



House Call

An energy auditor prescribes savings.

Andy Padian is a busy man. Padian, one of the country's most experienced multifamily energy auditors, runs the multifamily program for Steven Winter Associates, a nationally known architecture and engineering consulting firm. During 25 years in the business, Padian has seen interest in his services wax and wane, but with rising energy costs, his phone has been ringing a lot these days. "People have been screaming for help," he says.

The help Padian offers building owners and managers is advice on how to cut their utility costs and make their buildings more comfortable. Most multifamily buildings waste 40 percent of their energy, so there's plenty of room for savings. "If energy costs are 25 percent of your total costs, and you can cut them almost in half, that's a real profit center." The savings he recommends almost always pay for the audit in less than a year (and some audits pay off immediately), but realizing them may demand hard choices. "I tell managers they're going to have to rethink some key issues."

How much rethinking depends on how bad the problems are, and what's causing them. "Some good buildings are poorly managed. Some poor buildings are managed well." To address the management problem, Padian teaches four-day training courses that cover building efficiency, health, safety, and comfort. Graduates can get certified as energy-efficient building operators by the Building Performance Institute in Malta, N.Y. But before you can make an existing building more efficient, you have to find the problems. An energy audit is a real eye-opener.

FAN CHECK: Padian checks all kitchen and bath exhaust fans. A little thing like a loose fan housing tells him how well mechanical systems are maintained.

EXAM DAY

On a brisk day in mid-April, Padian inspects a 14-story apartment building on Manhattan's east side. Tomorrow he will use a computer program to simulate energy use, but today he is gathering data to feed that program. He's like a doctor examining a patient. He spends much of the day walking the building, probing and measuring. He inspects thermostats and other controls, counts light fixtures, takes the temperature of tap water, takes notes on mechanical equipment, and searches for unsealed holes in the building envelope. It's essentially detective work: With only one day to inspect the building, he has to deduce a lot. For instance, by inspecting a couple of vacant apartments, he can get a fairly accurate picture of how efficient the rest of the building's units are.

From the street, Padian counts

open windows. ("I don't see many open windows, which tells me the building isn't overheated.") He paces the roof to estimate building square footage. ("I usually get a set of plans for the building, but I don't trust them," he says.) He counts the vent fans for kitchens and baths, checks to see that each is working, and notes the model and wattage on all motors—from the kitchen exhaust to the elevator motor—to see if he should suggest more efficient ones.

By the time he's done, he can estimate all the building's energy usage. "We'll know the electric load, heating usage, hot water usage."

SAVINGS PRESCRIPTION

Padian will use this information to write detailed prescriptions on how to cut that usage. He has inspected "thousands of buildings" since his first auditing job with the New York mayor's energy office in 1980 and has found that while each building has its own unique problems, certain things will make almost any building more efficient.

Know the usage numbers. It's hard to save energy if you don't know how much you use. A building's energy use is different than its energy bill. "No multifamily manager has been able to tell me how many kilowatt-hours of electricity they used last year," says Padian. "They track it on a dollar



basis." But as energy prices change, the only way to know how effective your conservation measures are is to track actual consumption.

Read the directions. For every piece of equipment, get the instructions, read them, and follow them. That includes the controls that run the fans, the fans themselves, and the light switches. "Not many managers do this," says Padian. He asked one of his classes if anyone had a folder with instructions on how to operate and maintain their building's boiler. Not one hand went up. Such ignorance is expensive. "If a piece of equipment isn't tuned and lubed the way the manufacturer says it should be, it will degenerate and perform poorly."

Relinquish control. Who turns things on and off—from the lights to the heat to the fans—has a big impact on energy use. Padian likes to get people out of the process as much as possible. That usually means replacing timers with sensors: a thermostat for a vent fan in the elevator room, a motion detector for a light in the trash room. "The more you have automatic, simple controls, the better off you are," says Padian.

Mind the gaps. Plumbers, electricians, and other trades people almost never seal the holes they make. Holes near the top and bottom floors cause the worst problems by creating a chimney effect that sucks heat out of the building. Most of the time, this giant sucking phenomenon is caused by the cumulative effect of lots of relatively small holes, but not always. Padian recalls a building in Queens that was too hot on the top floor and too cold on the bottom. Engineers had suggested replacement windows and new boilers, at a cost of about \$4,000 per apartment. "I did an audit," recalls Padian. "The boilers were OK, and the windows were double-pane [glass], but there was a breeze in the stairwells and the hallways."

The problem: A loading dock at the back of the basement was sucking cold

WATTS WATCH: Padian checks the wattage on all of the buildings' motors to see how efficient they are.



BIG SUCKER. Big holes like this one are especially problematic near the top or bottom floors, where they can help create a chimney effect that sucks air out of the building.

air in at the bottom of the building and driving warmer air up. "I recommended a vestibule at a cost of \$500. It solved the problem."

Kill the watts. Most managers know that they can save money by switching from incandescent to fluorescent lights. But better fixtures can also pay off. In the hallways, for instance, he suggests more reflective ceiling fixtures. "We have 850 watts of light in a 100-foot hallway. If we can get it down to 400 watts, we will save \$425 per year for that hallway. If you multiply that savings times 14 floors, it's almost \$6,000 per year."

Watch the water. Water and hot water are among the biggest areas of waste. By code, water at the tap has to be at least 120 degrees, but it's often much hotter. This building's tap water measures 170 degrees—a waste. "The difference between 130 and 170 is a lot of energy and a lot of money," Padian notes.

Of course, management has to decide whether to take his suggestions. "Management in this building pays for heat, so they're very motivated to save," he says. But he believes that energy savings will pay off for any building owner. Earlier this year, he audited a building in New Jersey that had a historical vacancy rate of 2 percent. Rising energy costs had jacked the vacancy rate up to 15 percent. That's typical. "The biggest vacancies start to happen when it gets too expensive to live in a building." [M]

Charles Wardell is a freelance writer in Vineyard Haven, Mass.