

ENGR290: Renewable Energy

Homework 5: Real-World Design Example

Assigned: Nov 7, 2013. Due: Nov 14, 2013

Problem 1

All the ENGR290 students have passed the Midterm and are expecting to coast through the rest of the year and get a passing grade at the end, but of course Mr. West has other plans! If his students want to get a good grade in this class, then they need to be able to do something practical, not just regurgitate formulas on a exam. After all, they are supposed to be engineers, not just students!

Mr. West decided that he needs to make some additional money on the side, so he started his own consulting business. Since he does not like to do his own work, he is going to use his ENGR290 students as free labor (the students will be rewarded with knowledge!) As soon as he started advertising, a cell phone company called Mr. West with the following problem:

They need to build a stand-alone, off-grid cell phone repeater to relay wireless data transmissions between remote towns. The property rights and other costs prohibit running buried or overhead cables, so they are stuck with wireless transmissions and self-contained power.

The equipment they need to run operates on 24VDC with the power profile shown Figure 1.

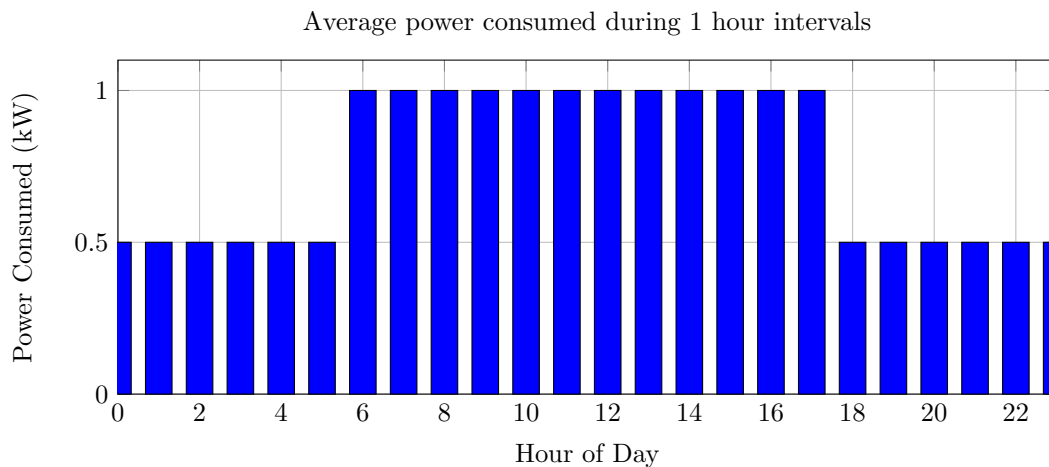


Figure 1: Power Load For Repeater

Your job is to design a system for the cell repeater that is the best option financially. Use the Homer design software and any other resources you have learned or can find on the internet.

By Nov 14, you need to have designed the system by identifying real world components along with their costs. You should have a design model in Homer with those components and show me the analysis that proves that your design selections are the best.

Turn in a list of components and a Homer file that models your design. Assume the climate is similar to Albuquerque's.