Using HOMER

EGR 325
October 17, 2014

Knowledge Building Thought

- You are encouraged to demonstrate your idea improvement, over the semester, in any way you like
- For midterm – self-assessment 1-2 pages
- A final “product” at the end of the semester could be a research proposal
  - (Appropriate for corporate or academic setting)
  - Introduction
  - Background of topic and previous research
  - Your new question
    - Why it is of interest and to whom
    - How you would go about answering/solving it
    - What form would your results take
  - Conclusions

Capacity Credit Readings

- Who read which one?
  - Capacity Credit Calcs, IEA
  - Capacity Value of Wind, IEEE Task Force
  - Capacity Credit Methods, NREL
  - Capacity Value, Electricity Jrnl
- Discuss and compare – either grouped for similar reading or different ones.
- Main points?
- How could you apply this to analyzing wind for this course, and beyond
- What questions remain? What was unclear?

Purpose of HOMER

- Micropower optimization model
  - Helps optimize system designs for both grid-connected and off-grid small systems
    - You must still do the thinking for the analysis
  - You must have a design question
    - HOMER will help sort through options to meet your design criteria
  - You provide a variety of system design options (a variety of available resources)
  - HOMER ranks them in terms of system cost
Select system design options

System Design Data
- HOMER provides you with data for
  - Generators – diesel and renewable
  - Batteries, converters
- You need to provide
  - Options for the system design
  - Number and capacities of generators
  - Cost data
  - Load data – hourly for a year
  - Resource (wind/solar) data – hourly for a year

Things to Understand & Justify
- Fixed and variable costs (O&M costs)
  - O&M units for diesel units ($/hour)
  - O&M units for wind ($/year)
  - Assumptions in cost curve created by HOMER versus the cost curves we saw in class for economic dispatch
- Definition of “Total NPC” (net present cost)
  - How this is, and can be alternatively, calculated
  - Making decisions based on NPC alone?
- Sensitivity analysis
  - Where in HOMER can you set these parameters
  - WHY are sensitivity analyses important
HOMER Homework

- Have a question that HOMER can help answer
- Input data
  - You can use some of what HOMER provides
  - You will need to find some (collectively) separate from HOMER
- Perform sensitivity analysis
- Understand the results, including NPC
- Make and justify a recommendation
  - e.g., a system design to meet a specific need