

Learn More About the Playbook



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The Playbook is a framework to support the decision-making process of building owners taking meaningful action to reduce the carbon emissions of their buildings. It provides guidance based on the practical experience of building owners, experts and engineers that have developed decarbonization plans in similar buildings. This section outlines the guiding principles of this work, and explains where and how it all began.

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The built environment is an important sector to target to achieve deep, near-term greenhouse gas (GHG) emissions reductions. It is responsible for roughly [40% of global annual greenhouse gas emissions](#). In New York City, which has the densest population of tall buildings in the United States, two thirds of GHG emissions come from the energy used to fuel buildings. In the past, building GHG emissions reduction efforts were largely focused on energy efficiency improvements; however, energy efficiency measures alone cannot achieve the drastic reductions needed to avoid the worst outcomes described by the [IPCC Special Report](#).

While many building sector stakeholders recognize that they must pursue more substantial decarbonization strategies that go beyond easy-to-implement energy efficiency solutions, they may not know how or where to get started. The primary goal of this playbook is to provide a clear and replicable process for building owners and their project teams to follow to achieve double-digit reductions in energy use and carbon emissions at commercially acceptable returns.

The Intergovernmental Panel on Climate Change (IPCC) of the United Nations has made reducing greenhouse gas emissions a global imperative:

"Without increased and urgent mitigation ambition in the coming years, leading to a sharp decline in greenhouse gas (GHG) emissions by 2030, global warming will surpass 1.5°C in the following decades, leading to irreversible loss of the most fragile ecosystems, and crisis after crisis for the most vulnerable people and societies."

The process described in this Playbook is applicable to different building types. It is based on insights and successes gained through case studies of existing, large and complex buildings, whose teams' insights and lessons learned were instrumental to the creation of this resource. The framework that is used takes a whole-system design approach that explores the following:

- The interplay between current retrofit and upgrade plans
- Operations and maintenance practices
- New technologies
- Interactions across energy subsystems and system boundaries
- The role of tenants in achieving energy and carbon reduction targets
- The role of the electric grid in building decarbonization

This effort will require support from all stakeholders across the building industry, significant mobilization of private sector investment, and strong leadership from government agencies and industry leaders in real estate, construction and engineering.

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Where Did This Work Begin?

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A New York City Icon

The Empire State Building (ESB) has been leading the charge towards decarbonization for over a decade under the leadership of Chairman and CEO Anthony E. Malkin. The first decarbonization effort began in 2007 when the Empire State Building team created the Empire Standard for Sustainable Building -- a working group that included the [Clinton Climate Initiative](#), [Johnson Controls, Inc.](#), [Jones Lang LaSalle](#), and the [Rocky Mountain Institute](#) -- whose main task was to prove or disprove the business case for investment in deep energy retrofits. The Empire State Building achieved double digit reductions in energy and emissions by focusing on a whole-building approach.



Anthony E. Malkin

"The goal with ESB has been to define intelligent choices which will either save money, spend the same money more efficiently, or spend additional sums for which there is reasonable payback through savings. Addressing these investments correctly will create a competitive advantage for ownership through lower costs and better work environment for tenants. Succeeding in these efforts will make a replicable model real for others to follow."

The results achieved with the first round of work at the Empire State Building were groundbreaking. However, more needs to be done to achieve the requirements of [Local Law 97](#), the trailblazing carbon cap law that could lead to fines in excess of \$4 billion on the existing building stock. When Mr. Malkin and Dana Robbins Schneider -- Empire State Realty Trust's (ESRT) Senior Vice President, Director of Energy, Sustainability, and ESG -- reached out to NYSERDA to propose a way forward, the idea for this Playbook was created.

Building a Coalition

ESRT and NYSERDA saw an opportunity to bring together a coalition of NYC building owners to create a blueprint for replicable approaches to achieving carbon neutral buildings:

- The inaugural cohort of real estate owners participating in this Playbook include The Durst Organization, Empire State Realty Trust (ESRT), Hudson Square Properties, and Vornado Realty Trust.
- Six additional real estate owners (who also participate in NYSERDA's [Empire Building Challenge](#) program (L+M Development Partners, Omni New York LLC, Jonathan Rose Companies, Beam Living, Rudin Management, and Silverstein Properties) will contribute their case studies and lessons learned to the Playbook over the course of 2022 and beyond.

Through the examples and lessons learned from the Empire State Building, the broader ESRT portfolio, the Hudson Square Portfolio, the Penn District, and One Bryant Park, this Playbook demonstrates that buildings can and must be part of the economy-wide decarbonization solution, and that there is a way to lower emissions in a financially responsible way, while creating local jobs and advancing technological development.



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Why Do Building Owners Need a Building Decarbonization Plan?

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Christine Figueres, Head of UN Climate Change Secretariat, 2010-2016 Leader of 2015 Paris Accord Talks says:

"The 2020s are the decisive decade for the world to avert the worst impacts of climate change."

There are three primary reasons that building owners need to plan for long-term building decarbonization across their portfolios:

- Climate science indicates that what we do in the next 10 years will be critical. Global annual CO₂ emissions have more than doubled since 1970 [2] and global average temperatures have already increased by 1°C relative to pre-industrial levels. [3] Decisive action is needed now to avoid the worst outcomes of climate change.
- Climate-related policy mandates at both the city and state level are becoming increasingly stringent and frequent. Building owners should act quickly to prepare for current mandates and stay ahead of future requirements.

- The market is demanding better buildings. There is mounting focus from investors, corporate shareholders, and customers for buildings to account for their emissions and to become more sustainable and resilient over time.

Climate Science Tells Us We Need Decisive Action Now

As governments, businesses, and communities face the impacts of climate change, it has become increasingly clear that immediate action is imperative. The way we choose to address climate change in the next 10 years has the potential to set us on a new, more sustainable, equitable and resilient trajectory. We need to act now, while we can.

The coming decade will be a time for governments, businesses, and communities to work together to create resilient strategies to ensure that we build a future that sees people, our economy and our environment thrive. In addition, these initiatives will generate new pathways for us to follow as we meet the ongoing challenges of climate change.

Climate Policy Mandates Are Pushing the Building Sector Toward Net Zero Emissions

At both the city and state level, climate-related policy mandates are requiring the building sector to improve energy efficiency and eliminate onsite fossil fuel dependence. The New York Climate Leadership and Community Protection Act and New York City Local Law 97-2019 are two examples of landmark policy mandates pushing the industry toward a net zero carbon future. Others across the United States are watching these efforts in preparation for their climate action plans and targets.

- [The New York Climate Leadership and Community Protection Act](#)

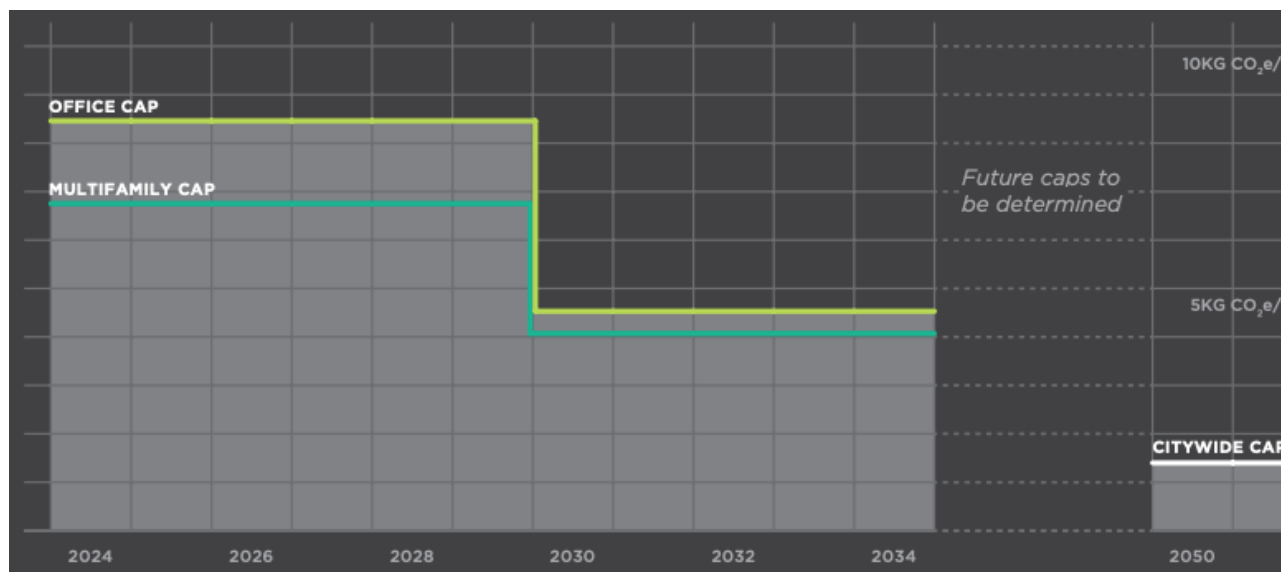
The [Climate Leadership and Community Protection Act](#) (Climate Act) is a comprehensive response to the climate change crisis that sets aggressive carbon reduction targets from various sectors across New York State. Passed in June of 2019, the Climate Act builds on the successful green energy initiatives that are already underway and sets new targets to increase the development of wind and solar power, increase energy efficiency, and facilitate the growth of energy storage technology. The Climate Act aims to achieve 100% zero emission electricity generation by 2040 and reduce 85% of CO2 emissions by 2050 (below 1990 levels).

Check out the [Climate Act Fact Sheet](#).

- [New York City: Local Law 97 \(LL97\)](#)

On April 18, 2019, New York City Council passed the [Climate Mobilization Act](#), a suite of 10 bills to reduce greenhouse gas emissions in New York City. The package includes the building emissions law, [Local Law 97](#) (LL97), which has been called “the centerpiece of the package and by far the most impactful.”

Local Law 97 provides carbon emission limits for buildings over 25,000 square feet for four periods, 2024-2029, 2030-2034, 2035-2050, and on 2050 and beyond. The emission limits depend on a building's use and square footage. It is estimated more than 57,000 buildings are subject to LL97. LL97 is the most ambitious and stringent climate legislation in the world to tackle emissions from existing buildings. The law intends to reduce building-based emissions 40% by 2030 from a 2005 baseline. Learn [all about LL97](#).



The Market is Demanding Better Buildings

Beyond the immediate financial implications of non-compliance status and potential fines in the case of LL97, building owners may face longer-term consequences by not preparing for a low carbon future. There is mounting focus from investors, corporate shareholders, and customers for buildings to account for their emissions and to become more resilient to the extreme weather events projected to intensify over time. Tenants – Fortune 100 to 500 companies in particular – now consider the energy and environmental performance of a building when selecting a site or negotiating a lease. Combine these trends with the desire of a younger workforce to work in sustainable and healthy workplace, and the pressure on buildings to decarbonize will only grow with time.

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Main Principles for Success

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This section outlines important guiding principles to consider when planning a deep energy retrofit. These guiding principles will support your team in the development of measures to go from single to double digit energy savings and maximize carbon reductions while maintaining financial viability.

ASPIRATION

- Set aspirational targets and encourage a “blue-sky” thinking approach; know your carbon neutrality date target even if it feels unrealistic
- Ensure support from top management and key decision makers. Do your best to cross institutional silos and eliminate internal barriers to communication and sharing
- Pursue new opportunities and innovative approaches and adopt methodologies which support continuous incremental progress

ONE TEAM

- Seamlessly integrate across all companies involved. Establish clear roles but allow cross-collaboration
- Engage building engineers, property managers and tenants so they are part of the solution
- Develop mutual respect through productive working sessions and collaborate via facilitated design charrettes
- Seek new perspectives from both inside and outside the building team to test assumptions

FACT-BASED

- Use data-driven analysis of current system performance and improvement measures
- Refine energy model through building performance tests
- Deeply understand where, how, when and during what weather conditions fossil fuels are used within the building
- Be open to new operational practices and controls sequences
- Evaluate energy, carbon and financial impact of ECMs individually and in packages compared to a base case or business-as-usual pathway. Include all drivers of energy consumption, carbon footprint and embedded carbon

WHOLE SYSTEM

- Include all drivers of energy consumption, carbon footprint and embedded carbon
- Consider measures in the right order; work from the envelope to building loads to central HVAC systems to controls
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COMMUNICATION

- Communicate the program goals and aspirations to staff and tenants in language digestible for stakeholders of varied backgrounds and aptitude
- Gain new ideas and insights from other building teams through charrette-like sessions
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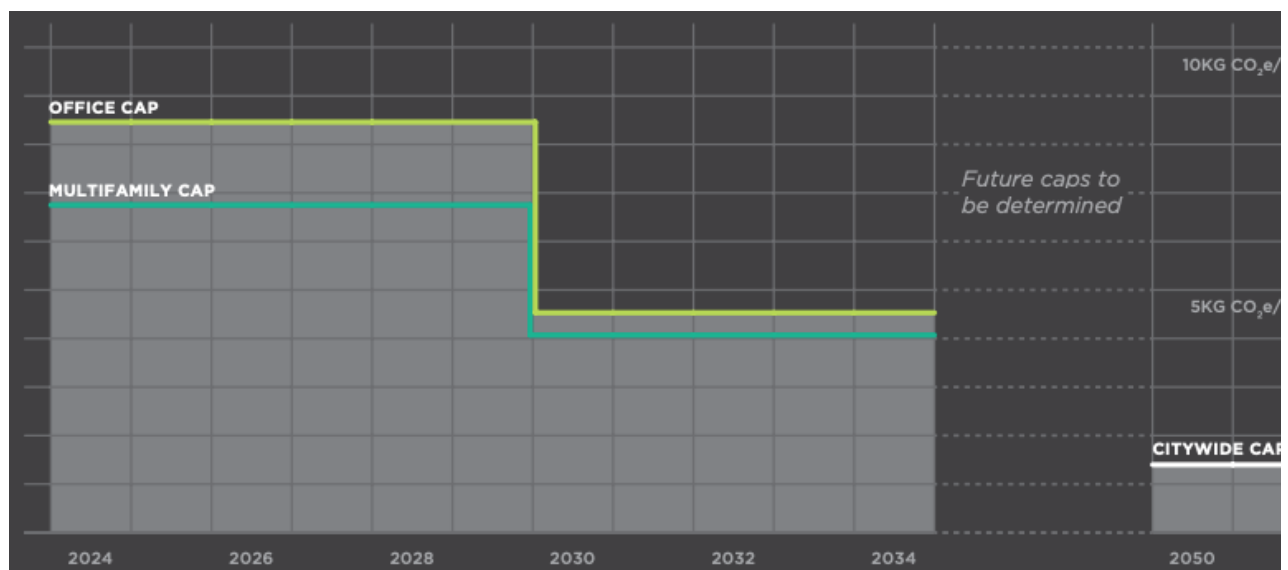
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