12 July Questions from Charlie Grist

1. I did some new cost-effectiveness runs with revised data from Tim. They are included in the workbook called SmallOffice-PC253-alpha.xls. I put together a pivot table which is helpful (to me) to look at results. Here are some things I notice:

    a. Do we have an answer about what's up with the 2X high Rooftop CX savings in the PSZHeatPump case?

    b. The gas savings for the VAV systems or about 3X that for the PSZ system. Does that seem reasonable? If so why?

    c. Tim. I don't think I see a fan box measure in the VAV systems. Were you going to do one? Right now fan savings on VAV systems look expensive compared to PSZ. Is this right? What's the baseline fan in the PVAV systems in practice? Is there a measure there?

    d. Most measures look to be TRC cost-effective except:

        i. CEE Tier 2 equipment

        ii. Fan power in the VAV systems

        iii. Rooftop CX in the PSZ systems

        iv. T5HO lighting option

    e. Most kWh savings provided by the HPT8 lighting measure

    f. Windows are the second biggest electric measure and the biggest gas savings measure

    g. HVAC measures in total provide about 1/5 of lighting and window kWh savings

    h. Climate makes almost no difference in the kWh savings estimates except for windows in the HP systems.

    i. Climate makes a very modest difference in gas savings for the U35 window measure.

2. For now I am de-rating the measure-level electric savings by 5% and the gas savings by 10%. This is based on comparing the sum of the individual measures to the package runs that Tim and Brian did. It's a clunky methodology, but maybe good enough. If it's not good enough, I need a run with interactive effects of all the measures installed.

3. Can we take a credit for cost savings from downsized cooling systems due to interaction from envelope or lighting measures? For example, do the better windows, and lower LPD, allow for less cooling capacity? If so, we should take a cost credit on the lower tonnage of cooling needed. How much? One of you modeler/engineers should figure this out.

4. Mira, Thanks for putting together the HVAC equipment cost data. I think the New Oregon Survey data from Will Miller includes Tier 2 equipment (Carrier 48HJ series). So I included it in your sheet as a Tier 2 data point. Please verify this with Will Miller.

5. The Tier 2 cost increment data contains some good and some questionable data in my view. The questionable stuff is the DEER data, which I understand is a California deemed value that has never been evaluated. The USDOE data for 2000 appear to be a "what-we-think-it-ought-to-cost" estimate based on a component cost approach. I am not sure what is behind the NE Cool Choice data. So I discount all of these.

6. The more realistic data looks to be that provided by Will Miller, Jeff Coles and Mark Jerome. That data looks bi-modal to me. The high numbers ($225/ton in year 2000$) appear to be from the Carrier 48HJ series. We have similar costs from both Will Miller's survey and from the Davis Langdon survey provided by Jeff Coles. Other data, from Ruud and Trane have cost increments more like ($70/ton). Maybe there's some non-EER-related costs in the Carrier units that is not in the Trane or Ruud. Can someone please check this? At $100/ton cost increment the B/C ratio is still only 0.5 or less.

7. When I look at the CEE Tier 2 cost data, it appears that cost increment for small equipment is higher. Median costs of about $125/ton for 5 tons and smaller. For larger equipment the Tier 2 cost increment is about $90/ton. Seems reasonable that small units have a 40% incremental cost premium. What do you think? I remember the design for the PSZ as a bunch of small units. So I am inclined to use the small-unit cost increment. But I do not remember what size units were deployed on the PVAV systems. If they are larger we could use the lower costs there.

8. We still have no cost increment data for Heat Pump systems. Let's get some.

9. What should we do with exterior lighting for offices?

10. Baseline assumptions for LPD and Windows is code. But the real baseline is practice. We don't know what practice is yet and may find out in fall with the completion of the New Commercial Characteristics survey.