You Can't Manage What You Don't Measure: PlaNYC and New York City's Greenhouse Gas Inventories

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Introduction

You can't manage what you don't measure. This was a recurring principle repeated often during the development of PlaNYC. Although the principle applied broadly to the quantitative metrics underpinning the initiative, it was invoked most frequently in relation to the city's greenhouse gas (GHG) emissions. PlaNYC marked the first comprehensive accounting of GHG emissions from both New York City government operations and the city as a whole. The resulting inventories established a basis for PlaNYC's emissions-reduction targets, informed subsequent municipal policies, and contributed to the development of consistent city-level GHG accounting methods.

Since publication of New York City's inaugural GHG inventory in 2007, city-level GHG accounting has evolved substantially. New analytical tools, methodological advances, and international protocol development have supported broader adoption of comparable and repeatable approaches. In 2006, however, no generally accepted city-level protocol existed. Although several cities had prepared GHG inventories, their methods were inconsistent and their results were not readily comparable. New York City also faced significant data limitations. The decision to proceed nevertheless reflected the view that transparent approximations could provide a useful basis for policymaking. This chapter traces the development of New York City's GHG accounting and reporting practices, from the initial approaches used in PlaNYC through refinements introduced over the following two decades.

Origins of New York City's GHG Inventory, 2001–2006

During his 2001 mayoral campaign, Mike Bloomberg committed to measuring and disclosing GHG emissions from New York City government operations. The campaign documented this commitment, and mayoral staff subsequently reviewed it after the administration took office. In early 2002, responsibility for the undertaking was assigned to the Mayor's Office of Environmental Coordination.

Jon Dickinson, a newly appointed policy advisor in the office was assigned to lead the project. Dickinson had recently completed a Master of Marine Affairs at the University of Rhode Island, where his research examined coastal management and compared state and federal policy and planning responses to sea-level rise and coastal erosion—issues then commonly described as climate adaptation and later more often as climate resilience. Although he had limited prior experience in GHG accounting, the assignment reflected the practical, resource-constrained conditions under which early municipal climate initiatives were often developed.

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The City's first draft government operations GHG inventory was completed in the summer of 2002, aided by an intern from Cornell University, who had recently completed a similar effort for the City of Ithaca. The intern was provided by ICLEI – Local Governments for Sustainability, a global organization supporting local government sustainability efforts.

The summer 2002 effort served as an initial methodological test. In the absence of an established protocol, the principal objective was to compile energy-use data from city agencies as far back as 1990, consistent with the Kyoto Protocol base year, and to calculate associated GHG emissions using standard emissions factors. The Department of Citywide Administrative Services (DCAS) Office of Energy Management, which managed agency energy use and paid municipal utility bills, maintained a centralized repository containing much of the data required to estimate emissions from more than 5,000 city-owned or city-operated buildings, including records for electricity, natural gas, and district steam.

Building utility data were considered reasonably complete beginning in 1995, which was therefore selected as the initial year of analysis. Records also showed that hundreds of public schools continued to use coal-fired boilers in the mid-1990s; some of these records remained available only as dot-matrix printouts. Fuel-oil data had to be obtained from individual agencies, as did information concerning the municipal on-road, marine, and aviation fleets, initially supplied by the Office of Management and Budget (OMB). Additional data were obtained for wastewater treatment from the Department of Environmental Protection (DEP), streetlights and traffic signals from the Department of Transportation (DOT), and solid waste from the Department of Sanitation (DSNY). By the end of summer 2002, the project had produced a preliminary inventory of GHG emissions from city government operations. The draft was neither published nor widely circulated within the administration.

The initial inventory was refined in subsequent years with assistance from successive summer interns. Additional data were validated, gaps were filled, and methods were reviewed and improved through exchanges with practitioners in other cities undertaking similar work. By 2006, this process had produced a defensible accounting of GHG emissions from New York City government operations for fiscal years 1995, 2000, and 2005. Work had also begun on the more complex task of calculating citywide emissions, although that analysis remained incomplete.

Transfer to the Mayor's Office of Long-Term Planning and Sustainability, 2006

After the Mayor's Office of Long-Term Planning and Sustainability (OLTPS) was established in early 2006, Rit Aggarwala was briefed on the existing inventories. He directed that the work be expanded to encompass all GHG emissions associated with activity in the city. Previous efforts had produced only partial citywide inventories, and the available results were not considered sufficiently complete or accurate to support a citywide emissions-reduction target. The project

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therefore shifted toward preparation of New York City's first comprehensive citywide GHG emissions inventory.

By 2006, ICLEI had expanded both its membership and its technical-support capacity. The organization connected the New York City team with Kim Lundgren, an ICLEI staff member who had completed a citywide GHG inventory for Medford, Massachusetts. Lundgren and other ICLEI colleagues assisted with the collection of utility data from Con Edison, KeySpan (now National Grid), and the Long Island Power Authority; on-road vehicle travel data from the New York Metropolitan Transportation Council (NYMTC) and the Taxi and Limousine Commission (TLC); transit electricity and fuel-use data from the Metropolitan Transportation Authority (MTA), New Jersey Transit, and the Port Authority of New York and New Jersey (PANYNJ); solid waste data from DSNY; wastewater treatment data from DEP; and aviation fuel-use data from PANYNJ.

By mid-2006, the draft inventory was sufficiently developed for a briefing with Deputy Mayor Dan Doctoroff. Doctoroff directed the team not to rely on 1995 as the base year, despite its status as recommended practice at the time, but instead to use the most recent year for which complete and accurate data were available. Accordingly, 2005 was selected as the citywide base year, while fiscal year 2006 became the base year for city government operations. Shortly thereafter, Doctoroff appointed Dickinson, Ariella Maron, and Laurie Kerr, from the Mayor's Office of Environmental Coordination, the New York City Economic Development Corporation, and the Department of Design and Construction, respectively, to join Aggarwala on the OLTPS team. In the following months, the team updated both inventories in preparation for the launch of PlaNYC.

Inaugural GHG Inventory – April 2007

The period preceding PlaNYC's release involved sustained consultation with agency colleagues and members of the Sustainability Advisory Board. Refining the inventories to the standard required for PlaNYC remained methodologically demanding because no city-level GHG protocol yet existed. The *Greenhouse Gas Protocol*, developed for corporate accounting, was therefore used as a proxy.[1] Published inventories from other cities, including Denver and London, also provided important precedents. London's practice of estimating aviation emissions from all jet fuel used by aircraft departing from its airports, for example, informed the approach adopted in New York and later used by cities elsewhere.

Although other municipal inventories provided general guidance, OLTPS and participating agencies were required to identify and address numerous activity data gaps. The *GHG Protocol* identifies five principles: relevance, completeness, consistency, transparency, and accuracy. In

[1] World Resource Institute and World Business Council for Sustainable Development, *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition),* 2004

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practice, these principles sometimes required balancing; completeness, for example, could require the use of estimates or proxy data that reduced accuracy. This approach enabled the inventory to provide a sufficiently comprehensive basis for PlaNYC's emissions-reduction targets within the available time and resource constraints.

In the absence of established protocols, the initial methodology drew on other cities' accounting practices and a series of documented professional judgments. Con Edison and LIPA supplied electricity consumption data. Translating aggregate kilowatt-hour use into policy-relevant building categories required interpretation of utility rate schedules. The resulting classification comprised five types: small residential buildings containing one to four dwelling units; large residential buildings containing more than four units; commercial buildings; industrial buildings; and institutional facilities, including government, academic, healthcare, and religious uses. Because utility rate classifications did not always correspond precisely to building use, the approach could misclassify electricity consumption and associated emissions, particularly in mixed-use and master-metered buildings. The same classification was applied to natural gas and district steam. The prevalence of master meters for natural gas introduced a further potential source of misclassification. Nevertheless, review against federal data indicated that the allocation was adequate for its intended policy purpose.

Whereas electricity, natural gas, and district steam data were comparatively accessible, fuel oil consumption was more difficult to quantify because numerous private companies supplied fuel oil to buildings throughout the city. Direct collection of these data was not feasible within the project's time and resource constraints. Fuel oil use was therefore modeled using the *2004 Petroleum Infrastructure Study* prepared by the New York State Energy Research and Development Authority (NYSERDA).[2] The study's estimate of 2004 fuel oil use in the New York City metropolitan area was downscaled to the city's population and adjusted to 2005 heating demand using heating degree data.

GHG emissions from transportation were calculated from several sources. Following ICLEI guidance, the City obtained on-road vehicle miles traveled (VMT) data from NYMTC for all travel within city boundaries. As with GHG emissions from buildings, the City developed appropriate vehicle-type categories to support policy development. VMT was allocated among passenger cars, light trucks, heavy trucks, and buses, and average fuel-efficiency values from the U.S. Energy Information Administration (EIA) were applied to estimate gasoline and diesel fuel use.

GHG emissions from transit were estimated using fuel use data for MTA buses, and electricity use data from MTA for subways. The MTA (Metro North Rail Road and Long Island Railroad) and

[2] New York State Research and Development Authority, *Petroleum Infrastructure Study,* September 2006

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PANYNJ (PATH) provided electricity and diesel fuel use data for only the portions of commuter rail trips occurring within New York City limits.

Calculating GHG emissions from solid waste required estimates of the mass of waste deposited into landfills, along with an estimate of waste characterization. DSNY provided both: landfilled DSNY-managed waste and commercial putrescible and construction and demolition waste, along with waste characterization, as reported in the *2004-2005 NYC Residential and Street Basket Waste Characterization Study*.[3] Waste characterization is critical to accurately estimating GHG emissions from landfills, as anaerobic decomposition of organic matter such as food, paper, wood, and textiles results in methane generation. For this inaugural GHG inventory, the City applied a method still widely used today known as the methane commitment method, which counts the lifetime of methane generation from solid waste decomposition in the year of deposition into the landfill.

Although aviation and marine-shipping emissions were excluded from the initial citywide inventory totals, both were estimated and reported as supplementary information. Their treatment is significant because later protocols incorporated these sources within standardized city-level accounting frameworks.

Earlier work on the inventory of city government operations supported greater confidence in those results; the principal remaining task was to update activity data for fiscal year 2006. One notable difference between the two inventories was the treatment of methane from the city's 14 wastewater-treatment plants: these emissions were included in the government-operations inventory but omitted from the first citywide inventory.

While the City used standard emission factors from the U.S. EPA to calculate GHG emissions from stationary and mobile fuel combustion and solid waste methane generation, indirect GHG emissions resulting from electricity generation required the development of a custom calculation approach.

The EPA publishes GHG emission factors for electricity generation in the U.S. in its Emissions & Generation Resource Integrated Database (eGRID).[4] However, at the time of the development of this first inventory, eGRID had not been updated in several years, and the electricity emission factor for New York City was based only on electricity generated within New York City and Westchester County. This presented two issues: first, several of New York's electricity plants had recently been retired or repowered, with old, inefficient generation units replaced by new, more

[3] New York City Department of Sanitation. (2005). 2004–2005 NYC residential and street basket waste characterization study.

[4] www.epa.gov/egrid

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efficient combined cycle natural gas units, which are far less carbon intensive; and second, New York City is a net electricity importer – in 2006 it was importing approximately half of its needed electricity, much of it from upstate and western New York, regions with lower carbon intensity due to hydropower generation. As such, the City elected to calculate a New York City-specific electricity emission factor.

Because no strong precedent existed for the initial electricity emission factor calculation, the City developed a model based partly on EPA's eGRID process and supplemented it with generation data from several external sources. These included unit-level data for in-city generation from the Energy Velocity database, which has since been discontinued; information on plants holding bilateral contracts with Con Edison or the New York Power Authority (NYPA); and data on the balance of the city's electricity requirements from the New York Independent System Operator (NYISO) *Load & Capacity Data Report*, commonly known as the "Gold Book."[5] For each group of generation sources, emissions were calculated using capacity factors, total generation, heat rate, and fuel type. Carbon intensity was then calculated from total generation, and the overall electricity emission factor was derived as a generation-weighted average. Although the method was substantially revised in later years, the initial model enabled the City to report an emission factor that more closely represented the carbon intensity of its electricity supply at that time.

On April 11, 2007, Mayor Bloomberg announced the release of New York City's first comprehensive GHG emissions inventory at a press conference in the recently completed 7 World Trade Center. Accompanied by members of the Sustainability Advisory Board, he reported that New York City accounted for an estimated 0.25 percent of global GHG emissions. The inventory also indicated that more than 75 percent of the city's emissions resulted from heating, lighting, cooling, and powering its more than one million buildings. Although the inaugural inventory contained acknowledged limitations, it established an empirical foundation for the building decarbonization measures later included in the Greener, Greater Buildings Plan of December 2009.

The release of PlaNYC would follow on Earth Day, relying on this first inventory effort to stand up two ambitious, but achievable GHG reduction targets: the City would commit to reducing citywide GHG emissions by 30% below 2005 levels by 2030, and City government operations GHG emissions 30% below Fiscal Year 2006 levels by Fiscal Year 2017. Mayor Bloomberg signed Executive Order 109 on October 22, 2007, mandating the City government reduction target. And, to track this commitment, Mayor Bloomberg signed Local Law 22 of 2008 on May 31, 2008,

[5] New York Independent System Operator, *Load & Capacity Data* (2006)

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requiring the City to publish annual updates to its citywide and city government operations GHG inventories.

Subsequent Years' GHG inventories – A Cycle of Continuous Improvement

In the years following PlaNYC's release, OLTPS published annual updates to the citywide and government-operations inventories. Each update provided an opportunity to address data gaps, refine assumptions, and strengthen exchanges among practitioners in U.S. cities developing methods to represent local emissions profiles in policy-relevant terms. During this period, city-level GHG accounting protocols evolved rapidly, first within the United States and subsequently at the global level.

The first new protocol to emerge was the *Local Government Operations Protocol* (LGOP).[6] The initial version of this protocol, released in September 2008, provided a standardized, transparent methodology for measuring and reporting GHG emissions from municipal buildings, vehicle fleets, facilities, and local-government-specific operations, such as wastewater treatment and solid waste management. The LGOP was updated two years later in May 2010, providing additional clarifying guidance.

In October 2012, ICLEI USA released the *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.0*, the first guidance designed specifically for citywide, or community-scale, GHG measurement and reporting in the United States.[7] ICLEI appointed Dickinson to the protocol's steering committee. His participation helped ensure that methods developed and refined through New York City's inventory process after 2007 were evaluated for inclusion where appropriate.

While ICLEI's U.S. protocol was under development, the C40 Cities Climate Leadership Group (C40), then chaired by Mayor Bloomberg, began developing a community-scale protocol applicable to local governments worldwide. In May 2012, C40, ICLEI, and the World Resources Institute (WRI) released a pilot version of the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)*.[8] In 2013, 35 cities tested the pilot, and six stakeholder workshops were held in Beijing, São Paulo, London, Dar es Salaam, New Delhi, and Jakarta. More than 150 city officials, researchers, and practitioners participated in these workshops and

[6] California Air Resources Board et al., *Local Government Operations Protocol: For the Quantification and Reporting of Greenhouse Gas Emissions Inventories*, Version 1.0, September 2008

[7] ICLEI – Local Governments for Sustainability USA, *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.0*, 2012

[8] C40 Cities Climate Leadership Group, ICLEI – Local Governments for Sustainability, and World Resources Institute. *Global Protocol for Community-Scale GHG Emissions: Version 0.9 (Pilot Version 1.0)*, May 2012

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provided feedback on *GPC Pilot Version 1.0*. The protocol was subsequently revised, and Dickinson served as a contributing author to the final version, released in December 2014.[9]

In the years following the release of New York's initial GHG inventory in 2007, each annual inventory revision brought the opportunity for improvements. These improvements addressed gaps uncovered through consultation with colleagues and counterparts in other cities, and the development of new protocols, to ensure New York was continuing to produce inventories to best support policy development. Other changes resulted from improved data collection processes, and the correction of errors discovered with additional time taken for more detailed review. This revision process also allowed the opportunity to refine methodology approaches to align better with evolving practices.

The City's second GHG inventory, released on September 17, 2008, and revised on February 24, 2009, documented several methodological changes arising from experience gained after PlaNYC's release.[10] The revisions reflected emerging draft protocols, including the LGOP and the *ICLEI International Local Government GHG Emissions Analysis Protocol* (IEAP).[11] To support transparency, the inventory described each change and its effect on base-year emissions. The revisions restated base-year citywide emissions upward by approximately 8 percent and government-operations emissions by almost 6 percent. Publication of these material changes in detail reflected the City's effort to adhere to the principles of the *GHG Protocol*.

The following year's GHG inventory provided an opportunity for further improvements. A notable change in methodology was the transition from using custom software to completing all GHG inventory calculations using Microsoft Excel. From the first draft inventories in 2002 to 2008, the City had relied on the Clean Air and Climate Protection (CACP) software, developed by Torrie Smith Associates and provided to cities participating in ICLEI USA's Cities for Climate Protection campaign (CCP) to manage their GHG inventory data and complete all calculations.[12] Beginning in 2009, the City moved to completing all GHG inventory processes to Excel, allowing for greater consistency and addressing several shortfall of the CACP software, including its use of outdated GHG emission factors.

One key gap addressed was the inclusion of sulfur hexafluoride (SF_6) in 2009, known as a fugitive emission. SF_6, used in electricity transmission and distribution equipment, has an extremely high global warming potential – its effect on atmospheric temperature rise is almost

[9] C40 Cities Climate Leadership Group, ICLEI – Local Governments for Sustainability, and World Resources Institute. *Global Protocol for Community-Scale GHG Emissions*, 2014
[10] City of New York, *Inventory of New York City Greenhouse Gas Emissions,* February 2009
[11] ICLEI – Local Governments for Sustainability, *International Local Government GHG Emissions Analysis Protocol,* October 2009
[12] City of New York, Mayor's Office of Long-Term Planning and Sustainability, *Inventory of New York City Greenhouse Gas Emissions*, April 2007

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24,000 times that of carbon dioxide (CO_2), per unit of mass. Deciding to include SF_6 in the 2007 base year inventory added almost more than 2 million metric tons of carbon dioxide equivalent (CO_2e) to the citywide GHG emissions total, representing more than 3 percent of total citywide emissions. While this decision provided a more accurate accounting of citywide GHG emissions, it also allowed the city to recognize a material reduction effort. Starting in 2000, Con Edison undertook a major effort to detect and repair SF_6 leakage from its equipment, resulting in a reduction of more than 1.5 million tons of CO_2e by 2012. However, as evidence of evolving practice in citywide GHG accounting, SF_6 was removed from the citywide inventory for the 2014 inventory release, following GPC guidance.[13]

Fugitive methane from the city's natural gas distribution network – due in part to aging cast iron pipes up to a century old – had also been overlooked in the City's first GHG inventory in 2007 and was also added 2009. Estimates of these emissions sources were derived from Con Edison and National Grid data, representing the "unaccounted for gas" in their distribution systems, or the delta between the volume of gas injected into the system, and that billed for in customers' homes and businesses.

Each annual inventory produced between 2007 and the end of the Bloomberg administration in 2013 incorporated opportunities for revision based on new data and evolving protocol guidance. The 2008 inventory was also notable for presenting a detailed decomposition of the factors contributing to interannual changes in both citywide and government-operations emissions. The analysis distinguished external effects, including population growth and weather; changes in consumption unrelated to population or weather, such as increased electricity and heating-fuel use and higher vehicle and transit activity; and changes in utility operations, including new in-city generating facilities, lower-carbon imported electricity, and improvements in steam-generation efficiency. This form of decomposition analysis provided a model that was subsequently adopted by other cities.

The GHG inventories completed during the Bloomberg administration were foundational for many reasons. Establishing and institutionalizing the process and methodology provided a solid accounting of the city's GHG emissions from which the City both based its GHG mitigation targets and tracked progress toward their achievement. However, this detailed accounting provided granularity that gave confidence on which to set policy, notably the Greener, Greater Buildings Plan in 2009. This plan included the City's buildings benchmarking law, Local Law 84 of 2009 (applicable to buildings with floor area over 25,000 square feet) and Local Law 87 of 2009, which required audits and retro-commissioning for buildings (applicable to buildings over 50,000 square feet). Similar laws were subsequently enacted by cities throughout the U.S, and these laws set the foundation for New York's Local Law 97 of 2019 ten years later, requiring

[13] City of New York, *City of New York Inventory of New York City's Greenhouse Gas Emissions in 2014*, April 2016

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buildings over 25,000 square feet to take actions to reduce their carbon emissions by 40 percent by 2030, and to be net zero by 2050.

The Post-Bloomberg Years – Further Changes

Mayoral transitions commonly bring changes in agency leadership, senior staff, and policy priorities. Dickinson left City service in November 2013, near the end of the Bloomberg administration; that administration's final GHG inventory was published the following month. The de Blasio administration did not issue another update until April 2016, when it reported 2014 emissions.[14] Dickinson led that work as a consultant to the Mayor's Office of Sustainability. The City published a further update the following year. Its methodology was largely continuous with the prior inventory, apart from the addition of several data sources required by guidance from the Global Covenant of Mayors (GCoM).

By 2017, the published GHG inventory had been condensed to 17 pages – reporting results only and omitting detailed calculation methodology. By 2018, the published GHG inventory had been further condensed to 9 pages. However, during this time, the Mayor's Office of Sustainability had partnered with New York University's Marron Institute of Urban Management and Urban Intelligence Lab, which provided critical data management and visualization capabilities, allowing the City to publish interactive dashboards on its website, rather than relying on static published reports only. The City also made all GHG inventory data available for download through a partnership with NYU's Tandon School of Engineering Center for Urban Science + Progress (CUSP).[15]

Changes in mayoral administrations can also alter the scope and presentation of emissions measurement. Such changes may reflect state or federal policy and regulatory developments as well as shifts in municipal priorities. In the 2023 PlaNYC update, the Mayor's Office of Climate and Environmental Justice made a material change by incorporating emissions associated with food consumption. This addition reflected a policy priority of the Adams administration and provided an accounting basis for subsequent municipal initiatives addressing food-related emissions.

Previously, New York's inventories were what is known as production-based – designed to capture all emissions associated with activates within the city's boundaries. Including GHG emissions from food required the additional completion of a consumption-based GHG inventory, which captures indirect upstream GHG emissions from the production of goods and services consumed by households, including food.

[14] City of New York, *Inventory of New York City Greenhouse Gas Emissions in 2014*, April 2016
[15] https://energy.cusp.nyu.edu/

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The city had previously completed an initial draft consumption-based GHG inventory in 2013, using a methodology developed by The University of California-Berkeley.[16] This draft effort allowed the city to also illustrate the geographic distribution of household GHG emissions for the first time, highlighting greater household GHG emissions intensity that comes with larger homes and auto ownership. Data used included several federal sources, including the U.S. Census Bureau's American Community and Housing Surveys and the U.S. Bureau of Labor Statistics' Consumer Expenditure Surveys, coupled with local activity data aggregated by zip-code.[17] While this initial draft effort provided a strong foundation, the City did not take further action to refine its consumption-based GHG inventory until the PlaNYC 2023 update.

The Mayor's Office of Climate and Environmental Justice picked this effort up again in the Adams Administration, partnering with the C40 Cities Climate Leadership Group, American Express, and EcoDataLab to complete a full Consumption-Based Emissions Inventory (CBEI) in 2023, based on 2019 data.[18] The CBEI reports consumption-based GHG emissions in five categories: food, goods, housing, private transportation, and services.

This inventory showed that GHG emissions from food – measured both in upstream emissions from food production, as well as emissions associated with food service businesses – represent the majority of New Yorker's household GHG emissions. Like the initial draft CBEI completed in 2013, this inventory also included a geographic breakdown of consumption-based emissions – but at more granular level by census track. This granular breakdown incorporates several indicators, including household income, college degree attainment, household size, home ownership rates, rooms per household, and vehicles per household, to produce a predictive model to estimate household expenditures on the CBEI categories. These data are then used to calculate GHG emissions per household using the U.S. EPA Environmentally Extended Input-Output (EEIO) model, which provides GHG emissions rates per dollar of spend.[19]

Conclusion

The development of New York City's GHG inventory and reporting practices over the past two decades illustrates the cumulative effects of methodological refinement. New protocols, improved data availability, more advanced modeling and analytical techniques, and changing policy priorities have produced increasingly robust information for municipal emissions mitigation efforts. The City's experience has also contributed to wider learning among municipalities in the United States and internationally as they have developed accounting approaches suited to local policy needs.

[16] City of New York, *Inventory of New York City Greenhouse Gas Emissions,* December 2013
[17] Ibid
[18] City of New York, *New York Household Consumption-Based Emissions Inventory*, February 2023
[19] https://www.epa.gov/land-research/us-environmentally-extended-input-output-useeio-models

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This development remains ongoing. The City recently completed a comprehensive third-party verification and methodology documentation report that identified opportunities for further improvement. It has also continued to revise the methods used to calculate electricity and steam emission factors so that reported emissions more accurately reflect those sources.

As New York City continues to pursue the emissions-reduction objectives first established in PlaNYC in 2007, continued measurement and public reporting will remain necessary to assess progress toward the more ambitious target, set out in *One City, Built to Last* in 2014, of reducing citywide GHG emissions 80 percent below 2005 levels by 2050. The inventory process initiated more than two decades ago, and subsequently refined, provides the institutional and methodological foundation for that assessment. Future revisions are likely to reflect additional advances in methods, data, and technology.

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References

C40 Cities Climate Leadership Group, ICLEI—Local Governments for Sustainability, & World Resources Institute. (2012, May). *Global protocol for community-scale GHG emissions: Version 0.9 (Pilot Version 1.0)*.

C40 Cities Climate Leadership Group, ICLEI—Local Governments for Sustainability, & World Resources Institute. (2014). *Global protocol for community-scale greenhouse gas emission inventories*.

California Air Resources Board, California Climate Action Registry, ICLEI—Local Governments for Sustainability, & The Climate Registry. (2008, September). *Local government operations protocol: For the quantification and reporting of greenhouse gas emissions inventories* (Version 1.0).

City of New York, Mayor's Office of Long-Term Planning and Sustainability. (2007, April). *Inventory of New York City greenhouse gas emissions*.

City of New York. (2009, February). *Inventory of New York City greenhouse gas emissions*.

City of New York. (2013, December). *Inventory of New York City greenhouse gas emissions*.

City of New York. (2014, September). *One city, built to last*.

City of New York. (2016, April). *Inventory of New York City greenhouse gas emissions in 2014*.

City of New York. (2017, April). *Inventory of New York City greenhouse gas emissions in 2015*.

City of New York. (2023, February). *New York household consumption-based emissions inventory*.

ICLEI—Local Governments for Sustainability. (2009, October). *International local government GHG emissions analysis protocol*.

ICLEI—Local Governments for Sustainability USA. (2012). *U.S. community protocol for accounting and reporting of greenhouse gas emissions* (Version 1.0).

New York City Department of Sanitation. (2005). *2004–2005 NYC residential and street basket waste characterization study*.

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Do not cite, distribute, or quote without permission of the authors.
Prepared for PlaNYC at 20: A Retrospective on 20 Years of Sustainability Planning in NYC, December 2026

New York Independent System Operator. (2006). *Load & capacity data*. https://www.nyiso.com/documents/20142/2226467/2006-Load-Capacity-Data-Report-Gold-Book.pdf/89ab7fc7-a228-2ed9-e201-8efcc482ba85

New York State Energy Research and Development Authority. (2006, September). *Petroleum infrastructure study*.

World Resources Institute, & World Business Council for Sustainable Development. (2004). *The greenhouse gas protocol: A corporate accounting and reporting standard* (Rev. ed.).

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