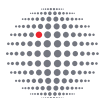




A Guide to Green Infrastructure Funding

Advancing New York's Clean Energy, Decarbonization and Economic Development Goals

March 2022



PARTNERSHIP
for New York City



Table of Contents

Purpose & Context	3
IIJA Funding Opportunities	5
New York City and State Climate & Clean Energy Goals Lead the Nation....	7
Criteria for Establishing Funding Priorities.....	9
Approach to Applying for & Securing IIJA Funding	10
Clean Energy & Climate Change Funding Available to New York City	12
Initiatives Underway Where IIJA Funds Can Accelerate Decarbonization....	14
Conclusions & Next Steps	20
Acknowledgments.....	23
References	24

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Purpose & Context

The Infrastructure Investment & Jobs Act (IIJA) of 2021 (often referred to as the Bipartisan Infrastructure Law) includes as much as \$65 billion in available funding to help the private sector, municipalities and states deploy clean energy at scale, reduce greenhouse gas (GHG) emissions and create clean energy jobs.² The funds can also help ensure that decarbonization does not come at the expense of economic growth and instead serves as bedrock for economic development and innovation.

The White House has indicated that the first opportunities to apply for IIJA grant funds will come in the second quarter of 2022 and will continue to be rolled out through the end of 2022. The funds will be awarded largely on a competitive basis. New York City and state, which have established some of the most ambitious goals in the nation for carbon reduction and transition to renewable energy, should quickly prepare to capture an aggressive share of these federal dollars. Public and private commitments to decarbonization and transition to renewable energy in New York City and state are significant, positioning New York well for leveraging federal infrastructure aid and contributing further to economic growth.

The greatest challenge to achieving decarbonization and renewable energy goals will be in New York City, the driver of the state economy, the largest contributor to its tax base and with the greatest concentration of low-income households.³ New York City real gross domestic product (GDP) of \$854 billion in 2020 represented 57% of the state's \$1.49 trillion GDP.⁴ The city accounted for 50% of the state's personal income tax collections and 41% of its sales tax collections.^{5,6} Over 50% of New Yorkers living below the poverty level reside in the five boroughs.⁷

Energy infrastructure investment by electric and gas utilities and public authorities of \$14.5 billion over the 2020 through 2023 period in New York City alone is projected to support creation and retention of an estimated 80,000 to 100,000 jobs. New York City's tristate metropolitan region utilities and authorities have budgeted \$8.2 billion in 2022 to invest aggressively in energy efficiency, renewable energy, battery storage and grid modernization creating and supporting an estimated 50,000 jobs. Leveraging federal funding would enable the city and state to be even more aggressive in speeding the transition to a cleaner energy economy.⁸

This paper represents our best thinking on how New York City can put together the strongest and most competitive applications to secure maximum federal dollars for projects that accelerate

transition to cleaner fuels while maintaining reliability and affordability that is essential to achieving economic development goals as New York emerges from the pandemic. New York City, and its disadvantaged communities, are where the challenges of the transition away from fossil fuels are considerable and the risks of failure or delay in achieving clean energy objectives are greatest.

Winning applications for IIJA grant funding will require cooperation among leaders of government, industry, labor, environmental advocates and communities to identify priority projects, set performance goals and metrics, and collaborate on compiling the data required to inform compelling grant proposals. Reviewers can be enlisted to ensure each proposal makes the strongest case for New York, meets federal evaluation criteria, and is consistent with federal legislated goals.

This paper is focused on the clean energy and energy efficiency provisions in the IIJA that would be of greatest interest to New York City and energy companies serving the region. It does not address non-energy infrastructure aspects of IIJA that are also very relevant to the city.⁹ The intent is to inform a timely city and statewide response to prioritizing and coordinating applications and execution of projects that advance clean energy, decarbonization, affordability and social equity goals while ensuring energy and grid resiliency.

IIJA Funding Opportunities

IIJA funding opportunities align well with city and state decarbonization, clean energy and climate goals and a range of associated priority grid modernization and energy efficiency projects and programs. Specific IIJA opportunities include funds for improving energy efficiency and decarbonization by retrofitting buildings (including public schools and government buildings), modernizing the electrical grid to deliver renewable energy and distributed energy resources, and strengthening resilience against extreme weather, purchasing alternative fuel and electric vehicles (including school buses, taxis, ridesharing vehicles and ferries), updating building energy codes, and reconnecting neighborhoods and communities by removing barriers of legacy energy infrastructure. An additional round of funding and tax incentives for clean energy and environmental and social justice initiatives may follow if Congress finalizes a modified version of the Biden administration's 'Build Back Better' reconciliation package.¹⁰

The sheer scale of the investments needed to fully modernize the city's energy infrastructure would put a great burden on state and local agencies as well as utility customers if done exclusively through the typical rate case process in front of state regulators and/or through normal agency appropriations in which case some costs would be borne by taxpayers.

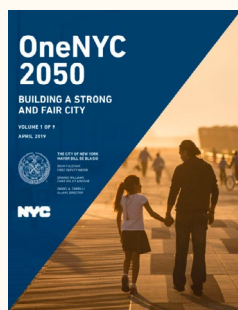
By leveraging grant funding through the IIJA, investments in crucial infrastructure can be done in such a way that pressing financial concerns can be addressed alongside development and demonstration of cutting-edge solutions that accelerate transition to a cleaner energy economy. Federal funding will be essential to optimizing affordability through the energy transition that will be a critical factor for both quality of life and economic recovery, as the city positions itself for leadership in the global digital economy.

The framework provided in this report is intended to help identify and prioritize projects eligible for federal funding and the potential benefits available from selected projects toward city and state policy goals. Success of the framework in securing federal funding is contingent upon close collaboration between the city and state to accomplish the following:

- Identifying funding opportunities and program assistance in the IIJA that is available to New York City and electric and gas utilities serving the city as well as funding provided to the state that can be regranted to energy companies and municipalities.

- Matching funding opportunities to critical new and planned infrastructure projects for which funds can be sought to achieve clean energy goals, reduce energy inequities and enhance economic development objectives.
- Establishing a process through which relevant public and private sector entities can agree on funding priorities and successfully apply for and win grants, including a return-on-investment paradigm that assesses the benefits and relative importance of individual projects to achieving city and statewide goals, as highlighted in the table below.

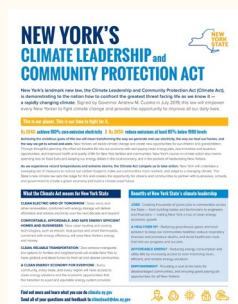
City and State Clean Energy and Environmental Goals



OneNYC 2050¹¹

Volume 7 of OneNYC 2050 lays out strong goals for achieving:

- **100% GHG emissions reduction** within New York City by 2050 and
- **100% clean electricity generation by 2040**, while also
- **Strengthening communities, buildings, infrastructure and the waterfront to be more resilient**, and
- Simultaneously **create economic opportunities for all New Yorkers** through climate action and fighting for climate accountability and justice.



Climate Leadership and Community Protection Act¹²

The nation-leading Climate Leadership and Community Protection Act (CLCPA) passed by the state Legislature and signed into law in 2019 requires that the state achieve deployment of:

- **70% renewable electricity generation by 2030**,
- **40% economy-wide GHG emissions reduction by 2030**,
- **Zero-emissions electricity by 2040**, and
- **Net-zero GHG emissions economy-wide by 2050**.

New York City and State Climate & Clean Energy Goals Lead the Nation

IIJA funding opportunities align well with the city and state's decarbonization, clean energy and climate goals and a range of associated utility and public authority priority projects and programs. Volume 7 of New York City's OneNYC 2050 plan lays out goals for achieving 100% GHG emissions reduction within the city by 2050 and 100% clean electricity generation by 2040, as well as strengthening communities, buildings, infrastructure and the waterfront to be more resilient, creating economic opportunities for all New Yorkers. The nation-leading Climate Leadership and Community Protection Act (CLCPA) of 2019, requires that the state achieve deployment of 70% renewable electricity generation and 40% economy-wide GHG emissions reduction by 2030, zero-emission electricity by 2040, and net-zero GHG emissions economy-wide by 2050. Achieving these aggressive goals requires significant investment in energy, buildings and transportation infrastructures.

The Pathways to Carbon-Neutral New York City is a collaborative public and private sector study recently completed by the New York City Mayor's Office of Sustainability, Consolidated Edison (Con Edison), and National Grid.¹³ The study envisions how energy delivery systems of both utilities could become key enablers for cleaner fuels across economic sectors to reach carbon neutrality. Specifically, the study envisions:

- The electricity system delivering 100% zero-emission electricity to a growing number of electrified buildings and more than 1 million zero emission vehicles, cleaning the air and significantly reducing on-site fossil fuel combustion.
- The natural gas system transitioning to delivering low carbon gas (e.g., such as hydrogen or renewable natural gas) for end uses too costly and complex to fully electrify, helping mitigate increases in winter peak electricity demand and customer costs.
- The steam system providing low carbon heating and cooling to some of the largest and most difficult buildings in the city to electrify or decarbonize.

This partnership among city government and investor-owned utilities provides an example of the coordination and collaboration required to reach carbon neutrality at the scale and pace being demanded. Successful IIJA funding for projects in the city has the potential to accelerate the pace and reduce the cost of meeting such goals.

Governor Kathy Hochul, in her first State of the State address on January 5, 2022, announced a slate of clean energy initiatives expected to deliver and support progress toward reducing GHG emissions in New York City all of which align well with the federal funding opportunities offered by the IIJA.¹⁴ Those initiatives include plans and/or legislation to:

- Achieve 2 million climate-friendly, electrified or electrification-ready homes by 2030 and ensure that all new building construction reaches zero-emissions by 2027.
- Power one-third of New York City with wind, hydropower and solar generated electricity.
- Double energy storage deployment to at least 6 gigawatts by 2030.
- Establish a New York State Green Hydrogen Hub and successfully compete for a share of the \$10 billion in new federal funding available for green hydrogen hubs.
- Expand the \$59 million Clean Green Schools initiative to serve more than 1,000 public schools.
- Deploy \$175 million over five years for electric vehicle (EV) charging stations through federal formula funds, with a focus on fast charging for light-duty vehicles along highway corridors.
- Require that, by 2027, all new school bus purchases will be zero-emissions, and by 2035, all 50,000 school buses on the road will be zero-emission vehicles.

Coordinating among business and state and local government leaders and energy companies, with attention to priority infrastructure needs to support the clean energy transition and climate goals, will demonstrate seriousness and commitment that federal funding awarded through IIJA is being used for its intended purpose—providing high value and limiting cost exposure to customers through cost-sharing.

Criteria for Establishing Funding Priorities

The following criteria are proposed for prioritizing applications for IIJA funding. Projects and programs that achieve a significant number of the criteria would qualify as high priority and high impact investment.

Specifically, projects and programs that:

1. Align with, and would help achieve, city and state climate, clean energy and energy resiliency and affordability goals.
2. Match with the stated purpose (and Congressional intent) of one or more federal funding programs and score well against evaluation criteria of the granting agency (e.g., U.S. Departments of Energy (DOE), Transportation and Environmental Protection Agency (U.S. EPA), and state Departments of Transportation, Environmental Conservation, New York State Energy Research and Development Authority (NYSERDA) and New York Power Authority (NYPA) planned investment slated for New York City.
3. Improve air quality and other health benefits to underserved or disadvantaged communities within New York City.
4. Support core energy industry infrastructure investments in electric and gas transmission and distribution to accelerate adoption of clean and distributed energy resources for building electrification and alternative fuels for transportation.
5. Create robust new employment opportunities and training programs for city residents in the growing clean energy and sustainability economy.
6. Significantly reduce GHG emissions and criteria pollutants within New York City, especially as they align with city priorities.
7. Have a strong likelihood of successfully obtaining federal funding.

If the criteria are met, such projects stand a better chance of having consensus support from city and state elected officials, business and industry, civic leaders, unions and labor, and residents. Meeting many of these criteria would position projects well for federal cost sharing with the added benefit of lowering costs for New Yorkers while advancing clean energy and climate goals.

Approach to Applying for & Securing IIJA Funding

Broadly, the approach to seeking federal funding under the IIJA falls into three phases: (1) Strategy, Opportunity Assessment and Prioritization, (2) Grant Proposal Development and Sponsor Support, and (3) Grant Compliance and Governance.

The first of these, 'Strategy, Opportunity Assessment and Prioritization', is where the most critical coordination among city and state governments, utilities and energy companies, stakeholders and elected officials is required. Working groups can enable coordination for each of the IIJA funding priority areas and will serve to identify where stakeholders might leverage complementary capabilities, hold common objectives, and otherwise demonstrate synergies that will best position New Yorkers to be the beneficiaries of IIJA funds. While authors of this paper represent utilities serving New York City, it is imperative that additional collaborators help to identify projects and apply for IIJA funding, including:

City Government

- New York City Department of Buildings
- New York City Department of Citywide Administrative Services
- New York City Department of Education
- New York City Department of Environmental Protection
- New York City Department of Parks and Recreation
- New York City Department of Transportation
- New York City Economic Development Corporation
- New York City Housing Authority
- New York City Mayor's Office of Climate and Environmental Justice
- New York City Office of Technology and Innovation

State Government

- Empire State Development
- Metropolitan Transportation Authority
- New York Power Authority
- New York State Department of Environmental Conservation
- New York State Energy Research and Development Authority
- Port Authority of New York and New Jersey

Other

- Business associations, community and environmental organizations, academic institutions, nonprofit organizations, labor unions and local elected officials
- Private sector businesses, investors and stakeholders including members of the Partnership for New York City

City and state officials and relevant utilities are already coordinating and considering available IIJA funding opportunities working to prioritize projects to pursue with teams assigned to decide which potential applicants will lead grant application efforts and garner signatory support from other business and community organizations. A more coordinated effort among teams could collect needed data and information from project partners and draft grant proposals. Reviewers can be enlisted to ensure each proposal makes the strongest case for New York City, meets federal evaluation criteria and is consistent with state goals. Each proposal should outline a governance and reporting framework that details how additional information will need to be captured and reported back to funders. Applications should also include a list of businesses, stakeholder groups and elected official endorsers. And finally, grant applications should include a statement of purpose and intent and include an estimate of economic development impacts and job creation potential from projects. The criteria identified earlier would guide the cooperative process.

Clean Energy & Climate Change Funding Available to New York City

IIJA opportunities for funding include, but are not limited to:

ELECTRIC GRID MODERNIZATION

Three major U.S. DOE grid modernization initiatives, including:

- A new grant program to strengthen the resiliency of electric grid infrastructure against extreme weather (**\$5 billion**),
- A complementary U.S. DOE grant program for states (with cost sharing by publicly regulated entities) to demonstrate innovative approaches to transmission, storage and distribution infrastructure to harden resilience and reliability (**\$5 billion**); and,
- Authorization of a Smart Grid Investment Matching Grant Program, to deploy technologies to incorporate distributed energy resources, energy storage and integrate intermittent generation sources (**\$3 billion**).

EXPANDED STATE ENERGY PROGRAMS

An expansion of the State Energy Program (administered by NYSERDA) to include programs to accelerate the use of alternative transportation fuels or the electrification of government/fleet vehicles, taxis, ridesharing services, mass transit, school buses and ferries.

CLEANER SCHOOL BUSES AND FERRIES

Funding to replace diesel-fueled school buses with zero emission/clean school buses (**\$5 billion**) and existing ferries with low carbon ferries (**\$2.5 billion**).

HYDROGEN HUBS

Funding for development of regional hydrogen hubs, likely including one in the Northeastern U.S., which are focused on the production of hydrogen from diverse feedstocks, including renewable resources and nuclear power, and serve diverse end uses including power generation, industrial processes and transportation. Funding for hydrogen-related initiatives total roughly **\$9.5 billion**.

ENERGY AUDITS AND RETROFITS

Creation of a **\$250 million energy efficiency revolving loan fund** capitalization grant program within the State Energy Program for recipients to conduct commercial and residential energy audits and energy upgrades/retrofits.

UPDATED BUILDING ENERGY CODES

Establishment of a **\$225 million** grant program within the U.S. DOE Building Technologies Office to enable implementation of updated building energy codes.

UPGRADING PUBLIC SCHOOLS

Grants totaling **\$500 million** over a five-year period for energy efficiency, renewable energy systems, EV charging and alternative fuels improvements at public schools.

RECONNECTING NEIGHBORHOODS

Funding to remove barriers caused by legacy infrastructure, with **\$1 billion** for the planning, design, demolition and reconstruction of street grids, parks and other infrastructure.

WEATHERIZATION AND ENERGY EFFICIENCY

Funding of **\$3.5 billion** for the Weatherization Assistance Program and **\$550 million** for the Energy Efficiency and Conservation Block Grant Program.

ADDITIONAL FUNDING OPPORTUNITIES:

Cybersecurity

Funding of **\$250 million** targeting cybersecurity technology applications for the energy sector. Additional provisions are intended to address cybersecurity risks associated with transportation infrastructure and gaps in workforce skillsets needed to counteract cyber threats.

Broadband expansion

A minimum of **\$100 million** allocated for each state, from a total pool of more than **\$42 billion** that will be administered through the National Telecommunications & Information Administration to aid in resolving the digital divide for unserved and underserved areas.

Water infrastructure upgrades

Funding of **\$24 billion** for upgrades to the nation's drinking water, wastewater and stormwater infrastructure, in addition to **\$15 billion** for the replacement of lead water pipes and **\$10 billion** to address perfluoroalkyl substance contamination in water. (A total of **\$49 billion**.)

Initiatives Underway Where IIJA Funds Can Accelerate Decarbonization

While there are many worthwhile infrastructure and clean energy projects that could apply for IIJA funding to accelerate the city's clean energy and decarbonization efforts, there are a handful of efforts and initiatives that would benefit from concerted and cohesive efforts. In many cases, existing initiatives and cross organizational partnerships are in place for leveraging IIJA funds to ensure that the city benefits from sufficient and effectively invested IIJA funds.

Projects singled out for meeting our criteria for consideration and joint IIJA funding listed earlier include the following.

Achieving 100% Clean Energy Targets By 2050 Will Require Acceleration of Power Transmission and Distribution Efforts

The aggressive targets laid out in OneNYC 2050 are further underscored by the State Climate Action Council implementing CLCPA. The city has worked closely with NYSERDA to solicit offshore wind development including the 816 megawatt (MW) Empire Wind 1 project that will interconnect directly to Con Edison's Gowanus substation with operations anticipated to begin in 2026. This has prompted development of the South Brooklyn Marine Terminal in Sunset Park, Brooklyn as a base for assembling wind turbines for this project, the 1,260 MW Empire Wind 2 project (operations expected to begin in 2027) that will interconnect in nearby Nassau County and the 1,230 MW Beacon Wind project (operations expected to begin in 2028) that interconnect into Con Edison's Astoria Substation in Queens. The terminal will also serve as the hub for operations and maintenance support for all three projects, promising living-income wages for labor.¹⁵

The state has workforce training programs in place to support the transition to a clean energy economy and Con Edison and National Grid already work with local colleges and universities training students for careers in the energy industry.

Initiatives That Make the New York City Region Ideal for a Regional Hydrogen Hub

New York City is well positioned to be a part of a federally designated regional hydrogen hub, of which there are expected to be at least four receiving funding under IIJA. National Grid and

Con Edison collectively provide gas service to residents, government entities and businesses across the five boroughs, and both are investigating uses for hydrogen in their plans for decarbonization.

In December 2021, the New York City Council voted to prohibit the use of natural gas in most new buildings, joining dozens of towns and cities along the East and West Coasts that have adopted the climate policy since 2019.¹⁶ By limiting the emissions threshold for carbon dioxide in fuel combustion, the legislation has the effect of limiting or eliminating the use of renewable natural gas (RNG) to heat and cool buildings, although blending low-carbon fuels such as RNG or hydrogen depending how it is produced, has been shown to result in lower carbon intensity of the gas use. The Biden administration and U.S. DOE are pursuing research and development and demonstration projects advancing the use of hydrogen as a cleaner alternative to natural gas to pursue multiple pathways to decarbonization.

New York Governor Kathy Hochul recently announced a plan to transform New York state into a green hydrogen hub. The IIJA legislation makes available \$9.5 billion in funding through U.S. DOE for hydrogen projects, with \$8.0 billion for the Regional Hydrogen Hub Program, \$1.0 billion for the Clean Hydrogen Electrolysis Program, and \$500 million to support U.S. DOE's Clean Hydrogen Manufacturing Initiative. The state is considering a plethora of technologies and energy sources under the CLCPA to meet clean energy and decarbonization goals and the state has recognized a potential role for hydrogen as part of its multipronged strategy. In order to realize the potential of green hydrogen, the city should consider what additional actions are needed to facilitate how hydrogen could be brought into new buildings given the New York City Council's ban on natural gas hookups in most new buildings.

This further underscores the need for careful city and state coordination in developing a cohesive approach to applying for federal funding. Policy, permitting, and financial certainty are necessary for attracting private investment to support a hydrogen hub initiative, especially as it relates to building decarbonization.

Renewable Natural Gas, Hydrogen and Fuels Blending

National Grid has developed its Newtown Creek Renewable Natural Gas Facility as a collaboration with the city and represents a key step in the decarbonization of the city's natural gas infrastructure. In addition to this, National Grid is focusing efforts to understand the feasibility of blending hydrogen into its existing natural gas distribution system. In December of 2021, National Grid began working with the Town of Hempstead on Long Island to heat nearly 800 homes using hydrogen-blended natural gas. National Grid has already begun similar efforts around hydrogen in the United Kingdom and will leverage lessons learned to make efficient use of IIJA funds allocated if New York City is selected as a hydrogen hub or plays a role in a regional hydrogen hub.

New York City is home to the largest commercial steam operation and district heating system in the world. The Con Edison district heating system runs more than 105 miles of steam pipe under the city and provides heat to upwards of 3 million customers. Development of steam cogeneration processes using green hydrogen provides an opportunity for decarbonization of building heating and cooling systems.¹⁷ Currently Con Edison derives most of its steam from the combustion of natural gas at its cogenerating facilities.

Additionally, NYPA, which owns and operates several high-efficiency fossil fuel generation units in the city has announced its first hydrogen blending pilot at its Brentwood natural gas generation facility on Long Island. The roughly \$10 million pilot will begin blending hydrogen into the facility's generation mix beginning with a 5% hydrogen composition ultimately ratcheting it up to 30%. The facility uses green hydrogen derived through electrolysis using hydroelectric power. Hydrogen is to be trucked directly to the facility. A successful outcome of this pilot may serve as fertile ground for similar retrofits of combustion and combined cycle fossil-fueled generation units within the city and will serve to drive down emissions in environmentally stressed communities.

Energy Efficiency and Weatherization Efforts Role in Economic Development

New York City's Climate Mobilization Act of 2019 aims to reduce carbon emissions from buildings and is comprised of four key areas spanning five local laws that address building energy use.¹⁸ The first three areas represent incremental change aimed at building energy practices, building standards and making additional funding available to finance energy efficiency improvements in buildings as illustrated below.

Green Roofs	" Local Law 92 and Local Law 94 require all new buildings and buildings undergoing major roof renovations to be covered with solar panels, green roofs or some combination of the two. The laws also require all buildings to reduce urban heat hazards."
Building Efficiency	" Local Law 95 amends the ranges for how energy efficiency grades are calculated as required by Local Law 33 of 2018. Local Law 33 of 2018 required the display of energy efficiency scores and grades for buildings required to that annually benchmark their energy and water consumption. The energy label will be displayed near a public entrance and include both a letter grade and the energy efficiency score."
Property-Assessed Clean Energy	" Local Law 96 establishes long-term, low-interest Property-Assessed Clean Energy financing to fund upgrades to building energy and water efficiency."

The building efficiency measures enforced through Local Law 92 and Local Laws 94-96 as outlined in the preceding table culminate in the hallmark law of the Climate Mobilization Act:

BUILDINGS MANDATE

“The centerpiece of the Climate Mobilization Act, **Local Law 97** requires all buildings larger than 25,000 square feet to meet ambitious carbon reduction targets.”

New York City Local Law 97 requires buildings to reduce annual emissions per square foot of space to or below certain thresholds depending on building use type. Annual reporting of emissions for buildings subject to Local Law 97 will begin in 2025 and failure to meet thresholds will result in fines. While there is a notable exception for this type of reporting and penalty structure for the number of New York City Housing Authority (NYCHA) properties across the city, NYCHA is directed to reduce its properties’ GHG emissions 40% by 2030 and 80% by 2050 based on 2005 emissions levels. NYCHA has developed its own roadmap for compliance with the Local Law 97 provision calling for an approach that prioritizes energy efficiency and beneficial electrification. NYCHA’s energy efficiency and beneficial electrification efforts are squarely aimed at space and water heating and notes the need for modernization and optimization of campus steam systems serving its buildings and facilities. This nicely complements Con Edison’s ambitions of leveraging green hydrogen for steam system decarbonization.

Similarly, NYSERDA, in support of the state’s Clean Energy Fund and CLCPA goals, has set aside roughly \$100 million in funds to accelerate clean energy and energy efficiency training through the following six Clean Energy Workforce Development initiatives:

- Building and Operations Program (\$10 million in available funds)¹⁹
- Career Pathway Training Partnerships for High Efficiency Heating, Ventilation Air Conditioning and Heat Pumps (\$3.7 million in available funds)
- Clean Energy Internships
- Clean Energy Training Services Program (\$70 million in funding through 2025)²⁰
- On-The-Job Training for Energy Efficiency and Clean Technology (\$8.5 million in funding through 2024)²¹

A number of these initiatives are also geared toward providing training to members of disadvantaged communities. In 2021, NYSERDA partnered with National Grid’s ‘Grid for Good’ Initiative and two businesses focused on building efficiency and retrofits, and a nonprofit organization to accelerate job training relevant to heat pump installation. Together a ‘Heat Pump 101’ course was developed to provide exposure and training to students interested in pursuing careers in building management and efficiency.²² This is particularly important given the 10%

drop in heat pump-related employment between 2019 and 2020 in New York state. This builds on a larger trend of declines in energy efficiency-related employment (roughly a loss of 4,900 jobs) over that same timeframe after continued growth in that sector between 2016 and 2019.²³

Electrification of Public Transportation and Port Infrastructure Drive Down Transit Emissions

New York City relies on diverse transit infrastructure that supports many uses ranging from commuting to public safety to supply of basic goods and services. OneNYC 2050 has laid out a goal for creating more sustainable transit through the following goals:

- 80% of trips on a sustainable mode (walking, biking, mass transit) by 2050, with remaining vehicular trips being zero emissions
- 100% electric city-owned fleet by 2040
- 100% electric school bus fleet by 2035
- 1,000 curbside chargers by 2025, increasing to 10,000 by 2030
- 6,000 publicly accessible fast chargers by 2030

Reducing particulate emissions has long been a focus public health policy and driving down transit-related particulate emissions can directly be addressed through electrified and green hydrogen-fueled transit. A 2021 study estimated that approximately 1,400 deaths annually in the New York metropolitan area can be attributed to on-road vehicle emissions alone.²⁴ Fine particulate matter and nitrous oxides are known causes of many adverse health effects. By increasing public transit accessibility and reliability and making clean transportation options more cost effective than traditional internal combustion vehicles, the city can continue to jointly reduce its GHG and criteria pollutant emissions and improve the quality of health for its residents, particularly in disadvantaged communities.

New York City legally limits idling of vehicles around all primary and secondary schools to a single minute.²⁵ Idling near schools is something more likely to happen with school buses, therefore, in November of 2021, the New York City Council passed a law requiring that all school buses be electrified by September of 2035.²⁶ This is just one among many opportunities the city has to electrify buses and build upon increases in electric bus purchases by the Metropolitan Transportation Authority (MTA) in partnership with NYPA to develop electric bus charging infrastructure at 67 sites, as part of the MTA's larger mission of eventually deploying a zero-emissions bus fleet.²⁷

Collaboration across the broader tri-state region could be part of an approach that attracts IIJA funds directed at transportation electrification. The Port Authority of New York and New Jersey (PANYNJ) is a stakeholder that can partner with Con Edison, National Grid and similar

utility partners in New Jersey to ready bus terminals, trucking facilities, and air and seaports for cleaner vehicles. Such a transition involves ample charging equipment for light, medium and heavy-duty vehicles on premises and cargo handling equipment such as cranes for cargo container movement. It also presents the opportunity to help define which scenarios or uses are better suited for hydrogen-powered or electrically powered vehicles and what vital utility infrastructure is required. As of July 2021, PANYNJ had acquired its 200th light-duty vehicle out of its fleet of roughly 1,200 such vehicles as part of its effort to electrify 50% of its fleet by 2030.²⁸

Coordination across state lines to decarbonize major economic corridors surrounding New York also present unique and compelling opportunities for pilots, demonstrations and rethinking of supply chain mechanics that are ripe for receipt of IIJA funds.

Conclusions & Next Steps

The funding available under IIJA covers many critical infrastructure areas that if funded can improve the life and health of New York City residents and businesses. New York City is well positioned to be a recipient of IIJA funding for a variety of reasons. New York City benefits from numerous ongoing initiatives that address diverse uses of green hydrogen and renewable natural gas, accelerating electric vehicle infrastructure and building electrification, and build on extensive weatherization and energy efficiency efforts.

Through careful coordination, cooperation and strategic prioritization, the city, with its business partners and stakeholder support, is well poised to secure IIJA funding to demonstrate the feasibility of meeting aggressive clean energy and decarbonization goals in an equitable manner that creates jobs and provides New Yorkers the requisite training and skills needed to drive down GHG emissions. A coordinated and cohesive approach to strategize how best to benefit from available funding is vital to effectively ensure IIJA funding is maximized to advance New York City's energy, decarbonization, energy affordability and social equity objectives.

Appendix A: Key Laws and Documents

Key Documents	Type	Description
City of New York		
<u>OneNYC 2050</u>	Action Plan	A nine-volume plan initially developed in 2015 by the City of New York outlining GHG emissions reduction targets and a vision for the city's clean energy future
<u>Local Law 154 of 2021</u>	Law	Signed into law in Dec. 2021, this legislation is aimed at phasing out the use of fossil fuels, namely natural gas, in new buildings beginning in 2024
<u>Local Law 92 of 2019</u>	Law	As part of the larger Climate Mobilization Act of 2019, amends building codes to require buildings with less than 200 square feet of roof space include solar photovoltaic (PV) rooftop installations and creates a pathway for evaluation of solar PV requirements not included in existing legislation
<u>Local Law 94 of 2019</u>	Law	As part of the larger Climate Mobilization Act of 2019, amends building codes to require buildings with more than 200 square feet include solar PV rooftop installations and outlines a number of exceptions
<u>Local Law 95 of 2019</u>	Law	As part of the larger Climate Mobilization Act of 2019, amends the building efficiency grading methodology outlined in Local Law 33 of 2018
<u>Local Law 96 of 2019</u>	Law	As part of the larger Climate Mobilization Act of 2019, establishes a Property Assessed Clean Energy financing loan program to provide financing for renewable energy assets (largely solar PV installations) and qualifying energy efficiency upgrades
<u>Local Law 97 of 2019</u>	Law	A hallmark component of the larger Climate Mobilization Act of 2019, requires significant phased reduction of GHG emissions from buildings over 25,000 square feet and imposes fines for failure to comply
<u>New York City Housing Authority Climate Mitigation Roadmap</u>	Action Plan	NYCHA-produced document outlining how it intends to comply with New York City Local Law 97 through investments and updated building efficiency measures
New York State		
<u>Climate Leadership & Community Protection Act (CLCPA)</u>	Law	Passed in 2019, sets a target for total reduction of GHG emissions by 2050, alongside interim targets, and outlining technology specific goals for development of offshore wind, battery storage and distributed solar
<u>New York State of the State Address, 2021</u>	Public Address	Detailed Governor Hochul's governing agenda and proposed approach to leveraging state agencies to deliver on CLCPA targets
Federal Government		
<u>Infrastructure Investment & Jobs Act</u>	Law	Signed into law in November of 2021, provides upwards of \$1.2 trillion in authorized spending tied to federal infrastructure, including several opportunities for grants aimed at advancing a clean energy future

Appendix B: Key Hochul Administration Energy Infrastructure Objectives

- Achieve **2 million climate-friendly, electrified or electrification-ready homes by 2030** and ensure that **all new building construction reaches zero-emissions by 2027**.
- **Power one-third of New York City with wind, hydropower and solar electricity.** The large-scale renewable energy infrastructure projects Clean Path NY and Champlain Hudson Power Express will provide enough energy to power one-third of the city with wind, solar and hydropower, creating an estimated 10,000 family-sustaining jobs statewide. When combined with New York's statewide deployment of clean energy and offshore wind, these projects are expected to reduce the city's fossil fuel use for electricity by more than 80% in 2030.
- **Double energy storage deployment to at least 6 gigawatts by 2030**, the largest target in the nation.
- Direct NYSERDA, NYPA and Empire State Development to **establish a New York State Green Hydrogen Hub and successfully compete for a share of the \$10 billion in new federal funding available for green hydrogen hubs.** The overall proposal would bring together multiple New York Regional Hubs—including New York City, Long Island, Buffalo, Central New York, Northern New York, Albany and Auburn—and demonstrate a minimum of \$1 billion in private and public non-federal funding.
- **Expand the \$59 million Clean Green Schools initiative to serve more than 1,000 public schools**, benefitting nearly 1 million students and reaching every public school located in a disadvantaged community. This program will drive significant infrastructure upgrades, such as geothermal heating and cooling, solar, green roofs, indoor air quality/ventilation and electric school bus charging.
- **Deploy \$175 million over five years for EV charging stations through federal formula funds, with a focus on fast charging for light-duty vehicles along highway corridors**—building on \$600 million for the EV charging make-ready program over the next four years and NYPA's up to \$250 million EVolve NY program. This state funding will enable New York to put forward winning proposals to capture a share of \$2.5 billion in additional competitive federal funding for EVs.
- **Require that, by 2027, all new school bus purchases will be zero-emissions, and by 2035, all 50,000 school buses on the road will be zero-emission vehicles.** The U.S. EPA is making \$5 billion available from the IIJA over five years for a competitive program for electric and other low-emission school buses. NYSERDA, NYPA and the New York State Education Department will work with schools to apply and deliver winning proposals for electric bus funding.

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efficiency and appliance electrification, including \$9 billion for rebates for “whole-house” energy saving retrofits and \$9 billion for rebates to homeowners and owners of multi-family buildings for qualifying electrification projects; d) support for low-income households and multi-family affordable housing to install solar energy equipment (\$2.5 billion); and e) an array of clean energy tax credits available to New York City residential and commercial homeowners, including extending a 30% tax credit for homeowners who install solar electric, solar water heating, fuel cell, small wind energy and geothermal heat pumps; extending and increasing the energy efficiency home credit for single and multi-family homes; expanding the energy efficient commercial buildings deduction; and providing a new plug-in electric vehicle credit for individual car buyers

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