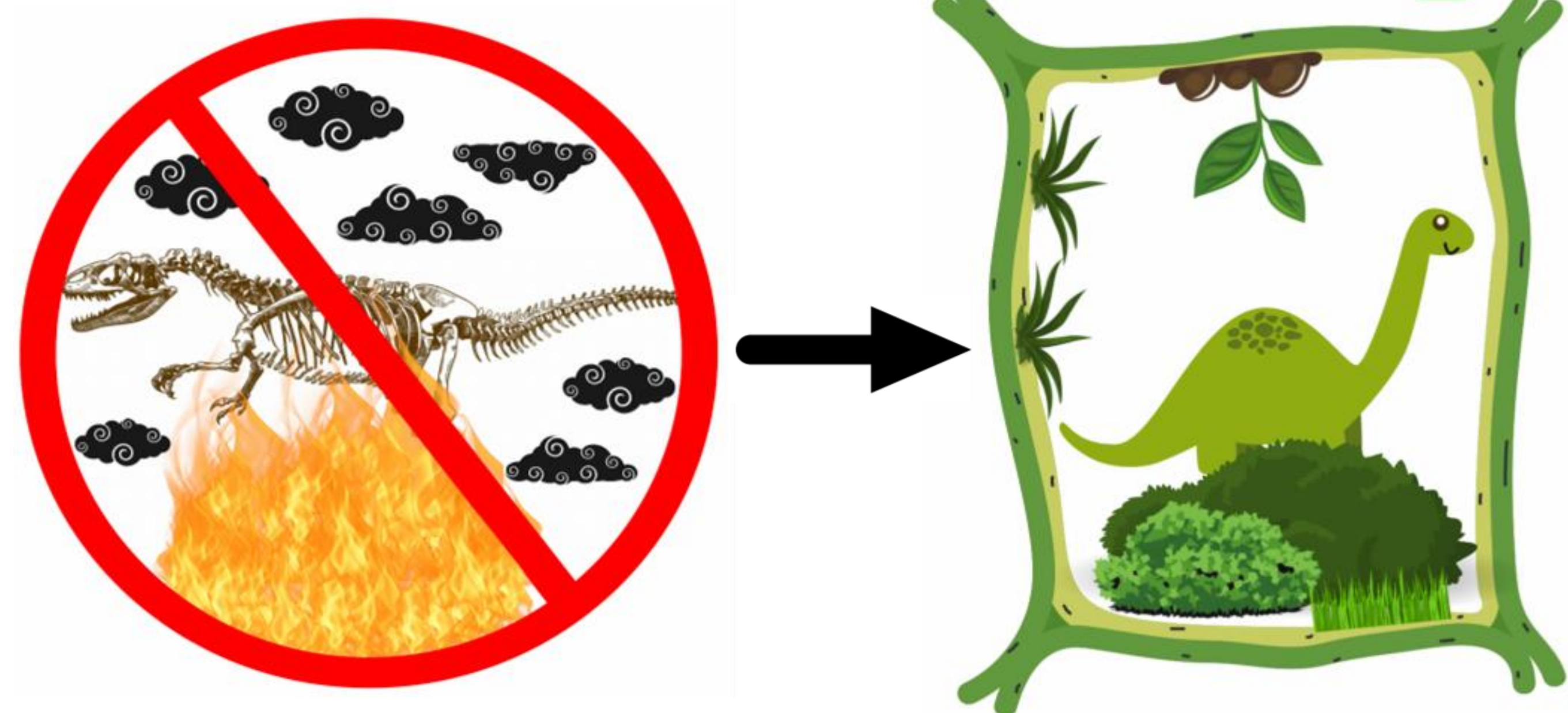


Green Waste & HTL

The Hydrothermal Liquefaction (HTL) process that was used is **sustainable, economically viable, and non-polluting**, thus allowing to **produce bio-oil** (clean energy) from energy-dense green waste feeds (yard clippings and agricultural waste).

Fossil Fuels ❌

Lignocellulose ✅



The HTL phases were characterized to determine the best conditions to **maximize oil production and quality**. Various reaction times and temperatures were also evaluated, to **achieve an optimal system**.

Gas



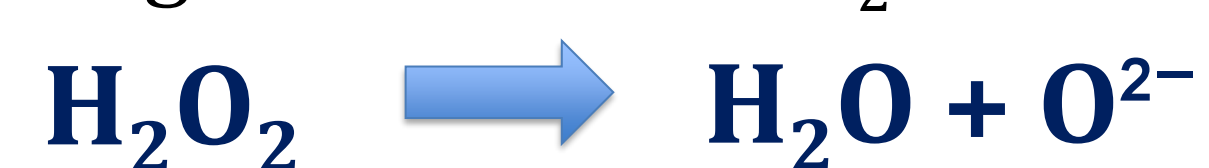
Char



Oil

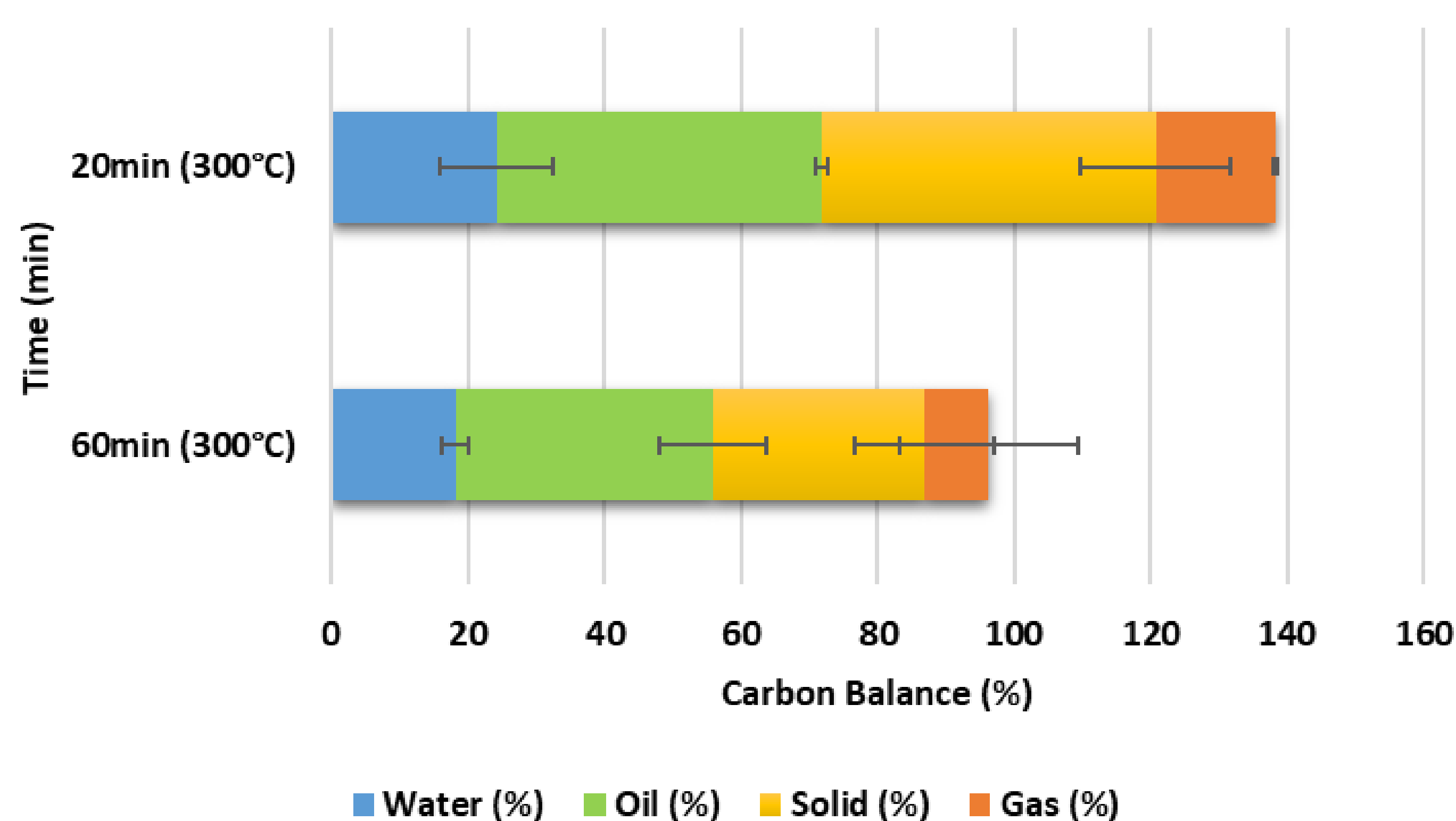


In the reaction Hydrogen Peroxide (the catalyst) acts as an **oxidant** to reduce the amount of char and produce more oil! More H₂O₂ results in gasification to CO₂

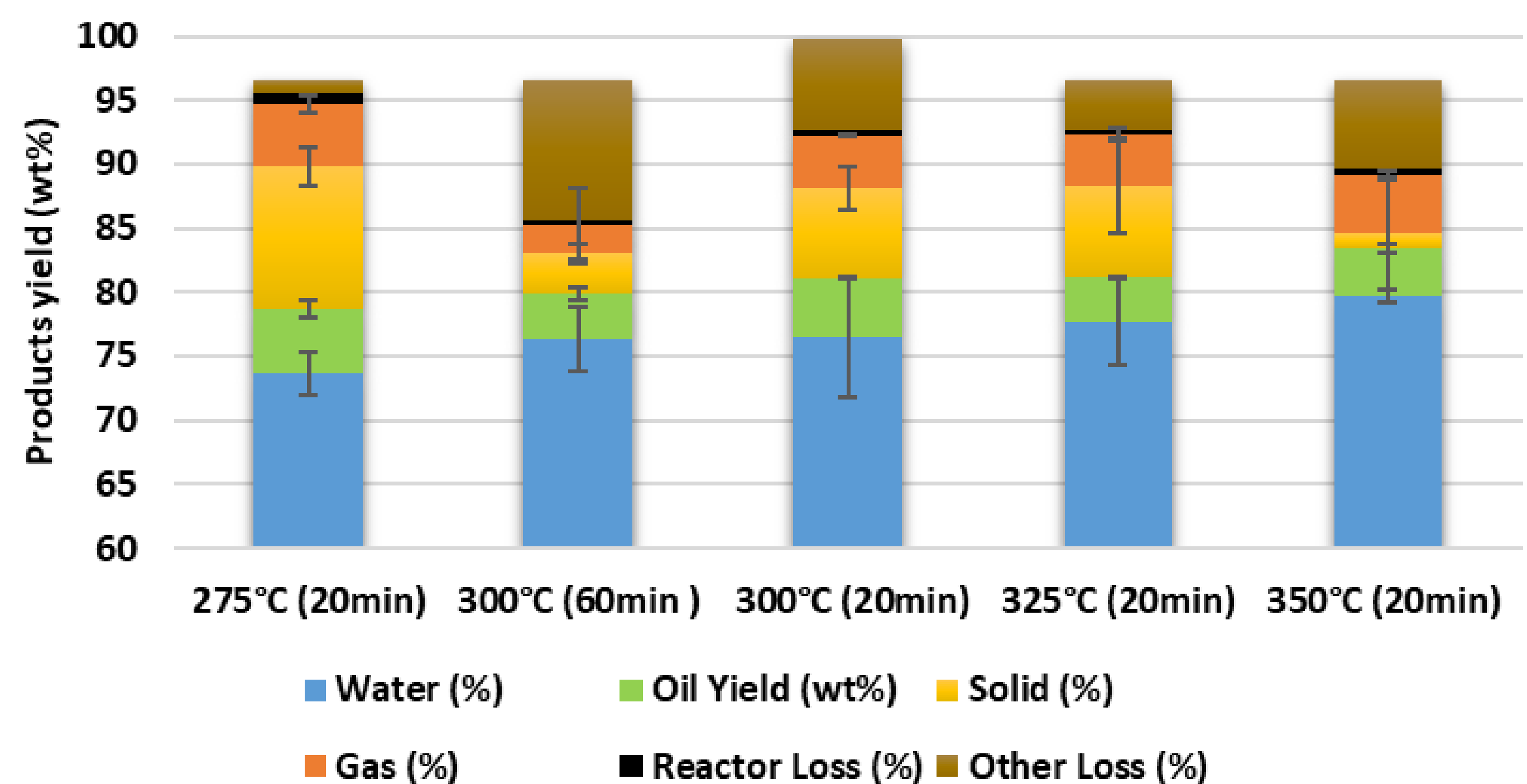


Increasing Oil Yield & Quality

Time (min) vs. Carbon Balance (%)



Average Yields (wt%) vs. Temperature (°C)



Future Work

Continuous research to achieve the most efficient system:

Lower temperatures



Lower cost



Shorter reaction time



References

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