Greetings Epworth,

Our Architect, The McKnight Group, has assisted us in estimating the annual operating (HVAC) costs of our proposed new facility. Let me summarize the information they have provided:

Based on the cost model that was developed, which considered code-compliant envelope (windows, walls, roof), and split system/packaged roof-top-units for the HVAC system, the combined 65,000 sq. ft. building will operate at a lower cost per sq. ft. that our cost today. The model calculated a current energy cost of **$47,000** for our current facility and a future energy cost of **$53,000** for the combined old & new facility. In other words an incremental cost increase of **$6,000 annually**. The actual cost of energy will be different from the model, and can vary based on the actual building occupancy/usage and weather conditions; a variance of 30% is possible.

Comments & Key Assumptions:

1. Overall, for an increase 44% from 45,000 sq. ft. to 65,000 sq. ft., the energy cost will increase by 13%
2. Building is bigger but the % glass stays the same
3. Average wall & roof R-value is better as the new addition will have better insulation (approx. 30% of the envelope is new)
4. Credit is given for better lighting in the addition as well as less air infiltration
5. HVAC system for existing building is kept the same (boiler/chiller/fan coil units)
6. 2 Packaged roof-top HVAC units are assumed for addition or other constant volume systems with gas heat (80% efficient)
7. Internal loads such as lights, people etc. are factored in
8. Summer design max temp is 88 degrees F
9. Winter design min temp is 1 degree F
10. This estimate is for HVAC (heating, ventilation, air conditioning) and does not include the cost of lighting and other energy uses (computers, internet, copiers, etc.)
11. Alternative energy solutions (solar, geothermal) were not considered in this model and are felt by McKnight to be more expensive from an initial capital cost standpoint and take up a considerable amount of land. These options can be considered in the future.

Summary

Based on the above, I would suggest that the following calculation might fairly summarize the total incremental operational cost of the new addition:

1. Energy (HVAC) -$6,000 annually
2. Lighting & miscellaneous - $5,000 annually
3. Custodial/janitorial - $5,000 annually
4. All other - $4,000 annually
5. **Total - $20,000 annually might be a safe assumption**

As we move into actual final design & engineering, we can refine these numbers further.

Peter Machin
Treasurer and Director of Operations
Epworth United Methodist Church