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Reduce Greenhouse-Gas Emissions with Vertical Transportation Equipment

Several methods for reducing electricity consumption for vertical transportation equipment are available, including energy-saving technologies

By Christine Toledo

Energy is a major issue today in the United States. We are faced with the challenge of finding new energy solutions through conservation and alternative energy sources. The most effective solution is often through energy-efficiency technologies.

Buildings are one of the largest users of electricity. According to the Washington, D.C.-based Energy Information Administration, buildings account for 79 percent (or \$214 billion) of total U.S. electricity expenditures. As of 2003, there were 4,859,000 commercial buildings alone. Most buildings consume a significant amount of electricity through the operation of vertical transportation equipment (elevators, escalators, and moving walks). This equipment generally runs all hours that the building is open for operation.

Several methods for reducing electricity consumption for vertical transportation equipment have been considered, including energy-saving technologies. In general, there are three alternatives to making escalators and moving walks more efficient:

1) Turn the power switch to "off."

There's no denying that the best way to save energy is to shut off the equipment. But, if the equipment needs to be running, then it obviously can't be shut off.

2) Install a variable frequency drive.

Power Efficiency Corporation

What is the Carbon Footprint of Your Escalator?

An escalator powered by a 20HP motor operating 24 hours a day, 7 days a week, will use about 28,000 kWh per year. According to the U.S. Environmental Protection Agency's/Department of Energy's ENERGY STAR® program, generating 1 kWh of electricity produces 1.55 pounds of CO₂ (the average car produces 11,560 pounds of CO₂ per year).

Variable frequency drives (VFDs) can positively impact energy consumption; however, they do not meet current U.S. code for escalator safety, and the additional sensors and equipment that are required to retrofit existing escalators can be expensive.

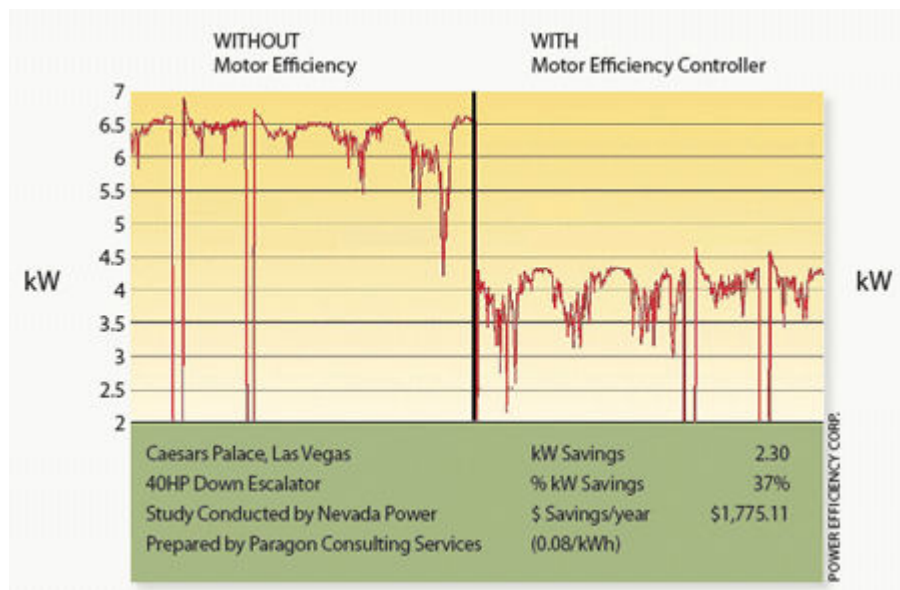
3 Install equipment that can control efficiency of the motor.

This equipment can leave the speed of the escalator unchanged, but can reduce power consumption when few riders are on it. A test by Reno, NV-based Nevada Power, the electric utility for Southern Nevada, on a 40HP escalator motor at a Las Vegas Strip casino showed a reduction in average power consumption of 37 percent (see graph) when using this type of product.

With energy efficiency and the curbing of greenhouse-gas emissions ranking among the highest national priorities, solutions for vertical transportation efficiency will continue to contribute to the overall effort to reduce power consumption.

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This means that one escalator creates roughly 43,000 pounds of CO2 per year (the equivalent of four cars' worth of CO2 per year). How can you reduce your carbon footprint? Using equipment that can control your escalator's motor efficiency can reduce escalator energy consumption by 30 percent: This means saving 8,400 kWh per year per escalator, which equals 12,900 pounds of CO2. That's equal to one car off the road.



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