Elevating Elevator Power

Regenerative elevator drives may save energy and dollars – and may soon be turning up in one of the five boroughs.

By Jennifer V. Hughes

When it comes to going green in your building, environmentally conscious boards and management companies immediately think of energy-guzzlers like lights and boilers. But there is another unlikely source of untapped energy savings in many condo and co-op buildings: your elevators. New technology, on display in a new system called a "regenerative elevator drive," can recapture some of the energy typically wasted in day-to-day operations.

Wayne Locker, director of technical support and field education for Transel Elevators, a company that installs, maintains, and repairs elevators in the five boroughs, says there are three ways that an elevator loses energy and a "regen" drive saves it:

(1) LOSS: anytime the elevator decelerates – i.e., when it reaches its destination – energy is created. In a typical elevator system, that energy is dissipated as heat through a device called a heat resister.
GAIN: with a regen drive, the energy is captured and sent back to the power grid.

(2) LOSS: whenever an empty or lightly loaded elevator goes up, the motor spins but the elevator's counter-weight is doing most of the work.

GAIN: a regen drive can allow the motor to essentially act as a generator, creating power which also goes back to the grid.

(3) LOSS: when a heavy elevator goes down, the motor spins but gravity is doing most of the work.

GAIN: a regen drive can again generate power to the grid.

Locker says the regen drive allows the building to use less power but that it is very hard to estimate how much because it depends on the height of the property, the frequency of elevator use, and the age of the equipment. Generally, he adds, a regen drive can lead a building to use between 20 and 40 percent less electricity to power elevators. Elevators do not use a large amount of power compared to a building's total load. Locker estimates that, in a residential building, elevators amount to only about five percent of total energy use. In addition, if a regen drive is in place and the energy does not have to be dissipated as heat, the building sees some savings. Why? The equipment rooms do not have to be cooled as much as with a typical elevator system. Ricky Williams, new business development director for Computerized Elevator Control Corporation, which manufactures elevator controls, agrees that the energy sav-

ings vary. He estimates that 15 to 40 percent less energy is used to power elevators. Williams referred to a regen project installed in a New York City commercial building where the cost to operate the 28-story buildings' seven elevators was reduced by $5,800 one year after a modernization and regeneration project was completed.

When it comes to who is installing regen drives for elevators, most consultants and contractors say that between 80 and 90 percent are commercial buildings because loads are larger, which leads to greater energy savings. "The technology has been available for a long time but a lot of people didn't put them in because they were expensive," says Locker. "But now everyone is becoming more conscious of their carbon footprint."

How much a regen drive system can cost can also have a huge range, based on a wide variety of factors, says Williams. It depends on the type of system installed, the existing condition of the elevators, the size of the building, and the demand. Parts alone can cost between $7,000 and $12,000 per elevator.

Lewis Kwit, president of the energy consulting firm Energy Investment Systems, is helping clients who are contemplating regen drives in at least five different city condos and co-ops. "No one really knows how much energy the elevators actually use," he says. Kwit is installing data-loggers to track elevator usage so that those buildings will know the elevator energy use and can decide if the regen drives are worth it and what technology to install. Kwit says the data-loggers are key. In one rental building, he says a simulation model showed that the regen drives would not save enough energy to make them economically viable. But the data tracking actual energy usage also showed that the elevators consumed four times more energy than the simulation showed. "You have to look at the real numbers so we can evaluate the cost effectiveness of the system," he says.

One of the buildings considering regen drives with Kwit's company is 201 East 66th Street, a 256-unit co-op with three elevators. Jon Shechter, on-site manager of the self-managed property, says the building is looking into a variety of upgrades, from the regen drives to changing the motor systems of the elevators so that they can operate on the AC current that comes into the building, instead of the DC current many elevators use. "We're considering a lot of things," he says. "First we

have to see how much energy our elevators really use." If the building decides to go with regen drives as part of its elevator upgrade, it would probably pay for them out of a combination of measures, perhaps combining funds from reserves, financing, and assessments.

Kwit and other elevator and energy experts say that regen drives can be installed in existing elevators without upgrading overall systems. But he points out that some city elevator codes will be changing in 2011 to comply with more stringent safety requirements. "Many co-ops and condos will have to upgrade their elevators anyway," he says. "If they have to spend $150,000 to upgrade, adding another $20,000 or $40,000 is not going to be as big of a stretch."

Currently, it is difficult to say whether there are any incentives for regen elevator drives. The New York State Energy Research and Development Authority (NYSERDA) program for residential buildings that offers grants if they perform environmental upgrades, known as the MPP, is in flux (see "Green Report: Greening Programs On Hold," *Habitat*, December 2009). Under the old MPP, buildings could, in most cases, probably use regen elevator drives as part of an overall environmental upgrade plan and get financial incentives, says James Reis, NYSERDA's manager for the MPP program. But under new rules that are being developed for the MPP, chances will be "pretty slim," that regen drives for elevators can help buildings qualify for incentives.

Kwit is trying to convince the state Public Service Commission (PSC) to classify elevator regenerative technology as a "renewable resource," similar to solar and wind power. Currently, it is considered an energy efficiency measure. Changing that designation would open up the door to even more incentive programs, says Kwit, who made his case to the PSC in March. In an April order, the PSC indicated that it did not have enough information to make a decision at this time, but that the agency "will not preclude future consideration" of the idea.

Kwit, who remains optimistic that this change will make a huge difference for residential buildings, is blunt: "Buildings would benefit like crazy." Stay tuned.

JENNIFER V. HUGHES, a freelance writer, has contributed stories to *The New York Times.*