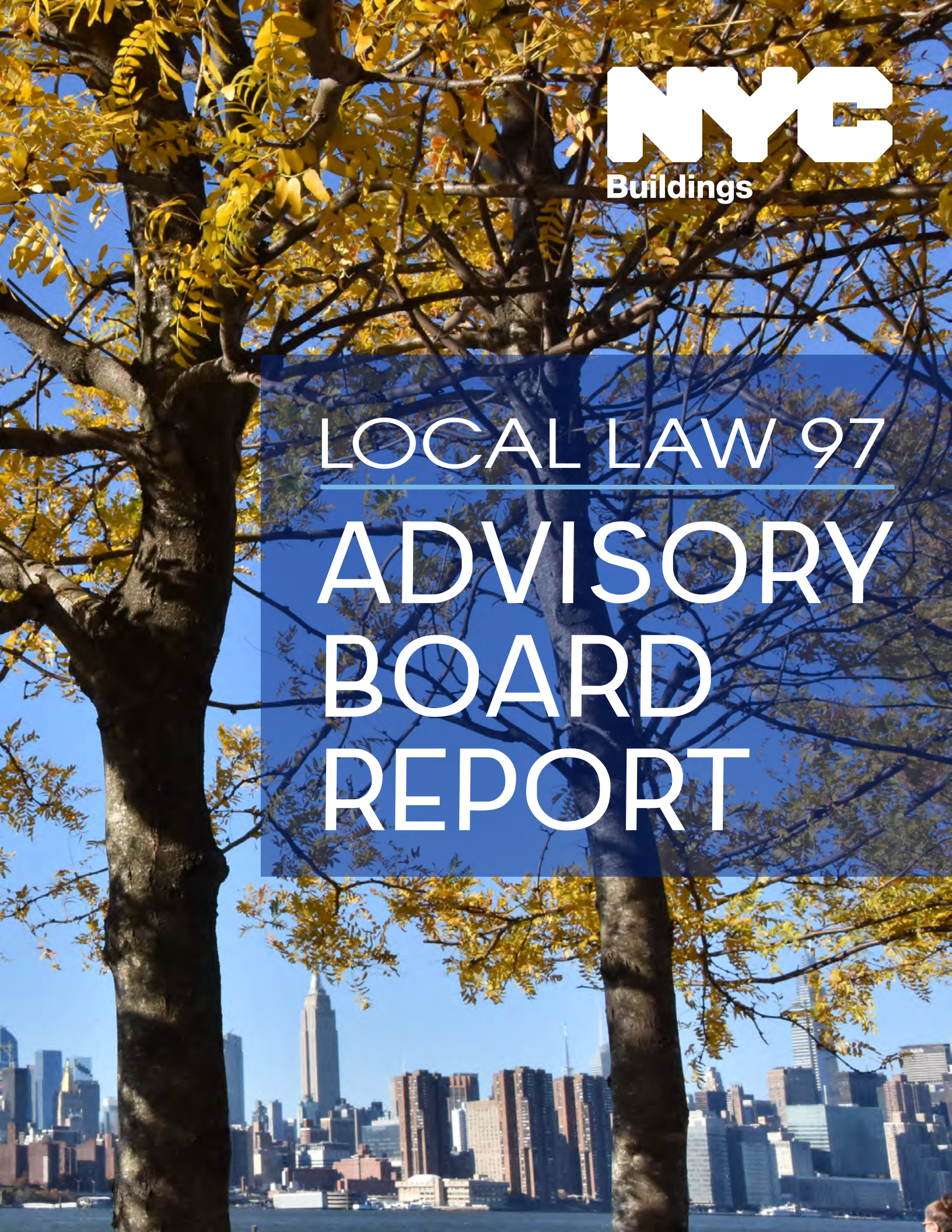

LOCAL LAW 97

ADVISORY BOARD REPORT

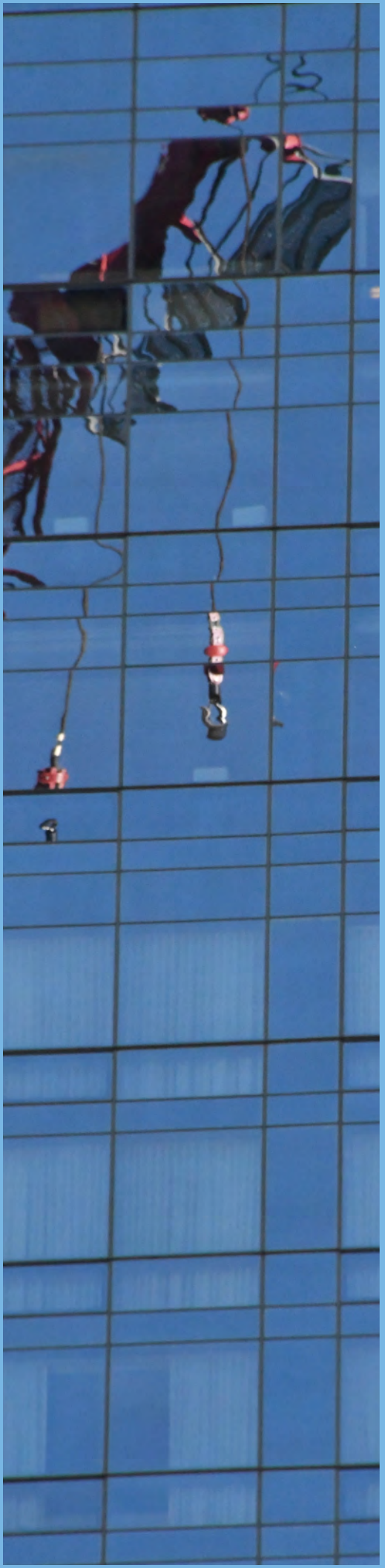

TABLE OF CONTENTS

Message from the New York City Department of Buildings.....1

Executive Summary.....2

Introduction.....4

The Climate Mobilization Act and Local Law 97.....4

Local Law 97 Advisory Board and Working Groups.....4

Purpose of This Report.....4

1.0 Calculating and Reporting GHG Emissions.....5

1.1 Metric of Measure and GHG Emissions Limits Changes.....5

1.1.1 Align Emissions Limits with Energy Star Portfolio Manager (ESPM).....5

1.1.2 Introduce an Energy Efficiency Metric in 2030.....5

1.2 Energy Coefficients.....6

1.2.1 Establish Carbon Coefficients for 2030 for Electricity and Steam.....6

1.2.2 Establish a Coefficient for Captured Methane.....7

1.2.3 Establish Coefficients for Clean-Generated Hydrogen and Ammonia.....7

1.2.4 Establish Coefficients for Other Energy Sources.....7

1.3 Establish Carbon Coefficients for Certain Distributed Energy Resources (DERs).....8

1.4 Submission of GHG Emissions and Energy Use Data.....9

1.5 Develop a Framework for Staggered Reporting Cycle.....9

2.0 Treatment of Different Property Typologies.....10

2.1 Rent Regulated Properties.....10

2.1.1 Explore Potential Misalignments between Article 321 and Needed Retrofits.....10

2.1.2 Assess the Appropriateness of Fining Rent-Regulated Properties.....11

2.2 City Properties....11
2.3 Manufacturing and Industrial Properties....11
2.4 Achieving Carbon Emissions Reductions in Hospitals....12
2.4.1 Review and Revise Hospitals Data....12
2.4.2 Provide Appropriate Financial Hardship Adjustment for Safety Net Hospitals....12
2.4.3 Support Islanded Mode Operations....13
2.4.4 Recognize Typologies Unique to Hospitals....13
2.4.5 Undertake Additional Analysis....13

3.0 Maximizing Emissions Reductions....14
3.1 Clarifying Responsibilities of Owners and Tenants....14
3.1.1 Encourage Incremental Standards and Roadmaps....14
3.1.2 Encourage an Active Role for Tenants....14
3.2 Establish a Time of Use (TOU) Coefficient....15
3.3 Support Development of New Technologies....16
3.4 Incentivize Beneficial Electrification....16
3.5 Support Infrastructure Developments to Expand Renewable Energy in NYC....17

4.0 Assistance to Covered Properties....18
4.1 Provide Financial and Technical Support....18
4.2 Support Local GHG Offsets....18
4.3 Allow Renewable Energy Credits with Reasonable Limits....19
4.3.1 Clarify Renewable Energy Credits Only Apply to Electricity Emissions....19
4.3.2 Limit Renewable Energy Credits to 30% of Overage....19
4.4 Allow Extensions and Adjustments when Appropriate....20
4.5 Support for Buildings in EJ Communities....20
4.6 Support the Decarbonization of Large, Islanded Campuses....20

5.0 Communications and Outreach....21
5.1 Identify a Reference Guide to Delineate Building Designer and Owner Responsibilities....21
5.2 Advance Outreach and Communications Efforts....22

6.0 Achieve Consistency Across Existing Regulations....23
6.1 Align LL97 with Existing City DOB Codes and Regulations....23
6.1.1 Align LL97 with Local Law 87 of 2009 (LL87)....23
6.1.2 Align LL97 with the Energy Conservation Code....23
6.1.3 Align LL97 with Local Law 11 of 1998 (LL11)....24
6.1.4 Align LL97 with Other City Regulations....24

6.2 Align LL97 with the Zoning Resolution, Fire Code, and Landmarks Preservation Commission Review Process....24
6.2.1 Align with the Zoning Resolution....24
6.2.2 Align LL97 with the Fire Code....24
6.2.3 Align LL97 with Landmarks Preservation Commission Review Process....24
6.3 Advocate for Alignment of LL97 and NY Public Service Commission and Utility Plans and Rules....25
6.4 Harmonize LL97 with New York State and Other Regulations....25
6.4.1 Support a Comprehensive Thermal Energy Decarbonization Policy....25
6.4.2 Align LL97 with City and State Policies that Regulate the Building Envelope....25
6.4.3 Remove Barriers to Sub-Metering and Streamline Sub-Metering Approvals....25

7.0 Additional Analysis....26
7.1 Consider a Carbon Trading Program....26
7.2 Establish Limits That Result in a Decarbonized Building Sector....26
7.3 Economic Impact....27
7.4 Study Additional Opportunities to Improve Implementation....28

Acknowledgements....29

MESSAGE...

from the NEW YORK CITY DEPARTMENT OF BUILDINGS

The world has reached a critical juncture. Global temperatures are rising, natural disasters are becoming more frequent, and inequality is deepening. This new normal is evident across New York City; superstorms such as Sandy and Ida, intensifying heatwaves and soaring summer temperatures, and sunny day and coastal flooding impact us all, and are felt acutely among our most vulnerable. But New York City is facing these tremendous challenges head on. We are mobilizing to achieve a more sustainable, resilient, and equitable city, and that includes dramatically reducing greenhouse gas emissions from the City's largest source of these pollutants – our buildings.

The centerpiece of the Climate Mobilization Act of 2019 is Local Law 97, which requires the City's biggest buildings to reduce their carbon emissions over time, beginning in 2024. This ground-breaking piece of legislation, along with other ambitious City and State policies, will propel our buildings towards a carbon neutral and clean energy future. To assist in that transition, an Advisory Board was convened to develop recommendations for the City to consider related to Local Law 97 implementation.

This report represents the culmination of hundreds of hours of work of the Advisory Board, Working Groups, and staff members who dedicated their time and expertise to help the City advance building energy efficiency and emissions reduction efforts. This collaboration would not have been possible without their dedication and passion for this work, and we owe them a debt of gratitude for playing such an active role in safeguarding a better future for our City and for our world.

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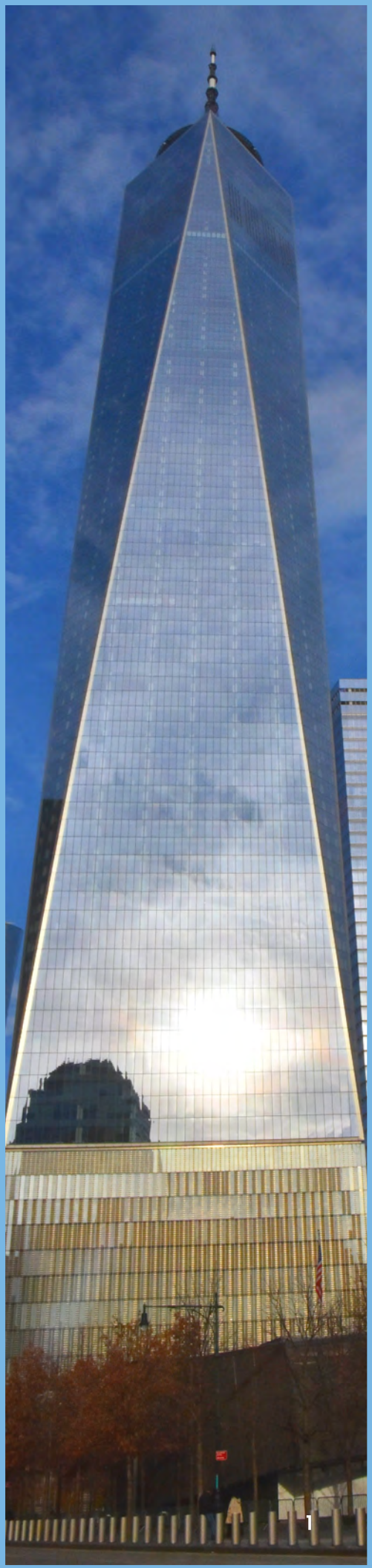


EXECUTIVE SUMMARY

REPORT OF THE LOCAL LAW 97 ADVISORY BOARD

Local Law 97 of 2019 required the creation of an Advisory Board to make recommendations for the City to consider regarding how to implement the law and effectively reduce greenhouse gas emissions from buildings. The Department of Buildings (DOB) convened the Advisory Board in November 2019, with appointees from the Mayor and City Council, representing stakeholders from the buildings industry, design professionals, environmental advocates, and government. Seven Climate Working Groups leveraged subject matter experts in a variety of fields to support the work of the Advisory Board.

The Advisory Board Report includes recommendations to help the City achieve at least a 40% reduction in aggregate GHG emissions from covered buildings by calendar year 2030, relative to such emissions for calendar year 2005. Topics of discussion include approaches to assessing and improving building energy performance and emissions reductions for covered buildings. The work of the Advisory Board represents nearly fifty recommendations organized into seven categories:

1. **Calculating and Reporting Greenhouse Gas (GHG) Emissions**: recommendations to guide building owners and registered design professionals in reporting key property information, energy use metrics, and emissions coefficients and limits, to properly comply with the law.
2. **Treatment of Different Property Types:** recommendations developed in recognition of the wide diversity in the City's building stock and designed to improve the law's impact by tailoring its application to certain property typologies.
3. **Maximizing Emission Reductions**: recommendations to achieve the greatest possible emissions reductions through the establishment of frameworks such as a Time of Use (TOU) coefficient, the incentivization of beneficial electrification, and the encouragement of an active role for tenants in reducing a property's emissions.

4. **Assisting Owners with Compliance:** recommendations that seek to deepen and strengthen the technical and financial assistance the City can provide to covered properties by way of multijurisdictional financing programs and specific financial and technical assistance in environmental justice (EJ) communities.

5. **Communications and Outreach:** recommendations to improve the manner in which the City communicates key components and deadlines of the law to the general public as well as to specific, impacted communities.

6. **Achieving Consistency with Local Law 97 Across Other Regulations:** recommendations intended to synthesize the goals and reporting requirements of Local Law 97 with related laws and regulations at the City and State level.

7. **Additional Analysis Needed to Support Implementation:** recommendations made in recognition of the subject areas and disciplines where additional analysis could improve and strengthen the implementation of Local Law 97.

Recommendations included in this report reflect hundreds of hours of discussion and are supported by the majority of Advisory Board members. The Department is honored to have had the role of convener for this Board and is grateful for the dedication of all who participated in this robust stakeholder process.

INTRODUCTION

The Climate Mobilization Act and Local Law 97

In New York City, buildings account for approximately two-thirds of greenhouse gas (GHG) emissions. To mitigate the effects of climate change, the City enacted the Climate Mobilization Act in 2019, a comprehensive climate plan to significantly reduce New York City's GHG emissions. The hallmark of this package of legislation is Local Law 97[i] (LL97), an ambitious law that sets GHG emissions limits for the City's largest properties (over 25,000 square feet) beginning in 2024 and tightening over several compliance periods.[ii] LL97 is driving property owners across the City to invest in energy efficiency and building system upgrades, leading to a once in a generation investment in New York City's clean energy economy, as well as improvements in air quality and health outcomes, particularly in historically underserved Environmental Justice (EJ) communities.

Local Law 97 Advisory Board and Working Groups

LL97 mandates the convening of an Advisory Board (the Advisory Board or the Board) to provide the Department of Buildings (DOB) and the Mayor's Office of Climate and Environmental Justice (MOCEJ) with advice and recommendations to consider relating to effectively reducing GHG emissions from buildings. As required by LL97, the Advisory Board is chaired by DOB's Chief Sustainability Officer and is composed of sixteen appointees,[iii] eight of whom were appointed by the mayor and eight of whom were appointed by the speaker of the City Council, representing key stakeholder interests from the building sector.[iv]

To develop recommendations for consideration, DOB, in conjunction with the Advisory Board, created seven Climate Working Groups. These Working Groups leveraged subject-matter experts in a variety of fields to present proposals to the Board on specific issue areas. The Working Groups were organized based on the following topics: multifamily buildings, commercial buildings, carbon accounting, energy grid, hospitals, communications, and economic impact. Implementation issues were considered in many of the Climate Working Group discussions. The LL97 Advisory Board met a total of 21 times between December 19, 2019, and November 9, 2022; and between the Advisory Board and the Working Groups, there were 363 formal meetings, accounting for approximately 682 hours. Work was also advanced during the many conversations that happened outside of the structured meetings between Working Group members, Board members, and DOB staff.

Purpose of This Report

The Advisory Board must submit recommendations for consideration in a report delivered to the Mayor and Speaker of the City Council no later than January 1, 2023.[v] Pursuant to LL97, the report must include recommendations regarding several issues related to implementation of the law, including improving performance requirements to achieve at least a 40% reduction in aggregate GHG emissions by 2030. What follows are recommendations discussed with the Advisory Board and Working Groups, approved by a majority of the Board, most often in consensus, and organized thematically.

1.0 CALCULATING AND REPORTING GHG EMISSIONS

Rooted in the principle that you cannot manage what you cannot measure, significant Advisory Board discussion centered on the manner in which buildings calculate and report their emissions and energy use. LL97 sets forth bold emissions reduction goals, but intentionally affords DOB the latitude to develop an administrable framework, process, and criteria for calculating and reporting GHG emissions. What follows are recommendations on energy metrics, data submission, and reporting cycles.

1.1 Metric of Measure and GHG Emissions Limits Changes

1.1.1 Align Emissions Limits with Energy Star Portfolio Manager (ESPM)

LL97 sets annual building GHG emissions limits for calendar years 2024-2029 and 2030-2034, with limits based on Building Code occupancy categories. After discussing the effectiveness and practical impact of using Building Code occupancy categories, the Advisory Board recommends that the City revise emissions limits to align with the United States Environmental Protection Agency Portfolio Manager (ESPM) property types. The ESPM categorization is more reflective of energy use patterns (e.g., hours of operation, process loads, etc.), leading to more accurate reporting as well as a more equitable distribution of carbon reduction responsibility. While the law already directs DOB to provide a method for converting to ESPM categorization,[vi] the Board supports the change. This transition is included in Rule 103-14.

1.1.2 Introduce an Energy Efficiency Metric in 2030

The Advisory Board recommends the City consider introducing an energy efficiency metric beginning in 2030 and for subsequent years, to work in tandem with the carbon metric already established. The metric would be annual, based on industry recognized metrics (e.g., ESPM Energy Star Score, Source Energy Use Intensity), and would drive down energy waste, which is critical to managing the costs of the energy grid transition.

Recognizing that the continual efficacy of LL97 relies on requirements and targets that grow more stringent during future compliance periods, the Board recommends that such a metric be mandatory, rather than an alternative to carbon emissions, and associated with a penalty for non-compliance. The Board also recommends that such metric be specific to energy use data from the City's covered buildings, except where data is insufficient. For property types with small sample sets, the Board recommends taking guidance from other available data sets, such as Energy Star. Energy efficiency is key to the City's and the State's plans for decarbonization and is a centerpiece of both the New York City **Pathways to Carbon-Neutral NYC Study** and the New York State Climate Leadership and Community Protection Act. A specific efficiency metric was not identified, and the Board recommends that the City study the potential impact of various efficiency metrics to determine if any such metric would drive decarbonization faster than GHG emissions limits alone.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

1.2 Energy Coefficients

1.2.1 Establish Carbon Coefficients for 2030 for Electricity and Steam

To calculate each building's annual emissions, the law sets energy coefficients to convert the amount of energy consumed by a building into an equivalent number of tons of carbon emissions. The Advisory Board believes that 2030 coefficients should reflect the forecasted composition of the energy grid using conservative estimates while aligning with State decarbonization targets. In developing these carbon coefficients, the Board consulted information provided by the **Pathways to Carbon Neutral NYC** report,[vii] 2021 **Carbon Trading for NYC's Building Sector Study**,[viii] the New York Independent System Operator's (NYISO) 2020 **Congestion Assessment and Resource Integration Study**,[ix] the New York State Energy Research and Development Authority (NYSERDA), and Consolidated Edison (ConEd). With these guiding principles and sources, the Board recommends that the following coefficients be used for 2030 – 2034:

- Utility electricity- 0.000145 tCO_2e per kWh
- District steam- 0.0000432 tCO_2e per kBtu.

The coefficient for utility electricity is an annual average value of the grid's carbon content, and this conservative proposed value considers multiple planned and funded projects that will deliver clean electricity to Zone J. However, it also recognizes the disparity between upstate New York and the grid in New York City, where renewables are much more challenging on a large scale, and transmission is hindered by congestion. The Board advocates that this conservative coefficient be coupled with a credit for beneficial electrification (see recommendation 3.4 of this report).

The coefficient for steam recognizes ConEd's planned improvements that were funded at the time of Advisory Board discussions. In addition to the average annual coefficient, the Board supports development of a 'clean steam' coefficient when ConEd makes such a product available for this market. The Board also supports development of a coefficient for thermal energy recovered from waste heat from steam condensate.

As these values may be adjusted by future rulemaking, the Board recommends that DOB only consider adjustments to reduce the coefficients as the grid cleans and advises against raising a coefficient if grid progress is slower than expected, in the interest of certainty for owners' capital planning.

LL97 requires DOB to establish carbon coefficients for energy sources for the 2030 – 2034 compliance period by rule.[x] Considering that a new Advisory Board will be convened in 2029,[xi] future energy coefficients beyond 2034 may be considered and set at that time, fully informed by the state of the energy grid. The Board recommends that future coefficients be set not later than four years prior to the commencement of a compliance year.

The coefficients for utility electricity and district steam, as recommended by the Advisory Board, are included in proposed Rule 103-14.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

1.2.2 Establish a Coefficient for Captured Methane

For biogenic methane captured from local landfills, wastewater treatment, composting, or other sources that would otherwise be vented or flared in New York City, especially those that are accounted for in the City's GHG Inventory, the Advisory Board recommends that the City set a carbon coefficient of zero to incentivize beneficial use of these sources in lieu of other fossil fuels.

1.2.3 Establish Coefficients for Clean-Generated Hydrogen and Ammonia

The Advisory Board recommends that a carbon coefficient of zero be applied to clean-generated green hydrogen and ammonia. Hydrogen is considered to be clean-generated when derived through an electrolysis process powered by clean energy sources such as wind, solar, or hydropower. Ammonia is considered to be clean-generated when it is developed without the use of fossil-fuel feedstock and through the use of renewable energy. The Board recommends that hydrogen or ammonia fuels generated from non-renewable energy sources or fossil fuel feedstock have a carbon coefficient assigned on a case-by-case basis.

1.2.4 Establish Coefficients for Other Energy Sources

For other energy sources, particularly those not currently available on the market, the Advisory Board recommends that the City consider emissions coefficients on a case-by-case basis,

depending on the original energy source and with the intent to allow for innovations. Language supporting this approach is included in proposed Rule 103-14. In setting these coefficients, the Board suggests that the following factors be considered:

- Impact on local pollution and air quality
- Safety (combustion and risk of CO poisoning)
- Differential impact on different building types
- Policy direction to drastically limit combustion of fossil fuels
- Grid cleanliness
- Impact on marginal emissions
- Additionality
- Equity
- Energy Efficiency.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

1.3 Establish Carbon Coefficients for Certain Distributed Energy Resources (DERs)

For calculating the emissions resulting from the operation of distributed energy resources (DERs), the Advisory Board recommends application of a Time of Use (TOU) methodology for utility electricity consumption. The coefficient for utility electricity established in Local Law 97 accounts for an averaging of total annual emissions on the grid,[xii] but it does not necessarily account for the real-time dynamic nature of the grid or for increased emissions on the 'margin' when dirtier generators are brought online to serve higher demand. While TOU applies differently in practice based on the type of DER that is being deployed and how an owner's property connects to the grid, for many DER systems, it translates to a reduction of purchased utility electricity.

A TOU approach rewards an owner for responsible, grid-responsive operation of DER equipment at times when the grid has high carbon content, reflecting lower carbon emissions based on the premise that the fuel sources used to operate the equipment will deliver more energy for less carbon than the electric grid for a given hour. In deliberating this approach, the Advisory Board discussed resiliency concerns and made related recommendations to account for systems that can support the grid at times of high peak demand. The Advisory Board also recognizes that as the grid cleans over time, the value of some DER – primarily those that are fossil fuel-based – should change. Once the grid has cleaned to a certain level, operating some DER systems may have a higher carbon output than the grid, and this would be reflected in the TOU methodology. At that transition point, owners may need to reconsider what options they have for provision of on-site energy and the City should consider whether additional rulemaking is necessary to reflect the changing energy grid and the role that DERs play.

The Advisory Board recognizes that some DERs are not on-site of a property and not reflected in the average annual utility electricity coefficient; therefore, the Board recommends that off-site energy storage and off-site solar procured through purchase agreements also be credited as a DER in a manner that reflects when these systems inject cleaner electricity into the grid. These recommendations are reflected in proposed Rule 103-14.

The Advisory Board also recommends eliminating special treatment for specific DER technology in the law. In particular, the Board is concerned that DER should be aligned with the broader goals of LL97, including reduction of energy waste and carbon, elimination of local and upstream pollution, job creation, and equity. In particular, the Board is concerned with any policy that supports the installation of new fossil fuel-based equipment. As such, the Advisory Board recommends that the exception added to the law by Local Law 95 of 2020,[xiii] requiring certain natural gas-powered fuel cells to be compared to a marginal carbon coefficient, be repealed by City Council.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

1.4 Submission of GHG Emissions and Energy Use Data

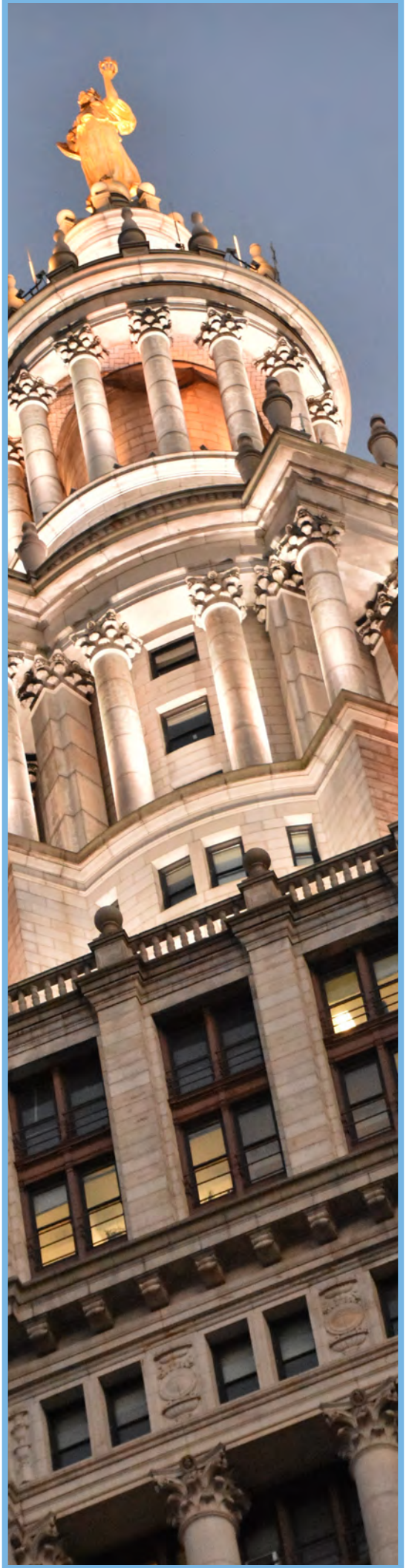
The Board views simple, streamlined reporting as an essential means of ensuring compliance with LL97 and defers to the City to determine precise mechanisms and reporting methods. The Advisory Board recommends that the City leverage existing systems (e.g., Energy Star Portfolio Manager and DOB NOW) and processes that owners already use to submit data in compliance with Local Law 84 of 2009 (LL84) and Local Law 87 of 2009 (LL87) in order to effect LL97 compliance. It should be noted that the Board recommends further alignment of LL97 with LL87, as described in Section 6 of this report. The Advisory Board also recommends that DOB develop a reporting method that allows owners of campuses to report emissions for multiple buildings in aggregate, where buildings cannot be easily metered or sub-metered. This recommendation is addressed in proposed Rule 103-14, allowing buildings to report emissions by campus and/or standalone depending on how metering is set-up (i.e., shared or not).

Corresponding Sections of LL97: N.Y.C. Admin. Code §28-320.2 (1.1) and N.Y.C. Admin. Code §28-320.2 (1.2)

1.5 Develop a Framework for Staggered Reporting Cycles

The Advisory Board did not recommend a framework for staggered reporting cycles. The nature of occupancy in buildings can change over time and the Board found it difficult to establish a basis for when a building has a sufficient margin for compliance that may alleviate the need to report in a subsequent year.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (2.2)



2.0 TREATMENT OF DIFFERENT PROPERTY TYPOLOGIES

In recognition of the variety of property types in New York City's building stock, the Advisory Board assembled a set of recommendations intended to develop tailored emission reduction approaches based on different property typologies. What follows are recommendations on the treatment of rent-regulated properties, City-owned properties, manufacturing and industrial properties, and hospitals.

2.1 Rent Regulated Properties

With EJ principles and tenant protection in mind, LL97 was crafted to avoid financially overburdening low-income communities, providing owners of some rent-regulated buildings with different compliance requirements (Article 321) and others with a delayed initial compliance timeline.[xiv] The Advisory Board expressed concerns that Article 321 does not necessarily put rent-regulated buildings on a path to decarbonization, while recognizing there are challenges to address in the application of LL97 to affordable housing, including potential limitations on the ability to finance retrofits. It should be noted that the City has been exploring ways to assist rent-regulated building owners with reducing GHG emissions and complying with LL97, including providing technical assistance and identifying financing options through NYC Accelerator and other programs.

2.1.1 Explore Potential Misalignments between Article 321 and Needed Retrofits

The Advisory Board recommends that the City explore the potential misalignment between the prescribed energy conservation measures[xv] and any deep energy retrofits rent-regulated properties might require, paying particular attention to avoiding potential misdirection of funding. The Advisory Board believes it would be appropriate to conduct further analysis exploring ways to decarbonize Article 321 buildings while also not overburdening tenants. Such analysis should consider whether these buildings

should be subject to additional or alternative requirements and could focus on topics such as impact on rent (avoidance of Major Capital Improvement triggered rent increases) and penalties, and a path to opt-in to Article 320 as a compliance alternative to prescriptive measures. The Board also recommends that DOB clarify the requirements of Article 321 in rulemaking.

2.1.2 Assess the Appropriateness of Fining Rent-Regulated Properties

The Advisory Board recommends that the City assess the appropriateness of fining rent-regulated properties and supports subjecting such properties to civil penalties according to DOB's standard fine schedule. The Board recommends that any mitigating circumstances considered for covered buildings subject to Article 320 be available to covered buildings subject to Article 321 requirements.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.5)

2.2 City Properties

Local Law 97 requires that the City reduce GHG emissions from government operations 40% by 2025 and 50% by 2030 - a faster rate than it requires of the private sector.[xvi] In 2021, the Department of Citywide Administrative Services (DCAS) issued the **LL97 Implementation Action Plan**[xvii] (LL97 IAP), which established agency-specific GHG reduction targets, made an additional commitment to reduce energy consumption 20% by 2030, and put forward a three-pronged approach to achieve the City's LL97 mandates:

1. Accelerate work to make City properties more energy efficient
2. Invest in clean energy generation both within the City and to power the grid
3. Convert fossil fuel-fired building systems, infrastructure, and appliances to electric powered systems

Through this combination of supply and demand side actions, the City is on track to go well beyond a 50% reduction by 2030. Furthermore, the LL97 IAP commitment to reduce energy consumption 20% supports transforming City facilities and infrastructure and advances a cleaner grid. Additionally, the City's commitment to reduce energy use and decarbonize its assets and infrastructure will catalyze market solutions and build capacity that benefit the private sector.

The Advisory Board had no specific recommendations for City Properties beyond the aggressive goals already being pursued by DCAS.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (2.6)

2.3 Manufacturing and Industrial Properties

The Advisory Board recommends that the City encourage owners to optimize the efficiency of manufacturing and industrial processes to achieve maximum emissions reductions. While a

transition to ESPM property types increases the limits for this particular use type, the Board anticipates that more will need to be done to balance the necessary decarbonization of industrial and manufacturing facilities with the role they play in the City's economy.

To maintain an active role for these types of properties under LL97, the Board recommends that the City develop a compliance pathway where manufacturing and industrial loads are evaluated under a different metric than carbon per square foot. The Advisory Board recommends factoring into compliance whether a facility is employing 'lean' manufacturing practices (a management process where waste is systematically reduced), separating process loads out from typical building loads, and allowing owners of industrial and manufacturing facilities to aggregate reports for multiple buildings on a campus.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (2.8)

2.4 Achieving Carbon Emissions Reductions in Hospitals

New York City is home to more than 50 hospitals that range from small community hospitals to complex academic medical institutions. These organizations collectively employ more than 200,000 workers, offer vital services to their patients, and are fundamental to the well-being of the public and New York City as a whole. They are also challenged with a unique set of constraints when compared to other sectors, which present additional hurdles to achieving significant operational carbon emissions reductions. It should be noted that LL97 already provides an adjustment to the building emissions limits for many of these institutions.[xviii] The Advisory Board proposes that the City adopt a number of recommendations in recognition of the complexity and variation of use across hospitals in New York City.

2.4.1 Review and Revise Hospitals Data

The Board recommends that the City review and revise the benchmarking data, where appropriate, that was used to develop the building emissions limits for hospitals. Members of the healthcare community have concerns that the data set contained properties that are not hospitals and that key hospital facilities were missing. While benchmarking data is submitted by owners and the City takes steps to clean that data, the benchmarking data sets may still include inaccuracies for individual buildings. Working with the hospital community, a data review may result in new data set that better reflects the energy intensity of hospital facilities.

2.4.2 Provide Appropriate Financial Hardship Adjustment for Safety Net Hospitals

The Board recommends providing a financial hardship adjustment for safety net hospitals (those that serve vulnerable populations and/or those with special financial circumstances), different from the adjustment provided for in the law.[xix] This unique property type is further addressed in recommendation 4.5 of this report.

2.4.3 Support Islanded Mode Operations

As previously noted in Section 1.3 of this report, the City supports responsible and grid-beneficial operation of cogeneration systems, while also encouraging long-term decarbonization of energy plants. For cogeneration systems that serve hospitals, the Advisory Board recommends that hospitals be allowed to compare the operation of such systems to an emissions limit based on marginal emissions for systems that are capable of operating in an islanded mode in the event of grid failure. Such systems comprise a necessary resilience strategy to protect health and safety. For cogeneration systems that cannot operate in islanded mode, such systems would be compared to the actual hourly emissions of the grid through a TOU coefficient.

2.4.4 Recognize Typologies Unique to Hospitals

One of the key challenges the Advisory Board discussed is the grouping of hospitals in one emission category. Hospitals perform an incredibly disparate number of services that require different types of spaces, including infectious disease rooms, offices, surgical areas, and labs. Because of this variety, the Advisory Board recommends that the City recognize that there are fundamental differences among types of hospitals based on their services, complexity, and energy intensity, as well as the age and design type of hospital buildings. This recognition, seeded with four possible categorizations from the Hospitals Working Group, could benefit the ESPM Program and enhance the way hospitals report energy benchmarking across the country.

2.4.5 Undertake Additional Analysis

Most major hospital systems in New York City have participated in the Mayor's Carbon Challenge, making them early adopters of emissions reduction targets. The Board recommends that the City work with its hospital systems to develop a collection of best practices, lessons learned, and examples of successful decarbonization projects executed in New York City hospitals. Furthermore, the Board recommends that the City and State support additional studies to identify specific challenges that hamper emissions reductions to further assist hospitals in overcoming these obstacles to comply with LL97. There may also be opportunities to leverage federal programs, such as the Biden Administration's **Health Sector Climate Pledge**.[xx]

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (2.9)

3.0 MAXIMIZING EMISSIONS REDUCTIONS

A significant portion of the Advisory Board and Working Group discussions centered on mechanisms for maximizing emissions reductions through the use of incentives, improved performance targets, the issuance of penalties, and clarity in the law around owners' and tenants' respective energy conservation responsibilities. What follows are recommendations designed to maximize emissions reductions.

3.1 Clarifying Responsibilities of Owners and Tenants

The Advisory Board recommends that the City explore ways in which it can encourage emissions reductions through the clarification of responsibilities held by building owners and tenants.

3.1.1 Encourage Incremental Standards and Roadmaps

The Board recommends that the City develop resources to provide guidance for owners and to address the different ways in which both owners and tenants can support GHG emissions reductions. In developing guidance materials, the Board recommends that the City consider how owners' planning should be informed by strategies to reduce total property emissions, recognizing that, while they will have more control over base-building systems than tenant-controlled ones, owners must work with tenants to make progress. In particular, guidance is needed to address the varying challenges of commercial tenants and include information on incremental decarbonization approaches, strategies for scaled-back use of fossil fuels, and how planning and implementation at individual buildings might unfold over time or in phases as tenants change.

The Board also recommends that the City consider prescriptive requirements for tenant space alterations that go beyond current Energy Code requirements or where such requirements aren't triggered, to ensure that commercial, tenant-owned and operated equipment achieves maximum efficiency and complies with rigorous code standards. As the New York City Energy Conservation Code is likely to be updated again in 2023, this recommendation can be considered by the Commercial Energy Conservation Code Advisory Committee.

3.1.2 Encourage an Active Role for Tenants

The Advisory Board supports an active role for tenants in reducing emissions and increasing energy efficiency, including through enhanced submetering of electricity and grid interactivity practices such as demand response programs, which would allow a tenant to deliver value into the market while no longer being isolated from the impacts of their energy use. The Board recognizes that affordable submetering of thermal energy in buildings remains a challenge and

that rulemaking could evolve over time as submetering of energy other than electricity (e.g., thermal energy) becomes easier and more affordable to install. It should be noted that Local Law 88 of 2009 requires many commercial properties subject to LL97 to install electric sub-meters in tenant spaces or by floor prior to 2025.

The Board also recommends that the City participate with a group of stakeholders, including building owners and lease attorneys, to explore the development of model lease language that would address how commercial building owners and tenants can share the responsibility for GHG emissions reductions and energy management, with a focus on prioritizing responsibility for those who are in control of a building's operations.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.3) and N.Y.C. Admin. Code §28-320.2 (2.7)

3.2 Establish a Time of Use (TOU) Coefficient

Local energy providers reduce customer demand during peak times when there is higher energy usage by adjusting the rate schedule based on time of use (TOU). This means that during peak demand, the price of electricity increases. Through this market mechanism, consumers are provided with incentives to consume cleaner energy in a way that is more sustainable for the grid itself. That is because when electricity is in high demand, its source typically becomes 'dirtier' as a mix of energy sources (both renewables and non-renewable) are employed to satisfy the demand. Incentivizing the use of electricity during off-peak hours can help encourage the use of only 'cleaner' energy sources.

The Advisory Board recommends that a price-as-proxy methodology be employed to account for TOU, as there is currently no published resource for predicted carbon content of the grid for a given hour. This approach would help convert a time-of-day price into a time-of-day coefficient, ultimately impacting how emissions are calculated. Day-ahead pricing would allow owners to act on information about their energy consumption for the next day, giving the opportunity for an operator to plan for deployment of on-site distributed energy resources, such as cogeneration or energy storage systems, or to implement demand management strategies. Furthermore, under this approach, buildings whose energy use was more concentrated during off-peak times would have lower calculated building emissions as opposed to buildings using electricity during peak times, even if the quantity of consumed electricity were equal.

The Board also recommends that the exact methodology for calculating a TOU coefficient beyond 2030 should be established at least two years prior to any compliance year to which it applies, as the law only requires the determination of a TOU methodology for calendar years 2024 – 2029. The Board supports continued use of a TOU coefficient for future compliance years to optimize grid and building performance. This TOU methodology is addressed in proposed Rule 103-14 and the City is working to streamline the methodology to make it accessible to more owners.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2) and N.Y.C. Admin. Code §28-320.2 (2.1)

3.3 Support Development of New Technologies

While contemplating the use of new technologies, the Advisory Board recommends the City adopt a regulatory approach guided by a technology-neutral philosophy focused on reducing emissions. The Board recommends against applying blanket bans against any technology and supports incremental steps as newer technologies phase in, rewarding partial implementation of solutions rather than limiting a technology to only full-building transitions. In particular, the Board recommends that the City promote district thermal energy networks and encourage early rather than delayed action on new technologies.

With respect to carbon capture and sequestering technologies, the Advisory Board recommends that the City consider reasonable limitations and guiderails consistent with LL97 goals and should:

- Consider emissions from other criteria pollutants beyond greenhouse gas emissions.
- Evaluate how technologies might reduce overall emissions as these technologies become available.
- Require that any new technology provide appropriate certification that is at least as stringent as would be required were these technologies to be used in generating offsets for the voluntary carbon market, including conditions of permanence and additionality.

The Board recognizes that there are concerns with carbon capture and sequestration. Unlike reductions realized through energy efficiency, these technologies do not necessarily reduce upstream fugitive emissions of natural gas or criteria pollutants, and therefore do not have the same local air quality improvements as would be achieved if fossil fuels were not combusted on-site in the first place.

The Advisory Board also suggests considering amendments to LL97 to include other sources of local emissions that drive climate change beyond carbon emissions, as well as criteria pollutants that impact local air quality and health.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

3.4 Incentivize Beneficial Electrification

Beneficial electrification - or the use of high efficiency electrical equipment to replace direct fossil fuel use or very low efficiency electric equipment - is a key strategy in the push to decarbonize buildings. The Advisory Board recommends that as early as possible, the City make beneficial electrification a central component of LL97 implementation to reduce overall emissions in the short term, accelerate equipment development and manufacturing, and expand the labor market needed to install and maintain this equipment in the medium to long term. The Board's recommendation supporting electrification and LL97 compliance considers simple and complex installations:

- Deemed credit: credit simple installations with equipment under 100 tons of capacity, based on the capacity of the equipment.

- Measured credit: credit complex installations of equipment over 100 tons of capacity, based on measured energy consumption.

For equipment installed prior to January 1, 2027, the Advisory Board recommends that the beneficial electrification credit could be double either the capacity or actual savings, as applicable. For equipment installed on or after January 1, 2027, credit could equal the deemed or actual savings, as applicable. To qualify, equipment should have a Coefficient of Performance (COP) of 1.5 or higher, at 5 degrees Fahrenheit. As there was much debate on the COP, this value should be carefully monitored and adjusted as the market for heat pumps matures and availability increases.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

3.5 Support Infrastructure Developments to Expand Renewable Energy in NYC

LL97 limits the use of Renewable Energy Credits (RECs) to those that directly sink, or deliver power, into the Zone J load zone. Currently, there are infrastructure bottlenecks that complicate the delivery of clean power from zones that are directly adjacent to New York City. The Advisory Board supports infrastructure investments that develop better connections between New York City and adjacent Electricity Zones (e.g., further than zone J) to bring more renewable energy into New York City.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

4.0 ASSISTANCE TO COVERED PROPERTIES

Because the primary goal of LL97 is to lower emissions from New York City's biggest buildings, the Advisory Board spent considerable discussion time on ways to assist properties – especially those in high need areas – with compliance, rather than to fine them for noncompliance. The following are recommendations to assist covered properties through technical and financial support; deductions, offsets, and credits; extensions and adjustments; and support for buildings in EJ communities.

4.1 Provide Financial and Technical Support

The Advisory Board recommends that the City ensure building owners receive robust assistance in order to achieve maximum compliance and the greatest possible emissions reductions. This assistance could include tax abatements (such as a program like J-51 but supporting carbon reduction), incentive programs for capital needs assessments and energy audits, support for submetering, and demonstration projects that address common challenges (such as rewiring of buildings for electrification). Furthermore, the Board supports the City's advocacy for the creation of more low-cost funding opportunities, especially considering that current available finance programs leave some gaps for certain owners.[xxi]

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.5)

4.2 Support Local GHG Offsets

GHG offsets certify a reduction in emissions through a variety of techniques, such as land restoration and carbon storage technology, that generally originate through reduction, avoidance, or sequestration of GHG emissions.[xxii] Under LL97, building owners may leverage GHG offsets to deduct emissions from their total emission calculations in 2024-2029 for up to 10%

of the annual building emissions limit.[xxiii] However, it should be noted that GHG offsets, as currently described in the law, comprise a nascent market in New York City.

In addition to the requirements already in the law, the Advisory Board recommends that any GHG offsets considered by DOB must be generated in New York City and must be permanent.[xxiv] Given these constraints, the Advisory Board recommends the City support a framework that would allow for the generation of GHG offsets through an energy efficiency and electrification program. Such program would derive offsets from carbon reduction projects executed in New York City buildings. Furthermore, the Advisory Board recommends that such offsets only be generated by buildings that are already below the law's GHG limits and that decide to further optimize their energy use, or that are generated by buildings that are not subject to LL97 emissions limits. While the Board recommends that this be open to any building as the most equitable approach, these offsets could be limited to those generated in affordable housing projects to advance improvements in those buildings that might otherwise take longer.

The Board also notes that an amendment may be necessary[xxv] to authorize a deduction only for offsets generated within the reporting calendar year, as this requirement is unlikely to be met due to the timeframe necessary to generate and certify an offset.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

4.3 Allow Renewable Energy Credits (RECs) with Reasonable Limits

A Renewable Energy Credit (REC) is an instrument certifying that a certain amount of electricity is generated and delivered to the grid from a renewable energy resource.[xxvi] The law provides that property owners may use RECs to deduct emissions from their total emissions calculations in an amount equal to the MWh value of the RECs acquired, provided that the energy 'directly sinks into' Zone J and meets certain other requirements.[xxvii]

4.3.1 Clarify Renewable Energy Credits Only Apply to Electricity Emissions

RECs are created through the production of electricity from renewable resources and support New York City and New York State long-term goals of reducing reliance on fossil fuels and slashing GHG emissions. The Advisory Board recommends that DOB clarify the application of RECs to electricity usage, which is supported by the language and intent of LL97 and consistent with the use of RECs within the energy industry. This clarification is addressed in proposed Rule 103-14.

4.3.2 Limit Renewable Energy Credits to 30% of Overage

In the context of LL97, RECs should help promote the generation and distribution of clean energy and not simply become a compliance tool to avoid actual investment in buildings through energy efficiency upgrades and electrification, which result in critical local benefits, in addition to reducing carbon. Further study is needed to determine limitations and understand the effects of the RECs market on LL97 implementation. The Advisory Board recommends that the City establish a limit on RECs of not more than 30% of a property's overage, meaning the

excess annual emissions beyond the building emissions limit for the property.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

4.4 Allow Extensions and Adjustments when Appropriate

The Advisory Board supports and seeks to expand the LL97 framework for extensions and adjustments for certain buildings in the following scenarios:

- Owners do not receive timely energy consumption data from their tenants and such data is not provided by the utility;
- Significant tenant energy pattern changes emerge in reporting that have a negative impact on compliance;
- The property type or space use changes or new owners purchase a covered building in a given calendar year (addressed in Rule 103-14); and
- Leases in existence prior to the effective date of LL97 provide preferential or non-market rate conditions for tenants, and co-operative or co-owners have no leverage or control over the energy use of these commercial tenants.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2) and N.Y.C. Admin. Code §28-320.2 (1.6)

4.5 Support for Buildings in EJ Communities

The Advisory Board encourages the City to support energy efficiency and electrification in EJ communities through a fund or other mechanism financing building improvements in affordable housing and safety net hospitals. The Board recommends giving owners an option to comply with LL97 through investment in such a dedicated fund or mechanism, rather than paying penalties into the City's general fund. The Board recognizes the many challenges of implementing such a program, but also that it is critical that LL97 results in investments in NYC buildings, particularly affordable housing where these upgrades are needed most.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2) and N.Y.C. Admin. Code §28-320.2 (2.3)

4.6 Support the Decarbonization of Large, Islanded Campuses

A few residential campuses across the five boroughs use fossil-fuel generated energy produced independently of the grid rather than or in addition to connecting to the grid itself. Multifamily buildings that are part of these campuses face significant challenges to transitioning from fossil fuels and connecting to the grid. To respond to specific challenges of large, islanded campuses, the Advisory Board recommends that the City convene an array of stakeholders, including ConEd, to discuss practical and feasible support to offset the cost of electric interconnection, as well as research into whether the local utility grid is ready to reliably provide electricity to these campuses if and when cogeneration facilities are taken offline. The Board encourages the City to advocate for incentives that will assist these properties.

Corresponding Section of LL97: N/A

5.0 COMMUNICATIONS AND OUTREACH

The Advisory Board discussed maximizing compliance with LL97 through clear communications to the public and robust, direct outreach to covered property owners and stakeholders. The following recommendations pertain to effective methods of communication and outreach that support implementation.

5.1 Identify a Reference Guide to Delineate Building Designer and Owner Responsibilities

LL97 requires the Advisory Board to identify a reference guide that delineates the responsibilities of building designers and owners to comply with emissions limits. The Advisory Board has identified a white paper, **Recommendations for the Reference Guide Required by Local Law 97 of 2019**,[xxviii] developed by the American Council of Engineering Companies New York (ACEC NY), to assist buildings in their compliance efforts. This guide includes information related to LL97 compliance during different phases of construction and will be posted as an online resource.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.8)

5.2 Advance Outreach and Communications Efforts

The Advisory Board believes that clear, concise, and early communications around LL97 will maximize compliance. The Advisory Board recommends that the City consider the following set of guiding principles in developing its LL97-related communications strategy:

- Develop clear and concise messaging that can be easily digested by property owners, managers, and other stakeholders involved in LL97 compliance.
- Provide ample lead time to understand and act on information - especially complex topics - before introducing new components of the law's implementation.
- Undertake specific educational efforts to inform certain segments of the industry about components of LL97 that merit enhanced outreach, including:
  - Educating small quantity buyers about available options for the purchase of RECs;
  - Targeting owners and residents to inform them about the many facets of building electrification;
  - Educating owners on specific low-carbon design practices, such as the cascade approach, which considers design approaches that prioritize regularly anticipated conditions rather than extremes or unusual load conditions;
  - Informing owners about NYSERDA's **Resource Efficient Electrification** model; and
  - Educating owners regarding the availability of existing financing incentives from various entities (NYSERDA, utilities, tax policy, NYC Accelerator, etc.) and financing options including Property Assessed Clean Energy (PACE) Financing, greenbanks, and other available financial products.

Corresponding Section of LL97: N/A

6.0 ACHIEVE CONSISTENCY ACROSS EXISTING REGULATIONS

The Advisory Board supports the harmonization of LL97 with existing City and State laws and regulations. Synthesizing compliance with myriad sustainability laws will maximize LL97 compliance, align City and State decarbonization and energy efficiency goals, limit confusion where multiple regulations and timelines overlap, and reduce costs for building owners who must hire third parties to prepare and submit reports.

6.1 Align LL97 with Existing City DOB Codes and Regulations

The Advisory Board urges the City to align LL97 with other City laws, rules, and policies through the following recommendations.

6.1.1 Align LL97 with Local Law 87 of 2009 (LL87)

LL87 subjects buildings over 50,000 square feet to retro-commissioning and energy audit requirements. In synthesizing this legislation with LL97, the Advisory Board supports consideration of the following:

- Requiring covered buildings to include tenant systems and equipment (currently excepted) when conducting audits and retro-commissioning;
- Identifying value-driven changes to LL87 for hospitals;
- Changing LL87 to a 5-year rather than a 10-year reporting cycle;
- Requiring audits to include a mandatory assessment of deep energy retrofits, electrification, and the potential carbon reductions of any recommended energy conservation measures; and
- Clarifying that 'owner' may include the party responsible for managing a property; for example, as in triple-net-leases, where an owner is largely removed from operational decisions.

6.1.2 Align LL97 with the Energy Conservation Code

The Advisory Board supports aligning LL97 with the New York City Energy Conservation Code, particularly with respect to alterations in existing covered buildings.

6.1.3 Align LL97 with Local Law 11 of 1998 (LL11)

The Advisory Board recommends the City assess and improve the interplay between LL97 and LL11, also known as FISP or the Facade Inspection and Safety Program. Such assessment should include identifying synergies and giving particular attention to streamlining the requirements of FISP in ways that support decarbonization of buildings while reducing the cost burden of FISP compliance to owners.

6.1.4 Align LL97 with Other City Regulations

The Advisory Board recommends aligning other existing laws and rules with LL97, including with respect to the definition of covered buildings and identifying any potential opportunities to streamline the collection of data and regulations enforced by DOB.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.3) and N.Y.C. Admin. Code §28-320.2 (1.4)

6.2 Align LL97 with the Zoning Resolution, Fire Code, and Landmarks Preservation Commission Review Process

6.2.1 Align with the Zoning Resolution

The Advisory Board recommends better alignment between LL97 and Department of City Planning's (DCP) Zoning Resolution, including:

- Updating how the Zoning Resolution regulates HVAC equipment as allowed obstructions, specifically for heat pumps;
- Allowing overcladding to project into required setbacks;
- Allowing overcladding without imposing a floor area penalty;
- Allowing for solar trellises on top of buildings that provide safe access for FDNY; and
- Allowing for battery storage system installation in required yards and as deductions from floor area.

Some of these recommendations may be addressed in DCP's **City of Carbon Neutrality** effort to modernize the Zoning Resolution.

6.2.2 Align LL97 with the Fire Code

The Advisory Board recommends improving support for LL97 within the New York City Fire Code, particularly with respect to areas where changes might facilitate the use of solar structures, overcladding, and energy storage to support electrification goals.

6.2.3 Align LL97 with Landmarks Preservation Commission Review Process

The Advisory Board recommends changing State law to remove the blanket exemption of historic buildings from the Energy Conservation Code. The Board also recommends that the Landmarks Preservation Commission support the spirit of LL97 in their review processes, approving decarbonization projects unless they truly threaten historic fabric.

Corresponding Section of LL97: N/A

6.3 Advocate for Alignment of LL97 and NY Public Service Commission and Utility Plans and Rules

The Advisory Board recommends that the City work with the New York Public Service Commission (PSC) and relevant utilities to confirm that installing new capacity to advance electrification does not create barriers or exorbitant customer costs. Further, the Board recommends that the City advocate for a utility rate structure that encourages electrification.

The Advisory Board also recommends a general alignment between LL97 and ConEd plans and rules. In particular, the Board supports the creation of a 'make-ready' electrification program to eliminate barriers to electrification and avoid excess electrification fees (notably, the Board identified that existing 'Contributions in Aid of Construction' and 'Excess Distribution Facilities' policies need modification). Such a program would provide for incentives to advance upgrades to electricity or thermal energy systems.

The Advisory Board expressed concerns about grid readiness and recommends that the City work with stakeholders to identify weakness in the existing grid that will not support electrification. It should be noted that such a study is already required by Local Law 154 of 2021.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.7)

6.4 Harmonize LL97 with New York State and Other Regulations

To maximize compliance, reduce redundancies and overlap, and better guarantee LL97's success, the Advisory Board recommends that the City and State work to align LL97 with existing New York State laws, rules, and policies.

6.4.1 Support a Comprehensive Thermal Energy Decarbonization Policy

The Board recommends that the City support the expansion of New York State thermal energy decarbonization policy. In particular, the Board recommends that the City support the authorization and regulation of new, clean thermal energy utilities. The Board also encourages the City to allow for the encroachment of these thermal energy networks in the public right-of-way and to allow for the connection to existing, untapped City-owned sources of thermal energy in New York City, such as the storm and sanitary sewer system.

6.4.2 Align LL97 with City and State Policies that Regulate the Building Envelope

The Board supports alignment of State and City policies to allow small encroachments into minimum habitable room sizes to allow owners to increase thermal insulation on existing exterior walls from inside the building, especially where exterior insulation is not feasible.

6.4.3 Remove Barriers to Sub-Metering and Streamline Sub-Metering Approvals

To facilitate sub-metering, the Advisory Board recommends that the City could work with the State to amend Division of Housing and Community Renewal (DHCR) rules that prevent sub-metering of dwelling units, and appeal to the PSC to streamline sub-metering approvals.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.3)

7.0 ADDITIONAL ANALYSIS

As envisioned in the law, successful implementation of LL97 requires a wide array of climate and clean energy analysis undertaken by technical experts. The Advisory Board recommends continued study of both the effects of LL97 and the various arenas in which the law has interplay, including carbon markets and investments in clean energy jobs. The following are a set of recommendations intended to strengthen the law through further analysis and study.

7.1 Consider a Carbon Trading Program

LL97 required the Mayor's Office to conduct a study regarding whether it would be feasible for the City to develop an emissions trading program (also known as carbon trading) as an alternative compliance pathway.[xxix] The 2021 study, **Carbon Trading for NYC's Building Sector**, was completed by an interdisciplinary team and its main finding is that adding carbon trading could reduce more local air pollution in the long term, increase investment in environmental justice communities, and save owners money when compared to LL97 implementation without trading. However, it was estimated that carbon trading could increase air pollution in the near term, which could require earlier phase out of Number 4 fuel oil and/or significant investment in building decarbonization in buildings in EJ communities to mitigate. Should the City move to implement a carbon trading program, which would require new legislation, the Advisory Board recommends adequate guardrails on any actions it may take to ensure maximum benefit for EJ communities.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

7.2 Establish Limits That Result in a Decarbonized Building Sector

The Advisory Board focused on the need for the law to encourage owners to reduce energy waste in buildings, as well as moving the building sector toward electrification. While the initial building emission limits set a foundation on which owners could plan for energy efficiency upgrades, as the State makes progress on its commitments to decarbonize the grid, buildings must continue to make needed retrofits.

There was concern that lowering the emission coefficients of energy sources could lead to inertia in the building sector, leaving owners to delay improvements. This concern was taken into consideration in developing emissions limits out to 2050, as established in Rule 103-14. The rule sets a trajectory that holds the limits to the initial compliance targets set by the law, with

approximately 20% of buildings mandated to do work to reduce their emissions in 2024, and approximately 75% of buildings requiring action to comply in 2030. Beyond these compliance targets,[xxx] the trajectory limits reflect the City and State's commitment to carbon neutrality by 2050. DOB anticipates that this new trajectory, based on ESPM property types and energy coefficients that reflect anticipated changes to the grid, will result in a net reduction of carbon emissions of 11.3% by 2024, and 38.1% by 2030.[xxxi] These emissions reductions are not inclusive of reductions that will also happen in City Buildings and New York City Housing Authority (NYCHA) properties, meaning these numbers are lower than what may be achieved. These estimates also do not reflect the emission reductions of rent-regulated or income-restricted buildings, which are anticipated to occur more slowly than in most covered buildings subject to building emission limits.

In looking out to the 2040s, the Board recommends that the City study the feasibility of electrification of the building sector to determine if any buildings should be allowed to continue to combust fossil fuels on site, in recognition that some building types have an easier path to electrification than others. This information will influence the emission limits as the City approaches the net-zero target for 2050.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (2.4)

7.3 Economic Impact

LL97 calls for the Board to make recommendations on the economic impact of the law,[xxxii] including benefits of achieving the energy and emissions performance requirements. Such impacts can happen at varying scales - from an individual building to a property type, to the building sector citywide, or even beyond. As such, the goal of the Economic Impact Working Group, and the resulting recommendations from the Board, was to identify gaps in existing economic analyses[xxxiii] related to LL97 and carbon emission reductions for the City. In their review, the Working Group noted that many of the existing studies examine only the benefits of LL97 implementation but do not sufficiently explore risks associated with implementation as well as with delayed action or inaction. The following three groups of additional study are recommended by the Board:

- Conduct a study to investigate the risks and benefits of implementing the law to both commercial and housing affordability, including the potential impact on neighborhoods that may have higher concentrations of buildings that may not comply. The study should further focus on energy costs and the availability of a trained workforce to implement retrofits, as well as needed workforce transitions (addressing job loss), construction supply chain issues, securing adequate, low-cost financing, availability of government and utility assistance, and the issues presented with technological innovation.
- Conduct a study that evaluates whether the various penalties and incentives encourage or dissuade carbon reduction measures among the different socio-economic strata, and whether there are additional federal, state, and local policy changes and funding initiatives that could further facilitate compliance, as well as the cost to the City of NY of not achieving the goals of LL97.

- Conduct a study to identify the impact of net jobs gained/lost, the ability to attract the appropriate talent to do LL97 work in time (including ways to ensure that educational training programs adequately improve accessibility to new jobs), and the retention of manufacturing, technology, and life-science operations in NYC.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (2.5)

7.4 Study Additional Opportunities to Improve Implementation

Several Advisory Board recommendations relate to pathways critical to improve compliance and require further research. It should be noted that undertaking any study indicated in this report may require additional staff and funding, which must be considered in setting the City's annual budget. Areas of study that the Board recommends include:

- Establishing an energy efficiency metric to be overlayed on top of carbon intensity, for reporting in 2030 and beyond;
- Examining the potential to consider occupant density and hours of operation in reporting carbon intensity for commercial buildings beyond the normalization that already happens in Energy Star Portfolio Manager;
- Examining the impact and potential to factor in occupant density per dwelling unit in reporting carbon intensity for multifamily and mixed-use buildings, with consideration for EJ issues;
- Exploring how to extend an adjustment for non-compliant properties owned by non-profits who fall outside of the definition of 'financial hardship;[xxxiv] and
- Estimating of the impact on emissions of buildings that comply with LL97 through the prescriptive measures of Article 321 and other timeframes for income-restricted housing.

Corresponding Section of LL97: N.Y.C. Admin. Code §28-320.2 (1.2)

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The Department has made every effort to include all who participated. Any errors or omissions in the Acknowledgments are entirely unintended.

END NOTES

[i] Local Law 97 has had several amendments by other local laws since its passage. At the time of publishing of this report, they include: Local Law 147 of 2019, Local Law 95 of 2020, and Local Law 117 of 2020.

[ii] Through the establishment of building emission limits, LL97 effectively creates four different compliance periods: 2024 -2029, 2030 – 2034, 2035 – 2039, and 2040 – 2050. These are identified in N.Y.C. Admin. Code §28-320-3.1, 28-320.3.2, and 28-320.3.4.

[iii] See Section 28-320.2.

[iv] The composition of the Board was set by N.Y.C. Admin. Code §28-320.2.1. These individuals, including those members who participated for only a portion of the Board's service to the City, are Nicole Abene, Jessica Steinberg Albin, Mark Chambers, Donna Chiu Fiona Cousins, Donna De Costanzo, Susanne DesRoches, Scott Frank, Jasmine Graham, Annel Hernandez, Shravanthi Kanekal, Kyle Kimball, Jill N. Lerner, Ross MacWhinney, Anthony Malkin, Angela Sung Pinsky, David Pollock, Peggy Shepard, Pete Sikora, Howard Styles, Candis Tall, Michael Yee, and Stas Zakrzewski.

[v] N.Y.C. Admin. Code §28-320.2 (1) and (2).

[vi] N.Y.C. Admin. Code §28-320.3.1

[vii] **https://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/Carbon-Neutral-NYC.pdf**

[viii] **https://guarinicenter.org/carbon-trading-for-nycs-buildings-sector/**

[ix] **https://www.nyiso.com/documents/20142/2226108/2019-CARIS-Phase1-Report-Final.pdf**

[x] N.Y.C. Admin. Code -§28-320.3.2.1

[xi] N.Y.C. Admin. Code §28-320.2

[xii] N.Y.C. Admin. Code §28-320.3.1.1

[xiii] N.Y.C. Admin. Code §28-320.3.1.1 Exceptions.

[xiv] Different types of affordable housing are addressed in various sections of the law, including N.Y.C. Admin. Code § 28-320.1 (definitions of covered building and rent regulated accommodation), N.Y.C. Admin. Code §28-320.3.9 (Extension for certain income-restricted housing), N.Y.C. Admin. Code §28-320.3.10.1 (Additional time for certain covered buildings), and Article 321.

[xv] N.Y.C. Admin. Code §28-321.2.2

[xvi] N.Y.C. Admin. Code §24-803 (b)

[xvii] **https://www1.nyc.gov/assets/dcas/downloads/pdf/energy/reportsandpublication/local_law_97_implementation_action_plan_2021_report.pdf**

[xviii] N.Y.C. Admin. Code §320.9

[xix] N.Y.C. Admin. Code §28-320.7

[xx] https://www.hhs.gov/climate-change-health-equity-environmental-justice/climate-change-health-equity/actions/health-sector-pledge/index.html

[xxi] The City is working to identify hurdles where owners have less access to financing than others. For example, PACE financing doesn't work well for housing with federal government backed loans, for properties with smaller capital needs (less than $500,000), or for some ownership structures, such as existing residential condominiums. Likewise, tax incentives may be of limited value to not-for-profit owners.

[xxii] N.Y.C. Admin. Code §28-320.1

[xxiii] N.Y.C. Admin. Code §28-320.6.2

[xxiv] The concept of permanence in carbon accounting is based in the fact that CO2 emissions are long-lived. If emitted today, these emissions can remain in the atmosphere for thousands of years, according to the GHG Management Institute and Stockholm Environment Institute. Reductions need to be similarly long-lived. Practicality must be considered, but "permanent" offset should mean that there is very low risk of reversal, or release of the offset carbon through natural disturbance or man-made causes.

[xxv] The Board recommends amendments to N.Y.C. Admin. Code §28-320.3.6.2.

[xxvi] N.Y.C. Admin. Code §28-320.1

[xxvii] As indicated in N.Y.C. Admin. Code §28-320.3.6.1, for an owner to apply the purchase of RECs toward their annual emissions as a deduction the RECs must (ii) be solely owned and retired by, or on behalf of, the building owner; (iii) be generated in the same year of reporting; (iv) and the building that hosts the system producing the energy may not also receive a deduction under section 320.3.6.3 for clean distributed energy resources.

[xxviii] https://cdn.ymaws.com/acecny.org/resource/resmgr/advocacy/Ref_Guide_White_Paper_7-7-20.pdf

[xxix] N.Y.C. Admin. Code §28-320.2 (2) (2.5)

[xxx] In the law, under Section 320.3.4 the Department was given authority to adjust the limits, as long as such limits were no more than an aggregate level of 0.0014 tCO_2e /sf/yr.

[xxxi] Under the requirements of LL97, as it was passed in 2019, the estimated reduction of emissions for covered buildings would have been approximately 11.5% by 2024 and 25.1% by 2030. These numbers represent covered buildings, and exclude estimated emission reductions from City owned buildings, NYCHA buildings, and buildings under 25,000 Square Feet (roughly 30% of emissions from the building sector).

[xxxii] N.Y.C. Admin. Code §28-320.2 (2) (2.5)

[xxxiii] The Economic Impact Working Group considered the following studies: Urban Green Council

(2019), **Retrofit Market Analysis**; Environmental Science & Technology Journal, (2020), **Assessing Air Quality and Public Health Benefits of New York City's Climate Action Plans**; New York University Guarini Center and the Brattle Group (2021), **Carbon Trading for New York City's Building Sector**; NYSERDA (2021), **New York State Clean Energy Report**; Energy Journal (2022) **Climate policy impact on building energy use, emissions, and health: New York City LL97**; Office of the New York State Comptroller (2022), **Green and Growing: Employment Opportunities in New York's Sustainable Economy**; Cornell University School of Industrial and Labor Relations (ILR) (2022), **Climate for Change: A Complete Climate Jobs Roadmap for New York City**; Federal Reserve Bank of New York (2022), **Sustainable Affordable Housing, Strategies for Financing an Inclusive Energy Transition**.

[xxxiv] See Section 28-320.1, definition of *Financial Hardship*, and Section 28-320.7, paragraph 2


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