

Assignment for Week 1 of Evans

1.

Ethanol produced from agriculture (seasonal growth and harvest of crops, such as sugar cane, corn, switch grass, ect.) is often referred to as a renewable, green fuel. What makes it renewable?

Why is it potentially greener than burning petroleum?

2.

Several investigators have attempted to perform an energy balance to illustrate the extent in which ethanol obtained from corn is green? Why is it important to perform an energy balance?

3.

The main critics of “growing fuel” talk about the second law of thermodynamics. What is the second law of thermodynamics and how is it relevant to a mass and energy balances of ethanol production? (If you have trouble formulating an answer to this, may want to read pg 539-540 of Patzek.)

4. Patzek calculates a negative energy balance for producing ethanol from corn. What is the main criticism of Patzek analysis in the “Ethanol Can Contribute to Energy and Environmental Goals” article by Farrell? Do you buy this argument?

5. Why is sugar cane a better energy crop than corn?

6. Critique the following statement. Ethanol is greener than petroleum because the only products of burning ethanol are carbon dioxide and water.

7. Critique the following statement. The value of any renewable alternative fuel source is dependent on the efficiency in which the process that produces the alternative fuel can extract the energy from the sun. Compare the biofuels vs. solar cells for generating power in terms of efficiency.