Social Media Portfolio

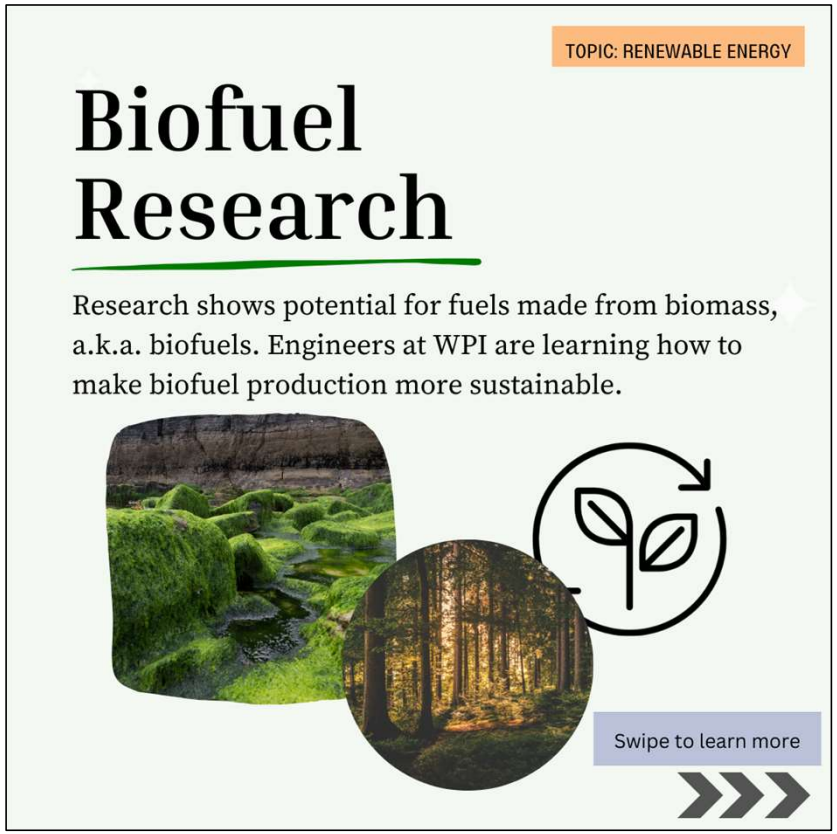
Developing a portfolio of Instagram posts about a climate-related topic: Biofuels

Jia Yazon

The Final Post

First, I want to show you the final and improved Instagram post I created. This post uses features from Post 1, 2 and 3, and has been improved using feedback from my third round of user-testing. In the sections afterward, I show the earlier stages of my portfolio. I hope you enjoy!

Final Post – Slide 1



Caption:

🌱 Biofuels are a growing source of renewable energy, showing that a sustainable future doesn't have to be limited to solar and wind! Swipe to read more about how engineers are making this alternate fuel.

•••

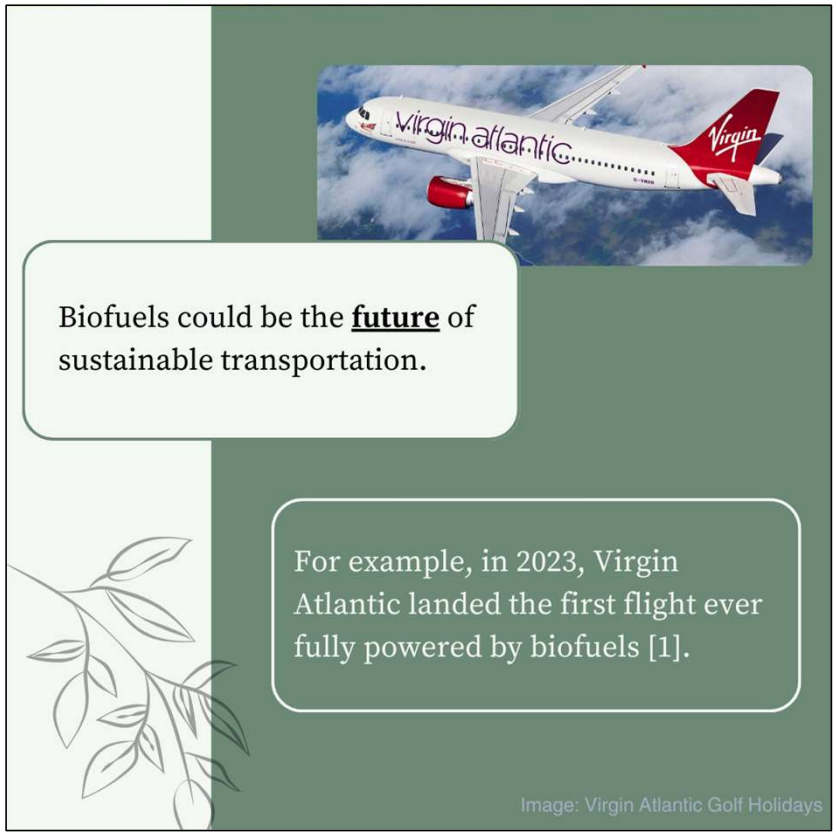
Hydrothermal Liquefaction (HTL) is a process that scientists and engineers can use to make biofuels. However, the process creates a toxic water-phase byproduct. Researchers at Worcester Polytechnic Institute are trying to research ways to remove the toxic chemicals in the waste stream.

The chemicals that are contaminating the stream are organic compounds. The total organic content (TOC), however, decreases as the waste stream undergoes a process that WPI researchers are calling Aqueous Phase Upgrading (APU).

The APU team at WPI is studying the performance of a solid, zeolite catalyst (ZSM-5) in a continuous, packed-bed reactor. Overall, the team has made progress in understanding ZSM-5's ability to upgrade the waste stream.

This additional process may cost more when adding it to the HTL process, however, it has the potential to make biofuels a more affordable, and much cleaner option than traditional fossil fuels!

Final Post – Slide 2



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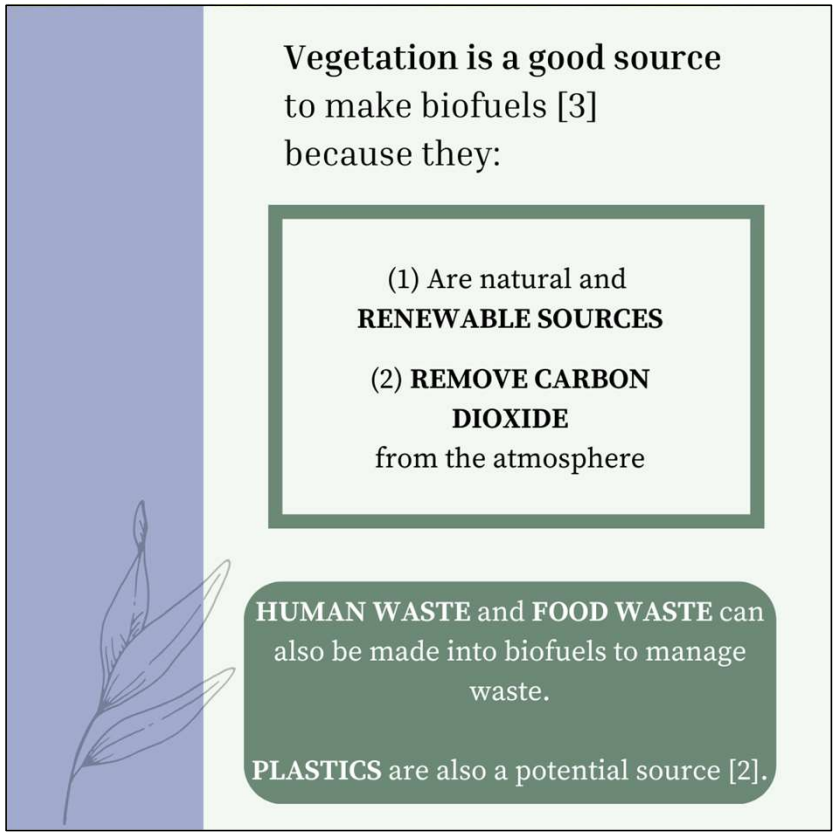

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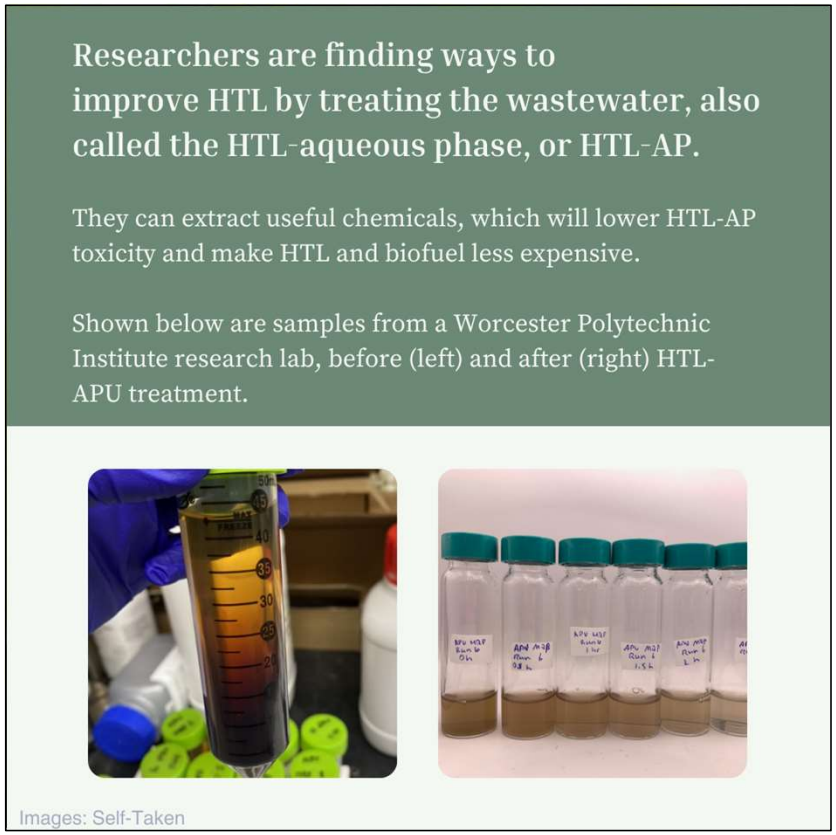
Final Post – Slide 5



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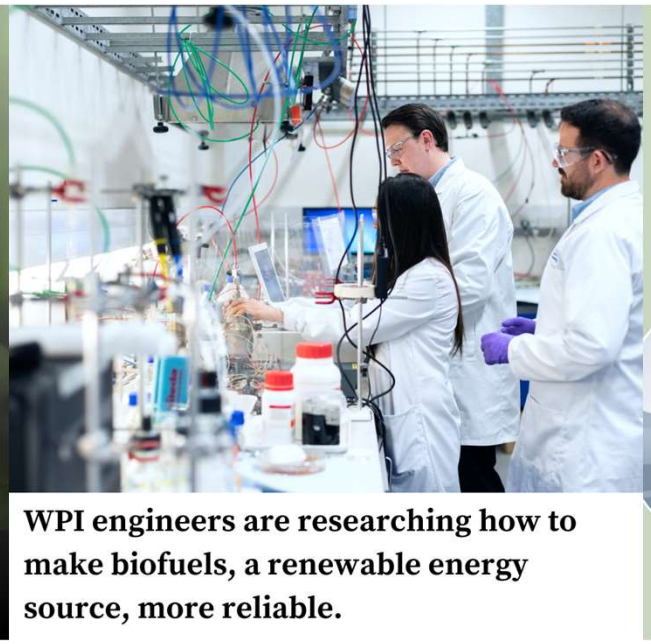
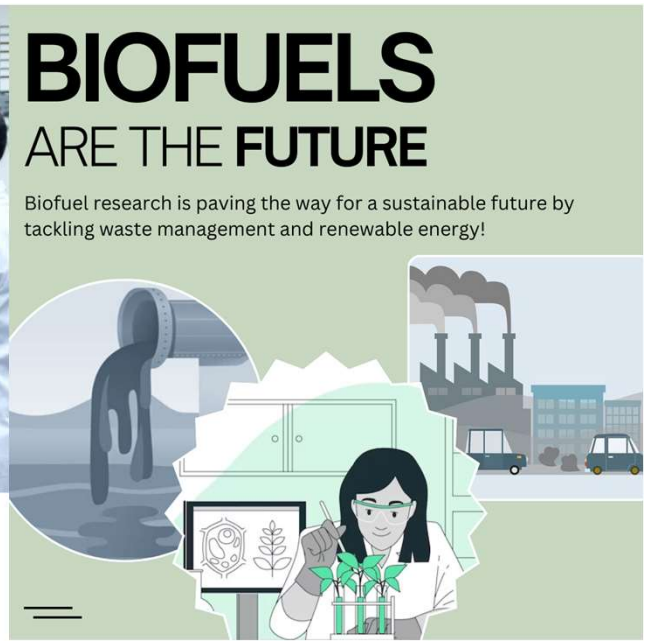
Round 1 of Portfolio Development

Cover images for an Instagram carousel

Posts 1, 2, and 3





Round 2 of Portfolio Development

Improved designs and full carousels

Post 1

Caption:

Experts in biotechnology are excited about biofuels as an alternative to fossil fuels. Biofuels can be made from biomass such as food waste, human waste, and vegetation—including algae (1).

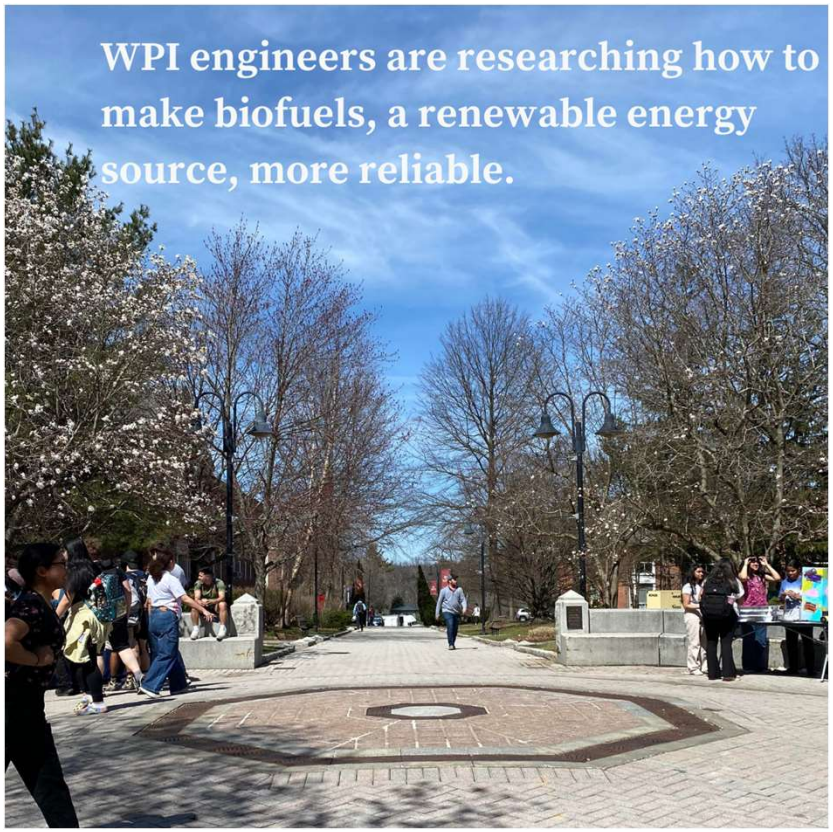
Biofuel production converts biomass into crude oils that will then require refining. Algae is an especially important biomass source due to its "faster growth rate and capability of greenhouse gas absorption," in other words convenient while also effective at removing carbon dioxide from the atmosphere. (2)

One promising method to convert biomass, including algae, is Hydrothermal Liquefaction (HTL). However, this technology has many undesired byproducts, such as a toxic wastewater stream called the Aqueous Phase (HTL-AP), that must be treated before being released to the environment (2, 3).

Scientists and engineers are studying how to improve these processes to make biofuels a more reliable source. This includes optimizing the HTL process itself, as well as finding ways to treat the toxic HTL-AP.

(1) https://pubmed.ncbi.nlm.nih.gov/21833344/
(2) https://www.sciencedirect.com/science/article/pii/S0045653523019914
(3) https://doi.org/10.1021/acssuschemeng.2c06266

Post 2 – Slide 1



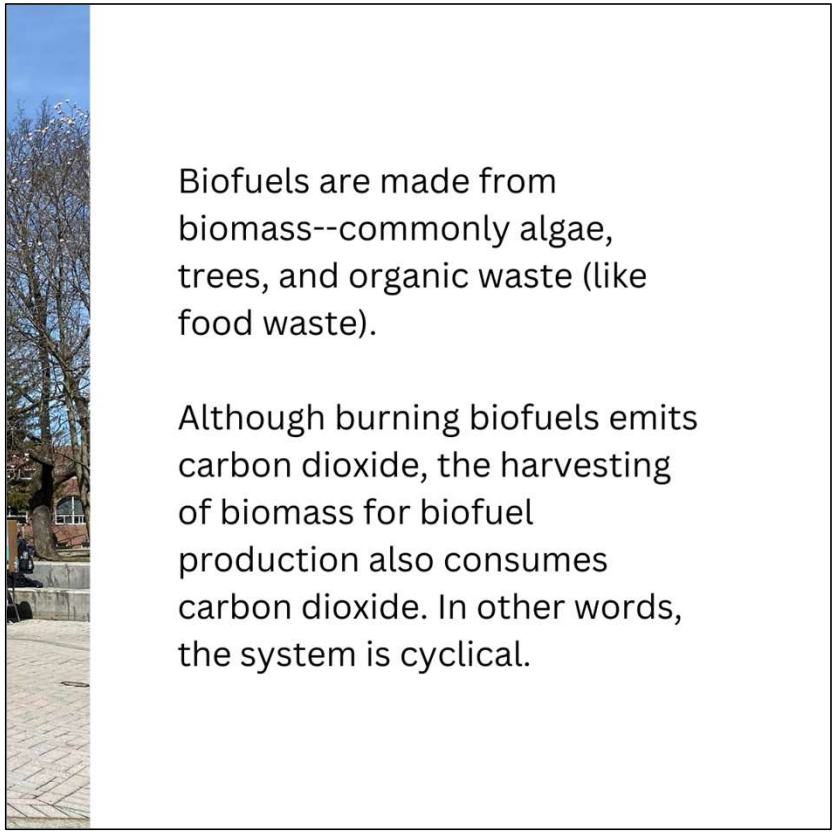
Caption:

Researchers at Worcester Polytechnic Institute (WPI) are studying biofuels, a promising source of renewable energy.

Biofuels can replace fossil fuels and lower total carbon dioxide emissions, especially as plants and waste are main sources of biofuel.

Undergraduate and graduate research projects at WPI are helping uncover more knowledge in the field.

Post 2 – Slide 2



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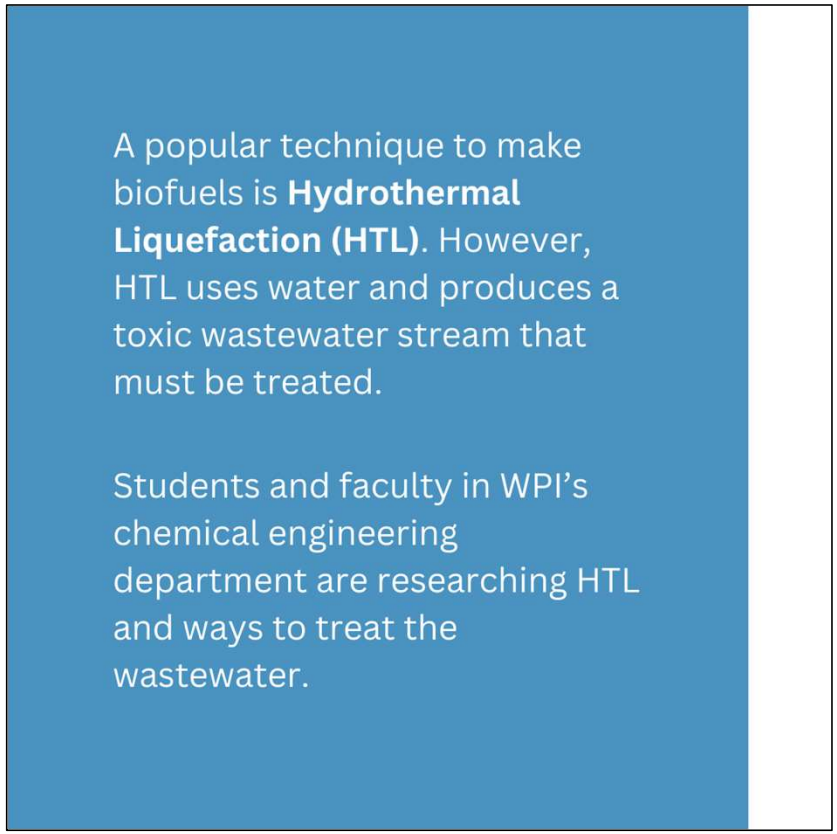

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Post 2 – Slide 4

The wastewater stream is toxic due to contaminating chemicals, which are mainly organic (or carbon-containing). The stream is sometimes called the Aqueous Phase (AP).

The process of cleaning the AP is called **Aqueous Phase Upgrading (APU).**

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Post 2 – Slide 5

APU removes the organic contaminants by flowing the liquid AP over a solid catalyst, which helps break the chemical bonds within the contaminants.

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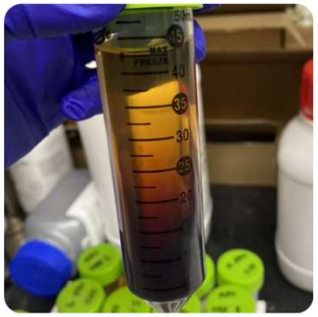
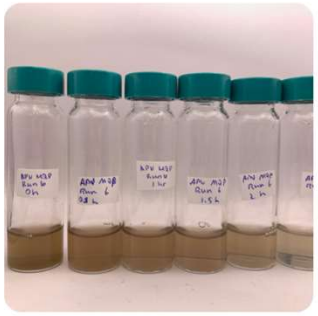
Post 2 – Slide 6

As a result, the AP goes from a dark brown color to a lighter and much less toxic liquid.





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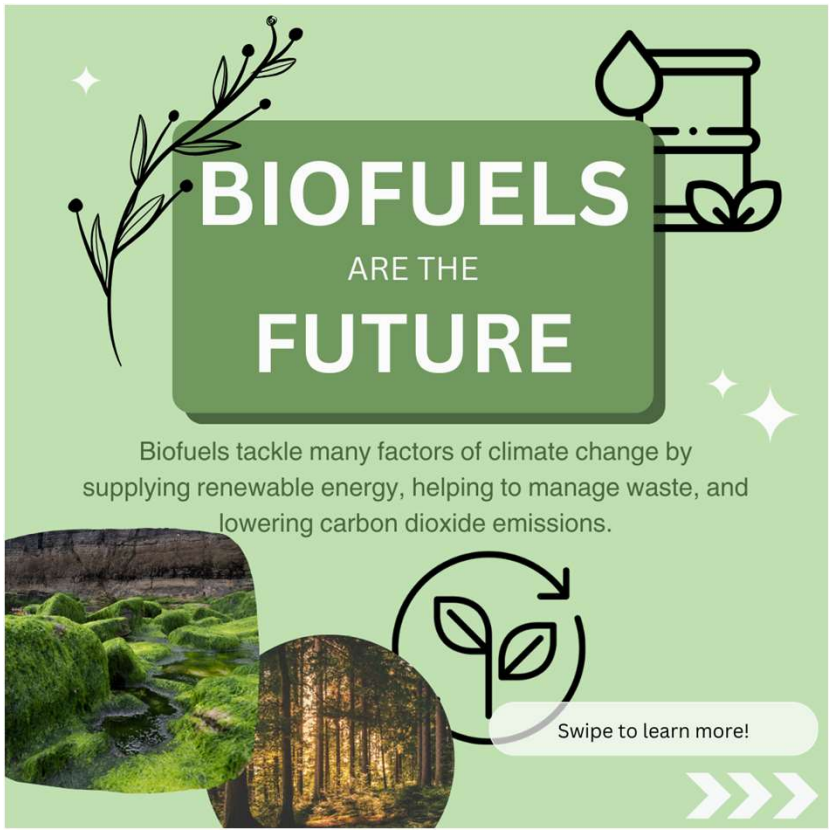
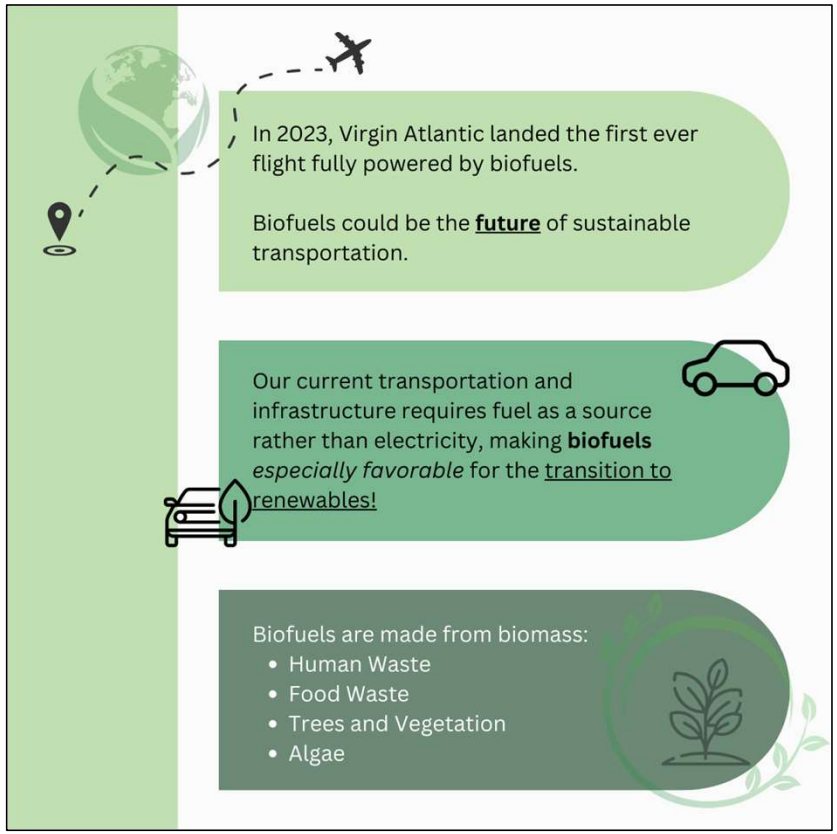


Caption:
More than solar panels and wind power, clean energy can be fuels made from renewable sources 🌱♻️

Post 3 – Slide 2



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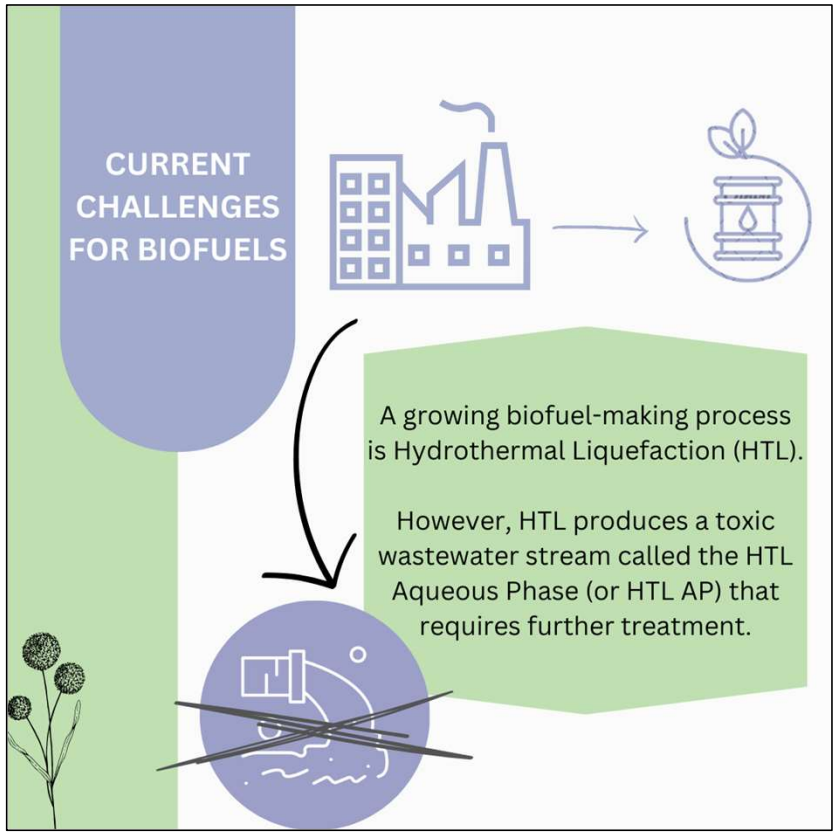

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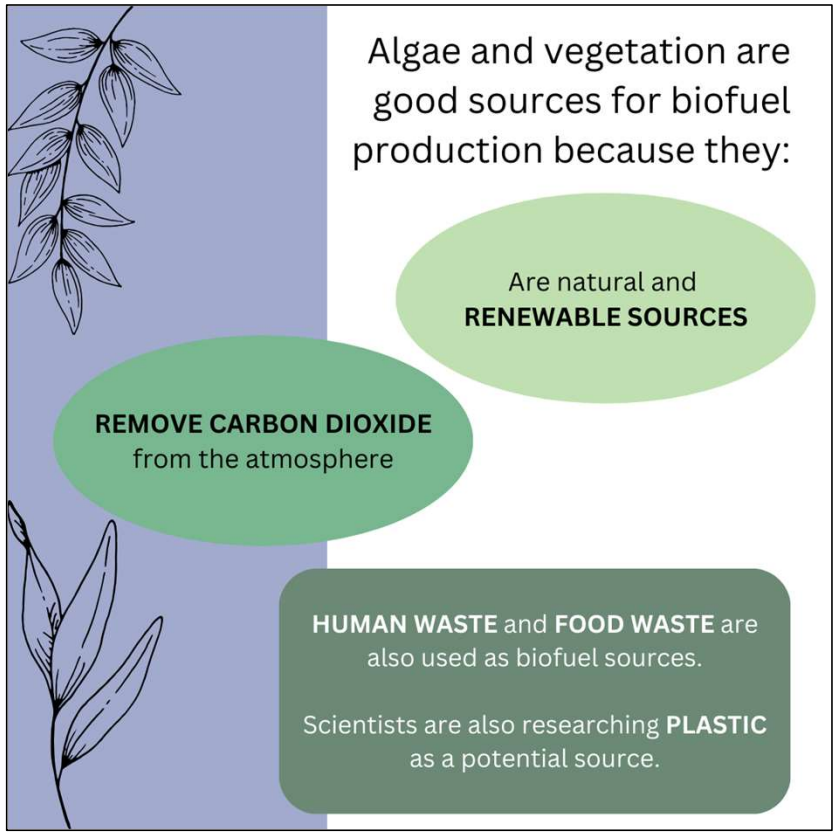

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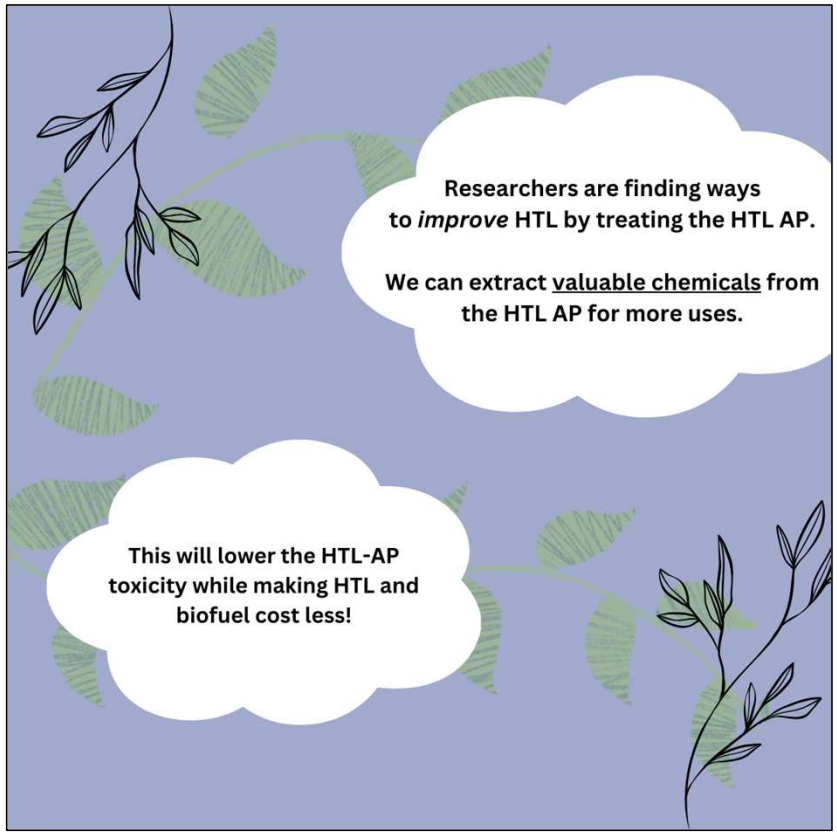

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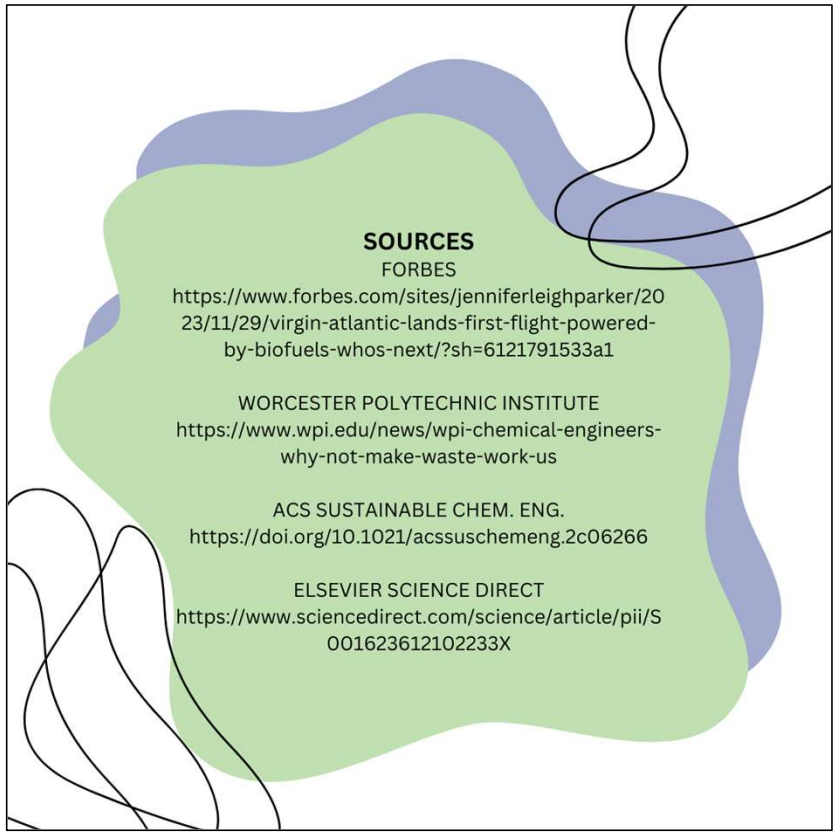

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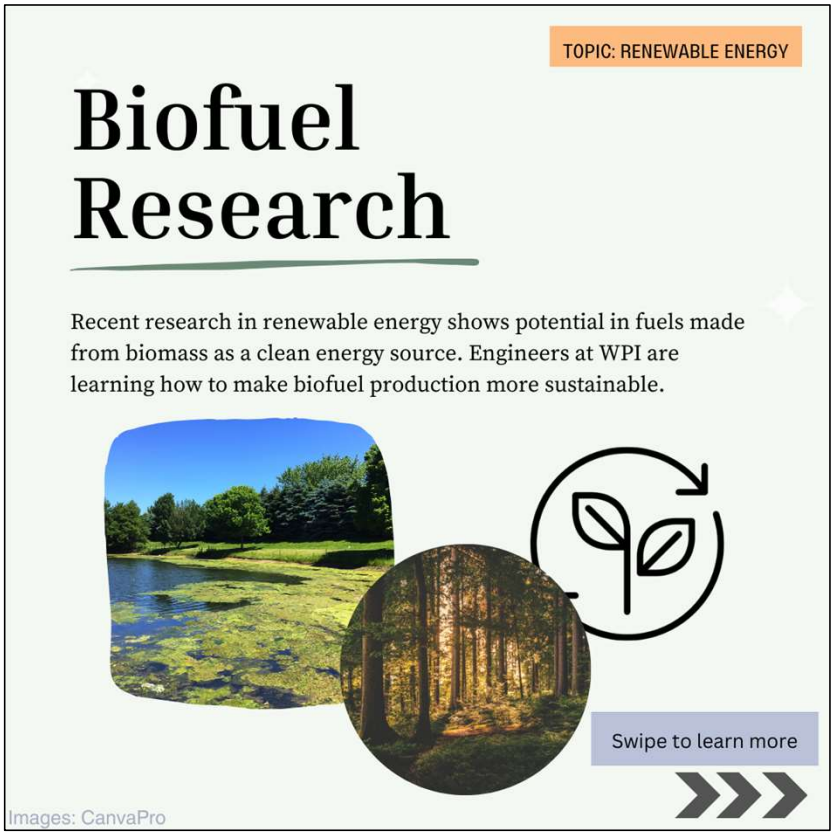
Round 3 of Portfolio Development

Drafting Post 4, which pulls together aspects from Post 1, 2, and 3

Post 4 – Slide 1



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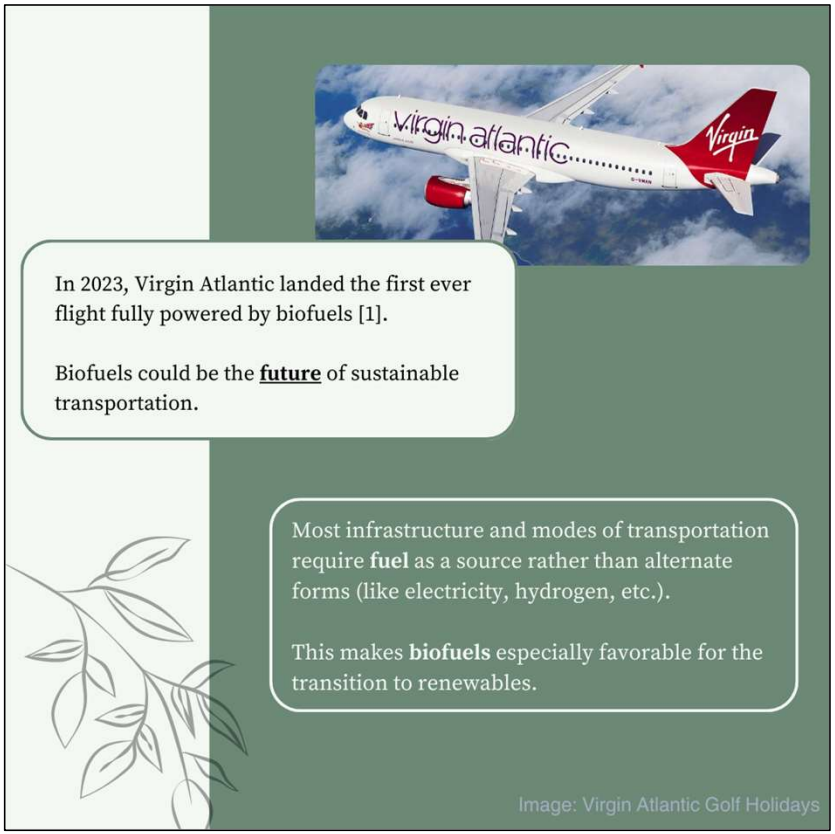
Post 4 – Slide 2



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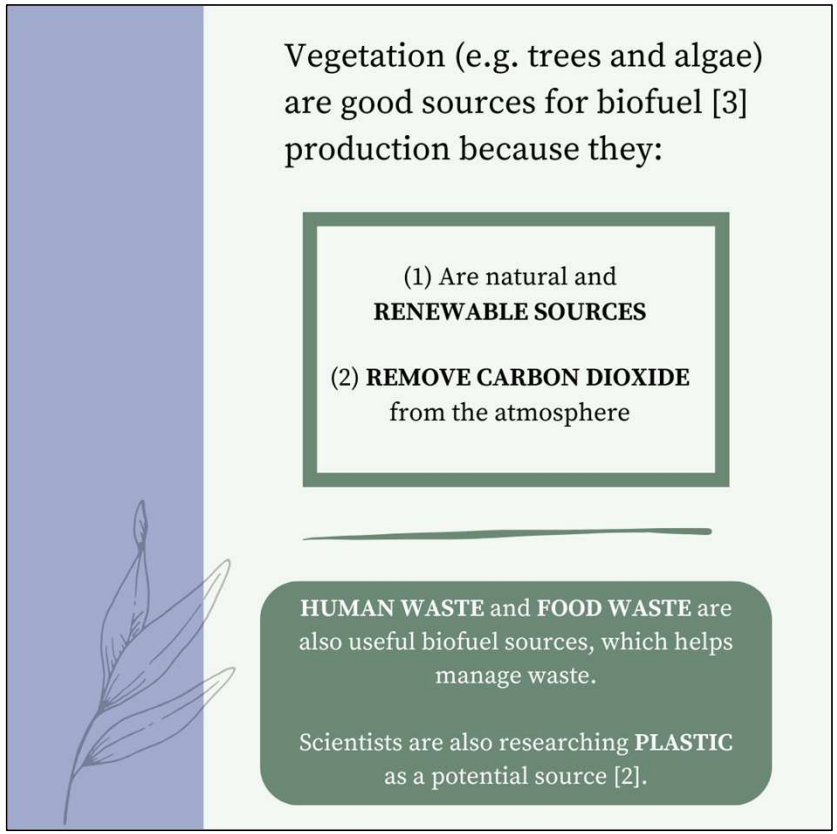

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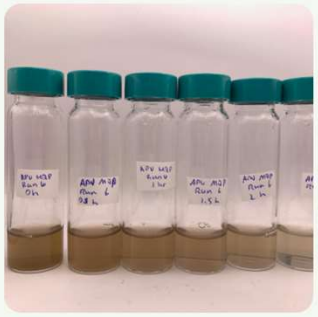
Post 4 – Slide 5

Researchers are finding ways
to improve HTL by treating the HTL AP.

We can extract valuable chemicals from the HTL AP for more uses. This will lower the HTL-AP toxicity while making HTL and biofuel cost less.

For example, shown below are samples from a Worcester Polytechnic Institute research lab. The HTL AP goes from a dark brown color to a much lighter, less-contaminated state.



Images: Self-Taken

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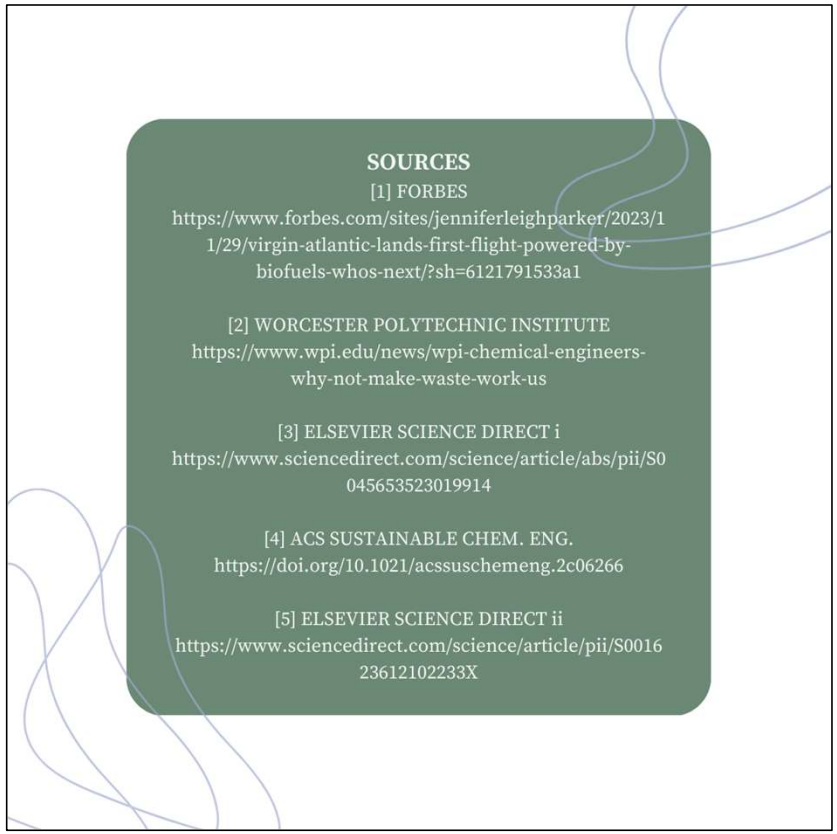

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