ME 417  
Design of Alternative Energy Systems  

Brief Guide to pv3.exe

The software pv3.exe has been developed by RETScreen International Clean Energy Decision Support Centre (http://www.retscreen.net/) and will provide the ability to analyze several different photovoltaic systems. Most of the analysis is done with an Excel workbook, PV3.xls and various data bases that it accesses. To obtain these files pve.exe must be run, which installs all the files needed. This cannot be done on DEC PC’s. The installation must be done on your own PC. Once it is installed, you may move the entire file structure for the program to your m-drive by either ftp or copying to a CD.

The primary analysis tool is the PV3.xls spreadsheet. This workbook has seven named tabs of which three will play a major role in the design project. Here is a review of the operations and inputs required for each tab.

**Energy Model:** Begin by entering some descriptors in the gray cells at the top of the spreadsheet. Then click on the Complete SR&L sheet, which will allow you to specify the location of interest. This will jump you to the Solar Resource Load and System Load spreadsheet. Click on the See Weather Database link and choose a location. Returning to the Energy Model sheet, the inputs for the power converter and battery may be left as the default values. For the PV array inputs, choose the PV Module Type from the pop-up menu and leave the other inputs to their default values. Finally, make the entry in the Nominal PV array power equal to the Suggested nominal PV array power cell. An important result will be extracted from the spreadsheet. After the Solar Resource Load and System Load spreadsheet is completed, the Renewable energy delivered in kWh should be recorded.

**Solar Resource Load and System Load:** For the Monthly Inputs section, it is suggested that for the project the cabin will used for the months of May to September and for half of April and October. For the Load Characteristics section, input the AC lights as the only load.

**Cost Analysis:** First zero all quantity inputs for all section except for the Energy Equipment and Balance of Equipment sections. In the Energy Equipment section, zero out all of the quantity inputs (not for the PV module, since this is calculated
and not an input). Input the unit cost for the PV module. In the Balance of Equipment section, zero out all of the quantity inputs. The following unit costs should be used:

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module support structure</td>
<td>$100</td>
</tr>
<tr>
<td>Inverter</td>
<td>$1,000</td>
</tr>
<tr>
<td>Batteries (1770 Ah @ 24 V)</td>
<td>$650</td>
</tr>
<tr>
<td>Other electrical equipment</td>
<td>$0</td>
</tr>
<tr>
<td>System installation</td>
<td>$1,500</td>
</tr>
</tbody>
</table>

The key result of the analysis is extracted from the spreadsheet, the Total Initial Costs. This will be the capital cost for the system.