MEMORANDUM

TO: INSTRUCTOR RADECSKY

FROM: KAILEIGH VINCENT-WELLING

SUBJECT: SERC AND CCAT FIELDTRIP

DATE: OCTOBER 7, 2013

Purpose:

The purpose of this memorandum is to review the recently-taken Engineering 115 field trip to the Schatz Energy Research Center (SERC) and the Campus Center for Appropriate Technology (CCAT). During lab last Friday, October 4, 2013, the class took a tour of these two places on campus.

Discussion:

While touring SERC, the project that stood out to me the most was the hydrogen fuel cell car being up-kept on campus. The tour guide representing SERC explained to our group how this car was actually fueled. First, hydrogen is extracted from splitting water molecules through hydrolysis. The water has to be turned over to a four-filter system, prior to the splitting, to assure that it is pure elements that will be extracted. Oxygen is the "waste product" from hydrolysis and is let into the atmosphere; whereas, the hydrogen must be stored in a highly closed and pressurized tank, which I believe, made out of a type of strong steel. Since hydrogen can easily escape its container, the material of the tank was very specifically chosen and made so ensure no "leaks". From the pressurized tank, the hydrogen is then able to travel over and pumped into the Toyota model to supply fuel for this design. Some pros discussed included environmental benefits. The fuel cell doesn't release greenhouse gases like other cars, and the fuel cell has a much "cleaner" engine in terms of environmental impact. Another pro is that hydrogen is less harmful to the environment in ways that it can be extracted (as opposed to extracting oil through, for example, hydraulic fracturing). Also, one tank full of hydrogen can take the car around 250 miles (down to San Francisco) without needing a fill up along the way. One con that came up, however, is the large amount of energy needed to extract the pure hydrogen gas and store it for the vehicle.

Installing and designing solar panels was another project that came up while on the SERC tour that interested me, and I related it to the fuel cell car in that it's using renewable resources and implementing them to do the same work as something that may be harmful for the environment. I am really interested in all of the stories about engineers traveling to and installing solar panels in different countries and in homes that may not have electricity or the means to acquire it. I am really interested in doing that in the future.

Conclusion:

There were a variety of fascinating ideas I came to learn about during both of these visits to CCAT and SERC. Other than learning about the fuel cell and the solar panels, which was most interesting to me, I was also really enthralled with the idea of maintaining and living in a house like CCAT. It was hopeful and inspiring to see students using kinetic energy to convert into electricity, making their own planter boxes and walls out of the clay mixture, using natural elements to make things like paint, and the dual-system toilet invention was really great, too. Overall, the field trip was informative and inspiring in that it presented so many possibilities and opportunities to my class and my engineering careers.