Municipal Energy Master Plan for the Built Environment

2025 PROGRESS UPDATE

Office of Sustainability
CITY OF PHILADELPHIA

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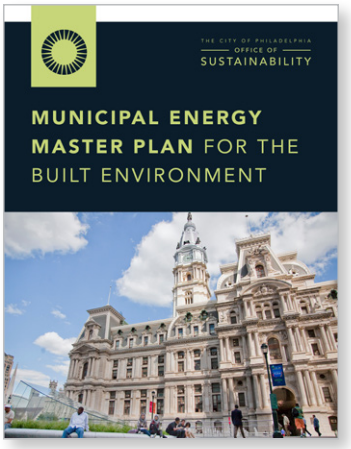
Municipal Energy Master Plan Overview and Progress



Released in 2017, the City's *Municipal Energy Master Plan* identified two broad strategies to achieve Philadelphia's clean energy goals for municipal operations:

1. **Lower Energy Use in City Operations, and**
2. **Clean the City's Energy Supply.**

The Plan outlined eight opportunities that would bring the City closer to cutting carbon emissions, reducing energy waste, and meeting its financial and environmental goals.

◀ The complete Municipal Energy Master Plan for the Built Environment can be found at: https://bit.ly/PhillyMEMP

The impact of achieving each of the eight opportunity areas is quantified as the following **four long-term goals** for the City's municipal buildings, fleet, and streetlighting:

Reduce greenhouse gas emissions from the municipal built environment 50 percent by 2030

Reduce the municipal built environment energy use 20 percent by 2030

Generate or purchase 100 percent of all electricity for the municipal built environment from renewable resources by 2030

Maintain or reduce the municipal built environment cost of energy

Letter from the Director

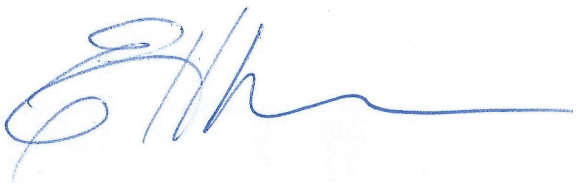
Dear Friends,

The Office of Sustainability is excited to report that Philadelphia has made significant progress on the City's goals to reduce municipal energy use, transition to a clean municipal fleet, and power our municipal operations with clean electricity. Since the Municipal Energy Master Plan was published in 2017, we've surpassed important milestones, such as the completion of the Adams Solar project, bringing the City's renewable usage to 30%, and converting all 130,000 of our streetlights to LED, the largest municipal energy conservation project to date. These projects protect the City from rising energy costs, ease strain on the electric grid during emergencies, and improve public health and safety outcomes, while contributing to our climate and clean energy goals.

At a time of unprecedented energy costs and increasingly frequent extreme weather, Philadelphia's work is far from done. We are committed to making energy more affordable and reliable for City operations. Through smart investments in energy management, we will conserve energy in our municipal facilities while ensuring that essential public services can continue uninterrupted during extreme weather conditions.

Building on this foundation, the Office of Sustainability will extend the benefits of energy procurement and management to additional City-affiliated entities. These efforts will reduce operating costs, expand access to renewable energy opportunities, and enable smart energy investments to improve resiliency. We remain focused on the ambitious goals ahead and are eager to take on the challenge.

Sincerely,



Elizabeth H. Lankenau, AICP
Director
OFFICE OF SUSTAINABILITY

Progress on Goals

The City's findings demonstrate a 49% reduction in municipal greenhouse gas emissions from the 2006 baseline, due to a cleaner electric grid and improved building energy efficiencies. The City's first renewable Power Purchase Agreement (PPA), Adams Solar, came online in March 2024, bringing the City's renewable usage to 30%. Investing in our buildings and infrastructure through a variety of upgrades and low-to-no-cost conservation strategies will continue to lower the City's electricity and heating use.

	Baseline	2021 Comparison	2024 Progress	2030 Goal	Status
GREENHOUSE GAS EMISSIONS	219,306 MT of CO_2e (2006)	122,750	112,057	109,653	➡ On Track
ELECTRICITY CONSUMPTION	281,324 Weather Normalized MWh (2016)	268,397	262,134	228,869	➡ On Track
PRIMARY HEATING CONSUMPTION	828,532 Weather Normalized MMBtu (2016)	743,356	675,742	662,825	➡ On Track
RENEWABLE ELECTRICITY	6% (FY16)	8%	30%	100%	⬆ Needs Improvement
TOTAL COST OF ENERGY	$42.4 Million	$33 Million	$34.21 Million	< $42.4 Million	➡ On Track

Strategy 1: Lower Energy Use

Opportunity: LED Streetlighting

PROGRESS: PHILLY STREETLIGHT IMPROVEMENT PROJECT

The Philly Streetlight Improvement Project (PSIP) is the City's single largest energy conservation project, replacing and connecting all 130,000 streetlights citywide with energy efficient LEDs with a lighting management system. Through a partnership between the Department of Streets, the Philadelphia Energy Authority (PEA), and the Office of Sustainability (OOS), this two-year construction project was completed in October 2025. This project reduces streetlighting energy use by 50% (36 million kWh saved), municipal greenhouse gas emissions by 10%, and saves the City $8 million in energy and operational costs per year.

A study released in April 2025 from the University of Pennsylvania Crime and Justice Policy Lab[1] found that PSIP has achieved a 21% reduction in nighttime outdoor gun crimes where new lights were installed, demonstrating the public safety benefits of upgrading lighting citywide. The new lighting management system allows the City to conserve energy during grid emergencies, detect outages, and adjust light levels during emergency responses. PSIP prioritized local workforce and economic opportunities, employing over 200 at-risk young adults as part of the Philadelphia Department of Streets Future Track job training program to complete the alleyway clearing work, and building and testing 40,000 lighting fixtures from American Power Electrical Supply Company, a local manufacturer. This local assembly partnership was with Youth Empowerment for Advancement Hangout (YEAH Philly) which focuses on finding local partners and placing young people into paid work experiences and opportunities, along with supportive services.

▲ **PSIP.** (Photo by Jared Piper/PHL Council)

[1] https://philaenergy.org/study-finds-citywide-streetlight-replacement-project-achieves-21-reduction-in-gun-violence/

Opportunity: Capital and Rebuild Projects

PROGRESS: QUADPLEX PLUS COMMUNITY HEALTH GESA PROJECT

The Department of Public Property, Department of Public Health, Office of Homeless Services, Capital Program Office, and OOS, in partnership with PEA, is working on its fourth large-scale project under Pennsylvania's Guaranteed Energy Savings Act (GESA). The Quadplex + Community Health GESA project will target energy and capital improvements across 14 municipal buildings, including the 'Quadplex', health centers, and homeless services facilities.

What is the Quadplex?
The term 'Quadplex' is used to refer to four large municipal buildings located in Center City: City Hall, the Municipal Services Building, One Parkway Building, and the Criminal Justice Center.

Planned energy improvements include measures such as lighting, HVAC, and building envelope upgrades. The GESA model uses energy and operational savings to pay for project costs. Using this self-financing approach, the project will address long-standing needs at many City facilities that provide critical services to the public, ensuring buildings stay comfortable year-round while improving reliability during extreme weather, reducing energy costs, and enhancing safety and care for the public. This project is expected to begin construction in Spring 2026 and be completed in Spring 2028.

PROGRESS: UPDATED LEED ORDINANCE AND CITY LEED CERTIFIED BUILDINGS

The update to the Energy Efficiency and Environmental Design in Construction of Buildings (Philadelphia Code § 17-111) ordinance requiring new municipal construction and renovation projects achieve a LEED Gold certification took effect in July 2023 (FY24). By 2024, two municipal buildings earned LEED Gold certifications: Rivera Recreation Center and Mann Older Adult Center as well as Fire Engine 37. You can learn about the City's other LEED and ENERGY STAR Certified buildings by visiting our website: https://www.phila.gov/departments/office-of-sustainability/about/divisions/division-of-energy-and-climate-solutions/building-compliance/high-performance-buildings/

(Photo by Rebuild)

Rivera Recreation Center and Mann Older Adult Center

Located in the Fairhill neighborhood, the Rivera Recreation Center and Mann Older Adult Center serves as a popular community hub offering activities for all ages. This project is a part of Rebuild, an initiative to improve the City's parks, recreation centers, and libraries, fueled by the Philadelphia Beverage Tax. As one of Rebuild's largest completed projects to date, this 5.4-acre site earned LEED v4 Gold certification in 2024. Sustainability features include a 30.2% reduction in energy use compared to the baseline, improved rainwater management, and reuse of the existing building structure.

(Photo by Kathy Matheson)

Engine 37

Built in 1894 in Chestnut Hill, Engine 37 is the oldest active firehouse in Philadelphia and is listed in the Philadelphia Register of Historic Places. Its renovation and expansion modernized the facility to meet today's firefighting standards. The project earned LEED v4 Gold certification and a 2024 Pennsylvania Preservation Award. Sustainability features include a new energy-efficient HVAC system, an insulated and restored building envelope, and LED lighting.

Opportunity: Improve Operational Practices

PROGRESS: BUILDING AUTOMATION SYSTEMS NETWORK (BASNET)

The Building Automation Systems Network (BASNet) is a new pilot project that will improve municipal facility operations and energy conservation. The Municipal Energy Unit within OOS, the Department of Public Property (DPP), and the Office of Innovation and Technology (OIT) have partnered together to create a dedicated virtual network of building automation systems (BAS) in City Hall, the Municipal Services Building, One Parkway Building, and the Criminal Justice Center.

These buildings already use BAS through the City's Building Monitoring Program. Buildings with BAS use sensors and controls to connect mechanical and electrical systems to a central platform, making it easier to track and optimize energy use. The pilot will build on that foundation by creating a central network that will standardize systems and protect City buildings from cyberattacks. The BASNet will support operational efficiency, improve cybersecurity, reduce costs through improved energy efficiency and demand response, and create a foundation for smart building integration throughout the City's municipal portfolio.

PROGRESS: DEMAND RESPONSE

The City has participated in the Demand Response Program (also known as the PJM Emergency Load Response Program) for more than 10 years by conserving energy during extreme weather events in the largest municipal facilities, such as the Philadelphia International Airport, large office buildings including City Hall and the Municipal Services Building, and wastewater treatment plants. The grid is most strained during extreme weather, such as summer heat waves and winter extreme cold snaps. Electricity usage is highest on those days and electricity generation is pushed to its limits, risking power outages and interruptions in essential services. The Demand Response Program pays the City for reducing energy usage during these emergency events. In turn, this supports grid resiliency and improves air quality for our communities by reducing the number of more inefficient, fossil fuel-based generating plants (also referred to as peaker plants) that need to operate.

> With energy costs on the rise, energy conservation programs like Demand Response are essential to prevent electricity price spikes for the City and the public.

The City plans to expand training to better prepare municipal building operators for Demand Response dispatches as extreme weather events become more frequent as well as investigate the ability for additional municipal facilities to participate in Demand Response to further increase the City's impact.

PROGRESS: AN UPDATE ON THE BUILDING ENERGY PERFORMANCE PROGRAM

Launched in 2021, the Building Energy Performance Program (BEPP) concluded its first five-year compliance cycle on September 30, 2024. All 20+ eligible municipal buildings met BEPP requirements through a combination of building tune-ups and high-performance pathways.

During 2023-2024, eight municipal buildings received tune-ups, resulting in a 6% overall reduction in annual energy use across those sites. The Police Woodhaven BRAC facility showed the greatest improvement, reducing energy use by more than 30% following HVAC system adjustments despite higher heating and cooling demands during the same period.

The Building Monitoring Program continues to expand the use of BAS, allowing participating buildings to continually monitor performance and achieve BEPP compliance through the Active Optimization pathway.

Citywide BEPP Compliance

The Please Touch Museum completed a tune-up in 2025 that improved the efficiency and operation of the museum's 70+ HVAC systems by aligning equipment schedules with occupancy, tightening temperature setpoints, fine-tuning controls sequences, and addressing maintenance needs.

▲ **Please Touch Museum.** (Photo by SSM)

Strategy 2: Clean Energy

Opportunity: Purchasing Clean Energy

PROGRESS: ADAMS SOLAR POWER PURCHASE AGREEMENT

The Adams Solar project, a 70MW solar farm in Adams County, PA, was completed in March 2024 and began delivering renewable electricity to the City, marking a major milestone toward our 2030 goal of powering 100% of municipal operations with clean electricity. This PPA with Energix Renewables brings the City's overall renewable usage to 30%, resulting in lower utility costs while cutting greenhouse gas emissions.

Energix worked with the City of Philadelphia and the Philadelphia Energy Authority to create an On-the-Job Training opportunity that gave graduates from PEA's solar job training programs the chance to work at the Adams Solar site during construction for at least two weeks, with housing support included. Two graduates participated in the program from mid-September until the end of November 2023, gaining hands-on experience that led to full-time careers in the energy field. In addition, the Adams Solar PPA provides the City with a stable, 20-year electricity rate that is comparable to, and in some cases lower than, the price the City pays for conventional electricity.

As the City's largest solar initiative to date, Adams Solar serves as a model for combining sustainability, job training, and economic development into municipal energy procurement.

▲ Adams Solar (Photo by City of Philadelphia)

PROGRESS: ABES RUN SOLAR POWER PURCHASE AGREEMENT

In October 2025, the City signed another Power Purchase Agreement (PPA) with Abes Run for a 20MW solar field in Clearfield County, PA. This new PPA will supply the City with another 5% of renewable electricity for municipal operations, with the commercial operation date estimated towards the end of 2026. Similar to Adams Solar, this 20-year PPA brings the City closer to its goal of 100% clean electricity for municipal operations by 2030 and serves as a hedge against rising electricity costs.

PROGRESS: WASTEWATER TREATMENT PLANTS GESA

The Philadelphia Water Department, in partnership with the Philadelphia Energy Authority and Philadelphia Gas Works (PGW), is pursuing a Guaranteed Energy Savings Act (GESA) project for the Northeast and Southwest Water Pollution Control Plants. The project will implement comprehensive equipment upgrades, operational improvements, and energy conservation measures to reduce energy costs and greenhouse gas emissions at both facilities. In addition, the City is evaluating strategies to enhance and monetize biogas production from anaerobic digestors, a key part of the wastewater treatment process.

> This renewable biogas can serve as an alternative to natural gas, supporting both sustainability and revenue generation.

Opportunity: Clean Fleet

PROGRESS: LEVEL 3 FAST CHARGER PILOT FOR ELECTRIC VEHICLES AT FLEET SHOP 258

As part of the *2021 Municipal Clean Fleet Plan*, the City is advancing the transition to electric vehicles (EVs) by both purchasing EVs and installing the chargers needed to support them. In September 2024, the City installed its first Level 3 EV fast charger at Fleet Shop #258 through a partnership between the Office of Sustainability, Department of Fleet Services, and the Office of Innovation and Technology with support from the Office of the Chief Administrative Officer. Level 3 EV fast chargers can charge an EV to 80% in as little as 20 minutes. This pilot project adds needed charging capacity for the City's electric fleet and serves as a model for installing additional chargers at more municipal buildings.

▲ **Fleet Shop 258 charger** (Photo by City of Philadelphia/ Department of Fleet Services)

What's Next

As we look ahead, the Office of Sustainability has several major projects underway that will advance our progress and strengthen municipal operations. This next round of initiatives builds on the momentum established since the *Municipal Energy Master Plan* was first published in 2017. Together, these efforts will improve energy affordability, increase resiliency, and better prepare the City for the future.

LEED v5 Update

The City's LEED ordinance (§ 17-111) requires all large municipal new construction and major renovation projects to achieve a LEED Gold certification. Under current regulations, City projects can certify under v4 or 4.1 of the LEED Building Design and Construction rating system. Starting in the spring of 2026, projects will no longer be able to register under those versions and instead will be required to follow the new LEED version 5. The Office of Sustainability is updating the LEED ordinance regulations to align with new LEED v5 requirements.

On-Site Solar on Municipal Facilities

The City is exploring the potential for solar installations on municipal assets to advance the development of local renewable energy.

Energy Conservation and Management in Schools

The City is supporting the School District of Philadelphia in managing its energy portfolio of more than 300 buildings, identifying efficiency opportunities, and strengthening energy and renewable energy procurement strategies.

Electric Vehicle Fast Chargers

The City is installing additional EV fast chargers at municipal facilities and evaluating future sites to add EV charging capacity across operations.

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