

# ACTIVITY 1



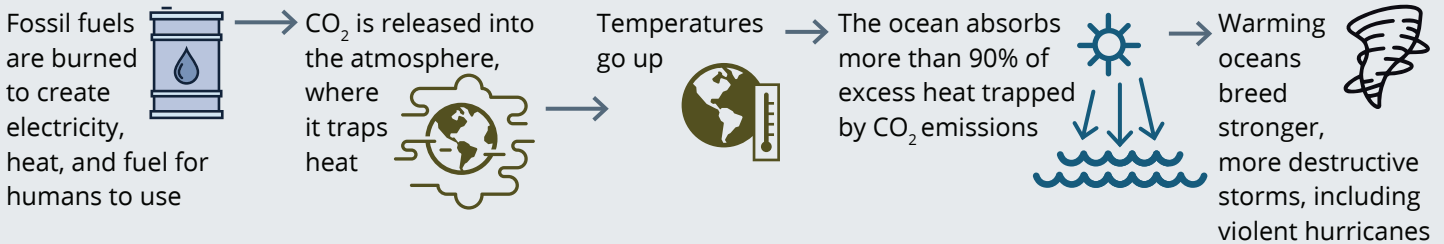
# HURRICANES AND CLIMATE CHANGE

Scientists agree we need to combat global warming and mitigate the damage that climate change is causing. But is it too late? Review the information below and then put your engineering skills to the test to help build a sustainable future.

## PART 1: HURRICANES: A CLEAR SIGN OF CLIMATE CHANGE

Our planet is warming because **greenhouse gases** like carbon dioxide trap heat when released into the atmosphere, creating a greenhouse effect. Unfortunately for the environment, humans rely on burning **fossil fuels** to create electricity, which releases huge amounts of **carbon dioxide (CO<sub>2</sub>)** into the air. This buildup of greenhouse gases in the atmosphere speeds warming, including a dramatic increase in the surface temperature of the oceans. Hurricanes, the fiercest type of storm, gather heat and energy through contact with warm ocean waters. As the oceans absorb more and more heat over time, it sets the stage for stronger, more frequent superstorms. The high-speed winds, heavy rains, and violent waves that hurricanes bring when they make landfall often cause massive destruction to a wide area.

### Global Warming at a Glance: Warming Oceans → Superstorms!



## PART 2: IMAGINING A MORE SUSTAINABLE FUTURE

Scientists are working to find alternatives to burning fossil fuels since there is a limited supply and burning them is harming the environment. Review the chart below to see how renewable energy sources compare to fossil fuels and how they are used to produce clean energy.

Fossil Fuels	Renewable Energy	Clean Energy Technology
<ul style="list-style-type: none"> <li>• Coal, oil, natural gas</li> <li>• Nonrenewable: will eventually run out</li> <li>• Accessed via drilling (oil, gas) and mining (coal)</li> <li>• Dirty = releases CO<sub>2</sub> into atmosphere</li> </ul>	<ul style="list-style-type: none"> <li>• Solar, wind, geothermal, hydro</li> <li>• Renewable: continually replenished</li> <li>• Accessed mostly via clean technology</li> <li>• Clean = zero carbon emissions</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Solar panels:</b> capture sunlight → convert it to electricity</li> <li>• <b>Wind turbines:</b> wind turns blades → powers generator → creates electricity</li> <li>• <b>Geothermal power plant:</b> underground heat → electricity</li> </ul>

**THINK LIKE AN ENGINEER!** Use what you know about clean energy alternatives to design a vehicle, machine, or building powered by one or more sources of renewable energy. Consider all benefits and any potential downsides to using a renewable energy source as you think through your design.

- **Step 1:** Identify how your vehicle, machine, or building will be used.
- **Step 2:** Sketch your design and label the different features powered by clean energy.
- **Step 3:** Write a report describing how your design will contribute to a greener future.