

*Best Practices Q&A:***Jeffrey Perlman, President and Founder, Bright Power, Inc.**

*Jeffrey Perlman is president and founder of **Bright Power, Inc.** in New York City, which provides consulting services and diverse energy solutions to building owners and organizations interested in making intelligent choices about energy use. He is also a LEED-accredited building professional and a Certified Energy Manager (CEM). Perlman spoke with us about why senior living providers should be doing energy audits and what results they might expect in terms of energy efficiency and cost savings.*

Senior Living Business

ISSN#: 1938-6613

Published Monthly by:

Irving Levin Associates, Inc.

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Publisher:	Eleanor B. Meredith
Executive Editor:	Stephen M. Monroe
Editor:	Jane E. Zarem
Circulation:	Stacey Faillaci
Advertising:	Karen H. Pujol

Annual Corporate Subscription Rate: \$587

Free additional copies: Paid subscribers may request additional copies of *Senior Living Business* for staff or board members at no extra charge. Call Karen Pujol at (800) 248-1668 or e-mail your request, including the relevant email address(es), to customerservice@levinassociates.com.

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• **What is the purpose of an energy audit?** The purpose is to find opportunities for savings in the way a building is configured, as well as to clean up some of the comfort issues—particularly in older buildings. In addition to the technical details, it's about making the building a better environment for its users. Our energy engineers are trained to find places where buildings are wasting energy. They walk through the building with the maintenance staff and talk to residents to determine more sensible ways for them to use energy and opportunities to increase comfort levels.

• **What's the procedure?** The first step is information gathering, or benchmarking. We send a survey to the building manager, requesting some basic information about the property (the number of units, square footage, number of stories, when it was built, etc.) and at least a year's worth of utility bills. We then analyze the data to get a sense of where the building fits into certain parameters. How much energy are they using? Is that high or low for that size senior living facility in that location? What systems are the best candidates for savings? We also use software that we designed in-house to compare the building's seasonal usages with weather data for the location of the property. That gives us a real sense for how much energy the building is using per unit of coldness or hotness each day.

Then we schedule a site visit. Two engineers spend a day going through every part of the building along with the maintenance staff. It starts with an hour or so sitting down with the property manager to discuss how the building is running, any problems they've had, regular repairs they've made, appliances they've replaced and complaints they've gotten. Then our engineers, along with the maintenance people, walk through the building, starting in the boiler or chiller room to see how the heating and cooling plants are operating. They do efficiency tests, take temperature readings, and observe how equipment is running. Then they examine the roof to see its condition and check the ventilation system.

They take light level readings in hallways and stairwells and check the water temperature and light usage in some of the apartment units. They also test for air leakage in or around window frames, cracks in the walls, and baseboards. They check thermostats and other controls in the units and check the age and models of any refrigerators. In the common areas, they look at the lighting, heating,

and cooling in the kitchen and dining room(s), as well as observe whether gas, which is less expensive and more efficient, or electricity is used for cooking.

• **How long does the process take, and what does it cost?**

It may take a few weeks in the beginning to gather the information, since it's often not all in one place. We're on site for a day. Then we analyze all the data and prepare a report, which the client generally receives within a month. The cost depends on whether we're doing one project or several projects at a time. If we do one facility, the cost may run about \$10,000; if we can bundle five or ten facilities together, it can be as low as \$5,000 per facility.

• **What are some examples of energy savings and efficiencies?**

The savings can vary quite a lot, depending on the initial condition of the property. Controls are the measures that tend to have the quickest ROI. For example, upgrading the controls for the hot water system so it doesn't run too hot or for the heating system to automatically set back the temp at night, or adjust it according to the outdoor temperature, can be very cost-effective. Those improvements pay for themselves in a couple of years. Changing incandescent light bulbs to fluorescent ones and installing motion sensors to shut off lights in maintenance rooms or bathrooms when they're not in use also have a quick payback. Sealing air leaks, recaulking windows, and filling in cracks in exterior walls also fall into the quick payback category. Upgrading toilets to 1.2 gallon-per-minute, pressure-assisted flush models can reduce water consumption and, depending on the price of water in the area, can be very cost-effective. Hot-water consumption, is also directly related to energy efficiency.

An older building with a roof without much insulation or a ventilation system that doesn't work well certainly presents cost-saving opportunities. Other measures with a moderate payback (5-10 years), such as upgrading to more efficient lighting or installing a high-efficiency condensing water heater, are worth doing, as well. Of course, there's also a big operational component to energy savings. There are more and less efficient types of equipment, but the savings also depend on how it is used.

• **What about replacing windows or appliances?**

Replacing 15- to 20-year-old refrigerators can be very cost-effective in terms of a five-year timeframe, but the payback on replacing a 10-year-old refrigerator may be closer to 10 years. It all depends on the price of electricity. In some parts of the country, the cost may be 8 cents per kwh; in other places, 25 cents.

Unless the windows are very old, are poorly fitting, or have single or cracked panes, window replacement is expensive and, purely from an energy-savings perspective, is often hard to make pay for itself. A lot of the problem with a window is often not the glass or frame but the way the window was installed or the cracking caulk. Those are problems that can be fixed.

• **What about renewable energy?** Solar power for electricity or water heating is really the only renewable energy opportunity, but the building must have an appropriate roof—not shaded by trees, not surrounded by taller buildings, and facing south. Solar can be quite expensive, and payback can take 20 years or more without some sort of subsidy; but once you've installed the system, the fuel is free. Depending on the roof area, it's conceivable to pick up more than half of the energy cost with solar water heating; for electricity, it's a smaller percentage. So building owners can make a nice dent in their energy bills and the long-term affordability of the property—and, of course, it's environmentally beneficial, as well.

• **What grant and financing resources are available?**

The **Database of State Incentives for Renewable Energy** (dsireusa.org) is the resource that everyone in the industry uses to figure out what incentives are available. It's a little complicated, and the programs tend to have relatively small amounts of money that get spent relatively quickly, but there's a lot of possibilities out there. You just have to stay on top of it.

There are certainly opportunities for getting loans or reduced interest rates on loans for this kind of work. **Property Assessed Clean Energy** (pacenow.org), for example, recently began an innovative program to help property owners finance energy retrofits. PACE bonds are issued by municipal financing districts or finance companies and, unlike a conventional loan, are repaid over 20 years via an annual assessment on the property tax bill.

For affordable senior residences, there are national resources, but opportunities for market-rate properties are usually local. Some states have little pots of money available for audits and retrofits, and I expect we'll see more due to the stimulus funding for energy efficiency. They may be part of a municipality's energy efficiency community block grant allocation or through some other stimulus effort, but it's likely that more of those opportunities will pop up. The utility companies and some state energy agencies sometimes have programs, as well; but overall, it's a pretty disaggregated world. □