



Energy Managers Change the Rules

Use the right inputs

For years, energy managers have focused on a simple three-word mantra when evaluating energy-saving projects: simple payback period. Energy managers who understand the shortcomings of simple payback period may have used other mantras, such as internal rate of return or even life cycle cost. The usefulness of any of these metrics, however, depends on the inputs used for costs and benefits. In this topsy-turvy world of changing rebate funding levels and rising utility rates, managers need a new mantra: use the right inputs. This advice is particularly relevant when introducing energy-saving technologies to a large, geographically dispersed portfolio. In fact, the greater the number of utility jurisdictions involved the more managers must

insist on using up-to-date, location-specific costs and benefits.

Consider the example of a national retailer interested in upgrading the efficiency of its stores' track lighting systems. A new technology emerges that could save 25 watts per track head. The retailer operates a total of 100 stores in 32 states. Each store has 500 track heads that operate an average of 4,000 hours per year. Approving the retrofit of all 50,000 lamps immediately could reduce the chain's aggregate electricity demand by 1.25 megawatts and its annual usage by 5 million kilowatt-hours.

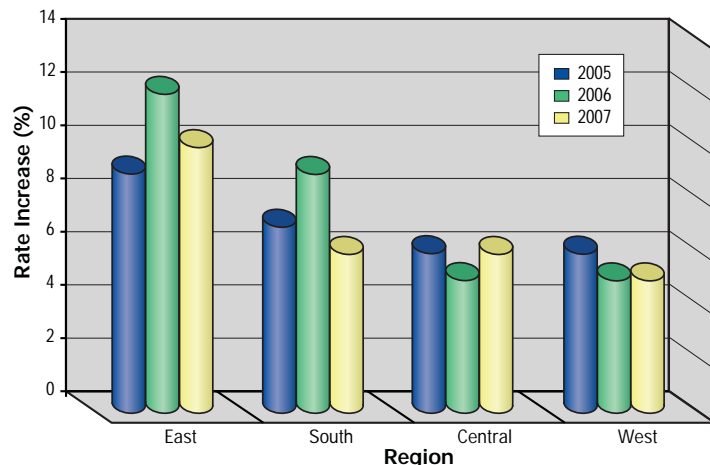
The energy manager must first answer the question: where does the retrofit make financial sense? Energy managers have many approaches to answering this question. Unfortunately, most of them are rules of thumb

that won't maximize the number of stores that receive this new technology.

If the manager has a good way of knowing where utility incentives exist for this measure, the rule might be: we'll approve retrofits wherever there are rebates. If utility A rebates half the installed cost of an energy-saving measure and utility B offers no rebates, but has electricity rates that are twice as high as utility A's rates, would a rule that limits retrofit approval to stores in utility A's territory maximize the number of cost-effective retrofits installed? No. Utility B's higher electricity rates offset the absence of rebates. Therefore, retrofits done in utility B's territory would enjoy the same simple payback period as those done in utility A's territory. And what happens after energy savings have completely repaid the first cost? The stores that received no rebate would actually save twice as much energy cost each year because of utility B's higher rates.

Of course, the relative attractiveness of upgrading stores in one utility territory or the other will vary as rates change over time, which brings us to the next misguided rule for selecting upgrade targets: we'll approve retrofits wherever electricity rates are greater than \$0.10/kWh. This approach begs several important questions. First, is average cost per kWh a useful metric if the upgrade would reduce peak demand, which could be more valuable than simply reducing usage? Second, which year's electricity rates should drive this decision? Last year's? This year's? How about the next several years'? That's when the retrofit would be saving energy, right?

It's vital to consider both historical and forward-looking data when evaluating potential upgrades. Figure 1 is based on data assembled by Mark Toebe, manager of Rate Analysis at Cadence Network. He analyzed



Expected electric rate increases in U.S. by region

rate changes at approximately 300 utilities that together serve about 90% of the commercial sites in the US. After removing statistical outliers and weighting the remaining results by size of utility, he categorized rate increases by year and by region. These data illustrate how the aftermath of deregulation, rising commodity prices, and other factors have fueled significant (and continuing) increases in electricity rates nationally.

New Rules

There's an old saying about the difference between hoping for accuracy and delivering it: "It does little good to measure a board with a laser if you're going to mark it with chalk and cut it with an ax." With budget season close at hand, now would be a great time for managers to rethink the rules they use for selecting which energy-saving projects to fund.

The first step is realizing which inputs are relevant. Returning to the lighting retrofit example above, the following inputs would be essential in deciding which stores to upgrade:

- Are there any significant differences in installation labor or materials by store location?
- What is the upgrade's actual effect on store demand and usage, and at what times of day?
- How do those savings influence each store's utility bill, paying particular attention to forecasted increases in demand and utility charges?

- Which utility jurisdictions already offer a rebate for this measure, and which could be persuaded to offer funding under a custom program?

- Is it possible to outsource the mapping of rebate availability and electricity savings for each store location, which would help in highlighting the most promising retrofit targets?

- How would landlord/tenant issues allocate the costs and benefits of contemplated retrofits?

- For how many years will savings persist at each location given the lifetime of the measure, projected lease duration, renovation plans, etc.?

Once these and similar inputs are collected and verified, a spreadsheet can be assembled that calculates the proposed retrofit's true costs and benefits. The goal is to derive SPP, IRR, and/or LCC outcomes at the store level. These outputs can then be combined into weighted-average results by utility, state, or region. This exercise will identify which stores' retrofits meet or exceed the retailer's investment criteria. Once the store-by-store analysis is complete, taking a weighted-average approach that uses certain stores' paybacks to subsidize others could be a manager's best chance of accelerating this technology's adoption throughout his portfolio. *e&pm*

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