**Energy from Algae?! Worksheet**

**Microalgae grown in a photobioreactor (left) and raceways at an algae farm in Hawaii (right).**



A **photobioreactor** is a container in which algae or other plants are grown. “Photo” comes from *photosynthesis* (what plants do to make energy), “bio” comes from *biological* (something is alive in there!), and reactor is just another word for the container where it all happens.

Algae can be grown in **photobioreactors** by using **recycled water** and **nutrients** from waste. The algae are harvested and converted into **biofuel** (even jet fuel!). Because algae grow so fast and naturally produce oil, we can make earth-friendly biofuel with a small **ecological footprint**!

If not converted to **biofuel**, algae can also be harvested and made into **other products**, such as human and animal food, fertilizers, and ingredients in makeup, vitamins and medicine.

**Show Your Smarts!**

1. **Why are algae (or other plant-based biofuels) important?**

During photosynthesis plants take in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is a greenhouse gas. Because plants use this gas, plant-based biofuels do not pollute the Earth’s atmosphere.

1. **What main things do algae (and plants) need to grow?**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. **Where might we find “waste” sources of these important items?**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. **Plants (and algae!) use the sun’s energy to grow in a process called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
2. **Besides biofuel, for what else can algae be used?**

*Image sources*: 2003 IGV Biotech via Wikimedia Commons: http://commons.wikimedia.org/wiki/File:Photobioreactor\_PBR\_500\_P\_IGV\_Biotech.jpg

Cyanotech Corp. via Commerce.gov: http://www.commerce.gov/blog/2011/06/13/manufacturers-receive-presidential-award-their-export-efforts