



NYC Carbon Challenge for Commercial Offices Program Design

Background

In September 2014, recognizing the existential threat that climate change poses to New York City and the world, Mayor Bill de Blasio set the ambitious goal to reduce citywide greenhouse gas (GHG) emissions 80% below 2005 levels by 2050 (80 x 50). Because the energy used in New York City's one million buildings represents 73% of citywide GHG emissions, and more than 90% of the buildings that exist today will still be here in 2050, improving the energy efficiency of the city's existing building stock represents the greatest opportunity to reduce citywide GHG emissions.

New York City cannot achieve this ambitious goal without the help of the private sector. Since 2007, the City of New York has launched and expanded the NYC Carbon Challenge program, a ground-breaking public-private partnership to accelerate reductions in GHG emissions. To date, New York City's 17 leading universities, the 11 largest hospital organizations, 12 global companies, 19 residential management firms, and 19 hotels have pledged to voluntarily reduce their building-based emissions by 30% or more over the course of ten years.

Commercial office spaces represent a largely untapped opportunity to realize significant energy savings in commercial buildings. Interior office space accounts for 40 to 60 percent of the energy use in a typical commercial office building. While energy consumption in base building systems has been the focus of most attention and innovation, energy used for lighting, plug loads, and data centers within tenant spaces are also great opportunities for energy savings and GHG emissions reductions.

The City of New York invites commercial offices to join the NYC Carbon Challenge. However, commercial tenants that lease out office space and building owners that occupy their owned commercial office space face major differences in operational control over energy use. To incorporate both groups into the Challenge for Commercial Offices, the program will include two sub-groups: commercial tenants and commercial owner-occupiers. These groups will participate in the same program, but will track and measure their energy use and emissions using separate metrics that reflect their fundamental differences.

This document details the NYC Carbon Challenge program design for Commercial Offices. For more information, please visit www.nyc.gov/carbonchallenges.



The Challenge

The NYC Carbon Challenge invites New York City's largest commercial firms to join universities, hospitals, and multifamily buildings, and hotels to reduce their greenhouse gas emissions by 30% or more over the course of ten years.

- **The 30% Challenge:** To meet the 30% reduction goal, participants in the Commercial Office Challenge must reduce their greenhouse gas emissions, measured in terms of emissions of carbon dioxide equivalent per full-time equivalent employee (CO₂e/FTE), by 30% from their base year within ten years of their start year in the Challenge.
- **The 40% Challenge:** If a commercial office participant has already achieved significant reductions in their emissions and would like previous reductions to count toward the NYC Carbon Challenge, the participant can choose to accept the "40% Challenge" to achieve 40% emissions reduction per FTE off a base year of 2006 or any year thereafter.
- **The 50% Challenge:** If a commercial office participant has already achieved significant reductions in their emissions and would like previous reductions to count toward the NYC Carbon Challenge, the participant can choose to accept the "50% Challenge" to achieve 50% emissions reduction per FTE off a base year of 2005 or any year thereafter.

Benefits of the Challenge

The NYC Carbon Challenge for Commercial Offices offers participants the opportunity to be recognized for their energy efficiency efforts as part of broader citywide goals. Participating commercial offices will have access to a diverse forum of peers, industry experts, and ancillary organizations that will provide the contacts, best practices, and technical assistance needed to realize meaningful reductions in energy use, costs, and emissions.

Summary of the Program

The NYC Carbon Challenge consists of the following (described in detail later in the document):

1. **Tracking Carbon Emissions.** The program requires annual submissions of a Carbon Emissions Inventory to track energy use and associated carbon emissions. To accurately measure energy consumption, all owner-occupier participants must have direct energy metering in their owned and occupied commercial office spaces. Participants are encouraged but not required to install separate sub-meters in their non-metered leased spaces, as long as non-metered leased space does not exceed 10% of the total space.
2. **Emissions Reduction Strategy.** All participants will be required to develop a Climate Action Plan that maps out a strategy to reduce emissions to meet the Challenge goal and update this strategy annually.



3. **Regular Partner Meetings.** The Mayor’s Office of Sustainability (MOS) will organize regular meetings with all Challenge participants to provide updates on the Challenge and encourage the exchange of ideas. At least one representative from each commercial office participant should plan to attend each meeting.
4. **Annual One-on-One Meetings.** MOS staff and the Challenge participants will meet once a year to review the participant’s progress, consider any obstacles to achieving reductions, and discuss a strategy to reach the carbon reduction goal.
5. **Working Groups.** MOS will convene voluntary working groups as needed to help develop new initiatives and/or to resolve issues as they arise.
6. **Access to Resources and Technical Expertise.** The Mayor’s Office will provide direct access to staff and information to connect participants with financial incentive programs. Additionally, there will be a Technical Advisory Group (TAG) to guide the Challenge and its participants.

Completing the Challenge

To complete the NYC Carbon Challenge for Commercial Tenants, each Challenge participant must document achievement of their selected Challenge goal across their Challenge portfolio, subject to verification by the Mayor’s Office. There are no negative consequences or punitive repercussions for not meeting the Challenge goal.

Details of the Program

1. Accept the Challenge

To accept the Challenge, each participating commercial owner-occupier or commercial office tenant must submit a participation letter to the NYC Mayor's Office confirming their commitment to reduce the emissions intensity of their buildings, measured as carbon dioxide equivalent per gross square foot (CO₂e/sq. ft.), by 30%, 40%, or 50% from the selected base year within ten years. The letter must be signed by a member of the organization with the authority to commit to the Challenge.

2. Tracking GHG Emissions

Each owner-occupier or commercial office tenant participant must measure building-based energy use and associated emissions in owned and occupied spaces covered by the NYC Carbon Challenge. Participants agree to track their carbon emissions per square foot *or* per FTE in a GHG Emissions Inventory according to the protocol of the NYC Carbon Challenge.

- **GHG Emissions Inventory.** Participants will submit a GHG Emissions Inventory to track their emissions by May 1 of each year of the Challenge. MOS will provide each participant with a GHG Emissions Inventory Calculator that will automatically calculate the Challenge participant's GHG emissions per square foot and per FTE.
- **GHG Emissions.** Participants have the option to measure their emissions as either carbon dioxide equivalent per gross square foot (CO₂e/sq. ft.) *or* carbon dioxide equivalent per full-time equivalent employee (CO₂e/FTE).
 - **Carbon Dioxide Equivalent.** The level of carbon dioxide (CO₂) that would have the same climate impact as a given concentration and type of greenhouse gas.
 - **Full-Time Equivalent (FTE) Employees.** The average number of employees employed by the Challenge participant located within office space covered by the NYC Carbon Challenge. To calculate the annual FTE, count the total number of employees, including consultants and contractors, who work in the covered office space on a given day of each month and take the average over the twelve months of the year. Count as a full-time employee each person that works at least 80% of a "full-time" work week (35 hours) onsite, and count as a half-time employee each person that works less than 80% of a "full-time" work week onsite.
 - **Gross Square Feet.** The total number of square feet measured between the exterior surfaces of the enclosing fixed walls of all of the Challenge participant's commercial office buildings. This includes spaces such as vent shafts, stairs, basements, etc.

Note: Owner-occupier participants will choose to measure their emissions either per square foot, which does not disadvantage growth, *or* per FTE, which does not disadvantage participants who choose to consolidate space as a strategy to reduce emissions. However, participants must choose their option within the first year of joining the Challenge and measure their emissions the same way for all properties.

- **Data and Disclosure.** All building-based energy use and associated emissions data will be received and kept confidentially by MOS. Any disclosed information will be anonymized and/or aggregated, unless a participant gives explicit approval to the Mayor's Office to release their data. When a Challenge participant reaches the Challenge goal, the Mayor's Office will assist with promotion of this progress.

Methodology for the GHG Emissions Inventory

Participants aggregate their annual energy use by fuel type and amount for all owner-occupied and leased office space covered by the NYC Carbon Challenge. Participants will input these amounts into the GHG Emissions Inventory calculator for each calendar year, from the base year until the end year.

The GHG Emissions Inventory calculator automatically applies carbon coefficients, fixed at 2005 levels, to each fuel type to calculate the participant's total emissions. The calculator then divides this value by gross square feet of the owner-occupied and leased space *or* the number of full-time equivalent employees to find either the participant's carbon emissions per square foot (CO₂e/sq. ft.) or carbon emissions per full-time employee (CO₂e/FTE). The Challenge participant may select only one metric to measure progress toward the Challenge goal.

Note: If data centers are measured by power usage effectiveness (PUE), the calculator will provide separate PUE calculations in addition to the overall carbon emissions calculated from annual energy use.

- **Base Year.** Each Challenge participant must choose a base year from which the 30%, 40%, or 50% reduction goal is measured.
 - **Base Years for the 30% Challenge.** Challenge participants who choose the 30% reduction goal must use the first year for which they have full energy data as their base year, which can be no earlier than 2011.
 - **Base Years for the 40% Challenge.** Challenge participants who choose the 40% goal can choose 2006 or any year thereafter as their base year.

- **Base Years for the 50% Challenge.** Challenge participants who choose the 50% goal can choose 2005 or any year thereafter as their base year.
- **Start Year.** The start year of the Challenge is the first calendar year after which the Challenge participant accepts the Challenge. For example, Challenge participants that accept the Challenge in 2016 will have a start year of 2017.
- **End Year.** The end year is ten years from the start year of the Challenge. To meet the Challenge goal, Challenge participants must reduce their carbon emissions 30 to 50% by December 31 of that year. For example, Challenge participants that have a start year of 2013 must complete the Challenge by December 31, 2023.
- **Calendar Year.** Energy use information for all Carbon Emissions Inventories must be aggregated on a calendar year basis (January 1 – December 31).
- **Owner-Occupied Space:** All office space and common areas greater than 10,000 square feet occupied by a Challenge participant in a building located in New York City or the Tri-State Area that is owned by the participant, including data centers and all common areas.
- **Owned Leased Space.** All office space greater than 10,000 square feet owned by the Challenge participant and leased to another party. These spaces are not required to be reported under the NYC Carbon Challenge.
- **Non-Owned Leased Space.** All office space greater than 10,000 square feet leased by the Challenge participant from a third party, including data centers, which is occupied at least 50% of the time and where the participant has direct operational control.

Note: Retail spaces and leased spaces less than 10,000 square feet are optional.

- **Power Usage Effectiveness (PUE).** A standard metric used for measuring efficiency of data centers. PUE is the ratio of total power used by a data center facility to the power used by the information technology (IT) equipment. PUE does not measure the efficiency of the IT equipment itself.
- **Data Centers.** A Challenge participant can choose to include data centers as part of their office space when calculating carbon per FTE, or calculate data centers separately by PUE. 30% Challenge participants can opt to measure 30% PUE improvement; 40% Challenge participants can opt to measure 40% PUE improvement; and 50% Challenge participants can opt to measure 50% PUE

improvement. The specific language of PUE improvement will be refined by a Working Group as described later in this document.

- **Fuel Types.** Challenge participants measure their energy use by fuel type and amount. Energy use is reported using the following metrics:
 1. Electricity: Kilowatt-Hours (kWh)
 2. Natural gas: Thermal Units (Therms)
 3. Heating oil distillates No. 2, No. 4, and No. 6: US Gallons (US Gal)
 4. Heating oil distillates No. 2, No. 4, and No. 6 with biodiesel blend: US Gallons (US Gal)
 5. District Steam: Thousand Pounds (Mlbs)
 6. Diesel or other fuels used for backup generation: US Gallons (US Gal)
 7. On-site/locally-based off-site renewable electricity: Kilowatt-Hours (kWh)

- **Carbon Coefficients:** A carbon coefficient determines the level of carbon dioxide equivalent (CO₂e) associated with a given amount of fuel or energy use. The NYC Carbon Challenge carbon coefficients for electricity and steam were developed by MOS and are in compliance with the 2010 Local Government Operations Protocol (LGOP).
 - **Electricity and Steam.** The NYC Carbon Challenge uses the New York City carbon coefficients for electricity and steam, fixed at 2005 levels. The coefficients for electricity and steam can vary significantly across years. Fixing the coefficients at 2005 levels ensures Challenge participants receive credit for their efforts, not for exogenous changes to the supply.
 - **Natural Gas, Propane, and #2, 4, and 6 Heating Oils.** The NYC Carbon Challenge uses the nation-wide carbon coefficient for natural gas, propane, and #2, 4, and 6 heating oils, which were developed by the U.S. Environmental Protection Agency (EPA).
 - **Onsite and Locally-Based Offsite Renewable Electricity.** The electricity generated by onsite and locally-based offsite renewable sources (wind, solar, or geothermal) will have a carbon coefficient of 0.00.
 - **Waste.** The NYC Carbon Challenge uses waste coefficients that are calculated by the EPA Waste Reduction Model (WARM) Version 12 for mixed solid waste, recycled, and composted waste.

- **Locally-Based Offsite Renewable Energy.** Offsite renewable energy purchased by a Challenge participant, such as through a power-purchase agreement, can count

towards reductions in emissions intensity if 100% of the electricity generated feeds directly into New York City's electric grid (New York Independent System Operator Zone J). The offsite renewable energy project must be a newly constructed source. Challenge participants must have direct ownership of the offsite renewable energy or must directly purchase the offsite renewable energy from the energy provider, as per a contract or other form of agreement such as a power-purchase agreement, and may not sell any RECs or environmental attributes generated by the renewable energy on the open market.

Energy Meters and Sub-Meters

Owner-occupier participants must have direct energy meters in place on all owned and occupied spaces covered by the NYC Carbon Challenge. Owner-occupier participants are encouraged but not required to install sub-meters in all owned leased space and non-owned leased space, as long as no more than 10% of a participant's leased space is non-metered.

- ***Calculating Energy Use in Sub-Metered Leased Space.*** If owned leased spaces are sub-metered, the participant will remove 100% of the energy use from their total energy use. If non-owned leased spaces are sub-metered, the participant will count 100% of the energy use toward their total energy use.
- ***Calculating Energy Use in Non-Metered Leased Space.*** The Mayor's Office encourages all owner-occupier participants to sub-meter the energy used in owned and non-owned leased spaces. If sub-metering is not possible, participants will prorate the whole building energy use based on square footage of the leased space. Altogether, no more than 10% of a participant's covered properties may be non-metered leased space.
- ***Calculating Baseline Carbon Emissions after Installing Sub-Meters.*** If an owner-occupier decides to install energy sub-meters in all leased spaces, the base year of the Challenge can be *either* the first full year *or* the first calendar year after a Challenge participant installs them. For example, if a participant completes installation in March of 2013, the participant can choose to aggregate their base year energy use from April 1, 2013 through March 30, 2014.

3. Create a GHG Emissions Reduction Strategy

Each Challenge participant is required to develop an emissions reduction strategy in the form of a Climate Action Plan and update it bi-annually. MOS will provide Challenge participants with a template to complete the Climate Action Plan. The first Climate Action Plan is due by June 15 of the start year and must be updated bi-annually each of the following years. All Climate Action Plans will be received and kept confidentially by the Mayor's Office.

- ***The Climate Action Plan Template and Toolkit.*** The Climate Action Plan Template includes the minimum information that a participant must submit. Challenge participants are encouraged to submit additional information, but must complete their Plan within the format provided by MOS.
- ***The Climate Action Plan should include:***
 - Background information about the Challenge participant's owned and leased office spaces
 - An overview of results from the Challenge participant's GHG Emissions Inventory
 - A plan that includes a description of progress made toward the emissions reduction goal and the strategy for achieving remaining reductions

4. Regular Partner Meetings

Regular partner meetings will be organized three to four times per year by MOS and held on the premises of a commercial office partner or an ancillary organization. Meetings will include:

- An update from the Mayor's Office staff
- Presentations by Challenge participants
- Presentations by technical speakers
- Open discussion

5. Annual One-on-One Meetings

Annual one-on-one meetings will be held in the MOS office between each Challenge partner and MOS staff. Meetings will cover:

- Background information about the Challenge partner and major changes to their owned and leased spaces
- Current progress toward the Challenge goal
- Status of deliverables to MOS, including the Climate Action Plan and annual updates to the Carbon Emissions Inventory
- Strategy moving forward, any issues or complications to achieving the goal, and potential solutions to help achieve success

6. Working Groups

The Mayor's Office will organize volunteer working groups of Challenge participants to discuss and develop solutions to any additional issues as they arise. These working groups will be convened on an as-needed basis. Points of discussion will include but are not limited to the following:

- Accounting methodology for part-time employees, consultants, and other contracted personnel

- Providing the right metrics, including PUE, for data center energy reduction
- Option of including office property and data centers in the Tri-State Area (New York, New Jersey, and Connecticut)
- Accounting for data centers that a Challenge participant moves in or out of the Challenge area during the ten years of the Challenge

7. Access to Resources and Technical Expertise

The Mayor's Office will provide direct access to staff and information to connect participants with financial incentive programs, industry experts, other peers, and City agencies.

8. Promotion and Recognition

The Mayor's Office will recognize the efforts and achievements of participating entities and their buildings. Promotion and recognition will include, but is not limited to:

- Press announcements from the Mayor's Office
- Placement of news articles and other media highlighting the success of Challenge participants
- Promotion of participant involvement at Mayor's Office and industry events
- Individually tailored Mayor's Office of Sustainability promotional materials
- Inclusion of firm name, logo, and profiles on official NYC documents, website, and social media outlets
- The ability to self-promote participation in the Challenge, including the use of the NYC Carbon Challenge logo on vetted documents, web pages, social media, or other media