

Energy Action Plan

FY22 Annual Progress Report

Background

Metro's Energy Action Plan defines the path to a greener, safer, more reliable transit system for the National Capital Region. By following this plan, Metro is achieving environmental goals through increased energy efficiency and is generating long-term cost savings to ensure responsible stewardship of the region's dedicated funding.

FY22 Summary — Metro continues to advance strategic investments in the clean energy transition

In Fiscal Year 2022, from July 2021 through June 2022, Metro advanced programs that increase energy efficiency, mitigate risk, and promote fiscal responsibility.

Highlights from the past year:



Completed construction of **1.5 MW solar carport** at **Anacostia Parking Garage**, the first of four community solar sites at Metrorail stations



In coordination with the General Services Administration (GSA), Metro secured a new **electricity supply contract** for facilities and rail service in Maryland that **requires the supplier to provide 50% of the electricity from renewables**



Completed construction and opened Metro's new Headquarters, **designed to Leadership in Energy and Environmental Design (LEED®) Gold standards**, located at L'Enfant Plaza, Washington, D.C.



Advanced Metro's Zero-Emission Bus program – initiated site design and procurement for **12 battery electric buses and chargers** at **Shepherd Parkway Bus Division** and revised plans for Northern Bus Garage to support **100% Battery Electric Bus from opening**



Solar carport installation
(Pictured: Anacostia Parking Garage)



LEED Gold designed facility
(Pictured: Metro Headquarters at L'Enfant Plaza)

Measuring Annual Progress:

Metro calculates the “energy use per vehicle mile” to measure its overall progress on energy efficiency.

In FY22, Metro’s energy use per vehicle mile increased by 9% compared to the previous year. This was due to the continued operation of all facilities and rail stations while fewer trains were in service – Metro ran 30% less service following the removal of 7000-series railcars to address wheel alignment safety concerns.

Despite this uptick, the Authority advanced energy efficiency projects across operations, including upgrading facility and tunnel lighting to light-emitting diode (LED) technology and advancing escalator replacements at Metrorail stations.

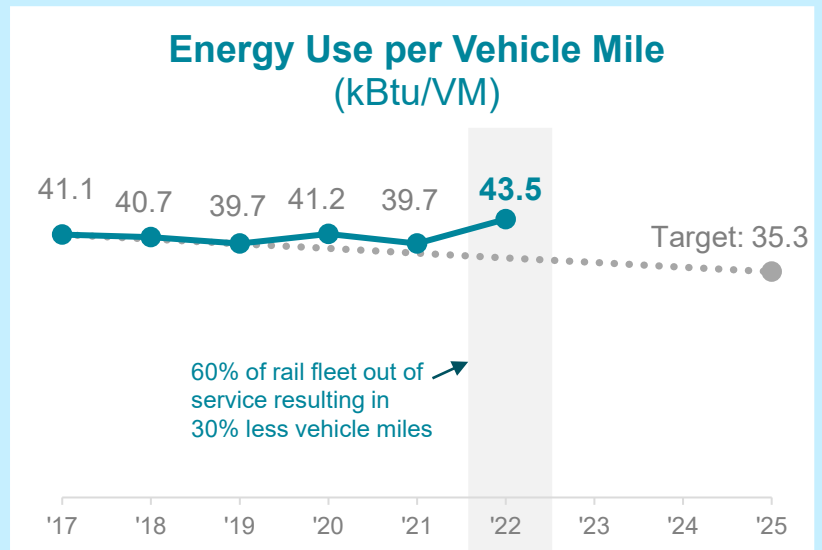


Figure 1: In 2014, Metro established the target of a 15% reduction in energy use per vehicle miles by 2025.

In This Report

This report communicates Metro’s progress and achievements in FY22. It focuses on the three key pillars in the Energy Action Plan:

1. Implement Energy Audit Identified Investments

2. Modernize Design, Construction, and Operations

3. Engage Dynamically in the Energy Market

1. Implement Energy Audit Identified Investments

In FY22, Metro continued to advance energy efficiency investments within its Capital Improvement Program.

SCORECARD

FY19–22 Project Accomplishments and FY23 Priorities

Project Category	Action	19	20	21	22	23	
Lighting	Station lighting systems (track beds, pylons, and parapets)	✓	✓				
	Non-revenue facilities	✓	✓	✓	✓	☐	
	Tunnel lighting	✓	✓	✓	✓	☐	
	Station backrooms		✓	✓			
Traction Power	8000-series railcar procurement	✓		+	✓	☐	
	Maintenance of way vehicle tracking		✓	✓	✓	☐	
	Braking energy recovery	Design (FY20) and install two energy recovery units for test and evaluation (FY22)*		✓	+	+	☐
		Update specifications to require modern technology in traction power upgrades*		→	→	+	☐
		Develop designs/specifications for two battery storage systems and initiate procurement*		→	→	+	☐
7000-series traction power settings			✓	✓			

*Action impacted by COVID-19 Pandemic

Scorecard Key

- ✓ Action completed
- + Action underway, partially completed
- Action moved to next fiscal year
- ☐ Planned action

Project Category	Action	19	20	21	22	23	
Facilities	Andrews Federal Bus Garage built and operating to LEED® Silver Standards (FY19), certified (FY20); est. 30% energy savings from ASHRAE 90.1-2007	✓	✓				
	Cinder Bed Road Bus Garage built, certified, and operating to LEED® Gold Standards (FY19); est. 20% energy savings from ASHRAE 90.1-2007	✓					
	Install occupancy sensors at 22 non-revenue facilities					☐	
	Install and operate energy management systems at LEED® designed headquarters in D.C. (FY22) and office buildings in MD (FY23) and VA (FY24)				✓	☐	
Manage to Energy Action Plan recommendations	Establish ownership for management of facilities		✓				
Stations	Chiller plant upgrades (incl. frictionless bearings and variable frequency drives)	✓	✓				
	Manage to Energy Action Plan recommendations		✓				
	Variable Frequency Drive (VFD) test and evaluation			✓			
	Escalator upgrades				✓	☐	
Bus	Zero-emission fleet strategy	Conduct electric bus strategy research (FY19); release Zero-Emission Bus Update (FY20-FY22), secure Metro’s Board adoption of zero-emission bus goals (FY21); Metrobus Fleet Plan (FY22), Zero-Emission Bus Transition Plan (FY23)	✓	✓	✓	✓	☐
		Initiate electric bus test and evaluation planning (FY20), secure FTA Low-No Grant for two buses and charging equipment (FY21), release RFP for additional ten buses (FY22); construct site infrastructure, install charging equipment, and accept delivery of initial buses (FY23)		✓	✓	✓	☐
	Bus priority measures	Conduct analysis of transit signal priority (TSP) (FY19), install TSP devices on Metrobus fleet (FY21-22)	✓		✓	✓	
		Partner with jurisdictions to implement dedicated bus lanes and other bus improvements, such as queue jumps and TSP (FY20-23)		✓	✓	✓	☐
	Cashless fare payment	Conduct a 12-month cashless fare payment pilot on the 79-bus route to reduce bus stop times	✓				
	Bus eco-driving	Install and evaluate efficient transmissions with FuelSense software on 7% of fleet (FY19), 14% of fleet (FY20), FuelSense software re-evaluated (FY21)	✓	✓	×		
	Bus Transformation Project	Engage with jurisdictions and the public to develop draft strategy	✓				
Release final strategy and action plan			✓				

✓ Action completed + Action underway, partially completed × Action reevaluated, no longer pursued ☐ Planned action

2. Modernize Design, Construction, and Operations

In FY22, Metro continued to incorporate energy-efficient design standards in major facilities projects—including advancing Leadership in Energy and Environmental Design (LEED®) incorporation into design and construction for three administrative facilities, two bus garages and one of the first LEED® for Transit stations. Metro will continue to standardize and adopt best practices for design, construction, and operation of Metro facilities.

SCORECARD

FY19–22 Project Accomplishments and FY23 Priorities

Project Category	Action	19	20	21	22	23	
Design, Construction & Operations	Design criteria & specifications update		+	+	+	<input type="checkbox"/>	
	Energy efficient operating procedures		+	+	+	<input type="checkbox"/>	
	Capital Improvement Program prioritization	Include utilities operating cost impact in project initiation review	✓				
		Integrate energy efficiency best practices into DC&S, contract language, lifecycle costing, etc.		+	+	+	<input type="checkbox"/>
		Train staff in LEED® and Envision® standards			✓		
	Lifecycle costing and energy efficient building standards included in major capital investment contracts	Release RFPs (FY19) and design Northern and Bladensburg Bus Garages and the Heavy Repair & Overhaul facility using LEED® criteria	✓	+	+	+	<input type="checkbox"/>
		Evaluate design of Metro’s new headquarter facilities using 30-year return on investment (ROI) threshold and LEED® criteria	✓				
		Incorporate ‘electric-bus-ready’ design in new bus garages currently under development (Northern and Bladensburg)		✓	✓	✓	<input type="checkbox"/>
	Project support for major capital projects	Design/build Potomac Yard Station to meet LEED® for Transit standards (FY20-21) and submit for certification (FY22)		+	+	✓	<input type="checkbox"/>
		Design/build Metro’s headquarters as a LEED®-certified buildings – D.C. (FY22); MD (FY23), VA (FY24)				✓	<input type="checkbox"/>
		Design/build Grosvenor-Strathmore Garage expansion to meet Parksmart® standards (FY22)			✓	✓	
	Best practice consultation with peer agencies and industries	Actively participate in APTA Sustainability Committee, CoMET/NOVA and UITP research and benchmarking efforts	✓	✓	✓	✓	<input type="checkbox"/>

Scorecard Key

- ✓ Action completed
- + Action underway, partially completed
- Planned action



Metro’s New Headquarters Building Achieves LEED® Design Goal

In FY22, Metro completed construction and opened its new headquarters designed to Leadership in Energy and Environmental Design (LEED®) Gold standards. Through the LEED® construction process, Metro prioritized energy efficiency, employee wellbeing, and reduced environmental impact.

- Achieved perfect score of 100 on the Energy Star® scale for reducing greenhouse emissions by 86%
- Investments in energy saving light-emitting diode (LED) lighting, automatic lighting controls, and high-performance HVAC systems for energy and emissions savings
- A 10,000 sq ft green roof, approximately 25% of the site, helps mitigate heat island effect
- Supports use of low-carbon transportation with bicycle storage, pedestrian access to public transit, and electric vehicle charging stations



LEED Gold designed facility
(Pictured: Metro Headquarters at L'Enfant Plaza)

3. Engage Dynamically in the Energy Market

In FY22, Metro advanced its solar carport project to construction and continued to decarbonize its energy supply. Metro secured a new electricity supply contract serving facilities and rail in Maryland – this contract combined with a similar contract signed in the District of Columbia the year prior means 35% of Metro’s electricity use is now carbon pollution-free. Next year, Metro will continue to explore energy market engagement opportunities, including renewable energy.

SCORECARD FY19–22 Project Accomplishments and FY23 Priorities

Project Category		Action	19	20	21	22	23
Energy Market Engagement	Strategic energy purchasing	Establish cross-departmental group to support strategic energy purchases	✓				
		Secure new natural gas supply contract in coordination with GSA (FY20 and FY23)		✓			☐
		Engage technical resources to prepare new electricity supply contracts		✓			
		Evaluate renewable natural gas opportunity (FY20)		✓			
		Award electricity supply contract in coordination with GSA and include renewables requirement in District of Columbia (FY21) and Maryland (FY22)				✓	✓

Scorecard Key

- ✓ Action completed
- ☐ Planned action

Project Category		Action	19	20	21	22	23
Energy Market Engagement	Enterprise Energy Monitoring Software (EEMS)	Issue RFP and select vendor for EEMS 2.0 (enhanced analysis and visibility into operations)	✓				
		Launch EEMS 2.0 (FY20); train interdepartmental staff to leverage tool capacity and analyze energy usage (FY21-23)		✓	✓	✓	☐
	Solar program	Phase 1– Solar Carports: Develop ground lease business case (FY19); issue RFP for third party design and operation at four Metro sites (FY20); complete design and permitting (FY21-22); initiate construction (FY22-23)	✓	✓	✓	✓	☐
		Phase 2—Other Metro facilities: Evaluate and advance designs for solar at additional facilities (FY21-23)			✓	✓	☐
	Utility rebates	Apply for/receive utility energy efficiency rebates: \$430K (FY19), \$245K (FY20), \$300K (FY21)	✓	✓	✓		
	Active engagement with regional stakeholders and working groups	Continue collaboration and advocacy with stakeholders (e.g., DC Power Path, Mid-Atlantic Hydrogen Hub, Washington Advanced Energy Group, and local Public Utility Commissions)	✓	✓	✓	✓	☐
Continue to work with utilities for fleet electrification (incl. garage and on-route charging) and EV charging opportunities at parking facilities			✓	✓	✓	☐	

Scorecard Key

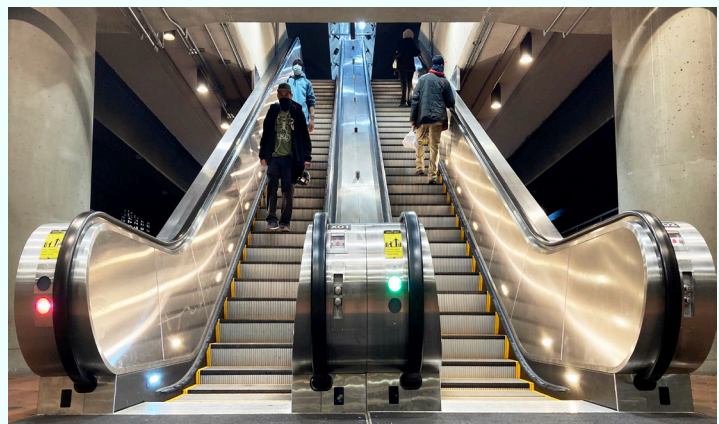
- ✓ Action completed
- ☐ Planned action



Escalator Replacements at Metrorail Stations

Metro owns and operates a network of more than 600 escalators and is replacing 130 in the next seven years. In FY22, 23 escalators were upgraded and replaced.

The new escalators feature energy efficient upgrades including light-emitting diode (LED) lighting and regenerative braking technology, which captures energy that is otherwise lost during braking and uses this energy to power escalator systems.



Escalator replacement at Metrorail Stations (Pictured: Rhode Island Avenue)