

Turning Green into Gold

What to Do About Higher Electricity Prices – Part 1

by B. Alan Whitson, RPA

Nationally, the price for electricity increased 10.3% for the 12-month period ending April 2006 according to the Energy Information Agency's June 2006, *Monthly Flash Estimates of Electric Power Data*. Much larger increases are on the horizon for many cities according to an analysis conducted by **Sieben Energy Associates** of Chicago. While Seattle is expected to have only a 5% increase, Baltimore is facing a 90% increase in the cost of electricity in 2007 over 2005.

Availability is another issue to be concerned about. Recent events such as Katrina, the Northeast Blackout and California's energy crisis should remind us of the frailty of our power grid and the importance electricity to our civilization. For decades BC-Hydro, the utility that serves Vancouver, BC, has sold its surplus electricity to the United States. Over the last few years, BC-Hydro like a number of utilities across North America has transitioned into a net importer of electricity to service the growing needs of its customers.

Yet efforts to build power plants of any type run into howls of protests. The ultimate NIMBY (*Not In My Back Yard*) battle is raging around a plan to build a 130-turbine wind farm six miles off the coast of Cape Cod. Ironically, this four-year-old battle has environmental groups on lining up both sides. Things got interesting last summer when **Greenpeace USA** staged a counter demonstration against **Robert F. Kennedy Jr.**, an opponent of the project and an attorney at the Natural Resources Defense Council. Kennedy was on a sailboat for an event with the **Alliance to Protect Nantucket Sound**, which opposes the wind farm; when a Greenpeace vessel sailed up alongside with a banner that read, "Bobby, you're on the wrong boat." This was part of a broader Greenpeace effort pressuring Kennedy to change his mind on the wind farm. Like all NIMBY battles this one has gotten nasty and personal. Some notable environmentalists have denounced

Kennedy as an elitist and have publicly called for him to resign from his post at the NRDC.

In an effort to reduce the need for additional power plants, utilities in the past offered incentives to shift demand to off peak periods. While these efforts were successful in getting savvy energy users to reduce consumption or shift demand to off peak periods; they fell out of favor when deregulation became the *fad de jour*. This may change – **The Energy Policy Act of 2005** along with its tax incentive for conservation efforts, requires every state to study the implantation of "Time of Use" rate structures.

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If incentives are a carrot – a "Time of Use" rate structure is a big stick that can quickly change the way people use electricity. The concept is to penalize customers that use electricity during peak demand periods; and reward customers that reduce their consumption during the peak demand period or shift their power consumption to lower cost "off-peak" periods. Below is the current commercial "time of use" rate structure for a California utility's summer peak period of June 1 to September 30:

\$0.1011/kWh	10:00 am to 2:00 pm
\$0.1275/kWh	2:00 pm to 8:00 pm
\$0.1011/kWh	8:00 pm to 10:00 pm
\$0.799/kWh	10:00 pm to 10:00 am

Adopting "time of use" rate structure offers three environmental benefits: 1) Encourages energy conservation; 2) Shifts load to the off-peak period, which uses the more environmentally efficient base load plants; 3) Reduces the number of new power plants that need to be built.



Clearly, working the graveyard shift wouldn't be practical for a law firm. So an effective way is needed to reduce energy consumption during the daytime. Lighting is a logical place to start since it accounts for up to 35% of an office building's energy use. Day-lighting is an obvious strategy, as would manual dimming and occupancy sensors. This has the added advantage of reducing the cooling load which will save even more energy.

Recently I participated in an analysis of a proposed 66,500 square-foot, five-story office building with private offices ringing the building's perimeter. As part of this study, DOE-2 energy modeling was done using ASHRAE 90.1 with a conventional rate structure as the base case.

[Using] Lutron Electronics new EcoSystem ballast . . . reduced the building's energy costs . . . by 17%. . . or a 524% ROI.

One of the scenarios studied used **Lutron Electronics** new **EcoSystem** ballast with perimeter zone day lighting, interior zone dimming and occupancy sensors in all private offices, common areas and conference rooms. Lighting energy was reduced 33%, which in turn reduced the building's overall energy demand on the grid by 107 KW – that's a 12.2% reduction. Demand charges typically account for half of a building's total cost for electricity. Overall, the building's energy costs were slashed by 17%.

The reduction in energy costs offers a whopping 22% Return on Investment (ROI). After all of the incentives (EP-Act 2005, state and utility) are factored in the ROI soars to 30%. Since this reduces operating cost, it will increase the building's net operating income, which in turn increases the building's value by \$7.08/sq. ft. – a 380% ROI. Now that the building is worth more, a building loan can be

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larger. This additional loan amount would pay for the incremental investment needed for the EcoSystem and provide \$3.44 per square foot for other uses or enhancements to the project. The cost of the additional debt will be covered by the energy savings. If this 66,500 square foot building was owned by an S&P 500 company the energy savings would have translated into \$649,291 of increased shareholder value or a 524% ROI.

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Electricity Cost ¢/kWh	2005	2006	2007	2-Yr. Change
Baltimore	9.58	11.4	18.2	90%
Delaware	7.06	7.3	13.1	86%
Washington, DC	6.94	9.23	11.1	60%
Boston	11.6	16.2	17.8	53%
Los Angeles	9.3	11.7	12.9	38%
Las Vegas	9.3	10.2	12.8	38%
Houston	9.3	10.2	12.8	38%
Dallas	7.66	9.47	10.5	37%
New York	11.7	12.8	16.0	37%
Miami	7.92	9.7	10.8	36%
Connecticut	10.5	12.1	13.5	28%
Chicago	7.18	7.21	9.0	25%
San Francisco	10.6	11.7	12.9	21%
Phoenix	6.96	7.07	8.3	20%
Detroit	7.81	8.4	9.3	19%
Atlanta	7.29	7.68	8.1	11%
Seattle	6.22	6.57	6.6	6%
St. Louis	5.05	5.28	5.28	5%
Philadelphia	8.68	8.72	8.7	0%

Source: Sieben Energy Associates

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