Exercise:

*AC/DC Electric* is a fictional utility in Colorado with primarily coal and gas generation. In recent years they have developed a fair amount of wind energy, which now provides 13% of energy generation, but until now they haven’t seriously considered solar PV. However, with falling panel prices, AC/DC Electric is now thinking the penetration of solar on their system will rapidly increase between now and 2020. They have asked for your help answering questions about the impact to their system.

To help you answer their questions AC/DC Electric has also provided select data (**separate attachment**). In particular, they have provided load and wind profiles from weather year 2005, which have been scaled to match 2020 forecasts. They have also given information on their thermal generators and forecasted fuel prices. Finally, they have informed you that, because of very weak transmission ties to their neighbors, they don’t count on the ability to import or export power in planning exercises.

**Questions**

1. What is the value of the first megawatt of solar PV on AC/DC Electric’s system?

*Value represents the reduction (with the solar PV vs. before the PV was added) in the annual cost of AC/DC to serve its load customers. Please express your answer in $/MWh. Also, please devote at least one slide to your methodology.*

1. How do you expect the marginal value of solar to change as the amount of solar PV already installed on AC/DC’s system increases?

*Feel free to answer qualitatively (in terms of the direction of value and why it might change), and/or using the data available to indicate how value may change after an increasingly large number of MW of solar PV are added on the system in the base case.*