



NEW
YORK
STATE

Climate Action
Council

SCOPING PLAN

December
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EXECUTIVE SUMMARY

Chapter 1

Executive Summary

The 2019 Climate Leadership and Community Protection Act (Climate Act), one of the most ambitious climate laws in the nation, called for the issuance of a Scoping Plan under the direction of a 22-member Climate Action Council (Council), to be completed by January 1, 2023.

This Scoping Plan includes recommendations to meet the Climate Act’s nation-leading goals and requirements, including actions to achieve a reduction in economywide greenhouse gas (GHG) emissions of 40% by 2030 and 85% by 2050 from 1990 levels, which will put New York on a path toward carbon neutrality while ensuring equity, system reliability, and a just transition from a fossil fuel economy to a robust clean energy economy.



This Scoping Plan prioritizes Disadvantaged Communities and the creation of good, family-sustaining, union jobs accessible to all New Yorkers.

The Scoping Plan sets the course for New York to create new job opportunities, support healthier communities, and ensure that all New Yorkers will benefit from investments in the State’s growing green economy. It builds on New York’s unprecedented investments to ramp-up clean energy, including:

This Scoping Plan also provides examples for other states and the nation to follow, to mitigate the effects of climate change and adapt to climate change risks while protecting workers and uplifting historically marginalized populations.

This Scoping Plan is the result of more than two years of diligent and inclusive work. It builds upon contributions from seven sector-specific Advisory Panels and the Just Transition Working Group (JTWG), with significant input from stakeholders and the public at large. Scoping Plan recommendations were informed by detailed input from the Climate Justice Working Group (CJWG), which provided the foundation for integrating these recommendations and assessing their ability to meet the Climate Act requirements. The process included the issuance of the draft Scoping Plan on December 30, 2021, which initiated a six-month public comment period. After hearing testimony at 11 public hearings across the State and receiving more than 35,000 written comments, the Council considered this feedback, heard further analytical information, and consulted with the CJWG in developing this Scoping Plan.

This Scoping Plan provides recommendations for both sector-specific and economywide actions to achieve the Climate Act’s goals and requirements. New York’s climate action strategy is fundamentally driven by the need to deliver on climate mitigation, justice, economic opportunity, and long-term job opportunities for New Yorkers.

**MORE THAN
\$35 BILLION**

for 120 large-scale renewable and transmission projects across the State

\$6.8 BILLION

to reduce buildings emissions

\$1.8 BILLION

to scale up solar

**MORE THAN
\$1 BILLION**

for clean transportation initiatives

**MORE THAN
\$1.6 BILLION**

in NY Green Bank commitments

ACCORDING TO BOTH THE U.S. GLOBAL CHANGE RESEARCH PROGRAM AND THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE,

substantial reductions in GHG emissions will be required by mid-century in order to limit the global average increase in temperature to no more than 2°C (and ideally 1.5°C), thus minimizing the risk of severe impacts from climate change.

1.1 Climate Action

The consequences of a changing climate are here globally and in New York State.

Around the world thousands of scientific studies have documented changes in air and water temperatures, melting glaciers, diminishing snow cover, shrinking sea ice, rising sea levels, ocean acidification, and increasing atmospheric water vapor. Warming trends and incidences of intense heat waves will contribute to greater localized heat stresses; heavy rainfall events that exacerbate localized flooding will continue to impact food production, natural ecosystems, and water resources; and sea-level rise will increasingly threaten sensitive coastal communities and ecosystems. Additionally, climate-driven impacts are magnified in New York's historically marginalized communities that have been disproportionately affected by and are on the front lines of climate change.

Climate change is adversely affecting New York's economic well-being, public health, natural resources, and environment. The severity of climate change and the threat of more severe impacts will be determined by the actions undertaken in New York and other jurisdictions to reduce GHG emissions.

A fundamental objective of New York's nation-leading climate and energy agenda is to advance the State's contributions to global climate change mitigation. As laid out in the Scoping Plan, the Council's recommendations will reduce GHG emissions consistent with the interim and long-term directives established in the Climate Act.

The Scoping Plan is one of the most ambitious climate change mitigation plans in the world and distinguishes New York as a climates leader.

It identifies actions needed for New York to achieve:

- 70% renewable electricity by 2030
- 100% zero-emission electricity by 2040
- 40% reduction in statewide GHG emissions from 1990 levels by 2030
- 85% reduction in statewide GHG emissions from 1990 levels by 2050
- Net zero emissions statewide by 2050

It outlines a variety of regulatory and legal changes, market mechanisms, and technologies essential to achieving the goals and requirements of the Climate Act. Changes in energy consumption patterns and in how consumers relate to and use energy will further enhance New York's ability to achieve these goals and requirements. The various education and outreach initiatives identified in the Scoping Plan will lay a foundation from which the State can further explore those options in years to come.

As demonstrated in the analyses supporting the Scoping Plan, focused and continuous progress is necessary to reduce emissions in all sectors, and the interconnection of the various sectors informs how to realize the GHG emission limits.

FOR EXAMPLE:

New York State will need to achieve a zero-emission electricity system to achieve deep emission reductions in the building and transportation sectors as those sectors become less dependent on fossil fuels.

As these transitions occur, New Yorkers will benefit from greater levels of energy efficiency through the installation of cold-climate heat pumps and the purchase of electric vehicles (EVs), providing more opportunities to manage energy use and reduce energy costs.

The development of the Scoping Plan included a comprehensive, science-based integration analysis of the benefits and costs of the recommendations that the Advisory Panels provided during the process. The integration analysis examined several pathways to achieving the GHG emission limits, governed by foundational principles of ensuring reliability of the energy system as fundamental to New Yorkers' welfare, safety, and prosperity and the cost-effectiveness of the approaches to achieving the required emissions limits. This integration analysis led to several key findings.

- **Achieving deep decarbonization is feasible by 2050:** Achieving the GHG emission limits requires action in all sectors, especially considering the Climate Act's GHG emissions accounting, as described in *Chapter 4. Current Emissions*. Every sector will see significant transformation over the next decade and beyond, which will require critical investments in New York's economy.
- **Energy efficiency and end-use electrification are essential parts of any pathway that achieves New York State emission limits:** Approximately one to two million efficient homes must be electrified with heat pumps by 2030. Approximately three million zero-emission vehicles (predominantly battery electric) will be needed by 2030.
- **The cost of inaction exceeds the cost of action by more than \$115 billion:** Achieving Climate Act GHG emission limits will require significant investment accompanied by even greater benefits. The GHG emission reduction strategies result in improvements in air quality, increased active transportation, and energy efficiency interventions in low- and moderate-income (LMI) homes, which generate health benefits. Reducing GHG emissions also avoids the economic impacts of societal damages caused by climate change.
- **Create hundreds of thousands of jobs:** In addition to health and avoided economic damage benefits, new jobs driven by Climate Act investments are estimated to outnumber potential displaced jobs by a ratio of ten-to-one in 2030, with as many as 211,000 jobs expected to be created in growing sub-sectors by 2030 and 318,000 by 2040.
- **Net direct costs are small relative to the size of New York's economy:** Net direct costs are estimated to be up to 0.6% of New York State's economy in 2030 and 1.3% in 2050. The passage of the federal Inflation Reduction Act is a major policy development that will likely reduce the costs of decarbonization economywide.

Notably, the integration analysis shows that climate investments are also health investments that will meaningfully reduce pollution in communities and buildings by decreasing harmful emissions and improving air quality.

For New Yorkers, this means cleaner air, avoiding tens of thousands of premature deaths, thousands of non-fatal heart attacks, thousands of other hospitalizations, thousands of asthma-related emergency room visits, and hundreds of thousands of lost workdays.

The information from the integration analysis also informed the development of the JTWG's *Jobs Study*, which revealed that climate investments will create hundreds of thousands of good quality jobs and careers across New York State. These economic benefits are in addition to the benefits and avoided costs discussed above.



New York’s transition to clean energy will deliver benefits to communities by:

- Integrating measures that create stronger and more resilient energy systems
- Ensuring clean, affordable, and reliable transportation; supporting clean and safe energy-efficient homes and businesses
- Ensuring clean and reliable electric power
- Creating high-quality jobs
- Improving public health
- Ensuring an equitable clean energy economy for everyone

Recommended investments in building and electric grid infrastructure, such as storm hardening, elevating equipment and substations, moving lines underground, and deploying energy storage or onsite renewables will improve the reliability and resilience of the electric grid in the face of worsening storms and other impacts of climate change. The transition will also spur investments in New York’s homes and commercial buildings.

As a result of these investments there will be more energy-efficient, zero-emission buildings that use grid-interactive appliances and energy storage to actively manage building energy demand on the power grid and incorporate strategies to protect residents from high heat. The results will be concrete, “kitchen-table” benefits for New Yorkers.

Stronger and More Resilient Energy Systems:

Energy infrastructure will be strengthened and enhanced to be better prepared for and withstand, adapt, and quickly recover from disruptions such as severe weather and natural and man-made disasters.

Clean, Affordable, Reliable Transportation:

EVs cost less to fuel, operate, and maintain, which will save individuals and families money. The upfront purchase price for EVs is approaching that of gasoline vehicles and continues to decrease. Zero-emission trucks and buses and expanded low-cost clean transportation options like biking, walking, and transit will enable New Yorkers to trade gridlock and diesel fumes for fresh air and cleaner communities.

Clean and Safe Energy-Efficient Homes and Businesses:

Modern clean heating and cooling technologies, such as electric heat pumps and smart thermostats, combined with energy efficiency, will improve comfort and save New Yorkers energy costs.

Clean and Reliable Electric Power:

Solar, wind, hydroelectric, and other zero-emission resources, combined with energy storage, will deliver safe and reliable electricity over the next decade and beyond, which will put an end to New Yorkers’ vulnerability to fossil fuel disruptions and energy price volatility.

Better Energy Choices:

When gasoline vehicles and fossil fuel heating or cooking appliances need replacement, State and federal incentives will help New Yorkers choose more efficient and higher-performing electric appliances and vehicles. Consumers may choose modern technologies that can save money and reduce emissions.

High-Quality Jobs:

New York’s energy transition will create tens of thousands of jobs, spur good quality union job employment, and drive job and wage gains across the economy and in every corner of the State.

Better Health:

New Yorkers will benefit from positive health outcomes as a direct result of reduced fossil fuel emissions in communities and homes.

An Equitable Clean Energy Economy for Everyone:

Every community, every trade, and every region will have access to clean energy solutions and the economic opportunities that the transition to a just and equitable energy system will provide.



1.2 Climate Justice

A fundamental objective of New York’s nation-leading climate and energy agenda is to ensure that the State’s transition to a clean energy economy addresses health, environmental, and energy burdens that have disproportionately impacted underrepresented or underserved communities (including people of color, indigenous populations, low-income individuals, and women) and to remedy the structural causes that underpin these burdens.



The Climate Act defines Disadvantaged Communities as “communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high concentrations of low- and moderate-income households.”

As required by the Climate Act, the CJWG identified Disadvantaged Communities based on geographic, public health, environmental hazard, and socioeconomic criteria. The CJWG released the draft criteria for public comment in March 2022 and received more than 3,000 comments. The CJWG is considering those comments as it works to finalize the criteria by early 2023. After final criteria are established, the CJWG will review them annually to ensure that they remain appropriate and effective.

As further laid out in the Scoping Plan, and through work led by the CJWG, New York will take comprehensive action to address climate justice and ensure that New York’s transition to a low-carbon clean energy economy will create a model in which achieving a high standard of economic well-being and health in every community is the baseline condition of climate action.

New York has witnessed how climate change heightens the vulnerability of Disadvantaged Communities, adversely affecting economic well-being, public health, and public safety through increased risk of extreme heat, flooding, or exposure to air pollutants emitted alongside GHG emissions. Through enshrining equity objectives in State investments, program design, and internal and external engagement strategies, the Scoping Plan describes how the Climate Act will work to address past discrimination.





The Scoping Plan includes recommendations from the *Barriers and Opportunities Report*, developed by the Department of Environmental Conservation (DEC), New York State Energy Research and Development Authority (NYSERDA), and the New York Power Authority (NYPA) pursuant to the Climate Act, in an effort to address past practices that excluded historically marginalized and overburdened communities from State decision-making processes.

The *Barriers and Opportunities Report* identifies problems associated with access to, or community ownership of, services and commodities in Disadvantaged Communities in five key clean energy and climate resilient infrastructure areas. State entities will work to improve engagement with residents and representatives of Disadvantaged Communities to identify and understand barriers and opportunities at the local level to increase participation in the clean energy transition and enhancing community resilience. This work will include ensuring that agencies and authorities are creating conditions for communities that would not typically engage in administrative processes to do so.

The Climate Act requires that Disadvantaged Communities receive a minimum of 35%, with a goal of 40%, of the benefits of spending on clean energy and energy efficiency programs, projects, or investments in the areas of housing, workforce development, pollution reduction, low-income energy assistance, energy, transportation, and economic development.

State agencies, in consultation with the CJWG and other relevant stakeholders, are developing a methodology for defining the benefits of State investments in Disadvantaged Communities. The definition of Disadvantaged Communities and the methodology for defining benefits will be provided to all State agencies to ensure a coordinated approach to directing benefits to Disadvantaged Communities as required by the Climate Act.

Prioritizing the reduction of GHG emissions and co-pollutants in Disadvantaged Communities, while not creating a disproportionate burden on such communities as required by the Climate Act, is woven throughout the recommended strategies in the Scoping Plan. These strategies are designed to target concrete benefits to individuals in Disadvantaged Communities in several ways:

- Addressing energy affordability concerns and reducing energy burden
- Reducing environmental burden from GHG emissions and co-pollutants
- Ensuring full participation in the new clean economy and corresponding job growth, including through access to good quality jobs and union-based employment opportunities
- Ensuring access to New York State's significant and growing policies and programs that invest in clean local resources, like solar and energy efficiency
- Ensuring an inclusive process and full participation by disadvantaged communities and their representatives in the ongoing work of developing and implementing climate action policies and programs



1.3 Economic Opportunities and a Just Transition

A fundamental objective of New York’s nation-leading climate and energy agenda is to ensure the advancement of a low-carbon and clean energy economy that results in new economic development opportunities across New York and a just and equitable transition for New York’s existing and emerging workforce.

The Scoping Plan prioritizes workforce support for New Yorkers who may be facing a shift from traditional jobs, particularly in the energy sector.

The Scoping Plan identifies actions needed to advance a just transition to a clean energy economy that creates opportunities for new entrants to low-carbon and clean energy occupations; builds connections among industry, State, and local interests to realize business opportunities for New York manufacturers and service providers so they can grow and thrive; and creates economic conditions that will result in an improved quality of life for all New Yorkers.

The national and statewide clean energy transition provides opportunities for New York manufacturers to develop new products and expand their clients. It also offers the opportunity for new manufacturers to develop a base in New York for ready access to the State’s and the region’s large building, transportation, and energy sectors.

The Scoping Plan advances workforce development and business development to actively promote clean technology manufacturing aimed at building out a robust clean technology supply chain in New York. This opportunity will be maximized through strategic planning and coordination in the short term to focus development in regions of the State where this could have the greatest impact, particularly in legacy/rust belt cities and Disadvantaged Communities.

New York will also look to leverage State investments with new federal resources. The **Inflation Reduction Act**, the **Infrastructure Investment and Jobs Act**, and the **CHIPS and Science Act** will provide unprecedented levels of federal funding to support job growth and economic expansion in the State.

New York will undertake a comprehensive strategy to ensure that its clean energy transition is a just transition.

With new tools at the State’s disposal, the achievement of a true, tangible just transition for New Yorkers across the State is more attainable than ever, both for existing workers in conventional energy industries who are concerned about risks to their livelihoods and for residents of underserved communities who want equitable access to the new jobs that will be created by investments under the Climate Act.

The convergence of these challenges and opportunities offers the State a chance to initiate a renewed, holistic effort to realize this just transition — putting the protection of workers, residents, and communities across New York at the focal point of the Climate Act’s realization. Union labor is important to Climate Act implementation, and State agencies will work with workers and their unions to ensure jobs created as a result of the State’s energy transition are good union jobs and accessible to all New Yorkers.

The *Jobs Study* developed by the Council’s JTWG projected that the clean energy transition in New York will add at least 211,000 new jobs by 2030 in key affected sectors. Major industry categories — including construction, professional services, manufacturing, and supply chain — will all see employment increases, and the buildings sector is expected to account for well over half of all jobs added in growing subsectors through 2030.

The potential upside for New York State is even greater, as these estimates do not take into account the significant opportunity for the State to add jobs by manufacturing and producing clean, renewable technologies for export and use in other jurisdictions in the coming decades. Being the first to take advantage of these opportunities will be vital to securing local supply chains and locking in economic productivity that will exceed even the ambitious needs of the State.



This Scoping Plan presents and strengthens the work coordinated by the JTWG including the following actionable recommendations to ensure that New York’s workforce is prepared for and stands to benefit from the State’s transition to a low-carbon economy:

- **Provide direct displaced worker support** to mitigate any economic impact and ensure that current and former fossil fuel workers benefit from the transition to clean energy
- **Ensure application of labor standards** across all sectors and projects, helping create good union jobs and helping the State take advantage of new federal tax credit requirements and attract greater financial benefits to New York
- **Target financial support for businesses** to ensure access to contracting and procurement opportunities in the transition away from fossil fuels
- **Create new and comprehensive training curricula and programs** focused on opportunities for people from underserved communities that meet employer hiring needs
- **Expand comprehensive career pathway programs** into clean energy for both existing and future workers
- **Leverage community engagement, stakeholder input, and market assessments** to identify and assess industry skills gaps, employee demand, and curriculum and training needs
- **Create a new Office of Just Transition and a Worker Support and Community Assurance Fund** to guide ongoing program and policy support for the near- to medium-term: host community support, existing worker support, and new worker support



New York State will:

- Re-tool existing businesses
- Attract new businesses
- Seek opportunities to manufacture, assemble, and distribute the equipment and components that are needed to realize sector-specific outcomes and provide jobs for New Yorkers.

For New York, this transition is a once-in-a-generation opportunity to implement decarbonization policies that bolster industry retention while providing sustainable economic development and growth.

1.4 Sector Summaries

TRANSPORTATION

BUILDINGS

ELECTRICITY

INDUSTRY

AGRICULTURE

FORESTRY

WASTE

The Scoping Plan recommends actions that advance the requirements of the Climate Act both within and across economic sectors.

The sectors discussed in this Scoping Plan include transportation, buildings, electricity, industry, agriculture, forestry, and waste. The cross-sector topics include land use, local government, adaptation and resilience, and an innovative design for an economywide cap-and-invest program.

The cap-and-invest program meets the need for assured emission reductions and allows for investments in technologies that help achieve emissions reductions and reduce the overall cost of this program.

Each sector-specific chapter includes an overview of the state of that sector including strategies New York currently employs to mitigate and adapt to climate change.

The chapter overviews also envision the future for each sector, identifying the scale of change required to meet the GHG emission reduction requirements by 2030 and 2050.

Each chapter's recommendations are organized into themes, which comprise key strategies that describe opportunities for programs, policies, legislation, regulation, and funding.



TRANSPORTATION

By 2030 nearly all new light-duty vehicle sales and almost half of new medium- and heavy-duty vehicle sales will be zero-emission, and a substantial portion of personal transportation in urbanized areas will shift to public transportation.

By 2050 nearly all vehicles in New York State will have zero tailpipe emissions, and New Yorkers will have substantially greater access to low-carbon modes of transportation including public transportation.

Achieving the 2050 vision in the transportation sector will require a mix of regulatory action and investments. Four themes encompass the recommended strategies in the transportation sector.

Transition to Zero-Emission Vehicles and Equipment: Vehicles using zero-emission technologies, including vehicles that use either battery electric, hydrogen fuel cell, or future zero-emission propulsion technologies, must progressively replace existing vehicles that use gasoline or diesel fuel. The strategies to achieve these goals involve a combination of regulations requiring vehicle manufacturers to sell zero-emission vehicles, fleet requirements, incentives for purchasing zero-emission vehicles, expansion of easily accessible charging infrastructure, and other enabling strategies. Deployment of zero-emission vehicles, particularly replacing or converting trucks and buses to zero-emission vehicles and expanding light-duty zero-emission vehicle adoption, will be prioritized in Disadvantaged Communities that bear a disproportionate burden of transportation-related emissions.

Enhance Public Transportation and Mobility Alternatives: Enhancing the availability, accessibility, reliability, and affordability of public transportation services with an emphasis on unserved and underserved communities will be one of the more impactful supporting strategies for achieving the Climate Act's energy efficiency, housing, and land use GHG emission reduction requirements. The strategies to achieve these goals and requirements involve service enhancements, mobility-oriented development, convenience and connectivity, and fleet modernization. These strategies will help reduce vehicle miles traveled (VMT) by providing alternatives to driving personal vehicles.

Promote Smart Growth and Mobility-Oriented Development: Smart growth land use patterns facilitate reductions in GHG emissions in the transportation sector by reducing VMT and increasing the use of mobility alternatives, including walking, biking, and public transportation. A concentration of compact, mixed-use development around transit and in municipal centers such as downtown areas also provides a critical mass of energy users to support clean energy investments, such as EV charging stations and solar carports. Strategies like mobility-oriented development and expanded mobility options reduce the environmental footprint of transportation in urban, suburban, and rural communities and increase access to jobs, education, and services such as healthcare, retail, hospitality, and entertainment.

Facilitate Market-Based Solutions and Financing: Public and private investments in transportation alternatives should be facilitated, in part, through market-based and other supportive policies to generate necessary resources. These policies can also provide a market signal, encouraging private action that reduces emissions from increased use of public transportation to the purchase of zero-emission vehicles. Potential strategies to achieve these goals include the development of a clean transportation standard that would support the replacement of petroleum fuels with electricity and possibly other fuels if they are shown to have lower co-pollutant emissions, with a primary emphasis on supporting electrification in Disadvantaged Communities.

BUILDINGS

By 2030 the majority of new purchases for space and water heating will be heatpumps, with one to two million homes and 10% to 20% of commercial space using them by 2030, and hundreds of thousands of additional homes and commercial buildings becoming efficiently electrified each year.

The 2050 vision for the buildings sector sees 85% of homes and commercial building space statewide electrified with a diverse mix of energy-efficient heat pump technologies and thermal energy networks. Four themes encompass the recommended strategies in this sector.

Adopt Zero-Emission Codes and Standards and Require Energy Benchmarking for Buildings: Policy action to decarbonize buildings must address both energy efficiency and electrification. Advanced State codes are a key strategy for requiring residential and commercial buildings to be built to a zero-emission and highly efficient standard (without equipment used for the combustion of fossil fuels) starting in 2025 for low-rise residential new construction and in 2028 for commercial new construction, and for incorporating strategies for building resilience. In existing buildings, energy improvements can be realized through routine home and capital improvements and when retiring equipment from service. This Scoping Plan includes recommendations for the adoption of equipment standards that require buildings to transition to modern technologies such as heat pumps that achieve the needed emissions reductions in the sector when equipment is replaced. In addition, energy benchmarking with disclosure requirements and building performance standards will encourage efficient operation of buildings and capital investments in high-performance building envelopes and efficient heating, ventilation, and air conditioning (HVAC) systems.

Scale Up Public Financial Incentives and Expand Access to Public and Private Low-Cost Financing for Building Decarbonization: The integration analysis indicates that to meet the necessary contribution from the buildings sector, more than 250,000 housing units each year will need to adopt electric heat pumps and energy efficiency measures from 2030 onward — greater than a tenfold increase from current market activity — with a comparable pace of transformation in commercial buildings. Additional investment will expand jobs in energy efficiency and building electrification in communities statewide by adding a projected 100,000 new clean energy jobs by 2030. This Scoping Plan provides recommendations to redirect existing spending toward a more sustainable buildings sector. Public funding should be scaled up and used strategically to accelerate wide market adoption of weatherization, electrification, and additional energy efficiency and resiliency upgrades; to expand dedicated financial support for LMI households, affordable and public housing, and Disadvantaged Communities to make and benefit from these energy and resiliency upgrades while improving housing quality and comfort; and to promote thermal energy networks with support for transitioning the existing workforce and workforce development.

Expand New York’s Commitment to Market Development, Innovation, and Leading by Example in State Projects: Development of the workforce and product supply chain and technology innovation in coordination with financial incentives are important to ensure the delivery of affordable building decarbonization solutions that perform well and improve quality of life. These strategies should include the creation of jobs in New York clean energy businesses and in businesses that serve Disadvantaged Communities, with dedicated support for minority- and women-owned business enterprises to innovate and actively participate in the transformation of the buildings sector. Market development also involves increasing public and industry awareness through education, technical assistance and case studies, strategic partnerships, and publicizing private and State buildings that demonstrate high energy performance, lower embodied carbon, and resilient building construction.

Transition from Hydrofluorocarbons (HFC): HFC use is currently widespread in refrigeration and HVAC equipment, including heat pumps that are recommended to electrify space conditioning and water heating, and in other end uses such as foams that provide insulation for higher efficiency buildings. New York State agencies should continue to adopt regulations and coordinate with other states on HFC reduction policies to ensure an effective HFC phase-down. For this transition, the State should support technical resources and toolkits; workforce training; demonstration projects; and incentives that make low-global warming potential refrigerant technologies and alternatives available and affordable; including a focus on natural refrigerants.

ELECTRICITY

The Climate Act requires that 70% of statewide electricity come from renewable energy sources by 2030 (70x30) and that the State achieve a zero-emission electricity system by 2040 (100x40).

It also requires that the State install:

6,000 megawatts (MW) of distributed solar by 2025

3,000 MW of energy storage by 2030

9,000 MW of offshore wind by 2035.

The Scoping Plan anticipates annual electricity demand will more than double by 2050, depending on the scale and timing of electrification and whether there are other clean alternatives for the transportation and building sectors. Three themes encompass the recommended strategies in this sector to be implemented through the State's Renewable Energy Program and other planning processes detailed in this Scoping Plan and as required by the Climate Act.

Transform Power Generation: Given the large amount of renewable energy that must be procured and developed to reach the Climate Act requirements, the State needs to incorporate load flexibility and controllability into the electric grid as sectors electrify to create a more manageable system. New and upgraded transmission and distribution systems will be needed statewide, including specific transmission and distribution investments that will be necessary to deliver energy from where the generation is located (both upstate and offshore), to where the load demand exists. To achieve stated Climate Act goals and requirements, New York must deploy clean energy resources such as land-based wind and solar, offshore wind, hydropower, fuel cells that use renewable fuels, and energy storage. While current programs have made significant progress, New York must continue to aggressively deploy clean resources while continually evaluating the effectiveness of programs and policies and amending them if renewable energy is not deployed at the pace necessary to achieve the requirements.

Enhance the Grid: While transformation of the power sector is critical to achieving the State's goals and requirements, it also presents an opportunity to make enhancements to the electric grid. Enhancements can improve the efficiency, delivery, and reliability of electricity, facilitate the integration of renewable energy, and prioritize clean resources consistent with the Climate Act.

Invest in New Technology: To achieve the 70x30 requirement, focus should be placed on energy delivery, energy efficiency, and aggressive deployment of existing renewable energy and energy storage technologies. However, Scoping Plan analysis and current studies show that the 100x40 goal requires 15 gigawatts (GW) to 45 GW of electricity from zero-emission, dispatchable resources in 2040 to meet demand and maintain reliability, although that gap may change over time depending on forecasted demand. Addressing this gap will require identifying and developing solutions for dispatchable technologies, like storage or nuclear power, that can be called on as needed to balance supply and demand.

INDUSTRY

Strategies for the State's industry sector are intended to mitigate the direct GHG emissions attributable to certain industrial activities such as manufacturing, mining and quarrying, and other energy- and emission-intensive industries.

These strategies are primarily incentive-based because non-incentive-oriented approaches are likely to cause leakage, where businesses leave or avoid the State and locate in other jurisdictions where they can emit higher levels of GHG emissions than they would have, had they remained in the State. Strategies designed to prevent emissions leakage also reflect the importance of protecting existing workers employed at such businesses and facilities.

Provide Financial and Technical Assistance: The State can provide financial and technical assistance to help alleviate unique industrial sector barriers and mitigate challenges to implementing GHG emission reduction measures, including risk aversion to manufacturing process interruption, lack of in-house expertise in new technologies, lack of time to commit to energy savings solutions, lack of trust that the solution will deliver the intended benefits, and intense competition for internal company capital. Using other economic incentives to develop an in-State supply chain of green economy businesses can provide further support for industrial decarbonization efforts.

Incentivize Procurement for Low-Carbon Products: Through the State's own procurement policies and practices, manufacturers may be incentivized to produce goods and products that are less emission-intensive. The State, including the GreenNY Council, should develop lists of products and standards and provide policy support to implement mechanisms that lead to greater utilization of low-carbon products.

Support Workforce Development: Expanding the State's green workforce and the focus on training workers on existing decarbonization solutions and new technology solutions as they become available are key strategies for industrial decarbonization. State agencies can build upon the long history of delivering successful clean energy workforce development and training programs in New York.

Facilitate Research, Development, and Demonstration: A robust research, development, and demonstration agenda will support accelerated changes, not only in the industrial sector, but in the buildings, transportation, and power sectors, all of which are likely to benefit from new solutions that likely can be realized at cost that is lower than that of current technologies. Solutions should be pursued only if they meet benchmarks for environmental justice and equity along with economic and technical scalability.

Establish GHG Emissions Registry and Reporting System: A complete picture of the GHG emissions from a larger percentage of facilities than currently tracked will allow for a more focused effort to reduce GHG emissions from existing industrial sources, which can often be accomplished by reducing fuel combustion. In order to ensure the State has sufficient emissions data, it should establish a new GHG emissions registry and reporting system or expand existing GHG emissions reporting requirements.

AGRICULTURE AND FORESTRY

Agriculture and forestry encompass several economic sectors including livestock, crops, dairy, timber, wood products, and bioeconomy products.

Strategies to achieve the Climate Act’s requirements and goals include mitigation of agricultural GHG emissions, primarily methane and nitrous oxide, as well as carbon capture (or sequestration), primarily through the growth of trees and other plants. Maximizing the carbon sequestration and storage potential in the agriculture and forestry sectors is a key strategy for achieving net-zero emissions across all sectors of the economy by 2050. Four themes encompass the recommended strategies in the agriculture and forestry sectors.

Promote Sustainable Forest Management: Promoting a wide diversity of site-specific forest management strategies across the landscape, including harvesting, thinning, and/or leaving mature forests intact, will be most effective at increasing New York’s carbon sequestration, storage, and climate resilience. New York’s forests are managed for a wide variety of benefits including promotion of tree health, downstream water quality, recreation, wildlife habitat, and wood products. How a forest is managed has implications for long-term carbon storage and sequestration and depends on factors like forest age and health, tree species, and how the wood is utilized following harvest. The State should develop guidance to promote forest management regarding carbon storage and sequestration, climate resilience, and other climate-related issues, recognizing that almost 75% of forest land is privately owned, with the majority of landowners owning small parcels.

Advance Livestock Management Strategies: Livestock management strategies could contribute to the deepest reductions in agricultural emissions by mitigating methane through manure management practices and precision animal feeding. Alternative manure management strategies rely heavily on the advancement and expansion of current programs. Precision feed, forage, and herd management strategies rely mainly on increased training and support to the farm community, expanded use of monitoring and decision tools, and continued and enhanced research and development of feed supplements and additives for further methane reductions.

Improve Soil Health, Nutrient Management, and Agroforestry: Strategies to improve soil health and nutrient management primarily focus on nitrous oxide reduction and increasing carbon sequestration. Agroforestry recommendations that add trees to areas of agricultural production have the potential to elevate local food production and resiliency; improve water and air quality; provide storm and flood mitigation; improve drought resiliency; provide habitat, scenic vistas, and agritourism; and increase economic development and jobs.

Promote a Climate-Focused Bioeconomy: Recommended climate-focused bioeconomy strategies include developing forestry training programs, expanding markets for sustainably harvested wood products, developing a sustainable biomass feedstock action plan, increasing market access and providing financial and technical assistance for New York’s low-carbon products, advancing bio-based products research, and deploying net negative carbon dioxide removal.



WASTE

The waste management sector includes all aspects of materials management and wastewater treatment. Materials management includes waste reduction, reuse, recycling (including organics recycling), combustion, and landfilling.

Significant opportunities exist to reduce or avoid GHG emissions by improving both materials and materials management practices. Three themes encompass the recommended strategies in the waste sector.

Reduce, Reuse, and Recycle Waste: Waste reduction, reuse, and recycling strategies in this Scoping Plan fundamentally shift the way New York currently produces, uses, and handles products and materials at end-of-life. Significant GHG emissions impacts from this sector include uncaptured emissions of methane from landfills, specifically from organic materials. The creation and distribution of products and packaging also produce significant GHG emissions. The recommended strategies address the full life cycle of materials and products from product creation to the beneficial use of materials that will otherwise be wasted.

Monitor, Detect, and Reduce Fugitive Emissions: Fugitive emissions at solid waste management facilities and water resource recovery facilities are currently under-reported and vary based on site-specific factors such as waste composition and facility design. Assessing these systems both during and beyond the active life of operation and repairing equipment to minimize fugitive emissions (leaks) can significantly reduce waste sector GHG emissions.

Establish Markets for Recovered Resources and Biogas Utilization: Solid waste management facilities and water resource recovery facilities should follow the strategies in this Scoping Plan to achieve the maximum reduction, reuse, and recycling of waste, recognizing that some wastes (including biosolids) are unavoidable. Additionally, the organic fraction of waste already in landfills will produce methane in place for many years. Capturing these unavoidable gases for strategic and local use as the State transitions to electrification will help meet the requirements and goals of the Climate Act while avoiding future reliance on fossil fuels.



LAND USE

Whether for development, conservation, or a mix of uses, land use directly affects the State's carbon emissions, sequestration, and storage and impacts the achievement of Climate Act requirements and goals.

Deciding where to conserve land, where to develop, and how to arrange and design that development are critical first steps in addressing climate change through land use strategies. Three themes encompass the recommended strategies in the land use sector.

Protect, Restore, and Monitor Natural and Working Lands: New York has more than 28 million acres of natural and working lands. Current and future use of natural and working lands has important implications for mitigation of GHG emissions and carbon sequestration and storage, including protecting high-value lands through acquisition, avoiding conversion and development, and land restoration. Afforestation and reforestation have the potential to greatly increase carbon sequestration and storage capacity in New York State. Another strategy includes protecting, restoring, monitoring, and maintaining the carbon stored in freshwater, non-tidal, coastal and estuarine tidal wetlands; submerged aquatic vegetation; and other coastal habitats.

Consider Forests and Farmland in Land Use Policies: The strategies to address forests and farmland in land use policies include equipping municipalities with the necessary tools and resources to effectively protect New York's publicly and privately owned natural and working lands while also advancing renewable energy siting. Such tools and resources include technical guidance and support and direct grants to municipalities to include afforestation, reforestation, farmland protection, and clean energy siting in municipal comprehensive plans and zoning ordinances.

Promote Smart Growth: Smart growth land use strategies seek to achieve smart, sustainable, and equitable planning, zoning, and projects that align with supportive transportation, economic development, and housing policies and practices. While land use zoning falls mostly within municipal authority, the State can support local land use decisions through direct planning and zoning grants; regional/county planning; technical assistance and capacity-building; and State and local incentives, disincentives, and, where appropriate, mandates. Smart growth principles should be implemented appropriately among rural, suburban, and urban areas of the State accounting for local conditions and needs, and State resources should also be tailored to fit those different conditions and needs.



LOCAL GOVERNMENT

Municipalities and other local government entities have an important role to play in meeting the Climate Act's requirements and goals. These entities are well positioned to have a far-reaching impact on community action because of their authority to enact codes and regulate land use and their leadership at the local level.

State programs that partner with communities and local governments are already contributing to the move toward a more energy-efficient future. This Scoping Plan recommends strategies to build on this momentum and respond to input provided by local leaders.

Establish Statewide Dashboard of Community GHG Emission Inventories: This strategy calls for a dashboard that would promote local climate action planning, monitor equity considerations, measure progress, and ensure data consistency at the county and municipal levels. This dashboard would bring together data from several sources to describe the community GHG emissions picture. The dashboard must be easy to use and provide accurate, actionable information that local government officials and staff and community stakeholders can use to inform decision-making at the local level.

Develop Local Energy Policies: This strategy recommends development of model above-minimum energy conservation codes and construction policies to encourage local energy policy decisions that accelerate energy efficiency with a focus on equity. Recognizing that many local governments struggle with tight budgets and limited staff capacity, which limits their ability to take local climate action, this strategy also includes leveraging and expanding existing State programs to help support communities with a focus on equity.

Provide Clean Energy Siting Support: This strategy looks to foster collaboration among State and local governments to support renewable energy growth, such as development and promotion of model local laws and streamlined permitting for renewable energy and storage technologies.

Promote Municipal Leadership to Support Clean Energy Adoption: This strategy includes connecting homes, businesses, and community institutions with clean energy products and services through Community Choice Aggregation programs, microgrids, district systems, and community-scale campaigns to encourage adoption of innovative technologies that will generate savings and reduce GHG emissions for consumers in an equitable manner. The intent is to allow more consumers to participate in the energy markets in ways that advance Climate Act goals and requirements while improving project economics, saving money, and generating new sources of revenue and ownership for consumers. This strategy also includes expansion of workforce development programs focused on training and job placement in clean energy and emerging technologies.

Provide State Support and Local Guidance: These strategies include continuing and expanding program opportunities, incentives, technical assistance, financial support, and centralized procurement services to motivate local governments, local government municipal bodies, and related public entities to improve assets they control with high-impact actions. This includes LED lighting installations, energy efficiency upgrades, heat pump projects, methane recovery for energy production from wastewater treatment and landfills, solar installations on municipal premises, and municipal and school district fleet electrification.

ADAPTATION AND RESILIENCE

The Scoping Plan recognizes that climate change mitigation strategies alone are not sufficient to prepare for the effects of present and future climate change, the impacts of which are already being realized and are projected to accelerate.

The Scoping Plan recommends strategies within three themes to take action to adapt to climate change and enhance resilience in communities, infrastructure, and living systems.

Build Capacity: The build capacity theme comprises strategies related to statewide planning, consideration of future conditions in State decision-making, enhancement of general understanding of climate change, improving the public's adaptive capacity, and identifying options for financing adaptation actions and reducing or shifting risk.

Enhance Community and Infrastructure Resilience: Enhancing resilience of communities and infrastructure includes strategies to help municipalities prepare for and react to increasingly severe climate hazards. Strategies include expanding State support for regional and local planning, assisting municipalities and local communities in their efforts to incorporate future conditions into local planning and regulatory decisions, addressing risks of flooding and extreme heat, and ensuring resilience of the energy system. Implementation of all components of these strategies should prioritize the use of natural resources and nature-based features to enhance resilience.

Enhance Resilience of Living Systems: "Living systems" refers to the State's natural ecosystems, agricultural systems, and forested lands. Strategies recommended to enhance resilience of living systems include addressing risks to ecosystems and biodiversity, enhancing resilience and adaptation of the agricultural sector, and protecting the ability of forests to serve as carbon sinks.

Gas System Transition

The Scoping Plan notes that, along with the full complement of sector-specific strategies, achieving the Climate Act's emission limits will require a substantial reduction of fossil natural gas use and a strategic downsizing of the gas system. A well-planned and strategic transition of the gas system will require coordination across numerous sectors to integrate planning with the decarbonization of the power generation sector and the build-out of local electric transmission and distribution systems to meet anticipated increases in electric demand throughout the State. Integrated planning will ensure the transition is equitable and cost-effective for consumers without compromising reliability, safety, energy affordability, and resiliency.

This Scoping Plan discusses the key principles in the transition away from gas and the importance of reducing fugitive emissions from gas infrastructure during this transition. Specifically, the Scoping Plan includes a detailed framework through which agencies can develop a coordinated gas system transition plan. The framework provides strategies and guidance to ensure the transition plan sets a clear timeline for the transition while satisfying key principles such as GHG and co-pollutant emission reductions, equity considerations, workforce protections, affordability, safety and reliability, decision-making informed by independent analysis, coordination with electric system expansion, and consumer engagement.

ECONOMYWIDE CAP-AND-INVEST PROGRAM

The Scoping Plan recommends implementation of an economywide cap-and-invest program that would ensure the Climate Act's emission limits are met while providing support for clean technology market development.

By establishing a consistent market signal across all economic sectors, an economywide program will help individuals and businesses make decisions that reduce their emissions and yield the emissions reductions specified by the program.

Revenues generated by the program will leverage federal funding sources to implement policies identified in this Scoping Plan, including investments to benefit Disadvantaged Communities. A cap-and-invest program can be designed to complement other policies and programs in the Scoping Plan to realize the Climate Act's emission limits and goals as efficiently and cost-effectively as possible. As the Climate Act requires programs to be designed to limit leakage, the proposed cap-and-invest program design must alleviate this risk through mechanisms designed to help support EITE Industries and protect workers, consistent with programs implemented elsewhere.

This Scoping Plan proposes that the State adopt an innovative program design that would meet the Climate Act requirements, including achieving the emission limits, promoting climate justice, and mitigating economic leakage. Design considerations to prioritize GHG and co-pollutant emission reductions in Disadvantaged Communities potentially include limits on trading allowances that preclude sources within or near Disadvantaged Communities from purchasing allowances from outside of Disadvantaged Communities, source-specific caps or other mechanisms designed to prioritize reduction of GHG or co-pollutant emissions from sources in or proximate to Disadvantaged Communities, and targeted air quality monitoring to ensure continued air quality improvement in Disadvantaged Communities.

In addition, as required by the Climate Act, at least 35% of the investments made with program proceeds will benefit Disadvantaged Communities, with a goal of 40%. Offsets would have little, if any, role in a cap-and-invest program designed to comply with the Climate Act.

The strategy also recommends rebates or other mechanisms to mitigate the program's financial impacts on LMI households so these households will benefit from program investments without bearing any additional energy costs as a result of the program's implementation.



1.5 Next Steps

The submittal of this Scoping Plan, approved by the Council, represents a critical milestone. It delivers on a central Climate Act requirement, establishing the pathway(s) the State should take to meet the goals and objectives of the Climate Act; to take action on realizing necessary GHG emission reductions; to deliver on climate justice; to create economic opportunity and jobs across the entire State; and to ensure a just transition to a clean, affordable, and reliable energy system.

Issuance of this Scoping Plan initiates the next phase of work to realize the Climate Act's outcomes. It provides new analyses and assessments to inform ongoing and future planning. For the next several years and beyond, the implementation of the Climate Act necessitates an all-hands-on-deck approach across State government, with input from a broad array of stakeholders, technical advisors, and experts. Many Scoping Plan strategies also require action on the part of local governments or the State legislature. The Climate Act requires the following actions after finalization of the Scoping Plan:

- DEC will have until January 1, 2024, to draft and promulgate enforceable regulations to ensure the State meets the Climate Act's statewide GHG emission limits (i.e., 40% reduction in Statewide GHG emissions by 2030 and 85% reduction by 2050, both from 1990 levels) as outlined in the Scoping Plan.
- An updated State Energy Plan will incorporate Scoping Plan recommendations.
- Every four years, DEC will publish a report on the implementation of GHG emission reduction measures, in consultation with the Council and CJWG.
- Every five years, the Council will update the Scoping Plan as part of the ongoing process to meet the Climate Act targets and GHG emissions reduction limits.
- By July 1, 2024, and every two years thereafter, the PSC will issue a comprehensive review of the renewable energy program, including progress in meeting the overall targets for 70% renewable electricity by 2030 and 100% zero-emission electricity by 2040. This review will also include a progress update on the programs the PSC has established to require procurement of 9 GW of offshore wind by 2035, 6 GW of solar PV by 2025, and 3 GW of energy storage by 2030.
- The PSC will continue to advance programs that are designed to provide substantial benefits to Disadvantaged Communities in the implementation of the renewable energy, energy efficiency, and energy storage programs.



This Scoping Plan is a product of extensive collaboration and the State will continue to communicate with the public and engage with stakeholders across the State, particularly in Disadvantaged Communities, to help advance the requirements of the Climate Act.

Robust and ongoing coordination and collaboration with the federal government, other states, local governments, community-based organizations, labor, and various businesses and industries will be necessary to develop the market for clean technologies that will help New York realize the recommendations of the Scoping Plan.

Additionally, with the implementation of the Scoping Plan — including rulemaking processes, administrative planning, and investment strategies — relevant New York State agencies, authorities, and entities will seek to consult with recognized Indigenous Nations with whom it shares overlapping interests, in accordance with consultation processes.

Success requires a committed private sector working with New Yorkers ready to seize the benefits that the transition to a clean energy economy will create.

New York will need industry partners to produce EVs, heat pumps, and more at an unprecedented scale and to invest in research and development to improve on existing technology options that will supply not only New York’s transition but also the national and global clean technology markets.

Such action will demonstrate throughout all New York communities — whether rural, suburban, or urban — that climate action will continue to improve the quality of life in New York for current and future generations.



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