

Beyond the Empire State Building

Building types across the country face widespread opportunities to harness the benefits of energy efficiency upgrades

Nearly five years ago the large-scale energy efficiency renovation of the Empire State Building in New York City captured the imagination of both energy efficiency advocates and the building industry. Part of a \$550 million project, the energy improvements were projected to save 38 percent of the iconic building's energy and \$4.4 million in energy costs annually. The first three years of monitoring and verification of the installed energy efficiency measures, however, indicate that the project is already tracking ahead of those targets.

A flagship project that garnered noteworthy attention across the country, the success of the Empire State Building's energy efficiency retrofit invited others to replicate the significant energy cost savings—which was, in fact, one of the project's main goals. In the years that have followed, many large-scale energy efficiency retrofits have been completed or are now underway across the U.S., and this market is only expected to grow. From 2010 to 2015, the green retrofit market grew from \$3 billion in projects nationwide to an estimated \$14–\$18 billion in 2015.¹

Much of the attention around these retrofits, however, has been focused on Class A offices in a central business district, hospitals, and other large public buildings. This could lead some investors and building owners to conclude that energy efficiency retrofits are only economically viable in these building types, given their size, market presence, and access to funding and



While energy efficiency retrofits in Class A office, central business districts, hospitals, and other large public buildings have been well documented, a wide range of existing building types across the United States stand to benefit from energy improvements.

technical expertise—and that these efforts may not be as worthwhile in other buildings types, which make up the majority of the country's existing building stock.

This misconception can not only hamper businesses and building owners from reaping the benefits brought by energy efficiency retrofits, but also will prevent the country as a whole from achieving major energy reductions in its buildings.

Valuing Energy Efficiency, a new package of case studies from the Institute for Market Transformation (IMT), seeks to dispel this misconception by examining the financial outlay and impact of energy efficient retrofits on a range of building types across the U.S., to show that building owners do not need a million dollar budget or a large floorplan to reap all the benefits of energy

¹ McGraw Hill Construction, "Business Case for Energy Efficiency: Building Retrofit and Renovation," *SmartMarketReport* (New York, 2013).

efficiency. The six buildings presented—including affordable multifamily housing, Class B office buildings, a small manufacturing plant, and an old university laboratory—represent the true depth of existing buildings across America.

Each of the buildings featured in this series was chosen because it is located outside of prime market areas, central business districts, and trendy neighborhoods. As a whole, the case studies show that with careful attention to financial parameters, substantial energy and cost

savings can be achieved in a diverse range of building types without requiring a raise in rent or product prices to justify the retrofit expenditure. While some outside technical assistance was required to supplement internal resources and expenses, these building owners accomplished most of their upgrades and adjustments as part of the ongoing improvements to their buildings and their businesses. Their ingenuity is something from which many buildings owners can learn.

Project Highlights

Courtesy the Regents of the University of Minnesota



Laboratory Space: University of Minnesota, Minneapolis, MN. The retro-commissioning of the University of Minnesota's Biological Sciences laboratory highlights the opportunity to invest in energy efficiency in the institutional sector, where optimizing an existing building's energy performance can extend its useful life. Completed for a cost of only \$450,000, the project yielded a 46 percent reduction in weather-normalized energy use intensity (EUI) and a \$242,000 reduction in annual utility costs. These savings were achieved primarily by significantly lowering the building's air change rate, or the rate at which indoor air is being replaced by conditioned outdoor air.

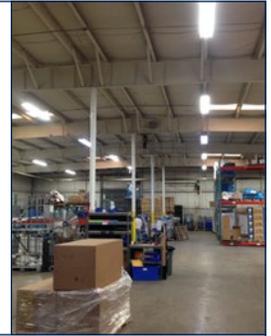
Mixed-Use Office Space: Self-Help, Wilmington, NC. Built in 1906, Self-Help's downtown Wilmington property shows that an older building, likely designed without efficiency in mind, can improve its energy performance through retrofits while making the building more affordable for its retail, small business, and non-profit tenants. Self-Help installed a building management system and a new chiller to achieve 21 percent energy cost savings and 13 percent water cost savings, lowering its site EUI by 28 percent. Annual energy savings of approximately \$11,100 have led to a more productive asset and may result in a lower cap rate and increased property value.



Multifamily Housing: CheckMate Realty & Development, Chicago, IL. CheckMate Realty, a Chicago property owner dedicated to providing high-quality affordable housing, worked with Elevate Energy and Community Investment Corporation to retrofit a 31-unit naturally affordable multifamily building in South Shore Chicago, originally built in 1928. The building reduced its annual weather-normalized gas consumption and site EUI by 36 percent through energy efficiency measures that included improved air sealing and insulation. With a \$44,384 project cost, where \$12,000 was funded through a low-interest loan and \$13,560 through a grant, the building owner saves nearly \$14,000 in annual fuel charges.

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Manufacturing Space: Tusco Display, Tuscarawas County, OH. The custom fabrication company Tusco Display has used energy efficiency in its manufacturing and commercial spaces as a strategy to lower costs, improve productivity, and gain a cost advantage in a challenging market with many competitors. Over the past 10 years, the company has reduced its energy use by 41 percent by making improvements to the building envelope, lighting, and HVAC systems, as well as installing a 15kW solar array.



Multifamily Housing: Continental Plaza, Chicago, IL. Continental Plaza is a 1950s building that provides 164 affordable, one-bedroom apartments for seniors. To fulfill the U.S. Department of Energy's Better Buildings Challenge, Hispanic Housing Development Corporation formed Affordable Community Energy, a unique mission-driven energy services company model. Through lighting, HVAC, solar photovoltaic, combined heat and power, and water conservation upgrades, ACE helped Continental Plaza reduce its 2014 utility costs by over \$47,000—cutting its energy bill by 23 percent and its water bill by nearly 5 percent. Retrofits resulted in over \$784,000 in potential added property value.



Office Space: Self-Help, Greensboro, NC. Through energy efficiency retrofits, Self-Help uses operational expense savings to help preserve affordable rents for 21 non-profit tenants that occupy its office building in Greensboro. Following an energy evaluation, Self-Help implemented measures that reduced its energy bill by 6.4 percent, saving \$8,111 in annual energy costs, and reduced its site EUI by 19 percent.



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About the Institute for Market Transformation (IMT)

The Institute for Market Transformation (IMT) is a Washington, DC-based nonprofit organization promoting energy efficiency, green building, and environmental protection in the United States and abroad. IMT's work addresses market failures that inhibit investment in energy efficiency and sustainability in the building sector. For more information, visit imt.org.

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