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CLIMATE ACTION

Fiscal Year 2021 Report

LETTER FROM THE CHIEF

Reverend Mariama White-Hammond

Dear neighbors,

During a year of unprecedented change, the City of Boston's commitment to environmental action and climate justice has not waivered. Throughout the COVID-19 pandemic, our public servants continued to deliver support to residents, including pivoting to online meetings and boosting language access in public meetings. City of Boston staff volunteered for the unemployment office, supported the rental relief fund, staffed Boston's vaccination sites, and delivered meals to homebound families. Despite these historic challenges, we continued to work towards our goal of carbon neutrality and mitigating the effects of climate change for all of Boston's residents.

In the building sector, the Department of Neighborhood Development led a zero-emission building standard for City funded affordable housing that was adopted by the Environment Department. Environment also adopted a new renewable energy and retrofit financing mechanism with Property Assessed Clean Energy. And most recently, in collaboration with the City Council and local stakeholders, Mayor Janey introduced a building emissions performance standard through the amended Building Emissions Reduction and Disclosure Ordinance, which is the single most effective measure to reduce Boston's carbon emissions and put us on a path to net-zero emissions.

In the transportation sector, Environment and the Boston Transportation Department released a Zero Emission Vehicle Roadmap. We also piloted a program to offer up to $60 public transit credits for workers in five Main Street Districts. And we partnered with E4theFuture, Nuestra Comunidad CDC, Eversource, and MAPC to launch Good2Go, a community-based income-tiered EV carshare program.

We've advanced our goal of becoming a zero-waste city by expanding residential yard waste options and installing textile drop boxes through a partnership with Boston Public Works.

In the energy sector, Environment launched Community Choice Electricity, a program that uses the City's collective buying power to provide affordable and renewable electricity to the program's customers. We also completed Renew Boston Trust Phase I, an initiative that uses money saved on energy bills to invest in energy efficiency upgrades.

We're advancing our goals of embedding community engagement by launching the Community Clean Air Grants program to fund community-based projects to reduce air pollution and support public health in our neighborhoods. We also enhanced our community engagement and outreach to embed residents in the City's policies and processes through procedural and administrative regulations and requesting public comment for more of our regulations-making processes.

We're creating more resilient communities by releasing Climate Ready Dorchester and Climate Ready Downtown and North End and launching the heat resilience study and Climate Ready Charlestown and East Boston Phase II.

All of this work to keep our communities safe, equitable and resilient is due to the dedication of City staff as well as all of our community partners. I want to especially thank my predecessor, Chris Cook, and the former Commissioner of Environment, Carl Spector. I also would like to congratulate our Department's Shattuck awardees, Lugardy Raymond and Brad Swing.

While we've made significant progress under incredibly difficult circumstances, we still have a long way to go if we are going to create the sustainable, equitable and resilient future that we all deserve. Initiatives like the amended Building Emissions Reduction and Disclosure Ordinance are putting us on a path to make crucial strides towards our carbon neutrality goals. I am excited to see what new innovative solutions develop in the future.

Sincerely,
Reverend Mariama White-Hammond

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1. INTRODUCTION

I. WHY WE CREATED THIS REPORT

This report presents up-to-date information regarding the status and implementation of the City of Boston's plans and initiatives around climate, energy, and waste. These include:

- The 2019 Climate Action Plan (CAP) Update,
- Climate Ready Boston and neighborhood-specific coastal resilience plans,
- Zero Waste Boston,
- Greenovate Boston, the City's initiative to empower residents to act on climate.

We also present our progress towards in implementing City ordinances, including the:

- Building Energy Reporting and Disclosure Ordinance (BERDO),
- Wetlands Protection Ordinance (WPO),
- Diesel Emissions Reduction Ordinance (DERO),
- Ordinance Regarding the Reduction of Plastic Bags in Boston.

With this report, we invite you, our partners and stakeholders, to follow our progress in carrying out climate action in our city. All of our plans and progress reports may be found on our website: www.boston.gov/departments/environment/boston-climate-action.

II. WHAT'S THE STATUS?

Our plans include short- and long-term actions. We are using the following designations to describe each one's status:

- **Not started**: The step has not begun implementation.
- **In progress**: The step is underway (e.g., a grant application has been submitted to create a program, an advisory board has been convened).
- **Delayed** (2019 CAP only): The implementation of this step is delayed; each step is assigned a timeline in the 2019 CAP Update.
- **Ongoing**: A step that calls for a recurring action (e.g., a taskforce that meets regularly) is ongoing. If its implementation is suspended, it will become "delayed".
- **Complete**: The step is complete and all milestones have been reached.

III. BOSTON'S CLIMATE GOALS AND COMMITMENTS

The City of Boston has a long history of climate action, releasing our first citywide climate action plan in 2007. Since then, the City has adopted ambitious long-term climate action goals, including for mitigation, adaptation, waste reduction, mobility, and community connectedness. Achieving these goals will help Boston become a healthy, equitable and resilient community.

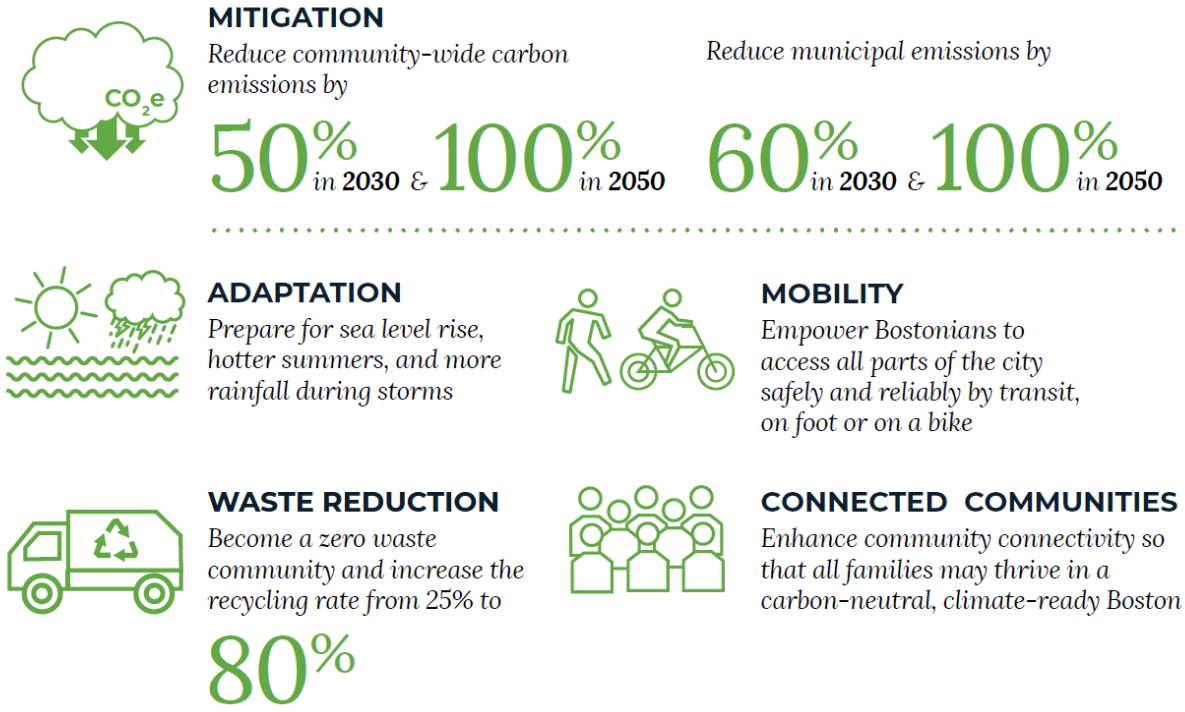


Figure 1. Summary of Boston's climate goals.

The City of Boston is committed to simultaneously addressing racial and social equity and environmental challenges. Vulnerable groups such as communities of color and low-income neighborhoods are often disproportionately impacted by environmental shocks and stresses and are less likely to have access to the resources necessary for recovery. Climate action in Boston has two guiding principles for equity:

1. People of color and low-income communities must not be disproportionately impacted by climate hazards.
2. Benefits from climate mitigation and preparedness efforts should be shared equitably among all people.

The City is also committed to global leadership and regional collaboration, in addition to engaging civic, business and institutional leaders in climate action. Our partnerships include:

- Metropolitan Mayors Coalition,
- Urban Sustainability Directors' Network,
- Climate Mayors,
- C40 Cities Climate Leadership Group,
- Global Covenant of Mayors for Climate and Energy.

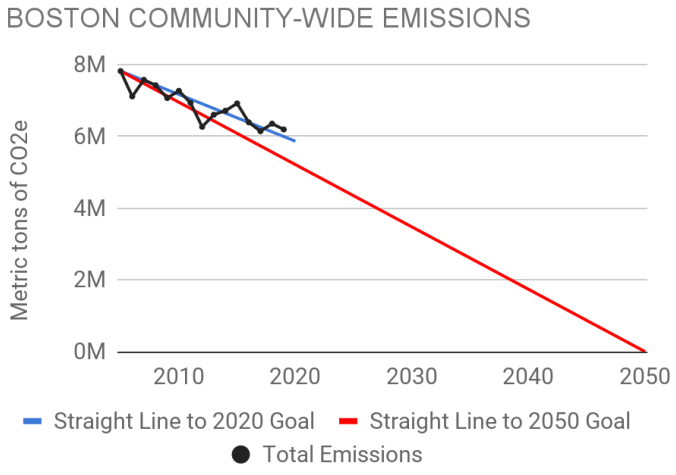
2. REDUCING CARBON POLLUTION

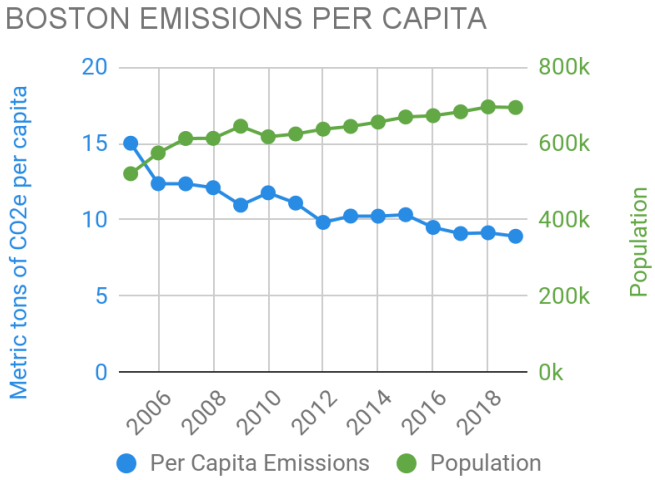
I. 2005-2019 GREENHOUSE GAS INVENTORY

The City of Boston has released an annual inventory of carbon emissions attributable to the City's residents and economic activity since 2005. The inventory allows the City to understand where our emissions come from, quantify the potential impacts of programs and policies to reduce emissions, and track progress towards our goals. The inventory accounts for emissions from energy use by residents, businesses and other activities, on- and off-road transportation (excluding airplanes), and waste disposal, within Boston's boundaries. To compile the inventory, we incorporate data from Boston utilities, data on fuel oil and vehicle fuel consumption, and a combination of measured and modeled transportation data. The City intends to develop in the next few years a consumption-based emissions inventory, which would include emissions from the production, shipping, use, and disposal of each product and service purchased and used by Boston residents and workers.

Between 2005 and 2019, Boston's emissions decreased by approximately 21%, from 7.9 to 6.2 million metric tons of carbon.[1] When adjusted for renewable energy credits purchased by the City of Boston and large buildings, Boston's emissions have decreased by an additional 1%. The reduction in Boston's emissions occurred at the same time that the population and the number of jobs in Boston have increased. Per capita emissions have decreased from 15 metric tons of carbon in 2005, to 9 metric tons in 2019. Emissions per million dollars of Gross City Product (GCP) have fallen from 76 to 46 metric tons of carbon per million dollars over the same period. Almost all of Boston's carbon emissions stem from the building and transportation sectors. Buildings account for 69%of total emissions. Transportation accounts for 30% of remaining emissions.

Boston is at risk of not meeting our 2020 carbon target of reducing carbon emissions by 25% from 2005 levels, or our long-term goal of carbon neutrality by 2050. Due to the COVID-19 pandemic, 2020 energy use patterns are not likely to be consistent with that of previous years, and may not be a reliable indicator of actual progress towards our carbon emissions reduction goals.





[1] Community-wide emissions are tracked by calendar year, local government operation emissions by fiscal year.

II. 2019 CLIMATE ACTION PLAN

This section identifies our progress toward carrying out the 18 strategies laid out in the 2019 Climate Action Plan. The 2019 update to Boston's Climate Action Plan details key actions to get Boston on track to become carbon neutral by 2050. Each action included detailed steps for equitable outcomes and implementation. The 2019 plan builds on the 2014 update, which identified 98 actions to make Boston a connected community that is low carbon, climate ready and zero waste. Progress is tracked by fiscal year.

I. CONSTRUCT NEW MUNICIPAL BUILDINGS TO A ZERO NET CARBON STANDARD

STEPS	STATUS	DETAILS
Construct new municipal buildings to a zero net carbon standard	COMPLETE (ongoing)	The executive order for carbon-neutral municipal buildings was signed in December 2019.

2. ADOPT A ZERO NET CARBON STANDARD FOR CITY-FUNDED AFFORDABLE HOUSING

STEP	STATUS	DETAILS
New construction		
1. Release Guidelines for Zero Emissions Buildings (2019)	COMPLETE	Neighborhood Development (DND) released a draft for public comment.
2. Identify high-carbon intensive building materials to avoid and suggest greener, alternative materials (2019-2020)	IN PROGRESS	Guidelines recommend avoiding carbon-intensive materials and toxic foams. The International Living Future Institute maintains a list of Red List Free materials.
3. Give special consideration in 2019 funding round to Zero Emission Buildings (2019)	COMPLETE	Proposals for zero emission projects were "highly considered" in FY19.
4. Update DND Request for Proposals (RFP) language to reflect new standards (2020)	COMPLETE	$30 million in funding for new zero emission and accessible affordable housing announced in August 2020.
5. Connect facilities managers to Building Operator Training programs (ongoing)	ONGOING	We have partnered with the Northeast Energy Efficiency Council and Boston-based partners to coordinate Building Operator Certification trainings.
Existing buildings		
1. Assess existing affordable housing stock and strategies for deep energy retrofits with combined electrification (2020)	IN PROGRESS	Neighborhood Development and Environment are studying affordable housing in the performance standard. (See Strategy 5: Performance Standard).
2. Partner with affordable housing providers and residents to demonstrate deep energy retrofits (starting 2020)	IN PROGRESS	A local affordable housing provider is participating in the Rocky Mountain Institute's REALIZE initiative.
3. Develop design guidelines for deep energy retrofits with electrification (by 2022)	NOT STARTED	
4. Update RFP language to reflect deep energy retrofit and electrification strategies (by 2022)	NOT STARTED	

3. STRENGTHEN GREEN BUILDING ZONING REQUIREMENTS TO A ZERO NET CARBON STANDARD

STEP	STATUS	DETAILS
1. Require that building developers submit a Carbon Neutral Building Assessment as part of Article 37 zoning review requirements (2019)	COMPLETE (ongoing)	As part of Article 37 Green Building and Climate Resiliency Guidelines review, developers are required to include a project-specific Zero Carbon Building Assessment.
2. Promote new ZNC buildings in the Boston area to improve knowledge of ZNC costs and best practices (ongoing)	IN PROGRESS	*Resource: Built Environment Plus (formerly U.S. Green Building Council Massachusetts) published a report in 2019 on zero energy buildings in Massachusetts, including 3 residential buildings in Boston.*
3. Launch technical analysis and public process (2019-2020)	COMPLETE	The Boston Planning and Development Agency (BPDA) launched the Zero Net Carbon Zoning Initiative in 2020.
4. Enact new zoning requirements and timeline for implementation (2020)	IN PROGRESS	The Zero Net Carbon Zoning Initiative is underway.
5. Evaluate the creation of a carbon linkage fee (starting 2020)	DELAYED	
6. Communicate, educate, and oversee compliance of ZNC building requirements (starting 2021)	NOT STARTED	

4. INVEST IN ENERGY EFFICIENCY AND RENEWABLE ENERGY GENERATION IN MUNICIPAL BUILDINGS

STEP	STATUS	PROGRESS
1. Complete Phase 1 projects 2019-2020	COMPLETE	The Renew Boston Trust is the City's initiative to invest in energy efficiency and resiliency in the City of Boston's buildings, using creative financing. Learn about the initiative and the efficiency measures we've carried out on our website.
2.Select building portfolio and carry out energy assessments for Phase 2 (2019)	COMPLETE	
3.Explore developing a separate energy service contract for streetlights (2020)	IN PROGRESS	
4.Complete design and begin installation of Phase 2 energy conservation measures (by mid-2020)	ONGOING	
5. Select building portfolio, including schools, and carry out energy assessments for Phase 3 (by late 2020)	COMPLETE	
6. Secure funding and begin early scoping for Phase 4 (by 2021)	DELAYED	
7. Complete design and begin installation of Phase 3 energy conservation measures (by early 2021)	IN PROGRESS	

5. DEVELOP A CARBON EMISSIONS PERFORMANCE STANDARD TO DECARBONIZE EXISTING LARGE BUILDINGS

STEP	STATUS	PROGRESS
1. Introduce a building performance scorecard for BERDO buildings (2019)	DELAYED	Beta versions were shared with building owners in 2019.
2. Launch the technical analysis and public process to develop a building emissions performance standard (by 2020)	COMPLETE	Environment convened technical and resident advisory groups and open houses in 2020 and 2021.
3. Expand financing mechanisms for retrofits, including exploring the creation of a local climate bank (starting 2020)	IN PROGRESS	Environment is exploring a climate bank with the Boston Green Ribbon Commission and Bank of America. The City joined the PACE program in 2020.
4. Engage with utility companies to improve the process for building owners to obtain and report their energy data (ongoing)	ONGOING	BERDO staff coordinate with Eversource and National Grid on an ongoing basis.
5. Develop guidance for combined deep energy retrofits and electrification, including for historic buildings (by 2021)	IN PROGRESS	Environment launched the Building Energy Retrofit Resource Hub in partnership with Eversource.
6. Propose BERDO amendment to replace energy action and assessment requirement with a building emissions performance standard (2021)	COMPLETE	The BERDO amendment was introduced to Council in June 2021.
7. Pilot deep energy retrofits with thermal electrification in the 15 Carbon Free Boston building typologies (2020-2024)	IN PROGRESS	The BSA is documenting retrofits. The REALIZE project is piloting an affordable housing retrofit.
8. Study mechanisms to improve the energy efficiency of existing buildings not covered by the standard (2020-2024)	IN PROGRESS	Environment is participating in a rental efficiency learning group through the Urban Sustainability Directors Network.

6. EXPAND WORKFORCE DEVELOPMENT PROGRAMS FOR BUILDING DECARBONIZATION

STEP	STATUS	PROGRESS
1. Regularly convene an internal City working group on workforce development for energy efficiency and green buildings (starting 2019)	ONGOING	Workforce Development, Economic Development and Environment meet on a regular basis.
2. Estimate baseline and future construction labor needs to meet carbon neutrality goals (2019-2020)	COMPLETE	We worked with Inclusive Economics to assess labor needs in the context of the building performance standard.
3. Pilot and coordinate training programs and support partner-led programs (starting 2019)	ONGOING	In 2019, we supported LISC Boston and Emerald Cities Collaborative trainings.
4. Develop new facilities management training and job opportunities for municipal building staff (2020-2021)	IN PROGRESS	The Municipal Energy Unit is collaborating with Workforce Development to evaluate.
5. Expand technical offerings and career pathways in Boston Public Schools (starting in 2020)	DELAYED	*The proposed FY22 budget includes $1 million for green jobs training (link).*

7. ADVOCATE FOR STATE BUILDING POLICIES THAT ALIGN WITH CARBON NEUTRALITY BY 2050

STEP	STATUS	PROGRESS
1. Provide public comment and support as part of the Board of Building Regulation and Standards (BBRS) process to study a zero-net carbon (ZNC) update to the Stretch Code	ONGOING	Environment staff attend both all-board and energy advisory committee meetings (mass.gov).
2. Advocate for energy efficiency programming that supports whole-building deep energy retrofits at the Massachusetts Energy Efficiency Advisory Council (EEAC)	ONGOING	Environment sits on the Global Warming Solutions Act (GWSA) Implementation Advisory Committee and attends EEAC meetings.
3. Advocate for state policy changes that support residential energy efficiency	ONGOING	Environment sits on the GWSA Implementation Advisory Committee.
4. Participate in Energy Code Conference to cast votes in favor of energy efficiency proposals	COMPLETE	Staff voted on the 2021 International Energy Conservation Code.

8. ADVOCATE FOR BOSTON'S PRIORITY TRANSIT PROJECTS WITHIN REGIONAL PLANS

STEP	STATUS	PROGRESS
1. Advance a service enhancement proposal for the Fairmount Line (2019)	IN PROGRESS	Transportation and MBTA added 8 trips and are evaluating further steps. (More.)
2. Create Boston's first Bus Priority Network and implement three or more bus priority projects per year (starting 2019)	IN PROGRESS	Several rapid bus projects are in design or in progress (Learn more.)
3. Expand Inner Harbor ferry service from Lovejoy Wharf, Fan Pier, Lewis Mall, and other new local ferry routes (ongoing)	IN PROGRESS	Ferry service has started between Lovejoy Wharf and the Seaport.(Learn more.)
4. Support upgrading the Silver Line to provide better rapid bus service and terminal from downtown to Nubian Square (2019-2020)	IN PROGRESS	Transportation added dedicated bus lanes and is partnering with MBTA to improve transfer points. (Learn more.)
5. Support technology improvements to increase Green Line speed and reliability (2019-2020)	IN PROGRESS	Real-time displays and signal priority will improve speed. (Learn more.)
6. Support flood protection & carbon reduction measures for at-risk MBTA stations (ongoing)	NOT STARTED	Transportation seeks to ensure that T stations are climate ready. (Learn more.)
7. Create new transit hubs or carry out improvements at existing hubs in the Longwood Medical Area, at West Station, and in Sullivan Square (ongoing)	IN PROGRESS	Several transit hub improvement projects are in implementation. A new West Station Transit Hub is part of MassDOT's I-90 project. (Learn more.)
8. Increase sense of transit reliability through realtime information integration initiative, with 20 pilot locations across the Boston area (starting 2020)	IN PROGRESS	Transportation created a bus priority network across the City and is introducing reliability enhancements. (Learn more.)
9. Advocate for measures that reduce the cost and improve the quality of public transit in Boston (ongoing)	ONGOING	The City gave free T passes to all middle and high school students, is piloting free public transit with Main Streets and on the 28 bus line, and helped support night bus service. (Learn more.)

9. IMPROVE AND EXPAND ACTIVE TRANSPORTATION INFRASTRUCTURE

STEP	STATUS	PROGRESS
Create a program to hire Boston non-profits and residents to implement outreach processes for walking and bicycling projects and to co-create neighborhood priorities for walking and bicycling improvements	NOT STARTED	Transportation has funding to begin a leadership academy for residents to learn more about transportation issues and solutions.
Deepen partnerships between City agencies to ensure equitable outcomes from transportation investments	IN PROGRESS	Transportation collaborates with other City agencies to understand tools and strategies to enable more equitable outcomes.
Develop relevant materials in commonly-used languages to ensure that all residents are informed about projects and are able to participate	ONGOING	Transportation regularly translates outreach and meeting materials for its projects (e.g., a fact sheet for Connect Downtown).
Continue to expand incentives and accessibility initiatives around bike riding, particularly for young people	IN PROGRESS	Transportation conducts online and in-person events to engage residents, and relaunched learn- to-ride clinics for adult women.

10. ENCOURAGE MODE SHIFT THROUGH TRANSPORTATION DEMAND MANAGEMENT (TDM) AND SUSTAINABLE PARKING POLICIES

STEP	STATUS	PROGRESS
1. Complete inventory of the Downtown Parking Freeze (2019)	DELAYED	The Downtown parking freeze inventory is currently undergoing quality control.
2.Release citywide TDM framework and new Transportation Access Plan Agreement (TAPA) guidelines (2020)	DELAYED	Transportation is currently working on a points-based TDM program.
3. Update Downtown, South Boston and East Boston parking freeze regulations (2020)	COMPLETE	Updated regulations were approved during the September hearing.
4. Launch an online platform to streamline the TAPA process (2021)	IN PROGRESS	Transportation is working with Stantec and Ease Consult to develop a points-based system and online platform.
5. Carry out parking inventories of priority areas and identify neighborhoods for tactical interventions (2020)	IN PROGRESS	Test projects like flexible lanes, pick-up and drop-off areas and mobility hubs are underway.
6. Study transportation impact fee that would be used to improve transportation networks outside of development projects (2022)	NOT STARTED	
7. Evaluate the impact of expanding the parking freeze to additional neighborhoods (2021-2024)	NOT STARTED	
8.Assess additional programs and policies to deter single occupancy vehicles, including residential parking permits, parking cash-out and other commuter incentives (ongoing)	IN PROGRESS	Transportation is piloting a program that offers preloaded MBTA passes and Bluebikes passes for 1,000 employees in five Main Streets Districts.

11. SUPPORT CITYWIDE ZERO-EMISSION VEHICLE (ZEV) DEPLOYMENT

STEP	STATUS	PROGRESS
1. Convene an internal City working group to help develop and implement a citywide ZEV strategy (starting in 2019, ongoing)	COMPLETE (ongoing)	Transportation, Environment and other City departments met most recently in March.
2. Develop a ZEV Roadmap to accelerate Boston's transition to EVs and other ZEV (starting 2020)	COMPLETE	The ZEV Roadmap was released in November 2020.
3.Pilot electric vehicle car share as an expansion of Car Share Boston and in partnership with community organizations (starting 2020)	IN PROGRESS	MassCEC awarded E4theFuture, the City and other partners a grant to pilot EV car share in Roxbury (Good2Go).
4. Install electric vehicle charging on 6 municipally-owned parking lots through the Eversource Make Ready program (by 2020)	IN PROGRESS	After delays due to the pandemic, installation is in progress (see locations and progress).
5. Release how-to guides for installing EV chargers targeted at landlords, employers and residents (by 2020)	COMPLETE	Recharge Boston, our EV resources page, includes guides for workplaces and residential buildings.
6. Incorporate ZEV strategies into Boston's travel demand management (TDM) programs (2020)	COMPLETE	Transportation is developing a "points-based" TDM program.
7. Work with dealerships and other partners to highlight availability of ZEVs (ongoing)	NOT STARTED	
8. Encourage uptake of electric vehicles in private fleets and third-party carshare systems, including through the TAPA process (ongoing)	IN PROGRESS	The EV Readiness Policy awards points for car share. Transportation is updating TAPA guidelines.
9. Consider additional transportation options through the permitting of shared micromobility such as e-scooters and e-bikes (starting 2020)	IN PROGRESS	The Small Vehicle Sharing Business Advisory Group meets monthly per the micro mobility ordinance.
10.Study equipment replacement strategies for older or highly-polluting vehicles, including developing a used EV market (ongoing)	NOT STARTED	

12. ACCELERATE MUNICIPAL FLEET TRANSITION TO ZERO- AND LOW-EMISSION VEHICLES (ZEV)

STEP	STATUS	PROGRESS
1. Convene a quarterly internal City Working Group to coordinate fleet management and citywide ZEV strategy (starting in 2019)	COMPLETE (ongoing)	Public Works, Transportation, Budget, Environment and fleet managers recently discussed FY22 purchasing.
2. Develop a vehicle replacement plan to convert the Central Fleet to 100% zero- and low-emission vehicles (2020)	COMPLETE	The ZEV Roadmap includes fleet replacement scenarios and actions to support fleet electrification.
3. Develop a plan and timeline to deploy electric vehicle charging infrastructure across municipal facilities and lots (2020)	COMPLETE	The ZEV Roadmap includes an assessment and timeline for public charging on municipal lots.
4. Pilot electric, renewable diesel, and other carbon-neutral technologies for heavy fleet vehicle replacement (starting 2021)	NOT STARTED	
5. Develop vehicle replacement plans for non-Central Fleet vehicles (2020-2023)	NOT STARTED	

13. IMPLEMENT AND EXPAND COMMUNITY CHOICE ELECTRICITY (CCE)

STEP	STATUS	PROGRESS
1. Launch CCE program, pending approval of Boston's plan by the Department of Public Utilities (2020)	COMPLETE	Boston launched the Community Choice Electricity program in February 2021.
2. Implement an opt-up engagement program in partnership with community organizations (starting 2020)	IN PROGRESS	Staff have been developing consumer protection campaigns in addition to CCE engagement.
3. Evaluate development of a municipal ratepayer-funded energy efficiency incentive program (starting 2020)	DELAYED	
4. Develop a plan to carry out direct investment in renewables through CCE (2020-2022)	DELAYED	Boston signed an agreement with a solar developer that would have made the developer eligible for low-income SMART incentives for 100 MW of new solar; in return, the developer would provide a share of the funds to pay for discounts to low-income customers. The DPU ordered Boston to delay implementation of the program. The future of the program is uncertain.
5. Use data collected through the CCE program to find opportunities to support energy efficiency programs (starting 2021)	NOT STARTED	

SPOTLIGHT: COMMUNITY CHOICE ELECTRICITY

In February of 2021, the City of Boston launched the Community Choice Electricity (CCE) Program. There are over 150 similar municipal aggregation programs in the Commonwealth of Massachusetts and still more in the other states where these programs are legal. Boston's program is now the biggest municipal aggregation program in New England, with over 200,000 customers at any given time. 63% of residential accounts, 70% of commercial accounts and 2% of industrial accounts are participating in CCE.

The purpose of municipal aggregation programs is to combine the buying power of residents and businesses to secure more favorable electric rates. CCE gives our community control over our electricity supply and allows us to ensure that energy decisions align with our values and goals. Boston's program serves as a vehicle for providing affordable and stable electric rates, procuring and investing in renewable electricity, supporting environmental justice, and strengthening consumer protection in electricity markets.

CCE offers customers three products that vary in price and renewable energy content. Most customers are enrolled in the program's *Standard Product*, which currently delivers 10% more renewable electricity content than required by state law. Customers may also "opt up" and select a 100% clean energy product. Boston's program is unique in that all voluntary renewable electricity purchases come from renewable sources that do not emit carbon and are sourced from generators located on the New England grid.

The City carried out a robust outreach and communications campaign to ensure that Boston's electricity users received information about the program and its opportunities. Eligible customers received a mailing that explained the program and invited them to attend webinars offered in English and eleven other languages. Other multilingual materials — written and visual — were developed for the program and shared with a diverse set of partners, both internal and external to the City.

CCE represents a significant shift from business as usual. It creates a new relationship between the City of Boston and electric customers. As the program matures, it will provide new services, products, and opportunities for constituents.

14. PLAN FOR THE DEPLOYMENT OF CARBON-NEUTRAL DISTRICT ENERGY MICROGRID SYSTEMS

STEP	STATUS	PROGRESS
Continue to align the Smart Utilities Policy with carbon neutrality goals by emphasizing carbon-neutral district energy systems using renewable and all-electric sources	IN PROGRESS	The Smart Utilities Policy was launched as a two-year pilot in 2018. BPDA is assessing potential additional technologies.
Develop a strategy to prioritize where, if at all, natural gas-based systems would still be needed in the future, including hospitals	IN PROGRESS	We are monitoring DPU Docket 20-80 into the future of natural gas distribution. MassCEC awarded the City a grant to conduct a feasibility assessment for resilience energy planning at the Mattapan campus of the Boston Public Health Commission.

15. SUPPORT STATE POLICIES AND PROGRAMS THAT FURTHER DECARBONIZE THE REGION'S AND BOSTON'S ENERGY SUPPLY

STEP	STATUS	PROGRESS
Support a 100% clean grid in the state's net-zero study and plans, and support policies and incentive programs for expanded energy storage, solar and wind generation, and other distributed energy resources	ONGOING	The City of Boston sits on the Implementation Advisory Committee for the Global Warming Solutions Act.
Support Mass Save programming that encourages systematic fuel-switching away from fuel oil and natural gas to electricity or other clean energy sources.	ONGOING	
Advance the 2019 legislative agenda, including an Act to Modernize Our Natural Gas Infrastructure	ONGOING	*See Bill H.2828*.
Support investments in facilities that serve low-income communities during grid outages under the Clean Peak Standard	NOT STARTED	

16. DECARBONIZE THE CONSUMPTION OF BOSTON RESIDENTS AND BUSINESSES

STEP	STATUS	PROGRESS
Conduct a consumption-based emissions inventory	NOT STARTED	
Promote sustainable consumption and help the public shift to goods and services with lower emissions	IN PROGRESS	The Climate Action Guide provides a list of steps residents can take to reduce their impact.
Explore embodied carbon and actions to increase material reuse and use of carbon-sequestering materials	IN PROGRESS	The Zero Net Carbon Zoning Initiative includes an embodied carbon technical advisory group.
Encourage land use and economic development policies that support neighborhood retail and Boston-based startups, to build a local, circular economy that allows residents to meet all of their basic needs close to home and to live car-free.	NOT STARTED	We worked with BU Spark! to carry out an analysis of the 15-minute city within Boston (where it is possible to meet your basic needs within a 15-minute walk or bike ride).

17. GREEN MUNICIPAL INVESTMENTS

STEP	STATUS	PROGRESS
Monitor the performance of the Environmental, Social and Governance (ESG) Investment Initiative	NOT STARTED	
Update our guidelines for environmentally preferable procurement (EPP), also sometimes called “green purchasing”	IN PROGRESS	Zero Waste and Procurement are evaluating options to update Boston’s EPP guidelines.
Explore incorporating ESG principles into management of the City of Boston pension and trust funds	NOT STARTED	

18. DEVELOP A VALUES-BASED FRAMEWORK FOR CARBON OFFSETS

STEP	STATUS	PROGRESS
Develop guidelines for carbon offsets for future City policies and programs	IN PROGRESS	Carbon Free Boston developed principles for carbon offsets.
Explore a local carbon offsets market in partnership with neighboring municipalities and regional partners	NOT STARTED	
Evaluate the role of urban forestry and resilience benefits of local carbon offsets	NOT STARTED	

III. BUILDING ENERGY AND EMISSIONS REPORTING AND DISCLOSURE ORDINANCE

Buildings account for over 70% of greenhouse gas emissions in Boston. The Building Energy Reporting and Disclosure Ordinance (BERDO) requires Boston's large- and medium-sized buildings to report their annual energy and water use. The ordinance also requires the City to make this data public. By reporting and disclosing building data, BERDO makes building owners, tenants and other stakeholders more aware of greenhouse gas emissions and opportunities to reduce both. Covered buildings must also complete a major energy savings action or energy assessment every five years. This helps Bostonians save money and the City achieve its emissions reduction goals, as laid out in its Climate Action Plan.

Compliance status for past 5 years (% of total covered gross floor area)	2016	2017	2018	2019	2020
Annual Reporting	83%	90%	89%	82%	84%
Energy Action & Assessment	N/A	N/A	N/A	62%	45%*

* Note: many building owners requested extensions due to the COVID-19 pandemic.

SPOTLIGHT: PROPOSED BUILDING EMISSIONS PERFORMANCE STANDARD

The City of Boston's 2019 Climate Action Plan (CAP) update identified Building Emissions Performance Standard (BEPS) for buildings as a high-priority strategy to accelerate progress towards the goal of making Boston carbon neutral by 2050. The strategy proposed that buildings over a certain size threshold would need to meet fixed carbon targets that would decrease over time and apply to all building types, including both commercial and multifamily buildings.

The BEPS would cover approximately 3,500 buildings that are at least 20,000 square feet or larger, or with 15 units or more. Covered buildings would include all building types, including large multifamily housing in environmental justice communities and low-income communities. Our approach to develop the policy included both consulting technical experts from the building sector, and engaging frontline community members as co-designers of the policy. This policy was developed in partnership with the City Council of Boston.

In June 2021, City Council President *pro tempore* Matt O'Malley introduced a draft ordinance to City Council to amend the Building Energy Reporting and Disclosure Ordinance to update the reporting requirements and replace the five-year Energy Action & Assessment requirement with the emissions performance standard.

IV. DIESEL EMISSIONS REDUCTION ORDINANCE

ABOUT DERO

The Diesel Emissions Reduction Ordinance, "An Ordinance to Protect Air Quality throughout the City of Boston by Reducing Fuel Emissions," was signed into law in June 2015 to help reduce harmful emissions from diesel vehicles and idling. The ordinance required that all pre-2007 vehicles owned or leased by the

City or used by its contractors to have been retrofitted with more effective emission-reduction equipment.

Since 2007, the U.S. Environmental Protection Agency (EPA) has considerably lowered the amount of pollution permissible from new diesel vehicles and equipment. However, because of their durability, many pre-2007 diesel vehicles remained in use at the time of the ordinance's passage. For this reason, federal, state, and local governments have established programs to encourage the installation of retrofit air pollution control equipment on diesel vehicles and other diesel engines.

To read the full text of DERO, see City of Boston Municipal Code Section 7-2.3.

CITY VEHICLES

DERO instructs that all on-road vehicles, non-road vehicles, and diesel equipment owned, leased, or operated by the City of Boston shall meet EPA emissions standards for new vehicles in effect in 2007 or have been retrofitted to remove at least 20% of particulates from the exhaust stream. There are exceptions for emergency vehicles, snow removal equipment, and equipment rarely used.

City of Boston Fleet

The Central Fleet Management team completed retrofits of diesel vehicles in the Public Works Department fleet that did not meet EPA emissions standards. Retrofits entail installation of Diesel Oxidation Catalysts (DOCs), which are capable of eliminating particulate matter by 20-50%. There are 335 diesel vehicles in the City of Boston fleet, of which 263 meet EPA emissions standards for new vehicles in effect in 2007 or later. Of the 83 pre-2007 diesel vehicles:

- 11 Central Fleet Vehicles have received DOCs;
- 13 vehicles have been inspected and targeted for replacement;
- 3 front-end loaders have no available aftermarket DOCs;
- 3 vehicles that are owned by other departments but are not serviced by Central Fleet have not been retrofit;
- 17 vehicles that are owned by quasi-City agencies that have not been retrofit (note: DERO does not cover quasi-City agency fleets);
- 37 vehicles are exempt, including 21 vehicles used solely for snow removal and 16 vehicles in operation for fewer than 100 hours per year.

As of July 2021, 291 diesel vehicles in the City of Boston fleet are in compliance.

Boston Public Schools Fleet

Since FY16, Boston Public Schools (BPS) has engaged in a long-term strategy to replace diesel-powered school buses with buses that run on liquid propane. As of December 2020, BPS has transitioned 57% of

the school bus fleet, replacing 407 diesel buses with propane buses. Replacements include all diesel buses with 2004 and 2007 emissions, as well as 55 buses with 2010 emissions.

Propane buses are less polluting than diesel buses, have reliable start-up in cold weather, and offer fuel savings. In 2019, BPS purchased 75 Type "A" propane buses with ultra-low NOx emissions; no vehicles were purchased in 2020. New buses are equipped with BEITA (Boston Exceeded Idle Time Abatement) devices, in order to reduce unnecessary school bus idling.

Over half of Boston's school buses run on propane. Photo: John Woike, Hartford Courant.

FUEL PURCHASE

DERO instructs that all on-road vehicles, non-road vehicles and diesel equipment owned, leased or operated by the City of Boston shall be powered by ultra-low-sulfur diesel fuel. The City of Boston has implemented contracts with fuel providers for Ultra Low Sulfur Diesel; the City does not maintain contracts for non-ultra-low-sulfur diesel fuel. The City also has contracts for biodiesel B5, B10 and B20, where the biofuel content ranges from 5% to 20% of a biofuel-diesel fuel blend.

CITY CONSTRUCTION CONTRACT REQUIREMENTS

All contracts entered into by the City of Boston for construction projects and other projects and services having a total estimated cost in excess of $2 million must sign a Certificate of Compliance with "Diesel Emissions Reductions Ordinance" (see form in Appendix III). In FY 2021, the Environment Department coordinated with Auditing to ensure compliance with DERO. The Public Works Department reviews the certificate with contractors at pre-construction meetings.

IDLING

The City of Boston is developing signage to raise awareness of the Massachusetts anti-idling law and will deploy signs at locations where idling complaints have been received from constituents. Residents may also suggest a location for an anti-idling sign.

3. PREPARING FOR CLIMATE CHANGE

I. CLIMATE READY BOSTON

This section identifies our progress in putting in place the 5 layers, 11 strategies, and 39 initiatives recommended in the Climate Ready Boston Outline of Actions.

LAYER 1: UPDATED CLIMATE PROJECTIONS

Strategy 1: Maintain up-to-date projections of future climate conditions to inform adaptation.

INITIATIVE	STATUS	PROGRESS
1.1: Launch the Greater Boston Panel on Climate Change and require periodic updating of Boston-specific climate projections.	IN PROGRESS	The Boston Research Advisory Group (BRAG) is currently updating projections as part of a metro Boston regional project for the MAPC.
1.2: Create updated local flood maps to support planning, policy and regulation.	COMPLETE	The Boston Planning & Development Agency (BPDA) released the updated Climate Change Resilience and Preparedness Checklist with a Flood Hazard Area Map.

LAYER 2: PREPARED AND CONNECTED COMMUNITIES

Strategy 2: Expand education and engagement of Bostonians on climate hazards and action.

INITIATIVE	STATUS	PROGRESS
2.1: Expand Citywide Climate Readiness Education and Engagement campaigns.	IN PROGRESS	Example: The City and BPHC have partnered with the Garrison Trotter Neighborhood Association, Boston Medical Center, Whittier Street Health Center and Shirley's Pantry, to distribute ACs and fans to older residents, residents with chronic health conditions, and low-income residents, and connect them with financial relief programs.
2.2: Launch a Climate Ready Buildings Education Program for property owners and users.	IN PROGRESS	Environment has begun initial planning to develop the program.
2.3: Conduct an outreach campaign to facilities that serve vulnerable populations to support preparedness and adaptation.	IN PROGRESS	Environment is developing targeted outreach and education strategies to increase heat resilience awareness.
2.4: Update the City's heat emergency action plan.	IN PROGRESS	In 2018, BPHC developed an action plan for extreme temperatures. In 2020, Environment was awarded a Massachusetts Municipal Vulnerability Program (MVP) grant for a heat resilience planning study.
2.5: Expand Boston's Small Business Preparedness Program.	NOT STARTED	

Strategy 3: Leverage climate adaptation as a tool for economic development.

INITIATIVE	STATUS	PROGRESS
3.1: Identify resilience focused workforce development pathways.	IN PROGRESS	The City of Boston formed a Community Advisory Board to guide the development and implementation of green jobs programming in Fiscal Year 2022. Environment, MOIA, and MONUM have begun initial planning for a green infrastructure worker-owned cooperative to benefit low-income immigrant communities in partnership with the Boston Center for Community Ownership (BCCO) and Codman Square Neighborhood Development Corporation (CSNDC).
3.2: Pursue inclusive hiring and living wages for resilience projects.	IN PROGRESS	The Boston Jobs and Living Wage Ordinance applies to service contracts with the City valued at or above $25,000 with companies that employ at least 25 full-time employees.
3.3: Prioritize use of minority-and-women-owned businesses for resilience projects.	IN PROGRESS	A 2016 Executive Order mandated that minority and women entrepreneurs be afforded fair and equitable opportunities when competing for City contracts.

LAYER 3: PROTECTED SHORES

Strategy 4: Develop local climate resilience plans to coordinate adaptation efforts.

INITIATIVE	STATUS	PROGRESS
4.1: Develop local climate resilience plans in vulnerable areas to support district-scale climate adaptation.	IN PROGRESS	Phase II of East Boston and Charlestown has begun and will be complete Fall 2021. The Heat Resilience Study is underway and due for completion in Fall 2021.
4.2: Establish local climate resilience committees to serve as long-term community partners for climate adaptation.	ONGOING	Greenovate Boston is continuing community education programs through Greenovate Leaders.

Strategy 5: Create a coastal protection system.

INITIATIVE	STATUS	PROGRESS
5.1: Establish Flood Resiliency Overlay District and require potential integration with flood protection.	IN PROGRESS	The BPDA released Coastal Flood Resilience Design Guidelines and in September 2021 approved a flood resilience overlay district (press release).
5.2: Determine a consistent evaluation framework for flood defense prioritization.	IN PROGRESS	Environment maintains a set evaluation criteria that have been used during the Climate Ready East Boston, Charlestown, South Boston, Downtown, and Dorchester plans.
5.3: Prioritize and study the feasibility of district-scale flood protection.	IN PROGRESS	Environment completed the Downtown, North End, Dorchester and South Boston plans; the planning for phase II of East Boston and Charlestown is underway.
5.4: Conduct a harbor-wide flood protection system feasibility study.	COMPLETE	University of Massachusetts Boston released the "Feasibility of Harbor-wide Barrier Systems" in May 2018, which informed the Resilient Boston Harbor Vision.

LAYER 4: RESILIENT INFRASTRUCTURE

Strategy 6: Coordinate investments to adapt infrastructure to future climate conditions.

INITIATIVE	STATUS	PROGRESS
6.1: Establish an Infrastructure Coordination Committee (ICC).	IN PROGRESS	The City of Boston participates in the Metro-Mayors Resiliency Taskforce, hosted by the Metro Area Planning Council every quarter.
6.2: Continue to collect important asset and hazard data for planning purposes.	ONGOING	The City is participating in a Storm-resilient Infrastructure Assessment led by the Resilient Mystic Collaborative with other Lower Mystic municipalities to understand coastal storm impacts across critical infrastructure in the region.
6.3: Provide guidance on priority evacuation and service road infrastructure to the ICC.	IN PROGRESS	The BPDA, Office of Emergency, and Environment meet regularly to coordinate efforts.

Strategy 7: Develop district-scale energy solutions to increase decentralization and redundancy.

INITIATIVE	STATUS	PROGRESS
7.1: Conduct feasibility studies for community energy solutions.	IN PROGRESS	Through the City of Boston's Smart Utilities Policy, Article 80 development promotes utilities that are easier to build, maintain and upgrade and hardens infrastructure against flooding and heat waves. Feasibility of energy solutions is considered throughout this process.

Strategy 8: Expand the use of green infrastructure and other natural systems to manage stormwater, mitigate heat, and provide additional benefits.

INITIATIVE	STATUS	PROGRESS
8.1: Develop a green infrastructure location plan for public land and rights-of-way.	IN PROGRESS	Parks completed a design and implementation guide for green infrastructure. Boston Water and Sewer Commission (BWSC) is finalizing conceptual designs and cost estimates of green infrastructure in Boston's tributary areas.
8.2: Develop a sustainable operating model for green infrastructure on public land and rights-of-way.	IN PROGRESS	The Green Stormwater Infrastructure working group meets monthly to coordinate green infrastructure planning across departments.
8.3: Evaluation incentives and other tools to support green infrastructure.	IN PROGRESS	The Smart Utilities Policy requires properties over 100,000 square feet under Article 80 Review to retain 1.25" rainfall on impervious areas onsite.
8.4 Develop design guidelines for green infrastructure on private property to support co-benefits.	IN PROGRESS	BWSC is creating a design manual for green infrastructure. BPDA Coastal Flood Resilience Design Guidelines are complete.
8.5 Develop an action plan to expand Boston's urban tree canopy.	IN PROGRESS	Parks and Recreation is leading the development of an Urban Forestry Plan.
8.6: Prepare outdoor facilities for climate change.	NOT STARTED	
8.7: Conduct a comprehensive wetlands inventory and develop a wetlands protection action plan.	NOT STARTED	Note: The FY22 budget included $50,000 to begin developing a wetlands inventory.

LAYER 5: ADAPTED BUILDINGS

Strategy 9: Update zoning and building regulations to support climate readiness.

INITIATIVE	STATUS	PROGRESS
9.1: Establish a planning flood elevation to support zoning regulations in the future floodplain.	IN PROGRESS	BPDA established a planning flood elevation based on 40 inches of sea level rise to evaluate new projects in the updated Climate Change Resilience and Preparedness Checklist.
9.2: Revise zoning code to support climate ready buildings.	IN PROGRESS	The BPDA is developing a flood resiliency zoning proposal to present to the Zoning Commission.
9.3: Promote climate readiness for projects in the development pipeline.	NOT STARTED	Pending completion of Initiative 9.2.
9.4: Pursue state building code amendments to promote climate readiness.	NOT STARTED	The City has partnered with the Cities of Somerville and Cambridge to advocate with the Commonwealth's Board of Building Regulation and Standards (BBRS) to advance a net zero carbon stretch code. The BBRS has since begun exploring the creation of a net zero carbon stretch code.
9.5: Incorporate future climate conditions into area plans.	IN PROGRESS	BPDA's Dot Ave , JP/Rox, and Glover's Corner plans include recommendations for climate preparedness and resiliency.

Strategy 10: Retrofit existing buildings.

INITIATIVE	STATUS	PROGRESS
10.1: Establish a Resilience Audit Program for property owners.	NOT STARTED	*Helpful resource: Please inquire A Better City for a report on resilient audit program recommendations.*
10.2: Prepare municipal facilities for climate change.	IN PROGRESS	The City's insurance company, FM Global, is assessing the flood vulnerability of several high-risk municipal buildings.
10.3: Expand back-up power at private buildings that serve vulnerable populations.	NOT STARTED	Completed in 2016, the Boston Community Energy Study identifies districts that are suitable for community solar projects.
10.4: Develop toolkit of building retrofit financing strategies.	NOT STARTED	*Helpful resource: UMass Boston released a report in April 2018, "Financing Climate Resilience".*

Strategy 11: Insure buildings against flood damage.

INITIATIVE	STATUS	PROGRESS
11.1: Evaluate the current flood insurance landscape in Boston.	COMPLETE	FEMA conducted an evaluation as part of the City of Boston's Community Assistance Visit in Fall 2019.
11.2: Join the NFIP Community Rating System.	IN PROGRESS	The Community Assistance Visit, which is a prerequisite to the Community Rating System, is underway with FEMA.
11.3: Advocate for reform in the National Flood Insurance Program.	NOT STARTED	

II. NEIGHBORHOOD COASTAL RESILIENCE PLANS

We can protect our coastal communities from sea level rise and storms by creating resilient, accessible open spaces, and prepared buildings and infrastructure. The Resilient Boston Harbor Vision lays out strategies along Boston's 47-mile shoreline that will increase access and open space along the waterfront while providing protection for the City. To achieve this, the City focuses neighborhood scale coastal resilience planning in Boston's most vulnerable flood pathways, identified by Climate Ready Boston flood maps.

INITIATIVE	STATUS	PROGRESS
East Boston and Charlestown	IN PROGRESS	Phase I of coastal resilience planning was completed and a report was released in 2017. Phase II began in summer 2020, with community engagement ongoing in summer 2021. (Learn more about Climate Ready East Boston and Charlestown.)
Downtown and North End	COMPLETE	Report released in 2020. (Learn more.)
South Boston	COMPLETE	Report released in 2018. (Learn more.)
Dorchester Waterfront	COMPLETE	Report released in 2020. (Learn more.)

4. PRESERVING OUR ENVIRONMENT

The Conservation Commission enhances the quality of life in Boston by protecting water and land resources. Protecting and restoring our natural environment and ecosystems is central to our mission. We know when people have clean parks and water, they are healthier and happier.

I. WETLANDS PROTECTION ORDINANCE

In 2019, the City of Boston passed a local wetlands ordinance. The Wetlands Protection Ordinance gives the City greater authority to protect its wetlands. Our wetlands are crucial to controlling flooding and protecting Boston's neighborhoods and green spaces. Developing regulations is the first step that will help Boston preserve its natural areas for years to come. (Learn more about the regulations process.)

Over the course of Fiscal Year 2021, the Conservation Commission:

- Adopted administrative and procedural regulations in August 2020;
- Developed and released for public comment a set of performance standards that projects would be required to follow to protect and preserve the following resources:
    - isolated vegetated wetlands, which are wetlands that are not next to open water
    - vernal pools and vernal pool habitat, which are small depressions that seasonally fill with water, and
    - land subject to coastal storm flowage, which is the same as the 100-year floodplain.
- Launched a Community Advisory Board (CAB) to inform regulations-making to address the climate resiliency and environmental justice components of the Ordinance.

In Fiscal Year 2022, the City has assembled a CAB to help guide the process of developing the third phase of regulations. CAB representatives are key partners who help shape an inclusive regulations development and community engagement process. In collaboration with the CAB, we hope to create regulations that represent community values and objectives.

II. URBAN WILDS

The City of Boston manages and takes care of 29 urban wilds across our neighborhoods. These urban wilds offer a peaceful break from Boston's urban environment. They serve as outdoor classrooms for children and adults to learn about nature and provide habitat to native plants and animals. Additionally, urban wilds perform many ecological services, such as:

- storing floodwater;
- filtering stormwater run-off;
- producing oxygen; and
- reducing the "urban heat island" effect.

In 2021, the Conservation Commission acquired an additional 6.51 acres of land for conservation and passive recreation purposes as of July 30, 2021.

5. BECOMING A ZERO-WASTE COMMUNITY

I. BY THE NUMBERS

Boston Residential Municipal Solid Waste (MSW) Tonnage

Fiscal Year	Trash	Recycling	Yard Waste	Project Oscar	Textiles	Residential Recycling Rate
2021	199,525	45,065	9,805	*	164**	22%
2020	194,228	42,953	9,050	120	--	22%
2019	190,459	41,370	9,290	104	--	21%

Note: Project Oscar is Boston's 24-hour community compost pilot program.
* Data not yet available.

** Drop off locations began October 21, 2020 through June 30, 2021

II. ZERO WASTE BOSTON

Released in June 2019, Zero Waste Boston is Boston's plan to become a zero-waste community. The plan details 30 short- and long-term strategies to increase diversion from 25% in 2018 to at least 80% by 2035.

REDUCE AND REUSE

STEP	STATUS	PROGRESS
Short-term strategies to advance		
1. Conduct citywide public education campaigns	ONGOING	Environment and Public Works developed messaging to inform the public about the safety of reusable PPE and to encourage their use during COVID-19. Environment has shared updates about the plastic bags ordinance to Economic Development's weekly Small Business meetings. Outreach also includes weekly social media posts (#ZeroWasteWednesdays) and events like "Feed the Monster", a Parks partnership for residents to compost Halloween pumpkins.
2. Provide targeted waste-reduction outreach and technical assistance	ONGOING	Environment and Inspectional Services partnered with RecyclingWorks MA to distribute "Waste Reduction for Businesses" resource cards. Environment is identifying deconstruction technical assistance opportunities.
3. Reduce problem products & packaging	ONGOING	The City contributed to the draft state Extended Producer Responsibility packaging legislation to be submitted this year.

STEP	STATUS	PROGRESS
Short-term strategies to advance (continued)		
4. Divert more reusable goods	IN PROGRESS	Public Works launched a textile recycling dropbox program with Helpsy at municipal lots and BYCF and BPS locations. Environment participates in the MassDEP Reduce & Reuse Working Group, the UPSTREAM - Government Reuse Forum, and the Carbon Leadership Forum - Reuse sub working group, and facilitates the Boston Deconstruction Working Group.
Long-term strategies to advance		
5. Divert more reusable goods	NOT STARTED	
6. Keep repairable products from disposal	IN PROGRESS	We are partnering with Boston Public Library to host Fix-it Clinics at local branch libraries.

INCREASE COMPOSTING

STEP	STATUS	PROGRESS
Short-term strategies to advance		
7. Expand residential yard waste options	COMPLETED	Public Works expanded residential yard waste collection to 20 weeks and added a drop-off day.
8. Pilot programs to handle residential food scraps	IN PROGRESS	Public Works is planning to expand Project Oscar to up to 12 new locations citywide.
9. Expand commercial composting	NOT STARTED	
10. Increase compost capacity	IN PROGRESS	Request for Information went out in August 2019 for how to manage compost for the city; responses under review.
Long-term strategies to advance		
11. Take residential composting programs to scale	IN PROGRESS	Public Works budget and the state's Department of Environmental Protection (DEP) dividends are funding sources for Oscar expansion.
12. Increase commercial composting	NOT STARTED	

RECYCLE MORE AND RECYCLE RIGHT

STEP	STATUS	PROGRESS
Short-term strategies to advance		
13. Educate boston residents, businesses and visitors to recycle correctly	ONGOING	Environment created "Recycle Right" classroom signage for Boston Public Schools during COVID-19, and increased social media posts, using the hashtag #ZeroWasteWednesdays and developing seasonal blog posts with zero waste tips. Public Works launched the Recycle Right campaign, to reduce contamination.
14. Expand and enforce state and local waste reduction and recycling requirements	IN PROGRESS	Inspectional Services enforces the plastic bag ordinance. Environment is preparing awareness-raising measures ahead of the state-level organic material waste ban for commercial generators, and submitted public comment on MassDEP's proposed waste disposal ban amendments.
15. Reinforce waste-reduction goals through the collection system	NOT STARTED	
16. Create new commercial hauler and generator rules	IN PROGRESS	In 2020, Public Works expanded commercial trash hauler permits to include all waste haulers. This helps commercial waste data collection.
17. Lead by example at public facilities	IN PROGRESS	Boston Public Schools is developing a food waste collection and diversion program to comply with the MassDEP organic material disposal ban and its forthcoming amendment. Procurement added green indicators to the pricing worksheet of the Purchasing Department's janitorial supplies and disposable paper and plastic bids.
18. Expand recycling during construction projects	IN PROGRESS	Environment is working with City agencies and the building industry to identify deconstruction pilot projects.
19. Increase transparency about costs	NOT STARTED	
20. Expand infrastructure for recycling "hard to recycle" materials	IN PROGRESS	Public Works is considering creating a zero waste drop-off center.
21. Require zero waste strategies for public events	IN PROGRESS	Published a "Zero Waste Event Checklist", available online.
Long-term strategies to advance		
22. Create a more equitable collection system by instituting trash limits.	NOT STARTED	

INSPIRE INNOVATION

STEP	STATUS	PROGRESS
Short-term strategies to advance		
23. Expand the city's environmentally preferable purchasing practices	IN PROGRESS	Environment and Procurement are collaborating with the MA Operational Services Division to review purchasing practices (for example, Procurement added green criteria for janitorial supplies and disposable paper and plastic procurements).
24. Set zero waste reduction goals and metrics	IN PROGRESS	Public Works, New Urban Mechanics and Innovation & Technology are creating a dashboard for Zero Waste metrics.
25. Advocate for redesign and take-back of products	IN PROGRESS	The City participates in the MassDEP Reduce & Reuse Working Group to advocate for designing products for repair and reuse.
26. Support green jobs	ONGOING	Environment provides technical assistance and supports waste reduction initiatives. Reuse and repair expertise is represented on the Green Jobs Community Advisory Board. Public Works received $500,000 for zero waste jobs training in the FY22 budget.
27. Create a zero waste economic development strategy	IN PROGRESS	Environment and Economic Development are developing a zero waste economic development team.
Long-term strategies to advance		
28. Fund new ideas and approaches	NOT STARTED	
29. Support a zero waste research and development network	NOT STARTED	
30. Explore the feasibility of city-owned trash and recycling infrastructure	IN PROGRESS	Public Works proposed for FY22 Budget a zero waste drop-off site at Forest Hills.

III. PLASTIC BAG ORDINANCE

Single-use plastic bags have adverse impacts on the environment. In an effort to conserve natural resources, reduce litter and marine pollution and to protect public health, Boston passed "an ordinance regarding the reduction of plastic bags in Boston" on December 14, 2018. Per the Ordinance, retailers are required to provide reusable bags, recyclable paper bags or compostable bags to customers for a minimum of 5 cents.

Due to COVID-19 on March 24, 2020, the City put in place a temporary executive order that exempted all establishments from the bag ordinance. On October 1, 2020, all provisions of the ordinance came back into effect.

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ENVIRONMENT DEPARTMENT STAFF

Katherine Eshel
Laura Alves
Alison Brizius
Susan Cascino
Zoe Davis
Kathleen Hart
Christopher Kramer
Joseph LaRusso
David Musselman
Victoria Phillips
Brenda Pike
Sanjay Seth
Benjamin Silverman
Carl Spector
Bradford Swing

TRANSPORTATION DEPARTMENT STAFF

Matthew Moran
Alaa Mukahhal
Stefanie Seskin
Matthew Warfield

PUBLIC WORKS DEPARTMENT STAFF

Mathew Bradley
Brian Coughlin
William Coughlin
Dennis Roache

BOSTON PLANNING AND DEVELOPMENT AGENCY STAFF

Manuel Esquivel
Christina Kim

APPENDICES

This section includes:

- City of Boston 2005-2019 Greenhouse Gas Inventory;
- Highlights from Boston's Previous Climate Action Plans.
- Template Certificate of Compliance with "Diesel Emissions Reductions" Ordinance.

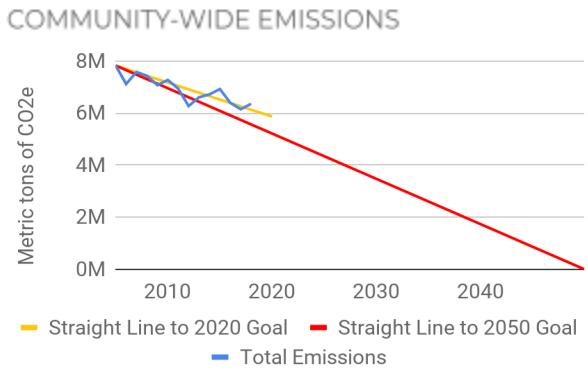
CITY OF BOSTON GREENHOUSE GAS EMISSIONS INVENTORY 2005-2019

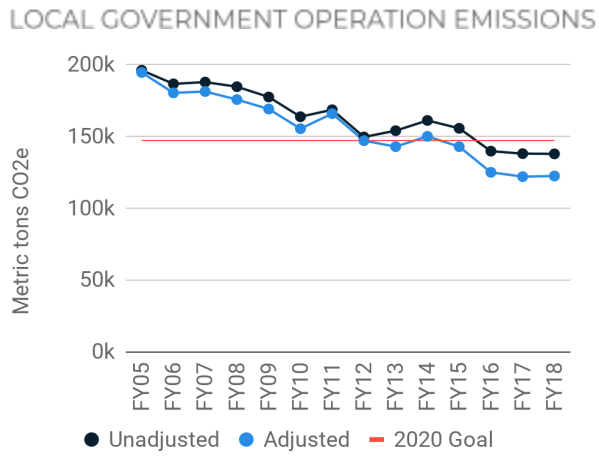
OVERVIEW

In 2019, the Boston community emitted 6.2 million metric tons of greenhouse gases (GHGs) from energy use in buildings and transportation. This is nearly a 2% decrease from 2018, when Boston emitted 6.4 million metric tons.[1] This decrease is due to cleaner electricity, lower electricity, natural gas (also known as methane gas), and fuel oil use. Overall, Boston's 2019 emissions represent a 21% reduction from 2005. Citywide emissions are reported by calendar year.

Local government operations emitted 138 thousand metric tons of GHGs, a 40% reduction from 2005 with Renewable Energy Certificates (RECs), and a 33% reduction without RECs. The City of Boston met its 2020 goal of cutting municipal emissions 25% below 2005 levels in 2015 five years ahead of schedule. Local government operation emissions are reported by fiscal year.

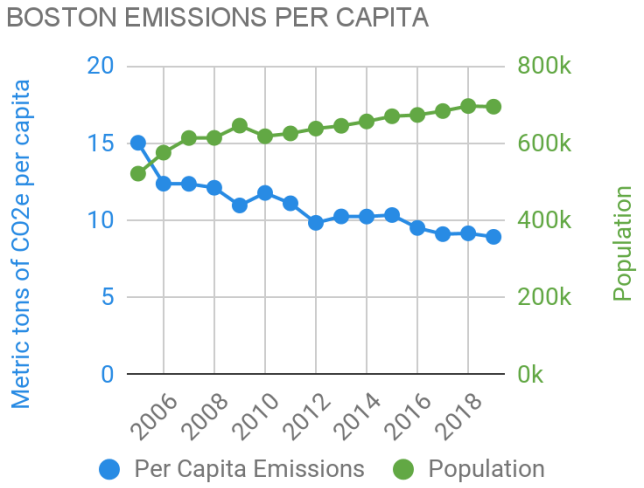
Greenhouse gas inventory datasets are available at:
https://data.boston.gov/dataset/greenhouse-gas-emissions

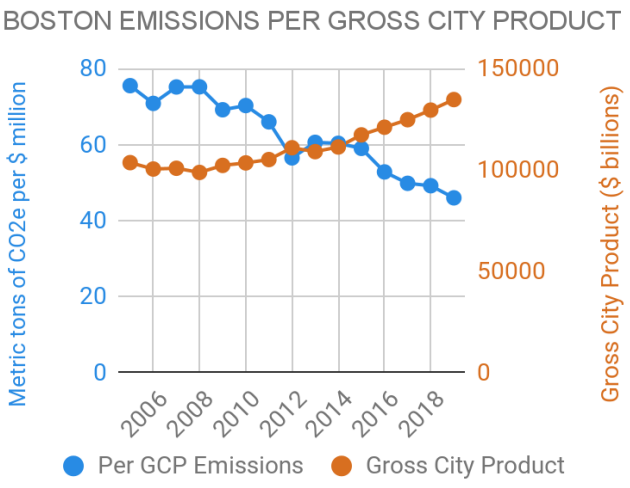




ECONOMIC & POPULATION GROWTH

The reduction in Boston's emissions has occurred at the same time that the population and the number of jobs in Boston have increased. The Boston community has grown from 520 thousand residents in 2015 to more than 694 thousand in 2019.[2] Emissions per resident over the same time period have decreased 41%, from 15 to 9 metric tons per year. Boston's economic growth, as measured by Gross City Product (GCP), has increased from 106 billion dollars to 135 billion.[3] Emissions per million dollars of GCP have decreased 39%, from 76 to 46 metric tons per million dollars.





BACKGROUND

In 2017, the City of Boston committed to a goal of reaching carbon neutrality by 2050.[4] This commitment underpins the City's 2019 Climate Action Plan Update, released in October 2019.[5] To measure progress, Boston follows the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC).[6] The baseline year is 2005, the first year in which consistent and reliable data was collected. Boston has interim goals to reduce citywide emissions by 25% by 2020 and by 50% by 2030.

The annual GHG inventory is based on a combination of direct data and estimates for data that cannot be obtained directly (see box below). Data sources include City records, utility company reports, and information from state and federal agencies. Reporting is separated into community-wide and local government operations inventories. Because the data for these inventories is collected using separate protocols on separate timescales, the Local Government Operations Inventory should be considered to be overlapping, but not completely contained within the Citywide Inventory. Detailed notes on inventory methodologies can be found in Appendix I.

WHAT'S INCLUDED?

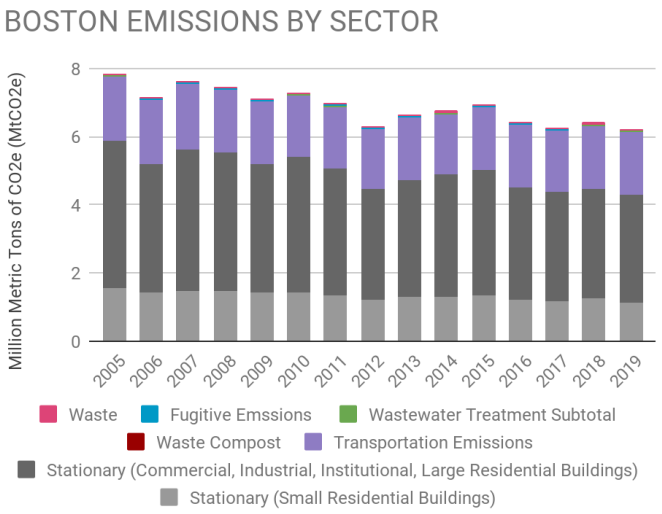
- Energy used by buildings and other stationary sources; fugitive emissions from methane distribution within Boston limits
- On-road and some off-road transportation, and public transportation trips within city limits.
- Wastewater treatment within city limits.

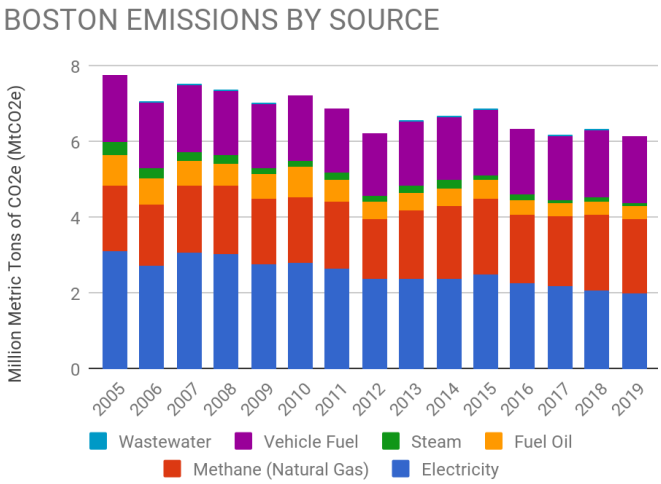
WHAT'S NOT?

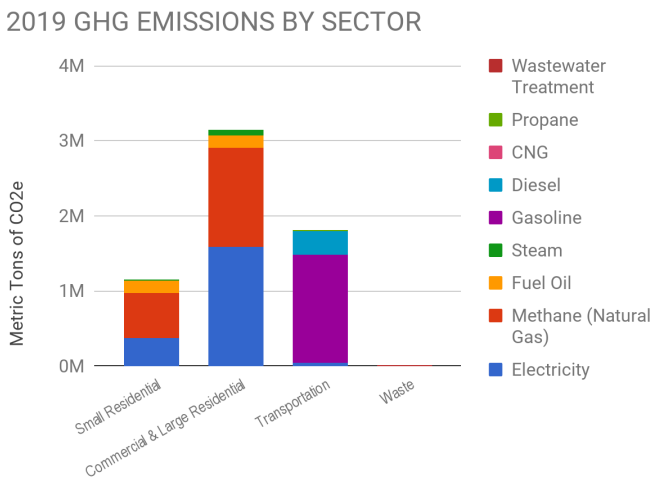
Emissions generated outside the city boundary to produce goods or services used by residents (for example, emissions from food produced elsewhere but consumed by Bostonians). Boston will continue to evaluate the benefits and challenges of "consumption-based" emissions accounting as a complement to the current inventory methodology.

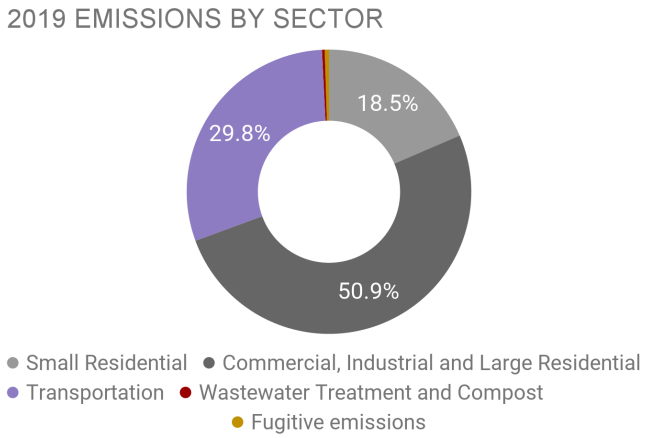
EMISSIONS BY SECTOR & SOURCE

This report contains details of GHG emissions from 2005 to 2019 by energy source and sector. GHG levels reflect both the quantity of energy used and the source of that energy.









STATIONARY SECTOR

The community inventory tracks stationary sector emissions from:

- Commercial, industrial and large residential buildings, including high-rise offices, hospitals, universities and research buildings, manufacturing, and construction,
- Small residential buildings,
- Fugitive emissions from oil and natural gas (or methane gas) systems.

In Boston, energy use in stationary sources dominates, accounting for 69% of total emissions (4.3 MtCO2e). Commercial, industrial, and large residential buildings generated 51% of emissions (3.1 MtCO2e), while small residential buildings accounted for 19% of emissions (1.1 MtCO2e). Fugitive gas emissions for all sectors account for less than 1% (30 thousand tCO2e) of emissions. Emissions in the building sector stem from the use of electricity (46%), natural gas (or methane gas) (45%), fuel oil (8%), and steam (2%).

All buildings over 35,000 square feet publicly report their energy and water usage annually. Data is available at: https://data.boston.gov/dataset/building-energy-reporting-and-disclosure-ordinance

TRANSPORTATION

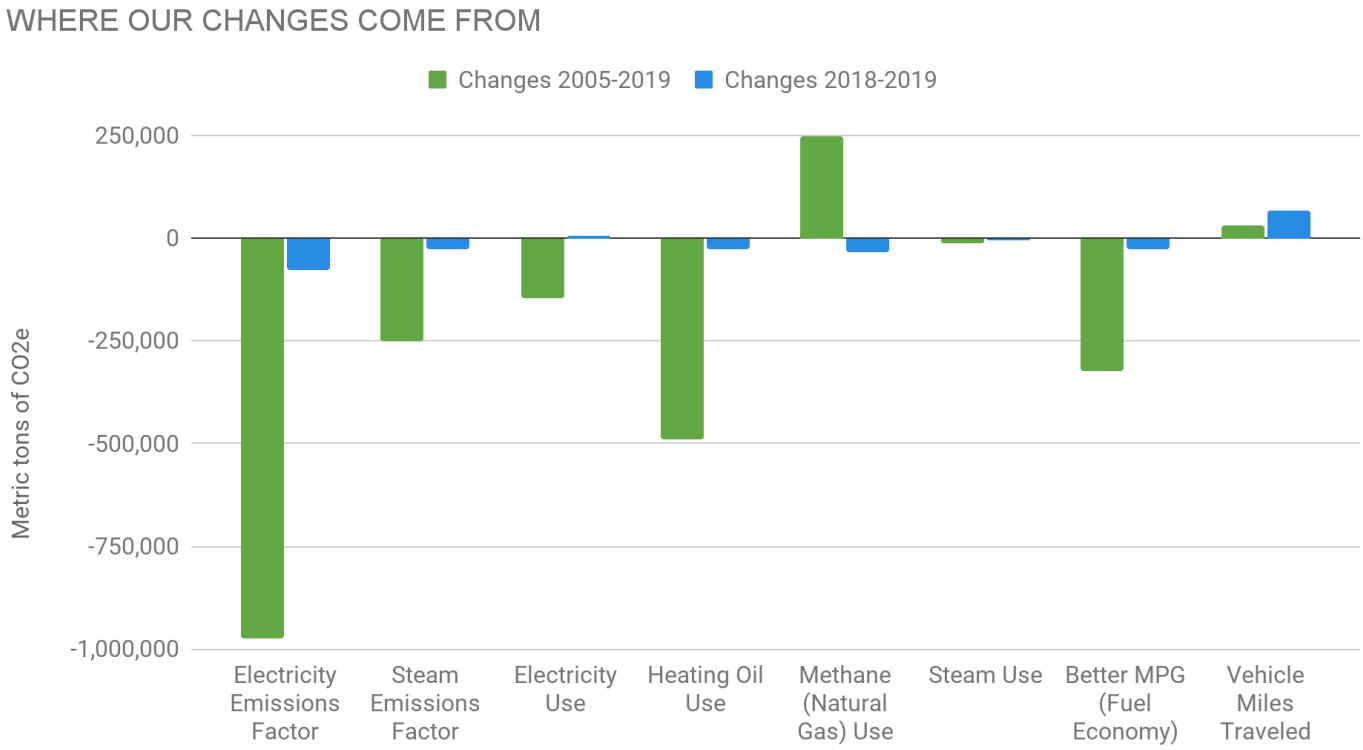
Emissions from transportation comprise 30% of the inventory (1.9 MtCO2e). This is lower than transportation's share of statewide or national emissions because of Boston's density and robust public transportation system. More than half of Bostonians get to work via a mode other than a car.[7] The inventory captures the emissions from the estimated Vehicle Miles Traveled (VMT) inside the City, plus public transportation and off-road vehicles used at the airport and wastewater treatment plant. Primary energy sources include gasoline (76%), diesel (20%), natural gas (or methane gas) (1%), electricity (2%), biodiesel and propane combined (<1%).

WASTE

GHGs reported in the waste sector refer to emissions from wastewater treatment and biological treatment of organic waste and account for less than 1% of total emissions (19 thousand tCO2e). All, or almost all, of Boston's solid waste is sent to Waste-To-Energy (WTE) incineration plants that feed the electricity grid, so emissions are counted as part of regional electricity generation within this inventory. This means solid waste emissions are embedded in the emissions from electricity used in buildings and transportation.

The Carbon Free Boston analysis estimated that Boston's waste sector accounted 393 thousand tons of direct carbon emissions in 2017, if the WTE emissions are broken out from the electricity emissions factor.[8] The Zero Waste Boston initiative has issued strategies to reduce, reuse, recycle and compost at least 80 to 90% of Boston's solid waste.[9] The Carbon Free Boston analysis determined that a 90% diversion rate would reduce waste emissions by 78% relative to 2017 emissions, including the WTE emissions.

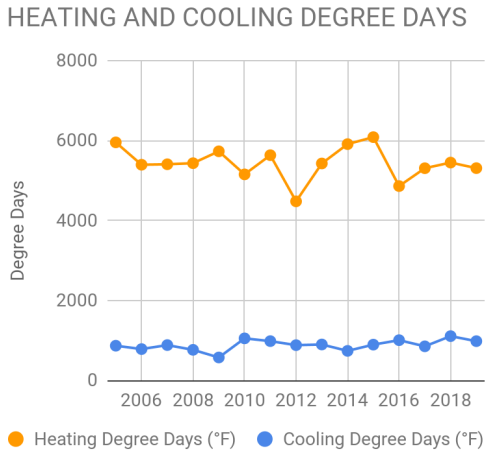
FACTORS DRIVING THE CHANGES



Short-term changes

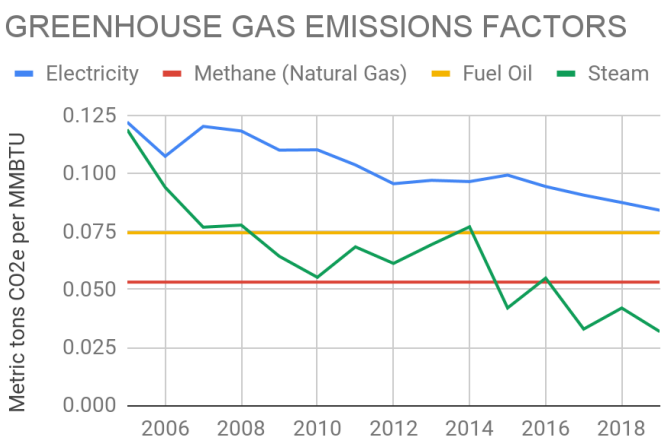
In 2019, the community's GHG emissions decreased nearly 2% (174 thousand tCO2e) from the previous year. This decrease reflects that:

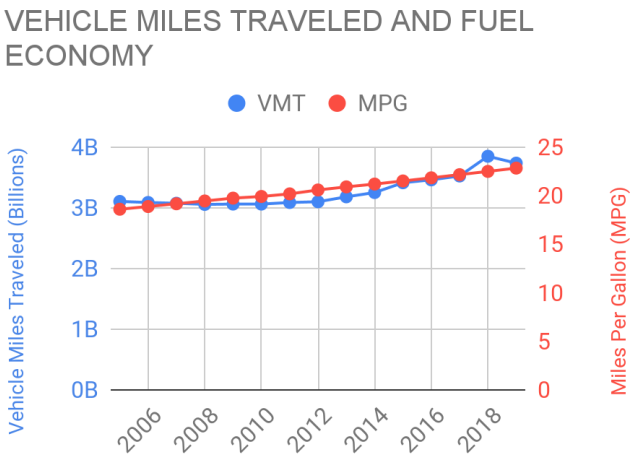
- Regional emissions per unit of electricity decreased by 3.4%.[12,13]
- Boston businesses and institutions consumed less electricity and Boston residents used less fuel oil.
- However, Boston residents, businesses and institutions used 2% less natural gas (or methane gas) than in 2018. The 2019-20 winter was slightly warmer than the 2018-19 winter.[10]



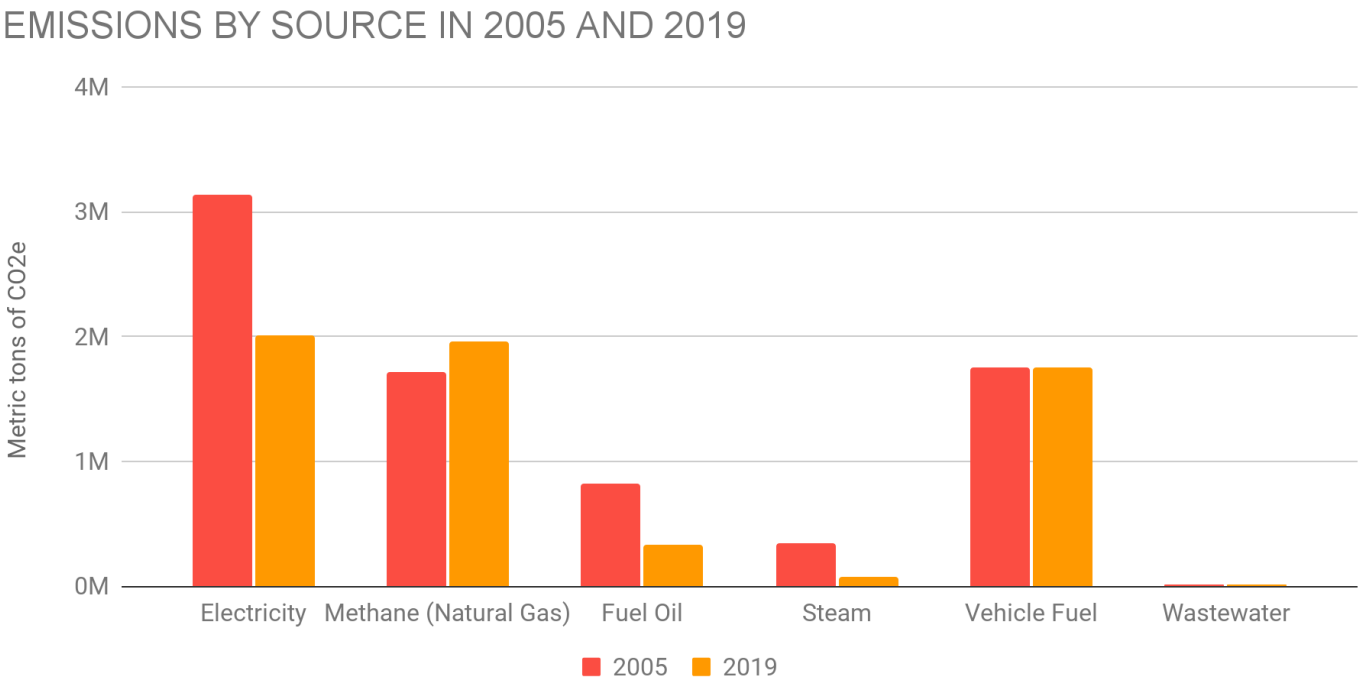
Long-term changes

Boston's GHG emissions from 2005 to 2019 have declined by 21%. 51% of GHG reductions are the result of state-level and regional action to clean the New England electric grid. As a result, the electricity emissions factor has improved continuously over time, as electricity has been less carbon-intensive. Another 25% of GHG reductions may be attributed to reduced fuel oil use. This is because many households and businesses are switching from fuel oil to natural gas (or methane gas) to heat their homes. Steam has become cleaner thanks to fuel-switching from oil to natural gas (or methane gas) and the addition of the Kendall cogeneration plant in 2014. The average fuel economy of vehicles registered in Boston has also improved from 19.8 miles per gallon (mpg) in 2009 to 21.2 mpg in 2014 (most recent year for which Boston-specific data is available).[14]





The energy-efficiency efforts of the Renew Boston program, Boston's utilities, local government and many businesses, institutions, and residents have offset much of Boston's recent growth.



UNCERTAINTY

The inventory employs measured data, projections, models, and, where data is scarce, best estimates. All of these sources have some level of uncertainty, most of which have not been quantified. Furthermore, the inventory is frequently revised as new and better data become available, models are improved, new methodology is developed, and international standards evolve.[15] For these reasons, longer term trends are likely more reliable than absolute numbers or year-to-year changes.

LOCAL GOVERNMENT OPERATIONS

BACKGROUND

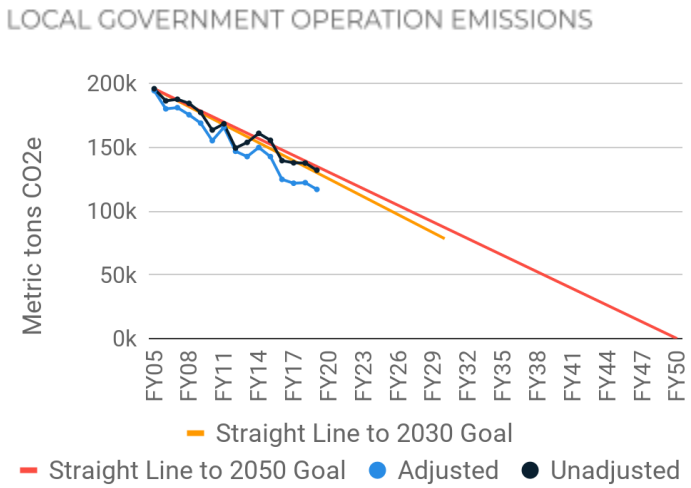
The Local Government Operations (LGO) inventory calculates all greenhouse gas emissions generated by municipal operations in the City of Boston. This includes the burning of fuels in the City's facilities, vehicles, and other equipment, and the energy used in municipal buildings, vehicles, parks, street lights, and traffic signals. The LGO inventory is based on the ICLEI greenhouse gas reporting protocol for local government operations.

Under the protocol, emissions that are not under the operational control of the City government or involve leased properties are excluded. Emissions from the Boston Housing Authority, the Massachusetts Water Resources Authority (MWRA), and the Boston Planning and Development Agency (BPDA) are not included in the inventory. Those from the Boston Public Health Commission (BPHC) and the Boston Water and Sewer Commission (BWSC) are included.

While the timeframe for the citywide inventory is the calendar year, the LGO inventory is conducted based on the fiscal year (FY), July-June. Because the data for these inventories is collected using separate protocols and on different timescales, the LGO should be considered to be largely overlapping but not completely contained within the citywide inventory.

OVERALL EMISSIONS

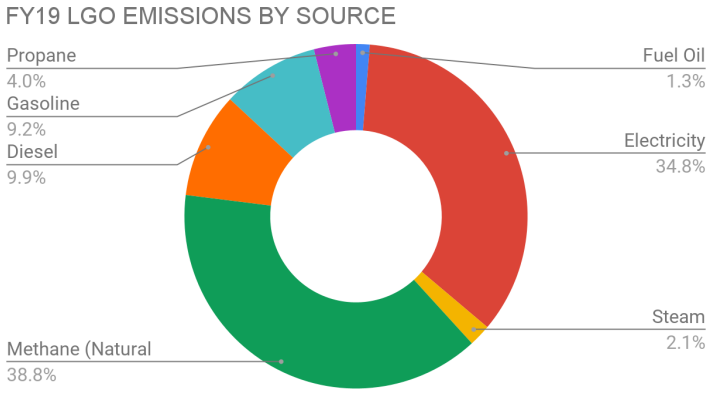
FY19 municipal emissions are down nearly 33% from 2005, before including adjustments for the purchase of renewable energy credits. Adjusting for the City of Boston's purchases of Green-E Certified Renewable Energy Certificates (RECs) equal to approximately one fourth of our total electricity consumption, emissions in FY19 are down more than 40% from 2005 levels. The City of Boston met its municipal 2020 goal of a 25% reduction 5 years ahead of schedule.



EMISSIONS BY ENERGY SOURCE

Boston's LGO emissions are dominated by building energy consumption. Electricity and gas consumption by buildings each make up about one third of total GHG emissions. Transportation fuels, diesel and gasoline, together make up one fourth of total municipal GHG emissions.

Similar to the community-wide inventory, Boston's municipal operations GHG inventory trends are driven by a number of external and internal factors. Diesel consumption is continuing to decrease as Boston Public Schools switches its fleets from diesel- to propane-powered school buses. The continued downward trend in the regional electric grid emissions rate also contributed to reduced emissions.

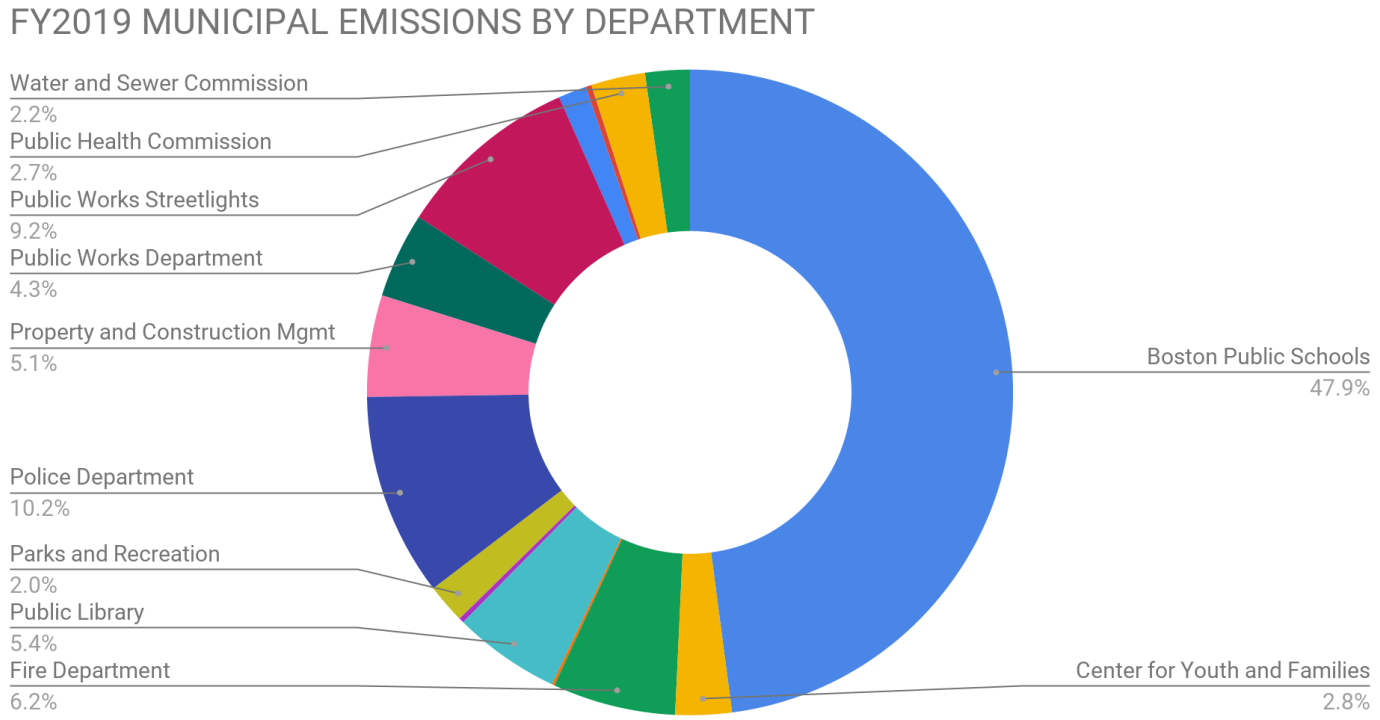


DEPARTMENTAL EMISSIONS

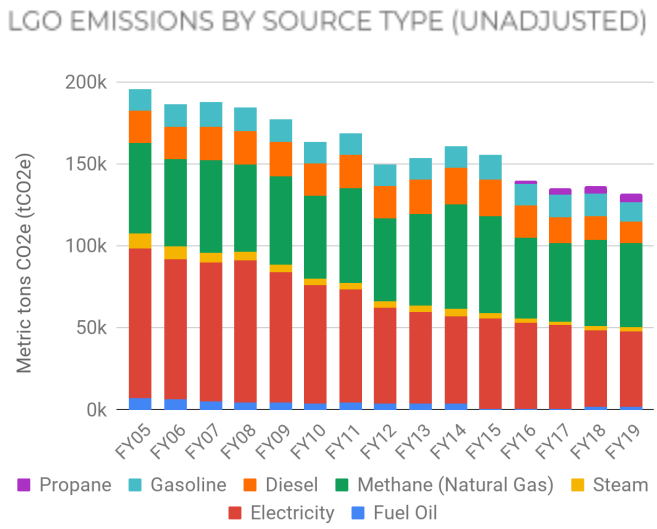
As the department with the largest building portfolio and the second largest vehicle inventory (after Boston Police Department), Boston Public Schools (BPS) represent the largest source of municipal emissions. BPS owns and operates approximately 11 million of the City's 16.5 million square feet of building space across the roughly 127 school buildings in the district.[16] These buildings represent over a third of municipal electricity consumption and two thirds of municipal gas consumption. The BPS Department of Transportation (DOT) fleet includes over 700 school buses and uses 73% of all the diesel fuel consumed by municipal government. BPS has continued their replacement of the oldest, dirtiest diesel buses to lower emissions propane engines; propane buses represented more than half of the fleet in 2020. Since BPS-DOT is on a roughly 10 year replacement cycle, these lower emissions vehicles will provide emissions reductions over the next decade.

The next largest source of GHG emissions from municipal operations is the Boston Police Department (BPD) at about 10.2% of total municipal emissions. In FY19, BPD operated approximately 660,000 square feet of building area and managed a fleet of over 1,000 vehicles. These buildings accounted for 7% of electricity and 5% of natural gas (or methane gas) consumed by City of Boston departments. The BPD fleet accounted for roughly 63% of all gasoline consumed by City of Boston vehicles in FY19.

The third largest source of GHG emission from municipal operation is the Public Works Department's street lighting inventory. The 66,000 electric street lights and the 2,800 natural gas (or methane gas) street lights (found in Boston's historic districts) account for 9% of total municipal GHG emissions. Street lighting used to make up a much larger share of Boston's municipal GHG profile; however, aggressive conversions of electric street lights to LEDs dating back to 2010 have cut emissions from street lights in half. While gas lamps comprise just 4% of total street light fixtures, they produce 37% of GHG emissions from street lights.



FACTORS DRIVING THE CHANGES



- The electricity emissions factor decreased as described in the community inventory.
- Emissions from natural gas (or methane gas) and fuel oil use have decreased since FY05 as the City converted some older schools from oil to gas, and opened new, energy-efficient buildings that use natural gas (or methane gas) for heat and hot water.
- Beginning in FY15, Boston saw a dramatic reduction in fuel oil use due to the closure of the Boston Public Health Commission's Long Island facility, which relied primarily on fuel oil as a heating source.
- Electricity use has decreased over the long term, primarily driven by the near complete conversion of Boston's 66,000 electric streetlights to more efficient LED fixtures. Boston has also invested in building energy efficiency measures on a project-by-project basis, and is engaging in deeper energy efficiency retrofits as part of the Renew Boston Trust.[17]
- Steam use has decreased over the long term due to the reduction in steam use at City Hall and Copley Library and the conversion of the West End Branch library from steam to gas.
- Boston Public Schools have adopted a policy to transition the bus fleet from diesel to propane, which offers a slight carbon benefit but reduces nitrogen dioxide (NOx) emissions by up to 95% compared to diesel.

INVENTORY METHODOLOGY SUMMARY

COMMUNITY INVENTORY PROTOCOL

In 2015, the City of Boston signed on to the Global Covenant of Mayors (GCoM), which required the City to follow the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC). ICLEI Local Governments for Sustainability, whose guidance the City already followed, was a co-developer of the GPC, so the differences were not major. The two main changes were in the categories in which the data is collated, and in two new categories of emissions collected. The GPC requires the ethanol content of gasoline to be reported as a separate biogenic source of emissions, and for an accounting of fugitive gas emissions from the natural gas (or methane gas) supply system.

Boston's GHG inventories are reported in CO2 equivalents (or CO2e), a universal unit of measurement that accounts for the global warming potential (GWP) of different greenhouse gases. Boston's inventory includes carbon dioxide (CO2), natural gas (CH4), and nitrous oxide (N2O), and uses Global Warming Potentials (GWPs) from the latest version of the International Panel on Climate Change (IPCC) Guidelines (currently 5AR). The formula used to determine the CO2e from a given energy use is Activity Data x Emissions Factor[1+2+3] = GHG Emissions from Activity.

Boston currently reports at the GCP BASIC level, which covers scope 1 and scope 2 emissions from stationary and transportation sources, as well as scope 1 and scope 3 emissions from waste.

Scope 1: GHG emissions from sources located within the city boundary Scope 2: GHG emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam, and cooling within the city boundary Scope 3: Emissions that occur outside the city boundary as a result of activities taking place within the city boundary

Our full methodology may be found in "Boston Greenhouse Gas Inventory Methodology," most recently updated for the 2016 inventory year.[18]

2019 Data Revisions

- The City received updated natural gas (or methane) consumption data for 2017 and 2018, in addition to 2019.

MUNICIPAL INVENTORY METHODOLOGY

The Local Government Operations inventory methodology for calculating GHG emissions is based on the ICLEI greenhouse gas reporting protocol for local government operations, developed by ICLEI and the National Association of Clean Air Agencies. The protocol categorizes emissions as direct (Scope 1) or indirect (Scope 2). Direct emissions come from the burning of natural gas (or methane gas), fuel oil, gasoline, diesel fuel, and other fuels in the City's facilities, vehicles, and other equipment. Indirect emissions come from the burning of fuels in facilities owned and operated by others to produce electricity, and steam that the City uses. Emissions that are not under the operational control of the City government, or involve leased properties, are excluded. Emissions from the Boston Housing Authority, the Massachusetts Water Resources Authority (MWRA), and the Boston Planning and Development Agency (BPDA) are not included in the inventory. Those from the Boston Public Health Commission (BPHC), and the Boston Water and Sewer Commission (BWSC) are included.

In 2013 the City invested in an Enterprise Energy Management System (EEMS) and an Energy Manager to track and report local government energy consumption, cost, and GHG emissions. Prior to 2013, reporting relied on annual data collection from numerous stakeholders in the auditing, budget and purchasing offices. This manual process sometimes led to inconsistent data collection. Now the process is almost entirely automated, and with complete invoice data for over 7 calendar years, the City can track progress towards energy and GHG reduction goals on a monthly basis. By tracking this data more closely, the City is able to identify which departments, buildings or assets are contributing most to our overall portfolio, and, in the process, has identified billing errors leading to over $1.2M in reimbursement credits for the City.

One notable correction in accounting methodology was a double-count identified in fleet fuels in FY15, corrected in the FY16 inventory. When the City began reporting vehicle fuels based on delivery point in FY15, it did not account for the fact that Boston Public Health Commission (BPHC), and Emergency Medical Services (EMS) fueled their vehicles at the Department of Public Works (DPW) and Boston Fire Department (BFD) fueling stations. Fueling reports from BPHC and EMS were counted separately even though their fuel use was already included in the DPW and BFD. This correction results in an approximately 141,000 gallon reduction between diesel and gasoline for the FY15 inventory. The correction is included in the new FY16 inventory, and all years FY05-FY14 are not affected by this correction.

Another notable correction was made to the FY17 electricity consumption. For every City of Boston electricity account, the City receives two bills: one from the local distribution company (Eversource) and one from the City's energy supplier. The electricity consumption for each bill should be the same month-to-month but there are some scenarios where they do not match. The City has decided to source the electricity consumed by a particular account from the local distribution company bill as opposed to the energy supply bill. In FY17, the total electricity consumed by Boston Public Schools (BPS) was calculated based on energy supply bills. In this report, the City has retroactively adjusted the BPS consumption figure to reflect the values listed on the local distribution company bills. The result is that the Chart titled "LGO Emissions by Source Type (Unadjusted)" will show a nominally higher GHG emissions contribution from electricity than the same chart did in last year's Climate Action Report.

Finally, the City reviews historical electricity, steam, natural gas (or methane gas), and fuel oil consumption every year and retroactively updates consumption figures from previous fiscal years based on the latest bill corrections and recently discovered errors. These annual adjustments are typically insignificant.

REFERENCES

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ACKNOWLEDGEMENTS

The City of Boston's GHG inventories are overseen by the Climate and Environmental Planning Division within the City of Boston Environment Department. The City of Boston would like to thank all of the following for their contributions and assistance in the production of the City of Boston's GHG Inventory and this report.

CITY OF BOSTON STAFF

Katherine Eshel
Christopher Kramer

ADDITIONAL CONTRIBUTORS

Boston Planning and Development Agency (BPDA)
Boston Public Schools (BPS)
Central Transportation Planning Staff (CTPS)
Massachusetts Bay Transportation Authority (MBTA)
Mass Energy Consumers Alliance
Massachusetts Port Authority (Massport)
Massachusetts Water Resources Authority (MWRA)
Eversource
National Grid
Vicinity

DESIGN CREDITS

All graphics produced using Google Sheets.

Please direct comments or questions about the community inventory to:
Katherine Eshel, Deputy Director of Climate and Environmental Planning, katherine.eshel@boston.gov

Please direct comments or questions about the local government operations inventory to:
Christopher Kramer, Energy Manager, christopher.kramer@boston.gov

APPENDIX II: HIGHLIGHTS FROM BOSTON'S PREVIOUS CLIMATE ACTION PLANS

Greenovate Boston (2014)

The 2014 update to our Climate Action Plan involved an extensive community process and identified nearly 100 actions to reach our 80x50 goal and to prepare for climate change, and to reduce waste. Programs and policies launched since the plan's release in January 2015 include:

- Greenovate Boston, a City initiative to engage Bostonians in climate action, including through the Greenovate Leaders and Ambassadors programs.
- Zero Waste Boston, the City's first ever roadmap to becoming a zero-waste community and cutting waste disposal by at least 80% by 2050.
- Carbon Free Boston, the City's initiative to make Boston carbon neutral by 2050, which was developed as a next step to the 80x50 vision laid out in the 2014 update.
- Grassroots, the Department of Neighborhood Development's program supports the development of community gardens by transforming vacant lots.
- E+ Green Building Program to pilot net-zero and energy-positive buildings.

A Climate of Progress (2011)

The first update to our climate action plan, A Climate of Progress was developed from the recommendations of the Climate Action Leadership Committee and Community Advisory Committee, as well as five community workshops. Its key initiatives include:

- Renew Boston, an energy efficiency outreach program that connected thousands of Boston residents to Mass Save and energy efficiency savings.
- Building Energy Reporting and Disclosure Ordinance, an ordinance requiring that large buildings report their annual energy and water use and take an energy action or assessment every 5 years.
- Development of the Massachusetts Stretch Energy Code, which was designed to be 15% more energy-efficient than the base building code.
- Oil heat efficiency programs offered by partner organizations.
- Programs to reduce vehicle miles traveled, including Blue Bikes and Car Share Boston.

Climate: *Change* (2007)

The 2007 Climate Action Plan was our first formal plan, and included several new policies and programs that still shape climate action in Boston today. The plan lay the groundwork for hallmark initiatives, including:

- Article 37, a green zoning rule that requires that large new developments be LEED-certifiable.
- Reporting of municipal energy consumption and greenhouse gas emissions, included today in CityScore.
- Mandate that all motor vehicle purchases be alternative fuel, flexible, or hybrid vehicles, unless not available. More than two-thirds of Central fleet vehicles are hybrid or electric.
- Audits and deployment of energy conservation measures and energy generation facilities, which has been formalized today in the Renew Boston Trust program.
- Prepare an integrated plan to address climate change risks, to be implemented in coordination with the City's plans for emergency response, homeland security, natural hazard mitigation, neighborhood planning and economic development - the Climate Ready Boston initiative.

APPENDIX III: CERTIFICATE OF COMPLIANCE WITH "DIESEL EMISSIONS REDUCTIONS" ORDINANCE

CM-

Certificate of Compliance with "Diesel Emissions Reductions" Ordinance

On June 1, 2015, the Mayor of the City of Boston approved a Diesel Emissions Reductions Ordinance (Section 7-2.3 of the City Code). The purpose of this ordinance is to minimize the public health risks associated with exposure to diesel particulate emissions by establishing requirements relating to the use of ultra-low sulfur diesel fuel and diesel emissions control technology by non-road and on-road diesel vehicles used in City projects and services, and by City owned, leased or operated diesel vehicles.

Pursuant to Section 7-2.3 of the City Code, all contracts entered into by the City of Boston for construction projects and other projects and services having a total estimated cost in excess of $2,000,000 (adjusted annually to reflect changes in the Consumer Price Index) shall require that on-road vehicles, non-road vehicles, and diesel equipment used to fulfill the contract or any subcontracts be powered by ultra-low sulfur diesel fuel. The vehicles and equipment must also meet certain EPA emissions standards or have verified or certified retrofit technology that removes a significant percentage of particulates from the exhaust stream. A copy of Section 7-2.3 is attached to this form for your reference.

Prior to beginning work on this contract, the undersigned vendor agrees to provide the City of Boston with a list identifying all diesel vehicles and diesel equipment used to fulfill the contract or any subcontracts, and demonstrating that such vehicles and equipment are in compliance with the emissions standards set forth in Section 7-2.3. The list shall be in a form provided by the City of Boston. Such a list shall be signed by the vendor under the pains and penalties of perjury, certifying that the information it contains is truthful and accurate. The vendor shall immediately provide an updated list to the City of Boston, certified and signed in a like manner, if any additional vehicles or equipment will be used at a later date.

The undersigned vendor agrees to provide documentation, upon reasonable request, to the City of Boston related to compliance with Section 7-2.3. The undersigned vendor also agrees to cooperate with the City of Boston and allow access to the project site to allow inspection of all vehicles and equipment covered by this ordinance.

The undersigned vendor understands that failure to comply with the requirements of Section 7-2.3, at any time during the course of the contract, shall allow the City of Boston to pursue any and all available remedies allowed under the contract to immediately halt non-compliance including, where appropriate, termination of the contract.

_____ _____

Signature of the Vendor Date