

EML 4550/5451 Energy Conversion Systems for Sustainability

Homework # 1

Tuesday August 29, 2006

Due: Tuesday September 5, 2006

CLEARLY STATE ANY ASSUMPTIONS

Topic: Powering your home and calculation of energy use

Considering the house/apartment that you are currently living in:

1. Input information about your appliances, lighting and other amenities and find their typical household usage. Breakdown the energy usage by categories such as lighting, hot water and refrigeration etc.
2. Determine the cost of electricity and natural gas in Tallahassee. Determine how much energy was used over the past year (September 2005 – August 2006) by going to <http://www.talgov.com/you/uos.cfm#>, clicking on Look Up My Account and then typing in your address and zip code. Determine how much money was spent over the past year and breakdown the cost into the categories from Question 1.
3. If you were to replace the appliances and light bulbs with fairly new, Energy Star rated, approximately how much energy would be conserved over the next year? How much money would be saved?
4. Determine the average fuel economy for your vehicle. Assuming that it is driven the typical 10,000 miles per year, how much gasoline is used annually? Determine how much energy, in Joules, is in a gallon of gasoline and then determine how much energy the car uses.
5. If you replace your car with a hybrid car, such as the “Toyota Prius”, how much fuel is saved during one year? How much energy? Use the average of the city and highway EPA values for the hybrid vehicle of your choice.
6. Calculate the total annual energy use of your household, including your typical vehicle, in Joules.
7. Assuming that you or your landlord does not want to purchase new Energy Star appliances, what are some realistic things that you can do to reduce your energy consumption?