RETROFIT MARKET ANALYSIS

June 18, 2019

RETROFIT MARKET VALUE AND GROWTH

New York City's building emissions law, Local Law 97 of 2019, is arguably the largest disruption of the NYC real estate industry. In order to meet the challenges ahead, we must do retrofits differently, and at scale. New technologies and new business models will be needed, and labor and professional services must significantly ramp up. Many changes lay ahead, but there's also an enormous opportunity for market growth if we invest now.

If all buildings choose efficiency to meet the carbon caps, our 2030 forecast shows a $16.6B to $24.3B energy retrofit market opportunity in New York City. In 2018, just $235M was spent on building improvements to save energy. The new law could trigger a 13-fold increase over today's annual market depending on how soon owners begin investing in their properties.

These are big numbers with a wide range of uncertainty with regard to timing and carbon reduction costs. Early changes will enable a smoother growth trajectory and less costly retrofits, while reducing the global warming impact of building emissions. There may also be opportunities to incorporate these costs into capital investments that are already planned.

FIGURE 1

The Market Must Grow

The first compliance period will need the retrofit market to at least double in annual investment, and the second compliance period will require over $3B in annual investment.

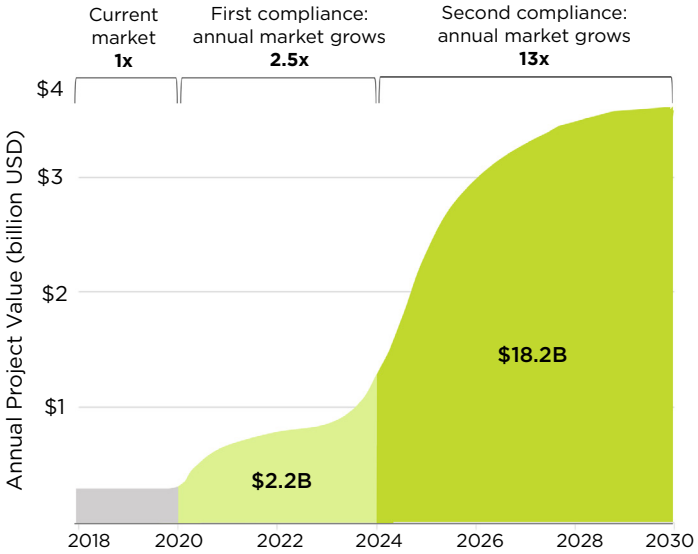
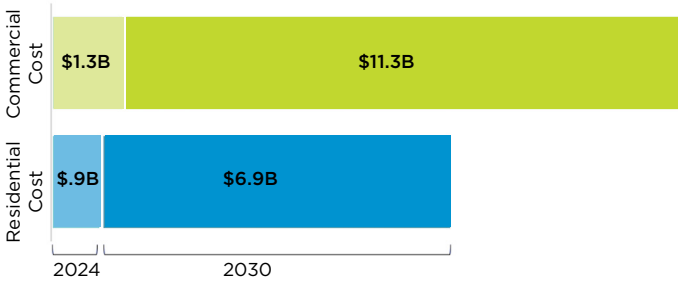


FIGURE 2

Costs for Commercial and Residential Buildings

Residential buildings account for more square footage, but commercial buildings have more complicated systems and requirements that will likely result in higher retrofit costs.



WORKFORCE GROWTH

According to David Hsu from MIT, the demand for building energy improvements has the potential to create 15,000 jobs by 2024 and an additional 126,000 jobs by 2030 in the NYC metro area. These estimates were made using the U.S. Bureau of Economic Analysis's economic impact model (RIMS II).[1]

These jobs include architects, engineers, sustainability consultants, building tradespeople and HVAC professionals. It will also include jobs in other industries such as retail, food services and product manufacturing needed to meet the demand created by industry growth.[2, 3]

But timing is critical. If building owners and contractors wait until just before each compliance deadline to retrofit their buildings, then the skilled labor necessary to support their projects may not exist.

The mid-range estimate of market opportunity **$20B**

The annual retrofit market will expand by **13x**

Number of jobs created across the NYC metro area by 2030 **141K**

METHODOLOGY

Urban Green assessed the size of today's energy retrofit market and compared it to the work required by Local Law 97 of 2019 (LL97). The current retrofit market was estimated based on Local Law 87 audit work, Carbon Challenge data, and mechanical and plumbing permits from the NYC Department of Buildings.[4, 5, 6]

To estimate the cost of retrofits, we convened a group of advisors to approximate the cost per square foot of various levels of energy efficiency retrofits (Table 1). Each sector has a low and high retrofit cost estimate due to the wide range of building types, vintages and systems across the city.

We assigned retrofit costs to residential and commercial areas based on the city's energy benchmarking information and the breakdown of LL97 covered buildings. Roughly 58 percent of citywide building area is covered by LL97, and nearly 80 percent of that area will need to make improvements by 2030. This includes 1.4B SF of residential area and 1.1B SF of commercial area.[7]

The first compliance period will require an investment of $1.75B to $2.7B, primarily in operational and control changes that could yield big savings without huge costs. The second compliance period will impact more properties and require larger investments, costing between $14.8B and $21.6B.

TABLE 1

Retrofit Cost Ranges

	Residential		Commercial	
Retrofit Size	**Low** (USD/SF)	**High** (USD/SF)	**Low** (USD/SF)	**High** (USD/SF)
Operational (<5% saved)	$0.20	$0.20	$0.50	$0.50
Light (5%-15% saved)	$1.00	$2.25	$1.50	$4.00
Medium (15%-25% saved)	$2.50	$3.75	$4.50	$8.50
Heavy (25%-35% saved)	$4.00	$6.00	$10.00	$13.00
Deep (>35% saved)	$7.00	$12.00	$15.00	$18.00

ASSUMPTIONS

- Every covered property will comply with LL97 exclusively through energy efficiency. Renewable energy, efficiency trading, carbon offsets and fines have not been included in this analysis.
- Proportional carbon reductions will be met by equivalent proportional energy reductions (e.g. a 5 percent energy cut results in a 5 percent carbon cut).
- Planned equipment replacement may already be included in a long-term capital investment plans.
- Affordable housing retrofits will yield the same carbon savings and costs as market rate properties.
- Office energy use, emissions and retrofit costs are representative of all commercial properties.
- Building owners will begin making changes to lower emissions in 2020 and the retrofits will continue at a steady pace until 2030.
- Jobs in the energy efficiency sector will expand similarly to the process outlined in the 2010 LBNL study.

SOURCES

1. Jobs analysis provided by Dr. David Hsu of MIT. These estimates were made using the U.S. Bureau of Economic Analysis's economic impact model (RIMS II).
2. 2016 County Business Patterns, US Bureau of Economic Analysis for NY-NJ-PA-CT Combined Statistical Area.
3. "Energy Efficiency Services Sector: Workforce Size and Expectations for Growth." Berkeley, CA: Lawrence Berkeley National Laboratory. A 2010 study of energy efficiency services sector found these jobs are 2 percent of economy.
4. The NYC Building Congress Construction Outlook 2018-2020.
5. Data from LL87 audits and the Carbon Challenge Progress Report 2018.
6. The DOB's Permit Issuance data on plumbing, mechanical, boiler and fuel combustion equipment work - efficiency was assumed to be a small portion (~6 percent) of these totals.
7. Both the 2016 LL84 benchmarked energy data and LL97 coefficients for oil, gas, steam and electricity were used to determine building emissions and required reductions.