EE 446/646 Assignment # 4

1) Following Assignment # 3, recalculate the monthly and yearly AC electrical energy assuming 10% of the DC power is lost due to inverter and wiring losses, soiling, mismatch and shading.

2) Now use PVWATTS tool to estimate the monthly and yearly energy production of the same 4.44 kW(DC, STC) PV array above. Use the same % system losses, premium type module, inverter efficiency of 96%, and DC to AC size ratio of 1. Compare your results and describe the sources of deviations (if any).

3) Use the hourly residential load demand in the attached Excel sheet to calculate the self-consumption rate. Then determine the reduction in yearly electricity bill if

    a. The electricity rate is $0.122/kWh and the net-metering rate is the also $0.122/kWh

    b. The electricity rate is $0.122/kWh and the net-metering rate is the also $0.09/kWh

    c. The electricity rate is $0.122/kWh and the net-metering rate is the also $0.00/kWh