Study shows energy certification programs actually do reduce energy demands of large buildings

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The downtown Dallas, Texas (USA) skyline from a levee along the Trinity River. Facing southeast. Credit: drumguy8800/Wikipedia

(Tech Xplore)—A pair of researchers with the Georgia Institute of Technology and UCLA has found that owners of large buildings who participate in voluntary energy performance certification programs really do see smaller energy bills than do owners of other buildings in the same general area. In their paper published in the journal *Nature Energy*, Omar Asensio and Magali Delmas describe how they analyzed data from a utility company in Los Angeles over a six-year period and compared

building energy consumption rates for those participating in three energy certification programs versus those who do not participate in any energy saving programs. Margaret Walls with Resources for the Future offers a News & Views piece on the work done by the team in the same journal issue.

Most consumers are aware of the federally run Energy Star program—manufacturers gain certification for products that meet certain energy usage limits and customers see the result as a sticker on consumer products such as refrigerators and other appliances. But the Energy Star program also involves certifying entire buildings. The government also runs another program called the Better Buildings Challenge—a certification program that operates on a continual basis by offering energy audits.

There is also another energy certification program aimed at improving energy efficiency in buildings called the Leadership in Energy and Environmental Design program—it is run by the U.S. Green Building Council and involves testing for multiple environmental factors before offering certification. The goal behind all three programs is to provide an incentive for building owners to increase building energy efficiency. In this new effort, the researchers sought to find out if participating in such programs actually does result in more efficient buildings as evidenced by lower energy consumption rates compared to neighboring buildings.

To find out, the researchers gained access to energy (electric) consumption statements from the Los Angeles Department of Water and Power for the years 2005 through 2012. They then searched for and found 254 buildings in Los Angeles that had been certified by one of the three energy programs during the same time period. In comparing those buildings with their neighboring buildings, the researchers found that those certified by the Energy Star program used 19 percent less energy

than comparable non-certified buildings in the area; those in the LEED program used 30 percent less, and those in the Better Buildings Challenge used 19 percent less.

More information: Omar Isaac Asensio et al. The effectiveness of US energy efficiency building labels, *Nature Energy* (2017). DOI: 10.1038/nenergy.2017.33

Abstract
Information programs are promising strategies to encourage investments in energy efficiency in commercial buildings. However, the realized effectiveness of these programs has not yet been estimated on a large scale. Here we take advantage of a large sample of monthly electricity consumption data for 178,777 commercial buildings in Los Angeles to analyse energy savings and emissions reductions from three major programs designed to encourage efficiency: the US Department of Energy's Better Buildings Challenge, the US Environmental Protection Agency's Energy Star program and the US Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Using matching techniques, we find energy savings that range from 18% to 30%, depending on the program. These savings represent a reduction of 210 million kilowatt-hours or 145 kilotons of CO2 equivalent emissions per year. However, we also find that these programs do not substantially reduce emissions in small and medium sized buildings, which represent about two-thirds of commercial sector building emissions.