Study finds big energy savings in the New York Times building

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To control daylighting for maximum comfort and energy efficiency, computer-controlled shades respond to changing exterior conditions. Credit: Renzo Piano Design Workshop

(Phys.org)—Designing a building holistically, and making sure that its components and systems work together according to design intent, can pay big dividends in energy savings and occupant satisfaction, according to a study of The New York Times Building by the Lawrence Berkeley National Laboratory (Berkeley Lab).

The study, "A Post-occupancy Monitored Evaluation of the Dimmable Lighting, Automated Shading, and Underfloor Air Distribution System in The New York Times Building," was funded by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy and the California Energy Commission through its Public Interest Energy Research Program. In-kind support for the research was provided by The New York Times Company.

Located near Times Square in New York City, the 52-story building has 1.5 million square feet of commercial office space, and the Times Company has occupied floors 2 through 21 since the building's opening in 2007. A Berkeley Lab research team began working with the Times Company in 2003 to design, evaluate and specify an integrated solution with energy-efficient lighting and automated shading systems for the windows in a full-scale mockup at a nearby Times Company site in Queens.

Measured results from the post-occupancy monitored evaluation in the final building five years after initial occupancy showed a 24% reduction in annual electricity use and 51% reduction in heating energy use, compared to expectations from a design that just met the prescriptive energy-efficiency code in effect at the time of construction (ASHRAE 90.1-2001), and a 25% reduction in peak electric demand. In addition, a significant fraction of occupants indicated a high level of satisfaction with the overall building and its design features. The Times Company's investment in advanced energy-efficiency technologies is estimated to yield a 12% rate of return on their initial investment.

"We aggressively pursued innovative designs to improve the quality of the workplace for our employees and to reduce energy use and other operating costs of our facility," said Angelo Salvatore, executive director of building operations at the Times Company, "And the outcomes of this study confirm that we were successful. More importantly, our hope is

that the energy efficient measures and designs documented in this independent study may inspire other companies' workplace designs."

By combining smart design, efficient technology and properly integrated building systems, carried from design to construction and commissioning and into operations, this study demonstrates that office buildings in an urban environment can deliver measured energy performance substantially surpassing energy codes. The lesson for replicating the success of this building on a large scale is that the technologies and systems solutions are available, but that it is essential to pay attention to details from the initial stage of procurement of building equipment to verifying the proper performance of the equipment after it is installed.

"The message of our study is that by designing the building holistically—that is, considering the energy efficiency, indoor environmental quality, new technologies and other factors like interior design and aesthetic appearance of the building together, you can achieve very high occupant satisfaction as well as significant energy efficiency," says Eleanor Lee, the project's Principal Investigator with Berkeley Lab. It is not just designing for energy efficiency, but following through in the execution stages that lead to a successful result.

Lee adds, "During construction and after occupancy, the Times Company facilities staff took the time to make sure the building was constructed according to design intent, and they commissioned the building before its opening—testing and adjusting the building's systems to ensure that they were performing properly. After the building opened, they continued to monitor the building's operation and made small adjustments to improve performance."

This study confirms that office buildings in an urban environment can deliver measured energy performance that substantially beats the energy codes with a combination of smart design, efficient technology and

properly integrated building systems, carried from design to construction and commissioning and into operations. Improved design tools and evolving building systems allow designers today to capture the performance benefits of these integrated systems without the use of custom mockup studies. The lesson for replicating and scaling the success of this building is that many of the required technologies and systems solutions are available, but that the design team and owner must pay attention to details in the procurement of high performance building equipment, and verifying the proper performance of the equipment and systems after they are installed.

More information: buildings.lbl.gov/sites/all/files/lbnl-6023e.pdf

Daylighting the New York Times Headquarters Building
windows.lbl.gov/comm_perf/newyorktimes.htm

Provided by Lawrence Berkeley National Laboratory

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