2025 Energy Action Plan – FY19 Annual Progress Report

November 2019

Metro's Energy Action Plan transforms the way Metro does business to ensure a greener, safer, more reliable ride. The Plan is helping Metro reach environmental goals through reduced energy consumption and is generating long-term cost savings to ensure responsible stewardship of the region's dedicated funding. In FY19, Metro progressed the Plan's three areas of focus:

1. **Implement Energy Audit Identified Investments** - Metro began implementing, tracking, and seeing the benefits from energy efficiency upgrades embedded into Metro's Capital Improvement Program. Metro will continue and accelerate project implementation to reach its 2025 energy savings target and help reduce operating costs.

2. **Modernize Design, Construction, and Operations** - Metro incorporated green design standards into current major capital projects. Next year, Metro will standardize and adopt best practices, including energy efficient building standards, design guidelines, and standard operating procedures.

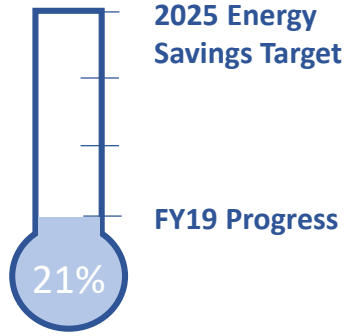
3. **Engage Dynamically in the Energy Market** - Metro initiated energy market engagement by joining major regional energy policy groups and forming partnerships for energy purchasing. Metro will continue to grow staff capacity and explore market opportunities, including renewable energy.

Metro is on track to meet its 2025 energy savings target

The Energy Action Plan established a 2025 energy savings target of **750,000 million BTUs,** based on modelled business-as-usual projections and recommended efficiency investments. This year, Metro advanced several programs that increase energy efficiency, mitigate risk, and promote fiscal responsibility.

Metro is on track and approximately 21% of the way towards the 2025 energy savings target.

Compared to modelled business-as-usual projections, Metro **saved approximately 160,000 MBTUs** in FY19, which equates to approximately $3 million in avoided costs.



New LED lighting reduces energy use by approx. 60% - each station saves enough to power 40 homes each year.

New bus wash bay at Andrews Federal Bus Garage reduces energy and water consumption.

Highlights from this past year include:

- Investments in energy efficiency resulted in the reduction of CO_2 emissions by approximately 33,000 metric tons
- Completed lighting upgrades at 25 underground stations and 11 support facilities, reducing energy consumption and improving visibility and safety
- Opened Metro's newest facility, Andrews Federal Bus Garage, which is now operating to LEED Silver standards
- Worked with utilities to claim energy efficiency rebates and partnered with the General Services Administration (GSA) for improved energy purchasing contracts

More Metro. Less CO_2.

Find the full 2025 Energy Action Plan at:

www.WMATA.com/Sustainability

1 Implement Energy Audit Identified Investments

In FY19, Metro began implementing, tracking, and seeing the benefits from energy efficiency upgrades embedded into its Capital Improvement Program. Metro will continue and accelerate project implementation to reach its 2025 energy savings target and help meet Metro's commitment to cap operating subsidy increases at 3% per year.

2025 Energy Action Plan Investments

Invest **$65 million by 2025,** with an average return on investment of **less than five years** from energy savings alone

Estimated Annual Outcome by 2025

- **750,000** MBTUs saved
- **$16.3** million energy savings
- **160,000** metric tons avoided CO_2 emissions = to **35,000 cars off the road**

Scorecard – FY19 Accomplishments and FY20 Priorities

Investment Category		Action	FY19	FY20
Lighting	Station lighting system upgrades (trackbeds, pylons, and parapets)	Completed upgrades at 25 underground stations (approx. 52% complete)	✓	
		Complete all 48 underground stations		❑
	Non-revenue facilities upgrades	Completed 11 facilities for Phase 1	✓	
		Complete additional 24 facilities for Phase 2 (100% complete)		❑
	Tunnel lighting upgrades	Completed approx. 20% of tunnel segments systemwide	✓	
		Complete all tunnel segments (approx. 22,000 fixtures)		❑
	Station backrooms upgrades	Complete 25 sites for Phase 1 (approx. 25% complete)		❑
Traction Power	8000-series railcar procurement	Efficiency incentives and penalties included in solicitation	✓	
		Continue evaluations of proposals and select vendor		❑
	Maintenance of way vehicle tracking	Complete installs and measurement and verification of tracking devices		❑
	Braking energy recovery	Finalize designs and initiate installs of 2 energy recovery units on the Blue Line		❑
		Update specifications to require modern technology in traction power upgrades		❑
		Initiate procurement for battery storage program		❑
Facilities	Investments in efficient facilities	Andrews Federal Bus Garage built and operating to LEED Silver Standards; est. 30% energy savings from ASHRAE 90.1-2007	✓	
		Cinder Bed Road Bus Garage built, certified, and operating to LEED Gold Standards; est. 20% energy savings from ASHRAE 90.1-2007	✓	
	Manage to Energy Action Plan recommendations	Establish a Master Plan for ownership and management of facilities		❑
		Initiate audits and interim efficiencies (e.g., smart metering, commissioning, HVAC)		❑
Stations	Chiller plant upgrades (incl. frictionless bearings and variable frequency drives)	Completed upgrades for 8 sites (systemwide approx. 74% complete)	✓	
		Complete upgrades at 5 sites (systemwide approx. 90% complete)		❑
	Manage to Energy Action Plan recommendations	Establish a Master Plan for management and ownership of stations		❑
		Initiate audits and interim efficiencies (e.g., smart metering, commissioning, HVAC)		❑
Bus	Zero emission fleet strategy	Initiated electric bus strategy research (EBSR)	✓	
		Complete EBSR and initiate testing and evaluation phase		❑
	Bus priority measures	Conducted analysis of transit signal priority (TSP)	✓	
		Advocate for jurisdictional investments in dedicated bus lanes and TSP		❑
	Cashless bus pilot	Completed a 12-month cashless fare payment pilot on the 79 bus route	✓	
	Bus eco-driving	Initiated rollout of efficient transmissions with FuelSense software (7% of fleet)	✓	
		Continue adoption of efficient transmissions with FuelSense software (14% of fleet)		❑
	Bus Transformation Project	Engaged with jurisdictions and the public to develop draft strategy	✓	
		Release final strategy and action plan		❑

2 Modernize Design, Construction, and Operations

In FY19, Metro incorporated green design standards into current major capital projects. Next year, Metro will standardize and adopt best practices, including energy efficient building standards, design guidelines, and standard operating procedures.

Anticipated Outcomes and Benefits

- Modernized capital investment standards
- Optimized operational standards and practices
- Cost savings throughout the life of the asset
- Reduced environmental impact over the life of the asset

Andrews Federal Bus Garage reduces energy use through energy efficient features such as infrared gas heating and blower curtains.

Scorecard – FY19 Accomplishments and FY20 Priorities

Project Category	Action	FY19	FY20
Design criteria & specifications update	Initiate review of DC&S and contract language to support energy efficiency		❑
Energy efficient operating procedures	Update policies and procedures affecting energy efficiency		❑
Capital Improvement Program prioritization	Included utilities operating cost impact into project initiation review	✓	
	Ensure standardization of DC&S, contract language, lifecycle costing, etc.		❑
Lifecycle costing and green building standards included in major capital investment contracts	Released RFP for new Heavy Repair and Overhaul (HRO) facility	✓	
	Evaluate design of Metro's new headquarter facilities using 30-year return on investment threshold and LEED criteria	✓	
	Initiated designs for Potomac Yard station to meet LEED for Transit	✓	
Project support for major capital projects	Release RFP for Northern and Bladensburg Bus Garages	✓	
	Evaluate bus garage designs using a 30-year ROI and LEED criteria		❑
	Finalize designs for Potomac Yard station and submit for LEED certification		❑
Best practice consultation with peer agencies and industries	Active participant of APTA's Sustainability committee, member of CoMET/NOVA and UITP, and actively participate in research and benchmarking efforts	✓	

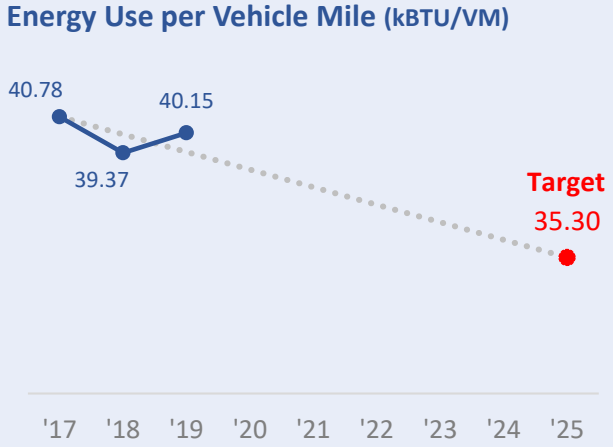
Metro is within range to meet its 2025 energy efficiency target

Metro tracks **energy use per vehicle mile** to effectively measure energy efficiency per unit of service provided. In 2014, Metro established the target of a 15% reduction in energy use per vehicle miles by 2025.

Metro advanced several projects this year that reduce energy use, however Metro also increased deployment of 7000-series railcars which use more energy than the legacy fleet.

Despite a 2% increase in energy use per vehicle mile in FY19, **Metro is within range** to meet its energy efficiency target by 2025 through continued implementation of the Energy Action Plan.

Next year, Metro will re-baseline the business-as-usual energy savings projection to account for changes in service and operations, including a 2.8% increase in rail vehicle miles (partially a result of eliminating the Red Line turnback).



3 Engage Dynamically in the Energy Market

In FY19, Metro initiated energy market engagement by joining major regional energy policy groups and forming partnerships for energy purchasing. Metro will continue to grow staff capacity and explore market opportunities, including renewable energy.

Anticipated Outcomes and benefits

- Active partnerships with utilities, technology providers, and jurisdictions across the region
- Strategic and informed decisions based on the latest technology trends and policy developments
- Forward-looking energy contracts for financial and environmental savings

Partnership with DCSEU to upgrade lighting at facilities in the District using a local certified business enterprise.

Scorecard – FY19 Accomplishments and FY20 Priorities

Project Category	Action	FY19	FY20
Strategic energy purchasing	Establish cross-departmental group to support strategic energy purchases	✓	
	Partner with GSA to efficiently secure a new favorable natural gas contract		❑
	Engage technical resources to prepare for new (2021) electricity supply contract		❑
	Evaluate renewable natural gas financial swap		❑
	Explore renewable energy purchasing opportunities		❑
Enterprise Energy Monitoring Software (EEMS)	Issue RFP and select vendor for EEMS 2.0 (enhanced analysis and visibility into operations)	✓	
	Launch EEMS version 2.0 and train interdepartmental staff to leverage tool capacity		❑
Solar program (phase 1)	Successfully develop business case and RFP for phase one launch	✓	
	Issue RFP and select vendor for 3rd party design and operation at 4 Metro sites		❑
Utility rebate programs	Claim approximately $400,000 in energy efficiency rebates	✓	
Active engagement with regional stakeholders and working groups	Advocate for Metro's interest at DC MEDSIS, BOT Energy and Resources working group, and Washington Advanced Energy Group	✓	
	Continue collaboration with existing and new stakeholder groups (e.g., Public Utility Commission)		❑
	Work with utilities for fleet electrification (incl. garage and on-route charging)		❑

$ Savings Opportunity

Metro is one of the largest energy users in the DC region, and energy costs account for Metro's largest non-personnel operating cost. As such, active engagement in the energy market has the potential to save Metro millions over the next several years. Energy costs are volatile and regulations continue to progress. As a result, strategic engagement provides an opportunity to avoid costs and achieve savings.

Metro participated at the U.S. DOE ARPA-E summit - discussing strategies to reduce the energy burden of transportation