

METRO ENERGY MANAGEMENT PLAN

IMPLEMENTATION PLAN
CONTRACT # 6498800
METRO GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY
GENERAL SERVICES
NASHVILLE, TN

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*Metro Energy Management Plan Building Dataset
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SECTION 1: EXECUTIVE SUMMARY

INTRODUCTION

The Metropolitan Government of Nashville and Davidson County (Metro) has committed to ambitious sustainability goals, including facility energy efficiency improvements and instituting LEED Zero Energy standards. This Metro Energy Management Plan aims to chart a course to significantly reduce energy consumption and greenhouse gas emissions across Metro-owned buildings. The Department of General Services (DGS) efforts are outlined herein, providing a best practice roadmap applicable to the larger portfolio of Metro-owned buildings.

KEY FINDINGS

- I. Energy Retrofit Program (as required by Metropolitan Code of Laws Section 2.32.070): Based on available data from 2019-2024, Metro achieved 46.5% of its energy retrofit square footage target, resulting in a 6% reduction in energy consumption.
- II. High-Performance Buildings: Energy consumption in DGS high-performance buildings decreased by 14.7% from 2019 to 2023, saving approximately \$387,056 as compared with CBECS benchmark in 2023 alone. When compared to non-LEED comparable buildings, high-performance buildings saved more than \$525,000 in 2023.
- III. LEED Zero Energy Roadmap: Metro has identified and categorized buildings into four tiers based on their readiness for LEED Zero Energy certification. Tier 1 buildings are prime candidates, while Tier 2 and Tier 3 buildings require additional energy conservation measures.

RECOMMENDATIONS

- I. Expand Energy Retrofits: Continue to invest in energy retrofits Metrowide, focusing on buildings with aging systems, to achieve further reductions in energy consumption. Establish an enterprise-wide reporting platform and cadence so that all agencies' work is captured.
- II. LEED Zero Energy Certification: Prioritize the certification of Tier 1 and Tier 2 buildings, leveraging renewable energy credits (RECs) from large-scale solar projects.
- III. Policy Enhancements: Develop and implement policies for sustainable operations, such as solid waste management, green cleaning, and indoor air quality management, that align with current LEED O+M guidance, and are long-term vendor contracts that can be applied to buildings in the Metro portfolio.

POTENTIAL IMPACT

- I. Cost Savings: Significant reductions in energy consumption will yield substantial operational cost savings for Metro.
- II. Environmental Benefits: Achieving LEED Zero Energy certification will reduce greenhouse gas emissions, contributing to Metro's sustainability goals.
- III. Leadership in Sustainability: Metro's commitment to LEED Zero Energy standards positions it on the forefront of sustainable urban development, leading the private sector by example.

CONCLUSION

This Metro Energy Management Plan sets a path towards sustainable growth and energy efficiency. By continuing to invest in energy retrofits and pursuing LEED Zero Energy certification, Metro can achieve its ambitious goals, resulting in cost savings, environmental benefits, and an enhanced reputation as a leader in sustainability.

SECTION 2: INTRODUCTION AND INTENT

GOALS AND REQUIREMENTS

The Metropolitan Government of Nashville and Davidson County (Metro) has set goals and is developing pathways to move towards equitable and sustainable growth. As one of the top 10 performing cities according to the Milken Institute, the city's investments in sustainability, resiliency, and the environment are key components to continued growth in the Nashville/ Davidson County area¹.

In 2019, Metro Council approved an ordinance for improving building operations through aggressive targets met through an Energy Management Plan. A second ordinance instituted a Renewable Portfolio Standard, with stair-step targets for offsetting all municipal energy consumption with renewable energy by 2041 (Metropolitan Code of Laws Section 2.32.070 and Section 2.32.080, respectively). These ordinances apply to Metro buildings owned by the Department of General Services, Metro Water Services, Metro Nashville Public Schools, and several other Metro departments.² The mandates cover a wide range of facility types such as libraries, public safety, offices, community centers, schools, etc. The ordinances require:

By July 1, 2020, the Department of General Services shall develop a strategic energy management plan for reducing energy and water use across metro-owned buildings. This strategic plan shall include elements for complying with the Equal Business Opportunity Program, found in Chapter 4.46 of the Metropolitan Code of Laws, to the fullest extent possible. The plan shall include timelines and cost estimates for implementing:

1. *An energy retrofit program across at least 9% of metro government-owned buildings by square footage between 2021 and 2024, prioritizing buildings that have core systems and equipment nearing the end of their useful lives, with a goal of achieving at least 20% reductions in average energy and greenhouse gas emissions, as measured in BTUs; and*
2. *A LEEDTM Zero retrofit program across at least 12.5% of metro government-owned buildings by square footage between 2026 and 2032. Renewable energy certificates ("RECs") may be used as part of this retrofit program.*

Metropolitan Code of Laws Section 2.32.070

B. 22. In 2041 and thereafter, that the percentage of total carbon-free energy usage shall be not less than 100%, with not less than 100% from tier one renewable sources, not less than 0% from tier two renewable sources, and not less than 10% from solar energy.

Metropolitan Code of Laws Section 2.32.080

Along with other formal targets for sustainability and climate action, the energy retrofit program, LEED Zero retrofit program, and renewable portfolio standards, set a framework for Metro departments.

INTENT

Through consistent and sustained execution of good building management practices, the Department of General Services has positioned Metro to successfully progress towards the Green Building Standards signed in 2019 (Metropolitan Code of Laws Section 2.32.070).

This Metro Energy Management Plan outlines progress made so far as well as remaining steps to satisfy ordinance requirements. The plan further accounts for potential solutions to the changing landscape of LEED for the years 2026-2032 identified as the target timeframe for this initiative. Specifically, the plan:

1. Presents progress to date

¹ Switek, Maggie et al, *Best-Performing Cities 2024: Focus on Sustainable Growth and Resilience*, The Milken Institute, 2024

² Metro Legal Department has opined (as relates to an adjacent mandate (Metropolitan Code of Laws Section 2.32.080) that all Metro agencies are included, except for Convention Center Authority, MDHA, MTA, MNAA, Sports Authority, and Hospital Authority (includes General Hospital)



2. Defines the program
3. Outlines the process
4. Categorizes and organizes facility inventory
5. Structures paths to goal achievement
6. Establishes a framework for continued work
7. Defines ongoing reporting

In so doing, this plan seeks to first identify the immediate steps Metro can take towards reaching established ordinance targets. Secondly, this plan sets a framework for repeatable and scalable improvements to continue achieving long-term ordinance targets.

ORGANIZATION AND REQUIRED SUPPORT

Supporting the development of this Metro Energy Management Plan are the guiding reference systems and published datasets available both externally through organizations such as the U.S. Green Building Council and internally through Metro's energy benchmarking/inventory management system. A complete listing of the supporting resources can be found as an attachment to this plan.

LEED Zero, like its counterparts for green building certifications, is on a continual review and improvement schedule. The guidance factored into this Metro Energy Management Plan comes from LEED Zero version 4 – specifically LEED Zero Energy - available as of August 2024. Future adjustments to the rating system may result in necessary adjustments to the plan to maintain the stated intents.

Achievement of this plan will be a coordinated effort of multiple stakeholders:

Table 1: Stakeholders

ENTITY	RESPONSIBILITY
Department of General Services, Division of Sustainability	Track and report compliance with M.C.L. Section 2.32.070 and 2.32.080. Develop and complete energy efficiency projects. Collect and manage departmental and Metrowide energy benchmarking and utility data. Support partner departments in collecting and reporting data both for energy efficiency goals and LEED Zero reporting and renewals. Track production of Green Invest large scale renewables project. Holds renewable energy accountability.
Department of General Services, Division of Design and Construction	Prioritize sustainable design practices, including energy efficiency and LEED Zero Energy in new construction and addition projects.
Department of General Services, Division of Building Operations and Support Services	Maintain and repair facilities with a focus on energy efficiency, incorporating high-efficiency technologies. Consult and collaborate with the Sustainability Division on facilities with equipment nearing the end of useful life.
Finance Department	Support for interdepartmental funding for facility energy efficiency upgrades. Account for utility rate escalations and avoided costs as part of the ESRF.
Mayor's Office & Metro Council	Support M.C.L. Section 2.32.070 and 2.32.080 and associated funding requests.
Participating Metro Departments	Report facility energy-related improvements and utility data regularly and as requested by General Services. Prioritize sustainable design practices, including energy efficiency and LEED Zero Energy in new construction and addition projects. Maintain and repair facilities with a focus on energy efficiency, incorporating high-efficiency technologies.



SECTION 3: SUMMARY OF CURRENT RESULTS

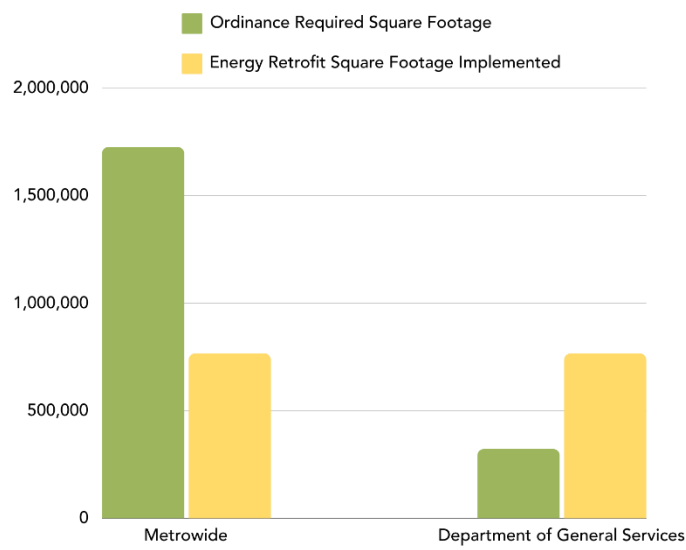
ENERGY RETROFIT PROGRAM

From 2019-2024, the General Services Sustainability Department has managed and executed an Energy Savings Revolving Fund. This fund was seeded with an initial investment of \$2 million towards the upgrades of lighting, HVAC, and other energy efficiency improvements. \$1.7 million of those funds have been deployed leaving \$300,000 remaining for continued projects (as of September 2024).

It is calculated that the Metrowide 9% square footage target is approximately 1,800,000 GSF (see Table 4). The program has achieved 46.5% of its target Metrowide based on data available to the Department of General Services.

As a standalone agency, the Department of General Services’ Energy Retrofit Program target square footage is 322,026 GSF when prorated by the facilities under management. The Energy Retrofit Program has been implemented on 834,029 GSF which is 218% of the ordinance’s targeted square footage.

A detailed methodology for how this data was calculated is attached to the report (*Metro Energy Management Plan Building Dataset Process*).



Energy Retrofit Program Results

Image 1: Energy Retrofit Program Results



Table 2: Energy Savings Revolving Fund Results

ENERGY SAVINGS REVOLVING FUND BUILDING ENERGY

YEAR	Square Footage Addressed	2019: Total Portfolio Energy (kBtu) by Calendar Year	2019: Average EUI	2024: Total Portfolio Energy (kBtu) by Calendar Year	2024: Average EUI ³
Fire	133,477	11,820,560	88.56	10,093,414	75.62
General Services	704,204	77,654,669	110.27	74,283,920	105.49
TOTAL	837,681 GSF ⁴	89,475,228	106.81	84,377,334	100.73
Energy Use Avoided in 2024 v. 2019					5,097,894 kBtu
Percent Change in Energy Use in 2024 v. 2019					-6% ⁵
Estimated Cost Avoidance for 2024:					\$112,153

As a result of this program, an energy consumption avoidance of 5,097,894 kBtu⁶ was observed across 837,681 GSF of Metro facilities. This constitutes an 6% decrease in energy consumption for these facilities and yielded a cost avoidance of over \$112,153 (when assuming a \$0.022/kBtu rate).

Notable among the efforts to improve energy efficiency across Metro facilities are the ongoing efforts in the High-Performance Buildings. General Services provides annual reports on the operational performance of these buildings compared to the Commercial Buildings Energy Consumption Survey (CBECS)⁷ and other average-performing facilities, but the continued maintenance and monitoring of these buildings has also resulted in these buildings sustaining or even improving their performance year-over-year. From 2019 to 2023, the total energy consumed by approximately 1 million GSF of High-Performance Buildings decreased by 15 percent (15.7%). This resulted in 17,593,470 kBtu less energy usage or equivalent cost avoidance of \$387,056 (when assuming a \$0.022/kBtu rate).

Note that in the *Metro High-Performance Buildings Report*, published annually, estimated cost savings are calculated differently. The *Metro High Performance Buildings Report* calculates savings and compares to non-LEED buildings. This is the reason for the discrepancy between the two reported utility savings.

Table 3: High-Performance Building Progress

HIGH-PERFORMANCE BUILDING ENERGY

YEAR	Square Footage*	Energy (kBtu)	Average EUI
2019	1,038,601	120,086,710	115.6
2020	996,245	105,862,539	106.3
2021	1,037,158	117,714,804	113.5
2022	1,037,158	112,223,897	108.2
2023	1,037,158	102,493,240	98.8
Energy Use Avoided in 2023 v. 2019:			17,593,470 kBtu
Percent Change in Energy Use in 2023 v. 2019			14.7%
Estimated Cost Avoidance for 2023:			\$387,056

³ Energy Use Intensity (EUI): Energy Use Intensity of a building is energy consumed in one year (measured in thousands of British Thermal Units of kBtu) divided by the total square footage of the building. Generally, a low EUI signifies energy performance, but certain property types will typically have a higher EUI than others. EUI varies with building age, use, controls, envelope efficiency, local climate, etc.)

⁴ The ESRF square footage data cannot be directly reconciled to the ArcGIS database. These values are based off ESRF tracking spreadsheet.

⁵ Accounting for only energy meters directly impacted by energy conservation measures, the ESRF facilities saw an 8% reduction in energy for 2024 compared to the baseline year 2019.

⁶ kBtu: thousands of British thermal units

⁷ Commercial Buildings Energy Consumption Survey (CBECS) is the Metrowide basis for energy benchmarking.

[Energy Information Administration \(EIA\)- About the Commercial Buildings Energy Consumption Survey \(CBECS\)](#)



**Variances in SF are due to inventory adjustments under management by Department of General Services*

LEED ZERO ENERGY RETROFIT PROGRAM

Beginning in June 2024, the Department of General Services began quantifying and developing a course of action for achieving LEED Zero Energy requirements across building inventory. However, as of September 2024, no Metro facilities had received LEED Zero Energy Certification.

RENEWABLE PORTFOLIO STANDARD

[Metro Code 2.32.080](#) establishes a renewable energy portfolio standard (RPS) overseen by the Department of General Services that requires Metro government operations to offset 100 percent of its energy consumption with tier one renewable energy resources by 2041. As of fall 2024, Metro government is about 6% toward offsetting its energy consumption with Tier 1 renewables. Progressing toward its RPS helps meet Metro's LEED Zero Energy goals.



SECTION 4: PROCESS SUMMARY

The Process Summary describes the general approach to Metro's Energy Management Plan. Narratives of the LEED Zero Energy requirements, general process steps, and building type-specific guidance are outlined to allow for application across numerous Metro agencies.

INTRODUCTION TO LEED ZERO ENERGY

LEED Zero is a U.S. Green Building Council voluntary program that verifies “zero” goals for buildings, where buildings are individually charged with drawing down their consumption to “zero” or beyond. There are four options for LEED Zero verification: Carbon, Energy, Water, and Waste. Metro's ordinance which requires LEED Zero retrofits for 12.5% of metro government-owned buildings by square footage was not specific in identification of which LEED Zero program to follow. The Mayor's Office later confirmed that the pursuit of LEED Zero **Energy** was desired by Metro. Therefore, this Metro Energy Management Plan has been structured to achieve targeted square footage from the LEED Zero Energy framework.

The LEED Zero Energy certification recognizes a *source energy* use balance of zero over 12 months. It is awarded at a building level and is renewed every three years after acceptance. Note that “source energy” is the energy consumed by a project building from the point of generation, transmission, and distribution within the project building. Comparatively, *site energy* is the energy consumed from the utility meter into the building. LEED Zero Energy provides source-to-site ratios for the calculation of source energy that will be required to be offset for the achievement of LEED Zero Energy. Note that the current version of LEED Zero Energy is subject to change with the adoption of v5 in 2025.

Eligible buildings for LEED Zero Energy certification must first achieve a series of prerequisites:

1. Be able to provide 12 months of building specific utility data (all energy sources: electric, gas, district)
2. Be LEED certified through LEED BD+C or LEED O+M
3. Be able to demonstrate how the zero energy target is achieved over the same 12-month timeframe as the utility data

Inherent in these requirements are four other important prerequisites that are part of the version 4 LEED BD+C or LEED O+M Minimum Project Requirements:

1. Must be a facility owned by Metro
2. Must be more than 1,000 sf
3. Must be a permanent structure built on land (no temporary, movable structures)
4. Must use a reasonable LEED Boundary

Therefore, the process and recommended next steps for meeting goal consider these prerequisite conditions.

METRO ENERGY MANAGEMENT PROCESS

In order to achieve a Zero Energy building, there is a well-understood framework for the process. These steps are repeatable throughout the building lifecycle. Ideally, the concepts are incorporated early into design concepts for new construction; however, the opportunity for net zero is possible for existing buildings. The goal is continuous improvement of the overall Metro portfolio of facilities.

Image 2: (at right) Steps to a Zero Energy Building

1. **Benchmark** – To know what is required, it is first needed to understand current energy consumption. The first action is accumulating energy projections (in the case of new construction) or existing utility bills (in the case of existing buildings). Next, the building is benchmarked against a standard (such as ASHRAE 90.1 Appendix G) or performance index (such as the CBECS) or its own historical data.



2. **Reduce Energy Demand** – In this stage, the goal is to use less energy than the comparative benchmark. Adjustments to operating conditions or capital investments in energy conservation measures may be necessary to confirm that the building is as energy efficient as possible while supporting intended uses.
3. **Off-set the Difference** – Through use of on-site generation, renewable energy credits, virtual power purchase agreements, or other means look for renewable options to reduce reliance on the purchased utilities.
4. **Measure and Report** – Institute regular feedback loops to monitor performance and utility consumption ensuring that the building remains net zero. Measures may include utility consumption, maintenance reports, operational adjustments, renewable performance, and equipment life expectancy projections.
5. **Optimize Performance** – Continually improve the performance of the facility through activities such as ongoing commissioning, auditing, preventative maintenance, and capital investment.

The Metro Energy Management Plan has taken these process steps with the Department of General Services inventory. Metro facilities owned by other departments can use this as a guide to apply to their own facilities. The Process Summary | LEED Zero Energy section of this report describes the specific actions and next steps to advance buildings through the net zero process with available building inventory to meet goals. An attachment includes the ArcGIS listing of the facilities considered.

SPECIFIC GUIDANCE BY BUILDING TYPE

The application of the Process Steps by building type varies. This subsection outlines the steps to meet the LEED Zero Energy mandate for both new construction and existing buildings.

I. NEW CONSTRUCTION

The application guidance applies to projects that meet the minimum requirements for LEED Zero Energy detailed in the *Introduction to LEED Zero* segment of the Process Summary.

- A. **Benchmarking:** Buildings will be benchmarked against prevailing LEED Energy and Atmosphere: Minimum Energy Performance Prerequisite requirements.
- B. **Achieve LEED Certification:** New Construction projects within Metro's building inventory are required to comply with Metropolitan Code of Laws Chapter 16.60 which ensures that projects are designed and constructed to achieve LEED certification under the applicable rating system variation. In this way, projects satisfy one of the key prerequisites for LEED Zero Energy.
- C. **Energy Efficient Design:** Projects will prioritize the efficiency of building enclosure, HVAC, lighting, water heating, and process systems design to minimize reliance on purchased utilities.
- D. **Consider On-site Renewables:** During design, projects will conduct a feasibility analysis for on-site renewables. Favorable results will warrant installation on new construction projects.
- E. **Green Purchase Agreements:** During project budget development (capital budget and/or operational budget), include allocations for green purchase agreements (renewable energy credits) to allow new construction projects to become LEED Zero Energy certified as Metro realizes completion of expanded renewable portfolios. Note that LEED Zero Energy utilizes source energy, so the calculations of any purchased off-set would need to extend beyond that of the current LEED BD+C point structure. Operational budgeting may consider additional agreements based on the LEED project pursuits. Agreements may include large scale solar developments or other sources.
- F. **Metering:** Projects will provide for energy submetering which will support the Department of General Services Division of Sustainability in tracking energy performance, identifying effectiveness of energy conservation measures, and supporting ongoing commissioning efforts.



II. EXISTING BUILDINGS

- A. **Benchmarking:** Buildings inside Metro's inventory are benchmarked against CBECS and data is available in Energy Star Portfolio Manager.
- B. **Achieve LEED Certification:** Buildings in Metro's inventory that have a legacy LEED certification do not need to achieve additional certifications. Buildings in Metro's inventory that do not have a LEED certification need to evaluate the feasibility of LEED O+M certification, of the version that is current at the time.
- C. **Energy Efficient Operations:** Buildings in operation need to achieve an EUI at or below CBECS target to be considered for LEED Zero Energy candidacy. Energy Retrofit projects shall be used to meet operational target.
- D. **Planned Projects:** Buildings in operation need to have completed any near-term capital improvements such as roofing replacements, lighting upgrades, HVAC upgrades, and/or tenant fitups. These activities will alter the energy profile of the project and require 12 months of utility data after the project completion to qualify.
- E. **Consider On-site Renewables:** Projects will conduct a feasibility analysis for on-site renewables. This will not only include production potential but also infrastructure requirements impacting the existing structure and electrical systems.
- F. **Metering:** Projects will be uniquely metered at the building level for each utility type.

III. LEASED FACILITIES

Leased facilities occupied by Metro are not in consideration for LEED Zero Energy.

ORGANIZING FACILITIES BY PRIORITY – INTRODUCING TIERS

When reviewing large building inventories, it is important to develop consistent categorization for LEED Zero Energy candidacy. A 4-Tier classification for facilities based on specific characteristics required for certification considers readiness, efficiency, capital cost, and soft cost variables.



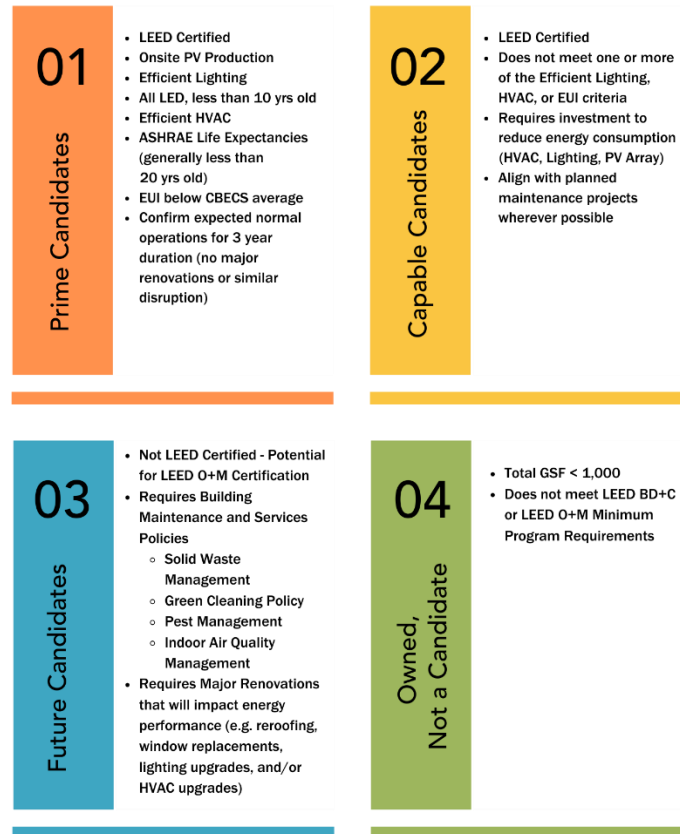


Image 3: Tier Structure

I. TIER 1: PRIME CANDIDATE

- A. LEED Certified (via BD+C: New Construction or O+M)
- B. Onsite PV Production (not an absolute requirement, but a supporting characteristic)
- C. Efficient Lighting – All LED, less than 10 years old
- D. Efficient HVAC – Use ASHRAE Life Expectancies (generally less than 20 years old)
- E. EUI below CBECS average
- F. Confirm expected normal operations for 3-year duration (no major renovations or similar disruption)

II. TIER 2: CAPABLE CANDIDATE

- A. LEED Certified (via BD+C: New Construction or O+M)
- B. Does not meet one or more of the Efficient Lighting, HVAC, or EUI criteria



- C. Requires investment to reduce energy consumption (HVAC, Lighting, PV array)
- D. Align with planned maintenance projects wherever possible

III. TIER 3: FUTURE CANDIDATE

- A. Not LEED Certified - potential for LEED O+M Certification
- B. Requires Building Maintenance and Services Policies to align with LEED O+M requirements, not limited to:
 - 1. Solid Waste Management,
 - 2. Green Cleaning Policy,
 - 3. Pest Management
 - 4. Indoor Air Quality Management
- C. Requires Major Renovations that will impact energy performance (e.g. reroofing, window replacements, lighting upgrades, and/or HVAC upgrades)
- D. LEED v5 Considerations for Tier 3 project pursuing LEED Certification
 - 1. At the time of this document and plan creation, LEED v4 is the adopted rating system version with LEED v4.1 available for use as a beta. Project teams have the ability to register under either system.
 - 2. In September 2024, LEED v5 was issued for its second public comment with the target of going to ballot for the USGBC Members final vote near the end of 2024. If this timeline holds, LEED v5 will be launched for use in early 2025 and the sunset date for v4 and v4.1 will be established. This affects new projects that wish to register for LEED BD+C and/or LEED O+M.
 - 3. The current public draft of v5 O+M (Dated September 2024) enhances the prerequisite criteria for LEED O+M projects. O+M projects must earn LEED Gold, not just LEED certified.
 - 4. There is no published v5 BD+C guidance to minimum eligibility prerequisite enhancements for LEED Zero as of this report date. (LEED v5 uses ASHRAE 90.1-2019 for projects registered prior to January 1, 2028 and ASHRAE 90.1-2022 for projects registered after January 1, 2028.) There are several enhancements in v5 for the award of points in the Energy & Atmosphere category.

IV. TIER 4: OWNED, NOT A CANDIDATE

- A. Total GSF < 1,000
- B. Does not meet LEED BD+C or LEED O+M Minimum Program Requirements

V. LEASED FACILITIES

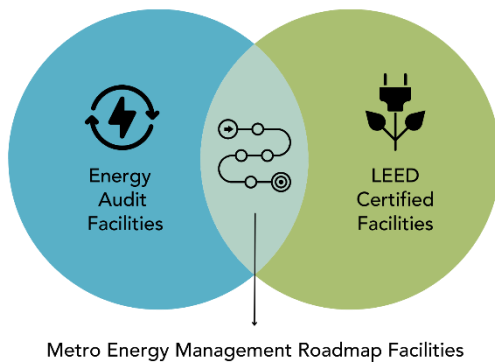
- A. All Leased Facilities must be removed from the LEED Zero Energy Assessment and cannot be considered for the program or used in the total square footage.



SECTION 5: METRO ENERGY MANAGEMENT ROADMAP

The Metro Energy Management Roadmap outlines Metro's strategy for achieving the goals associated with Metropolitan Code of Laws Section 2.32.070 – 9% of Metro Gross Square footage to receive energy retrofits resulting in 20% reduction between 2021-2024 and 12.5% of Metro Gross Square footage to be LEED Zero Energy between 2026-2032.

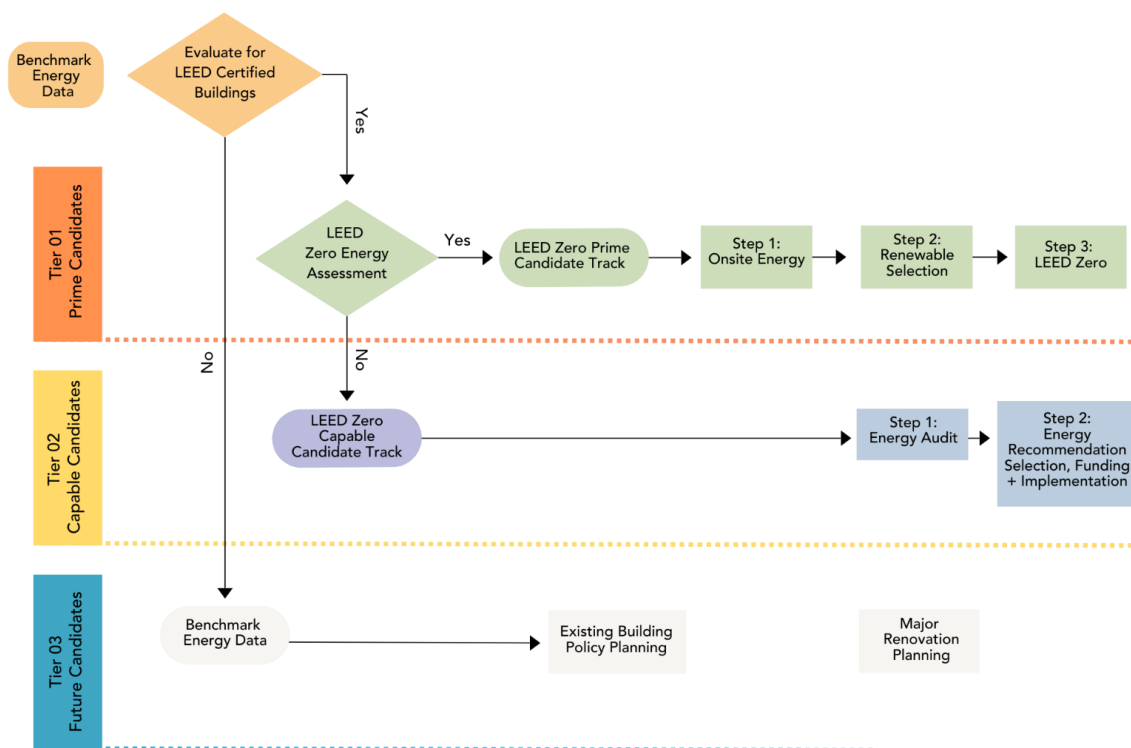
Plan to Achieve Metro Ordinances
(Metropolitan Code of Laws Section 2.32.070 and Section 2.32.080)



Facilities that are included in the Metro Energy Management Roadmap will both address the energy retrofit and LEED Zero mandate criteria.

To begin the certification process for LEED Zero Energy, the building site must be LEED certified in BD+C or O+M and be able to provide 12 months of operating data. The certification process requires the calculation of the source energy used by the building and site and the acquisition of off-site renewable energy to displace any non-renewable energy consumption.

Image 4: (at left) Plan to Achieve Metro Ordinances
Image 5: (below) Metro Energy Plan Roadmap Steps



The Metro Energy Management Plan Roadmap then follows through the following seven steps.



STEP 1: QUANTIFYING SQUARE FOOTAGE REQUIREMENTS

The first task was to determine the total square footage against which the programs described in the Ordinance can be measured. General Services used the current *Metro ArcGIS Finance Public Property Viewer* database to collect building information and then filtered for the requirement that properties must be government-owned. The total square footage is 19,176,491 GSF.

Using these calculations, the Energy Retrofit Program for 9% of Metro Government-Owned buildings should consist of at least 1,725,885 GSF and the LEED Zero retrofit program for 12.5% of Metro Government-Owned buildings should consist of at least 2,397,061 GSF.

Table 4: Square Footages

ORDINANCE COMPLIANCE TARGETS: METROWIDE GOVERNMENT-OWNED BUILDINGS		
Total Building Square Footage	19,176,491	GSF
9% Energy Program Square Footage Target	1,725,885	GSF
12.5% LEED Zero Square Footage Target	2,397,061	GSF

*ArcGIS Dated June 11, 2024, variances in GSF can occur due to Metro’s on-going real estate planning

STEP 2: EVALUATE FACILITIES AND CLASSIFY BY TIER

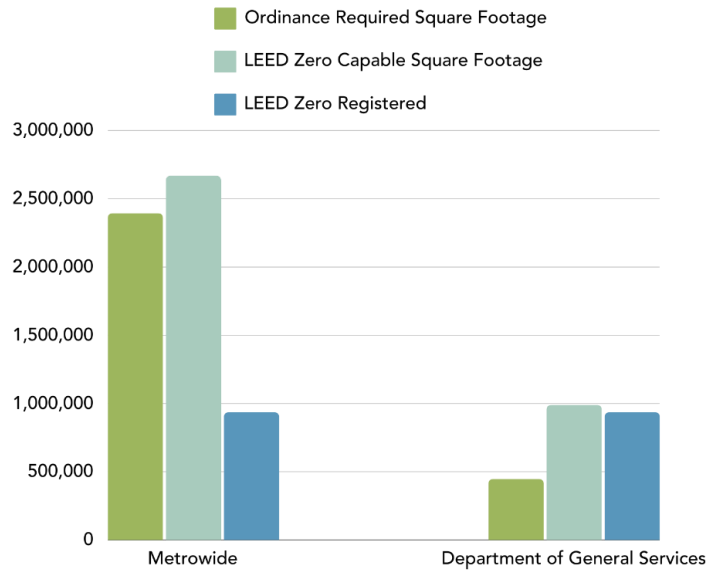
SUBSTEP 2A: CRITERIA AND DATA COLLECTION

Once the square footage targets were established, each of the 23 Department of General Services-owned LEED buildings with at least 12 months of energy data was evaluated for LEED Zero Energy candidacy. Analysis required the following information:

- 1. Building Information: Name, Location, Size, Construction Date
- 2. Building LEED Status
- 3. Current Building EUI
- 4. Annual Energy Consumption (3 years desired)
- 5. Age of Lighting
- 6. Age of HVAC Systems
- 7. Size of Photovoltaic Production, if available
- 8. Building-specific metering availability

NB: facility performance analyses and results presented in this roadmap are focused on the Department of General Services portfolio, as this was the data available. Note that DGS GSF is only a portion of the GSF required by MCL 2.32.070; additional Metro Departments’ participation is required to meet goals.





LEED Zero Inventory

Image 6: LEED Zero Energy Inventory

Additional information such as available ASHRAE Energy Audits and notable planned construction activity (renovation, demolition, additions, etc.) for each facility was annotated in the building inventory. Using this information, buildings were reviewed individually and classified by LEED Zero Energy Tier.

Initial analysis showed that based on basic criteria for compliance, it is possible to achieve the LEED Zero Energy goal for DGS with inventory already LEED Certified. There is additional work in order to identify and quantify compliance with the energy program goals. The first steps of this effort have been made with the Department of General Services building inventory. Fulfillment of the ordinance goals will require this Metro Energy Management Plan's implementation by other departments.

The timing of the LEED Zero certification award is dependent upon the availability of Metro's renewable energy portfolio, most significantly, the Tullahoma Green Invest 40MW.



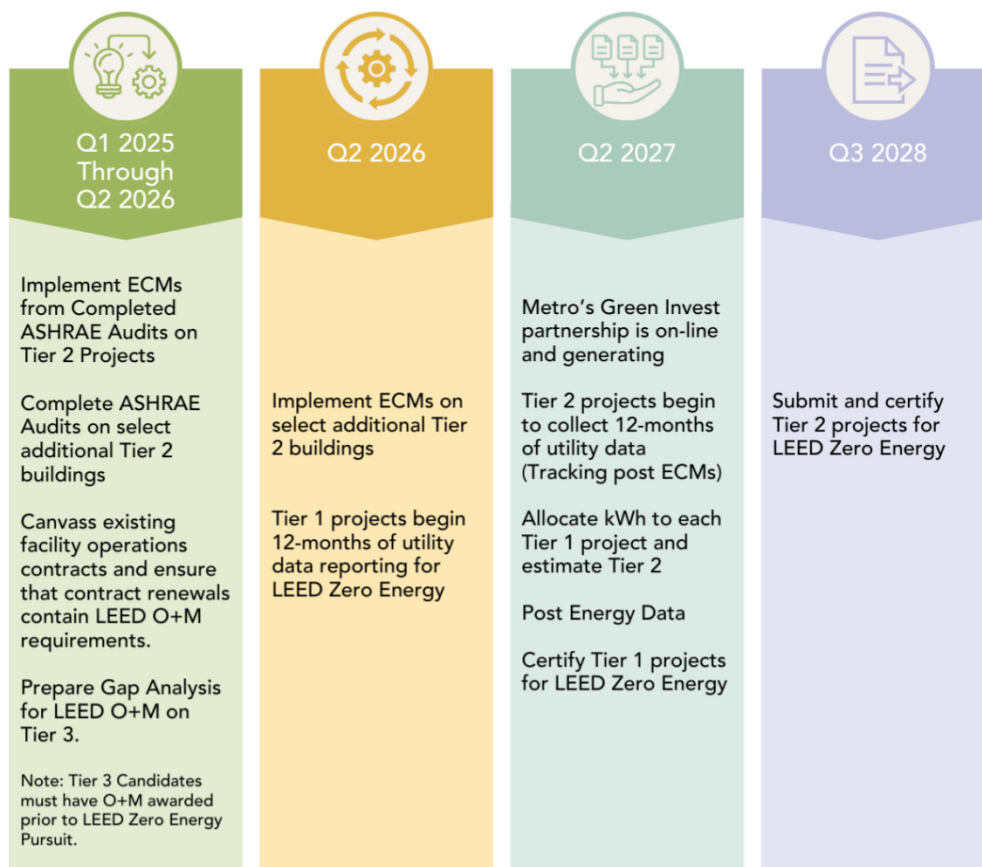


Image 7: Energy Management & Certification Timeline

SUBSTEP 2B: ORGANIZE PROJECTS IN TIER CATEGORIZATIONS

Metro General Services has a robust energy monitoring program that tracks energy consumption for all buildings in its department. Through a benchmarking initiative, DGS is assisting other Metro departments in collecting and reporting their energy use. In this analysis, each DGS building that meets the eligibility criteria for Tier candidacy and listed as maintained by the General Services in the ArcGIS dataset was sorted into one of the four tiers:

1. Tier 1 – LEED Zero Energy Prime Candidate
2. Tier 2 – LEED Zero Energy Capable Candidate
3. Tier 3 – LEED Zero Energy Future Candidate
4. Tier 4 – Not a LEED Zero Candidate

This analysis revealed that the Department of General Services has a distribution of buildings by Tier with several candidates that can be LEED Zero Energy certified within 1-2 years and additional buildings within the 2-3 year timeframe.



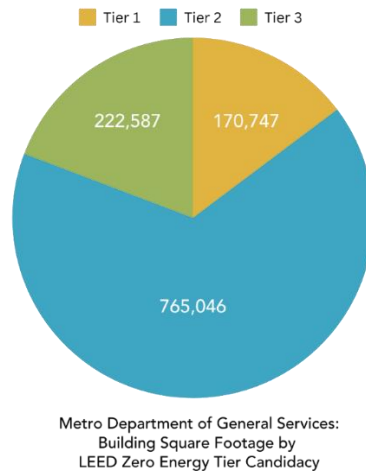


Image 8: DGS Candidates, by square footage in each tier.

I. TIER 1 PRIME CANDIDATES:

- A. 11 Buildings
- B. 182,211 GSF
- C. 3,388 MWH Energy Consumption
- D. 2.7 MW Solar Estimated for Offset
 - 1. This project has assumed that 1 MW of solar panels will generate 1,253 MWh of energy/year⁸.
 - 2. Actual production estimates for the RECs are required based on variances of location, efficiency, and transmission losses associated with each installation.
- E. The Tier 1 Prime Candidates are characterized by their existing LEED Certification, favorable EUI compared to the CBECS benchmark, age and condition of the HVAC system, age and condition of the lighting systems, and on-site photovoltaic systems.
- F. The below candidates have been registered for LEED Zero Energy, as registration is free of charge and locks in the date of rating system language that can be used (in case of addenda or version changes in the future).

Table 5: Tier 1 Prime Candidates

Facility Name	Maintained By	LEED Level	Building Area (Sq Ft)	TOTAL (kBtu) 2022 Data	EUI	CBECS	HVAC	LIGHTING	ON-SITE PV
Fire Station 03	General Services	Gold	17,539	1,150,941	65.9	84.3	2011		YES
Fire Station 11	General Services	Gold	15,748	985,964	63.3	84.3	2013	2022	YES
Fire Station 19	General Services	Platinum	20,142	1,228,047	61	84.3	2015	2022	YES
Fire Station 20	General Services	Silver	13,487	955,724	70.4	84.3	2015	2021	NO
Fire Station 21	General Services	Silver	19,328	1,220,751	63.4	84.3	2012	2021	YES
Fire Station 30	General Services	Silver	14,389	949,380	65.8	84.3	2012	2022	YES
Fire Station 31	General Services	Gold	17,459	955,379	55.2	84.3	2012, 2023	2021	YES
Fire Station 32	General Services	Gold	17,693	1,134,468	64.1	84.3	2020	2020	YES
Fire Station 33	General Services	Silver	15,657	942,940	60.7	84.3	2024	2021	YES
Fire Station 35	General Services	Silver	11,464	712,192	62.1	84.3			NO
Fire Station 37	General Services	Gold	19,305	1,326,435	68.7	84.3	2020	2020	YES
			182,211 GSF						

⁸ Tennessee Valley Authority Solar Calculator. Accessed August 2024. [Solar Calculator \(tva.gov\)](https://tva.gov/solar-calculator)



II. TIER 2 CAPABLE CANDIDATES:

- A. 12 Buildings
- B. 845,646 GSF
- C. 26,495 MWH Energy Consumption
- D. 23.54 MW Solar Estimated
 - 1. This project has assumed that 1 MW of solar panels will generate 1,253 MWh of energy/year⁹.
 - 2. Actual production estimates for the RECs are required based on variances of location, efficiency, and transmission losses associated with each installation.
- E. The Tier 2 candidates are characterized by their existing LEED certification, age and condition of HVAC and lighting systems, and EUI's. Several of these buildings have on-site renewables. These buildings are not Tier 1 candidates primarily due to the opportunity for energy conservation measures prior to offsetting consumption with additional renewables.
- F. The below candidates have been registered for LEED Zero Energy, as registration is free of charge and locks in the date of rating system language that can be used (in case of addenda or version changes in the future).

Table 6: Tier 2 Capable Candidates

Facility Name	LEED Level	Building Area (Sq Ft)	TOTAL (kBtu) 2022 Data	EUI	CBECS	HVAC	LIGHTING	SOLAR
Bellevue Community Center	Silver	54,579	2,388,001	43.8				YES
Southeast Community Center and Library ¹⁰	Gold	80,600	5,109,153	63.39				NO
Bellevue Library	Gold	24,912	1,776,716	71.3				NO
Frederick Douglass Head Start	Silver	26,602	1,336,609	50.2		2013		NO
Howard Office Building	Silver	146,473	17,481,811	119.4		2024	2024	YES
KIPP Academy Nashville	Silver	92,406	6,444,391	69.7		2013		NO
Lentz Public Health Center	Silver	108,365	20,661,699	190.7				NO
Lindsley Hall	Silver	34,198	3,585,227	104.9				NO
Madison Police Precinct & Regional Crime Lab	Silver	84,664	17,319,134	204.6		2023	2016, 2022	NO
Police - Headquarters	Gold	125,935	20,220,873	160.6				YES
Police - Midtown Hills Precinct	Gold	21,829	1,918,143	87.9			2022	
Police - West Precinct	Gold	45,083	2,419,919	53.7			2016, 2022	
		845,646 GSF						

III. TIER 3 FUTURE CANDIDATES:

- A. 7 buildings
- B. 222,587 GSF
- C. These buildings were identified as good Tier 3 candidates due to their EUI performance against CBECS. They are not currently LEED certified and therefore, would first need to undergo the LEED O+M certification process to become LEED Zero Energy certified. During the course of LEED O+M the additional data collection as well as energy improvements necessary would be addressed.

⁹ Tennessee Valley Authority Solar Calculator. Accessed August 2024. [Solar Calculator \(tva.gov\)](https://tva.gov/solar-calculator)

¹⁰ Southeast Community Center and Library has inconsistent square footage data across reporting databases. Data selected is based on the reported square footage from the energy database rather than the ArcGIS database as the total more closely aligns with USGBC LEED Project Directory.



Table 7: Tier 3 Future Candidates

Facility Name	Maintained By	Building Area (Sq Ft)	Building Type	EUI 2021	EUI 2022	EUI 2023	CBECS 2018
Police - Special Investigations	General Services	122,903	Laboratory	53.2	57.1	50.2	135.6
Police - Central Precinct	General Services	11,525	Police Station	96.4	95.0	78.0	86.3
Police - East Precinct	General Services	20,006	Police Station	181.9	225.0	210.0	86.3
Police - Hermitage Precinct	General Services	21,948	Police Station	134.4	122.9	132.1	86.3
Police - North Precinct	General Services	21,378	Police Station	135.6	124.1	129.7	86.3
Police - South Precinct	General Services	23,327	Police Station	118.1	107.8	126.3	86.3
Police - Auto Theft	General Services	1,500	Office	69.6	63.7	38.6	65.9
		222,587 GSF					

STEP 3: ALLOCATE PHOTOVOLTAIC RENEWABLE ENERGY CERTIFICATES (RECS) PROGRAM

Metro Department of General Services has invested in two primary strategies to develop renewable energy resources. The first is the installation of on-site solar on high-performance buildings. Currently, General Services operates 13 facilities with solar PV onsite. Six of those are behind-the-meter, where all produced electricity is used onsite to offset the electricity load. Seven sites are front-of-the-meter, where all electricity generated is sold to Nashville Electric Service. Other Metro agencies have also made strong investments in onsite solar, notably Metro Water Services, which has installed 4.4 MW of capacity on both rooftops and the ground as of fall 2024.

The second renewable strategy is contracting for large-scale Virtual Power Purchase Agreements (VPPA's). These large-scale solar facilities generate renewable energy credits (RECs) that flow to Metro to allocate to various offsetting initiatives. Metro has entered into a partnership to purchase 40 megawatts (MW) of solar energy from a TVA Green Invest project in Tullahoma, TN. The facility is scheduled to come online in Q2 of 2027. At 40 MW, there are opportunities to leverage this installation for purposes of Tier 1 Prime Candidate facilities seeking LEED Zero Energy certification. In fact, all of the Tier 1 DGS facilities could be certified LEED Zero Energy using just a fraction (2.7 MW) of the Green Invest RECs.

The requirements for allocation by LEED Zero Energy are a minimum 3-year REC commitment for offsetting building source energy consumption. The installation must be on-line and the required RECs must exclusively accrue to the certified building throughout the 3-year certification period.

For Tier 2 Capable Candidates, allocation from the Tullahoma solar facility, future installations, on-site solar, and/or a combination of other choices requires selection once the building source energy consumption of those candidate facilities is optimized.

STEP 4: INITIATE PILOT PROGRAM WITH GENERAL SERVICES DEPARTMENT FACILITIES: TIER 1 PRIME CANDIDATES AND REC ALLOCATIONS

Tier 1 Prime Candidates are ready to become LEED Zero Energy certified. The steps involve:

- I. Registration with LEED Zero Energy
- II. Submission of utility data
- III. Submission of renewable energy credits
- IV. Review/comment by Green Building Certification Institute (GBCI)
- V. Certification which is valid for 3 years

Part of this Pilot program is the allocation of RECs from the Tullahoma installation. To do so, Department of General Services – the Metro department overseeing the RECs – would need to prepare a letter identifying the production capacity allocated, the LEED Zero Energy unique identification number, the building name, and duration of



allocation. In addition, Department of General Services would need to keep a master registry of RECs and their allocation.

Of note is that any newly constructed LEED facilities will be Tier 1 Prime Candidates and immediately enter into the LEED Zero Energy enrollment upon eligibility.

The costs associated with the certification include:

Table 8: LEED Zero Certification Costs

COST CATEGORY	SOFT COSTS	HARD COSTS	ALLOCATED COSTS
LEED Zero Energy Registration	Consulting hours	None	None
LEED Zero Documentation Costs	Consulting hours	None	None
LEED Zero Review Costs	Consulting hours	\$1,680/building under 499,999 sf	None
Renewable Energy Costs	Consulting hours	None	Estimated 2.7 MW Solar production/year

STEP 5: IMPLEMENT LEED ZERO ENERGY FOR TIER 2 CAPABLE CANDIDATES

For the Tier 2 Capable Candidates, the first step towards LEED Zero Energy certification is an energy audit and/or existing building commissioning to identify opportunities for improving energy efficiency. The results of those exercises will identify energy conservation measures in three categories.

1. Low Cost/No Cost Improvements
2. Operational Changes
3. Capital Projects

It is suggested that based on the outcomes, Metro evaluate the ideal performance target for the facility along with the combination of energy conservation measures that will reach that target. Consideration of ECM viability will be weighted based on equipment age/ replacement schedule, lifecycle cost, ECM impact, and practical considerations identified by Metro facility staff.

It is also suggested that Metro proceed with registering the Tier 2 candidates, listed in TABLE 6, with LEED Zero Energy.

The current known costs include:

Table 9: Certification Costs

COST CATEGORY	SOFT COSTS	HARD COSTS	ALLOCATED COSTS
LEED Zero Energy Registration	Consulting hours	None	None
Energy Audit or Existing Building Commissioning	Consulting hours	None	None
Implementation of ECM's	Consulting hours and controls programming	Equipment modifications and/or Capital projects	Costs will vary based on audit findings.
LEED Zero Documentation Costs	Consulting hours	None	None
LEED Zero Review Costs	Consulting hours	\$1,680/building under 499,999 sf	None
Renewable Energy Costs	Consulting hours	None	Estimated <23.54 MW Solar production/year



STEP 6: INITIATE TIER 3 FUTURE CANDIDATE PROGRAM

The Tier 3 Future Candidates have the longest duration in their path to LEED Zero Energy certification. The LEED O+M process focuses on sustainable operations and sustainable building features. LEED O+M will require both energy benchmarking and energy conservation measure completion as well as the development of policies that impact how Metro operates the building. Therefore, careful planning for LEED O+M Certification is required.

Metro Department of General Services plans to begin this process by canvassing existing policies and creating timelines for when service contracts expire. Then, use contract renewals as an opportunity to add revised or enhanced language that aligns with the goals of LEED O+M. Key examples of policies that would be in consideration include:

1. Solid Waste Management,
2. Green Cleaning Policy,
3. Pest Management Policy
4. Fit-up and Renovation Project Policy
5. Indoor Air Quality Management Policy
6. Thermal Comfort Policy

During this period of reviewing and assessing operational policies. Metro Department of General Services will begin using the Energy Savings Revolving Fund to systematically perform energy audits or existing building commissioning on the Tier 3 candidates. As of this writing, the ESRF has about \$300,000 available. Due to rising energy prices the Fund is not being replenished as necessary to perform this work. Additional budgetary support is needed. It is suggested that the facilities representing the largest square footage are first addressed, then proceeding in descending order through the other facilities.

The Tier 3 Future Candidates are only able to register for LEED Zero Energy upon award of LEED O+M.



Table 10: Tier 3 Future Candidates Costs

COST CATEGORY	SOFT COSTS	HARD COSTS	ALLOCATED COSTS
LEED Zero Energy Registration	Consulting hours	None	None
Policy Rewriting	Consulting hours Internal hours	None anticipated unless there is non-compliant equipment that requires replacement (e.g. cleaning equipment)	None
LEED O+M Certification	Consulting hours	-Registration - \$1350/building -Review Fees based on SF -Required Energy Audits (ASHRAE Level 1 and Level 2) -Equipment modifications and/or Capital projects -Measurements of Outside Air, Supply Air -One Time Air Sample Testing OR Continuous Monitoring -Refrigerant Phase Out Plans *Each building will need to individually be assessed for gaps to achieving LEED O+M and costs will vary.	None – potential to dual-purpose the LEED Zero Energy RECs for the O+M certification. Costs of ASHRAE Audits range based on building square footage and complexity. Typical range for Level I and Level II, can be from \$4,100 to \$21,250 Capital projects and other on-site testing will vary based on audit findings and types of systems that require measurement and/or phased planning.
LEED Zero Documentation Costs	Consulting hours	None	None
LEED Zero Review Costs	Consulting hours	\$1,680/building under 499,999 sf	None
Renewable Energy Costs	Consulting hours	None	TBD MW Solar production/year

STEP 7: MEASURE, ASSESS, AND EXTEND TO OTHER DEPARTMENTS

Additional Metro departments can utilize the same processes to roll out this Metro Energy Management Plan through their facilities. Inclusion of facilities outside of the Department of General Services will be required in order to comply with ordinance thresholds while balancing cost and impact.

A summary, which can be cross-referenced with specific examples above walks a department through:

- I. **Quantify square footage requirements.** This task includes vetting departmental facility inventory data. The targets for Metro-wide ordinance compliance have already been quantified based on the 2024 inventory from the ARCGis Metro Facilities database.
- II. **Evaluate government-owned buildings and classify facilities by Tier.** This task includes looking at the characteristics of each departmental facility. Based on those characteristics, use the framework of Tier classification to organize inventory into one of four groups (Tier 1, Tier 2, Tier 3, or Tier 4).
- III. **Identify the quantity of solar RECs required for buildings in the Tier 1 and Tier 2 candidacy categories** – By reviewing the collected energy data for buildings in each Tier category, the required solar RECs to offset those buildings can be calculated.
- IV. **Execute LEED Zero Energy for Tier 1 Prime Candidates.** Register the Tier 1 Prime Candidate facilities for LEED Zero Energy program. Request and then allocate necessary RECs to achieve zero energy status.



- V. **Implement Energy Retrofits and LEED Zero Energy for Tier 2 Capable Candidates.** Complete energy auditing and retrofits necessary to bring the Tier 2 Capable Candidate buildings into compliance with CBECS Benchmark. Implement appropriate energy conservation measures and implement those improvements. Then, register the projects for LEED Zero Energy and allocate necessary RECs.
- VI. **Initiate Energy Retrofits and LEED Zero Energy for Tier 3 LEED O+M Future Candidates.** Complete the LEED O+M certification for those facilities included in the Tier 3 classification of facilities. Through LEED O+M the projects will complete requirements for energy auditing and retrofits to achieve higher levels of energy performance. Once certified, register the buildings for LEED Zero Energy and allocate necessary RECs.
- VII. **Measure, Assess, and Improve.** Upon successful certification of the Tier 1 Prime Candidate facilities through LEED Zero Energy program, continue to optimize building performance to reduce reliance on RECs. Consider extending the program to additional eligible facilities beyond the ordinance thresholds as a continual improvement program aimed to achieve Metro's 2041 carbon free energy targets.



SECTION 6 – ONGOING REPORTING

To maintain trajectory for the efforts associated with ordinance compliance, Metro will be reporting on select measures in an ongoing manner.

The following table indicates the requirements for reporting, responsible party, and frequency. Reporting is a multi-agency effort. The Department of General Services will be overseeing compliance with this reporting.

Table 11: On-Going Reporting Matrix

REPORT	RESPONSIBLE CHARGE	FREQUENCY	REPORTING METHOD	NOTES
Progress Report	Department of General Services	Periodic	Presentation to Mayor's Office. Publish Publicly	
Energy Benchmarking for each building and each utility type	All Metro agencies ¹¹	Monthly data	Energy Star Portfolio Manager in cooperation with DGS Energy Manager.	Collected annually
Renewable Energy Credit Ledger	Department of General Services	Quarterly	Completed by Department of General Services, Division of Sustainability and reported to the Mayor's Office and Metro agencies.	Balancing of REC portfolio will require regular review. Suggesting report out to all agencies that plan to use RECs for their projects or departmental goals.
New Construction or Existing Building LEED BD+C or LEED O+M Certificates	LEED Consultant	As Awarded	Email to General Services	
LEED Zero Energy Certificates	LEED Consultant	As Awarded	Email to General Services	
Annual VPPA generation	TVA/ Department of General Services	Annual		

¹¹ Metro Legal Department has opined (as relates to an adjacent mandate (Metropolitan Code of Laws Section 2.32.080) that all Metro agencies are included, except for Convention Center Authority, MDHA, MTA, MNAA, Sports Authority, and Hospital Authority (includes General Hospital)



SECTION 7 – EXCEPTIONS AND COMPLIANCE

- I. Introduction of LEED v5
 - A. LEED v5 is anticipated to launch in early 2025, and that launch will set the sunset date for v4 and v4.1 registration. The complete timeline for adoption and sunset is not publicly available at this time. Projects can be registered for current LEED versions until the sunset date is established.
 - B. At this time, LEED v5 is still in draft form and under public review. Until it is approved via USGBC Member ballot and officially issued with reference guidance and templates, there can be program and criteria changes. Care will need to be taken to evaluate v5's enhancements from previous versions, if only LEED v5 is available for registration.
- II. All Metro departments are subject to the Metropolitan Code of Laws Section 2.32.070 and Section 2.32.080, per Metropolitan Legal Department except the following:
 - A. Convention Center Authority
 - B. Metropolitan Development and Housing Authority (MDHA)
 - C. Metro Transit Authority (MTA)
 - D. Metro Nashville Airport Authority (MNAA)
 - E. Metro Nashville Sports Authority
 - F. The Hospital Authority of Metropolitan Nashville and Davidson County (includes General Hospital)
- III. For departments that are subject to the Metropolitan Code of Laws Section 2.32.070, the common reasons for exceptions to complete reporting include:
 - A. Incomplete building attribute data
 - B. Lack of delineation of building space types/square footage for multi-use buildings
 - C. New or recently renovated building without 12 consecutive months of energy usage data
 - D. Incomplete meter mapping for buildings with multiple electricity and/or gas meters/accounts
- IV. Participating departments should report required data to the following Department of General Services points of contact (current as of October 2024):
 - A. Jennifer Westerholm, Assistant Director, Sustainability Division
 - B. Freddie Adom, Energy Manager
 - C. TBD, Energy Efficiency Manager
- V. To aid the Department of General Services in meeting reporting requirements to Metro Council and the Mayor's Office, participating departments should adhere to the following timeline:



Table 12: Additional Participants

INFORMATION	RESPONSIBLE PARTY	DUE DATE	FREQUENCY	NOTES
Facility electricity and natural gas data entered in Energy Star Portfolio Manager for previous calendar year	All participating Metro departments	April 1	Annual	Assistance with utility data reporting can be requested to Freddie.Adom@nashville.gov
Accounting of ECMs performed in Metro facilities between 2021-2024	Any participating Metro department that owns a facility and made upgrades resulting in energy savings between 2021-2024	July 1, 2025	One-time	Details on scope of ECMs should be sent to DGS Energy Efficiency Manager.
Registration, certification, or recert of LEED Zero Energy projects, LEED O&M projects, and LEED D&C projects	All participating Metro departments	April 1	Annual	Details on projects should be sent to DGS Energy Projects Manager.



SECTION 8 – CONCLUSION

The Department of General Services has demonstrated leadership in advancing the Metro ordinances and achieving significant milestones in energy efficiency and sustainability. Efforts have resulted in substantial energy savings, cost avoidance, and progress towards LEED Zero Energy certification. The Department's proactive approach and strategic planning have set a strong foundation for Metro's sustainable future through this Metro Energy Management Plan.

However, the journey towards achieving Metro's ambitious energy and sustainability goals requires the collective participation and commitment of all Metro departments. The success of the Metro Energy Management Plan hinges on collaboration, resource sharing, and adherence to the established roadmap. Each Metro department must actively engage in energy conservation measures, policy enhancements, and reporting to ensure consistent progress.

Moreover, sustained funding is crucial to maintain the momentum and expand the scope of energy retrofits, renewable energy, and LEED Zero Energy certifications. Investment in energy efficiency projects, renewable energy initiatives, and ongoing maintenance will yield long-term benefits, including reduced operational costs, enhanced environmental performance, and improved public perception.

In conclusion, the Department of General Services has trailblazed a path for Metro's sustainable growth. The U.S. Green Building Council commends Metro for the forward-thinking ordinance for LEED Zero. It is imperative that all Metro departments join forces, leveraging their collective expertise and resources, to build on this foundation. Together, Metro can achieve a greener, more resilient future for Nashville and Davidson County. Continued funding and interdepartmental cooperation are essential to realize the full potential of the Metro Energy Management Plan and meet the city's sustainability goals.



SECTION 9 – DEFINITIONS

- A. **Benchmarking:** A method used to determine whether a building is using more or less energy than its peer facilities with similar occupancies, climates, and sizes. Benchmarking is done by taking a building's total energy use and dividing by the building's total area. This number is frequently referred to as the Energy Use Intensity or EUI, is then compared to buildings of the same use type to determine how efficiently the building is utilizing energy.
- B. **City-owned:** Facilities owned by Metro. Excludes leased facilities.
- C. **Commercial Buildings Energy Consumption Survey (CBECS):** A national sample survey that collects information on the stock of US commercial buildings, including their energy-related building characteristics and energy usage data (consumption and expenditures). It is run by the US Energy Information Administration. [Energy Information Administration \(EIA\)- About the Commercial Buildings Energy Consumption Survey \(CBECS\)](#)
- D. **Energy Audit:** An inspection survey and an analysis of energy flows for energy conservation in a building. It may include a process or system to reduce the amount of energy input into the system without negatively affecting the output. An energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprint.
- E. **Existing Building Commissioning:** the application of the commissioning process to existing buildings. Retro-commissioning is a process that seeks to improve how building equipment and systems function together. Depending on the age of the building, retro-commissioning can often resolve problems that occurred during design or construction, or address problems that have developed throughout the building's life. In all, retro-commissioning improves a building's operations and maintenance procedures to enhance overall building performance. Retro-commissioning work should follow ASHRAE Guideline 0.2-2015, Commissioning Process for Existing Building Systems and Assemblies.
- F. **Facilities Manager:** The designated person at each City building who is responsible for submitting maintenance work orders.
- G. **LEED (Leadership in Energy and Environmental Design):** Consensus-based generalized point rating system for locating, designing, constructing, operating and certifying sustainable buildings. Rating system addresses environmental predetermined categories that include sustainable sites, water efficiency, energy & atmosphere, materials & resources, indoor environmental quality, and design and process innovation.
- H. **Major Renovation:** Extensive alteration work in addition to work on the exterior shell of the building and/or primary structural components and/or the core and peripheral mechanical, electrical, and plumbing and service systems and/or site work. Typically, the extent and nature of the work is such that the primary function space cannot be used for its intended purpose while the work is in progress and where a new certificate of occupancy is required before the work area can be reoccupied.
- I. **New Construction:** City-owned buildings and facilities that are to be planned and constructed on a new or existing site. For the purposes of LEED construction under MCL 16.60.050, "For new construction, this chapter shall apply to projects which exceed five thousand gross square feet of occupied space or for which the total project cost exceeds two million dollars. For additions to existing buildings or facilities, this chapter shall only apply to projects that add five thousand or more gross square feet of occupied space, LEEDTM certification requirements shall only apply to the scope of the addition itself."
- J. **Occupied facility/space:** A facility or enclosed space providing for human activity on a regular basis, including parking decks.
- K. **Site Energy** – the amount of energy consumed by a building as reflected in utility bills. *Compare to: "source energy."*



- L. **Source Energy** – energy consumed by utilities and other entities in order to supply energy consumed by the building site.

