Sierra College

ESS 30
Instructor: Steve Geiger

STUDENT TERM PROJECT

Project Name: **Residential Photovoltaic System Design Project**

Project Description:
You will assume the roll of a PV system designer of a solar installation company. Your job is to create a working system for your residence (or a family member's, or a friend's). You will use the tools you are learning in class to analyze the electric bills and come up with a system design to cover the complete energy consumption in the house. Your system will be grid tied without a battery back up.

Project Specifications:

1. Gather the residence's energy bills, total the $ and KWh for the year, then do the energy audit for your utility, and print it.
2. Do a formal Site Analysis of the location (using the Site Survey Form on the CD-ROM from your text book) – checkout and use the Solar Pathfinder (Solmetrics are NOT available for checkout) -OR- use the site data report given to you to determine the shading.
3. Use PVWatts, In My Backyard or another energy production/system design tool (see www.energyinstructor.info for a list of these tools) to find the appropriate system size to fit your location. There is also an Interactive System Sizing worksheet on the CD-ROM from your text book – see examples on Pg. 249 and 471.
4. Select the system components, gather the cut sheets (PDFs) from their websites, and get the prices of each separate component needed to complete the system installation. Use the following as a guide to choose from:
    - Panels: Sharp, Solar World, Canadian Solar, REC, Hanwha, etc.
    - Inverter: SMA, Fronius, Xantrex or Enphase
    - Racking: Unirac or ProSolar

    (Visit www.energyinstructor.info for a list of these component websites.)
5. Create a site elevation drawing and single line drawing for the building permit for this system (hand drawn documents are acceptable – see Pg. 87 and 384-385 in Text). Be sure to use the CA State Fire Code requirements for your site configuration/array location. Check online with the local jurisdiction (city or county) building dept. for the appropriate PV requirements for this building project. Provide the engineering sheets (cut sheets) for your products with this building permit submission package.
6. Use the above to create a formal cost estimate for a customer proposal.
7. Put everything together in a folder or binder in the above order to turn in.

Extra Credit:
1) Create a logo for your solar installation company and put it on the on the outside of your folder and/or use it for letterhead on your pages. 2) Include pricing for BOS components (wire, combiners, disconnects, etc.) in your cost estimate.

Due Date: 12/4/13

Note: This is a project that you may present to an industry interviewer. The better job you do and the better it looks, the better impression you can make! Therefore the more $ you can ask for when they hire you!!!