



2022 DOE Vehicle Technologies Office Annual Merit Review

Cold-Weather Operation, Observation and Learning Electric Vehicles

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This presentation does not contain any proprietary, confidential, or otherwise restricted information.

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Overview

Timeline

- Start: October 1, 2020
- End: December 31, 2023
- 50% complete

• Barriers Addressed

- Lack of data on medium/heavy duty electric vehicles (EVs) in cold weather climates
- Cost of medium and heavy-duty electric vehicles

• Targets

- Deploy 4 medium/heavy duty vehicles
- Performance Monitoring Reports
- Community-based Outreach and Collaboration

Budget

Total project funding: \$2,017,265

DOE share: \$997,274

Cost share: \$1,019,991

2021 (BP1): \$1,665,870

2022 (BP2): \$198,279

Partners

- American Lung Association
- Eastern Carver County School
- Eureka Recycling
- CTE
- Xcel Energy

Project Objectives

Objectives

deploy electric vehicle charging and electric vehicles

Analyze extreme weather impacts to EV functionality

Inform EV industry and fleet operators about lessons learned

Technology Integration Goals

National Security

Economic Growth

Affordability for Fleets

Impacts

Increased EV adoption & awareness

Increased availability of electric vehicle charging infrastructure

Documented best practices for one-way & two-way carshare

Project Approach

Implement

- Vehicle procurement and design of four commercially available 100% battery electric medium- and heavy-duty vehicles
- Facility EVSE design and installation to be completed with three unique fleets at four sites.
- Planning and implementation of Training and Outreach

Deploy

- Vehicle delivery, acceptance testing, and validation testing
- Electric vehicles performance monitoring and charging evaluation
- Training and Outreach

Data
Collection

- Electric vehicles performance monitoring
- Training and Outreach

Milestones

Budget Period 1

Milestone	Type	Description
Project Administration	Technical	Executed contractual agreements between Prime and all sub-recipients, Project Management Plan completed, and Kick-off meeting held by end of Q1
Vehicle Deployment: 3 fleets	Technical	Preliminary operational analysis and recommended operational scenarios results to fleet partners, identifying any deployment risks by end of Q2
EVSE Evaluation: 3 fleet sites	Technical	Infrastructure site evaluations completed by Q3
Purchase Orders Placed	Technical	All vehicles and infrastructure purchase orders are verified by vendors by Q4
Training and Outreach Initiative	Technical	Key messaging developed for training and outreach will be finalized by Q2
Training and Outreach Initiative	Technical	Attend one tradeshow; develop & execute two written articles/case studies by Q5
EVSE Infrastructure Installed: 3 fleets at 4 sites	Technical	Charging infrastructure installed and ready for use at respective fleet partners' locations by Q5
Project Initiation	Go/No Go	All contracts secured, vehicles are available to be delivered and in service, vehicles are expected to meet service requirements and project requirements, as reported in the Preliminary Operational Analysis.

Budget Period 2

Milestone	Type	Description
Vehicle Delivery	Technical	Vehicles delivered to fleet operators by Q3
Vehicle Acceptance and Validation Testing: 3 fleets	Technical	Fleet operators conduct acceptance and performance validation testing on delivered vehicles, accept vehicles, and update operating scenarios based on testing results Q4
Vehicle Training: 3 fleets	Technical	Vehicle OEM will train vehicle operators & maintenance staff at each fleet by Q3
Training and Outreach Initiative	Technical	Host First Responder training and High Voltage Safety training by Q4
Training and Outreach Initiative	Technical	Attending a minimum of two tradeshows and two article/case study completed by Q1
Vehicle Deployment: 3 fleets	Technical	Deploy vehicles and infrastructure in regular service with three fleets by Q4
EVSE Commissioned to vehicles-three fleets/four sites	Technical	Charging infrastructure commissioned to the vehicles by Q4
Performance Monitoring – KPI	Technical	Host one KPI planning workshop by Q3
Training and Outreach Initiative	Technical	Host one EV ride and drive for employees at fleet site Q2
Project Deployment	Go/No Go	All vehicles are in active service by Q4

Project Accomplishments and Progress



Fleet Update:

- Eastern Carver School District Deployed Electric Blue Bird School Bus
- Eureka Recycling ordered Battle Motors Battle Electric 480 Refuse
- University of Minnesota ordered Peterbilt 220 e

Project Accomplishments and Progress (continued)



Outreach & Education

Bus Demos

- Minnesota School Board Association Leadership Conference
- InterFaith Creation Care South Metro

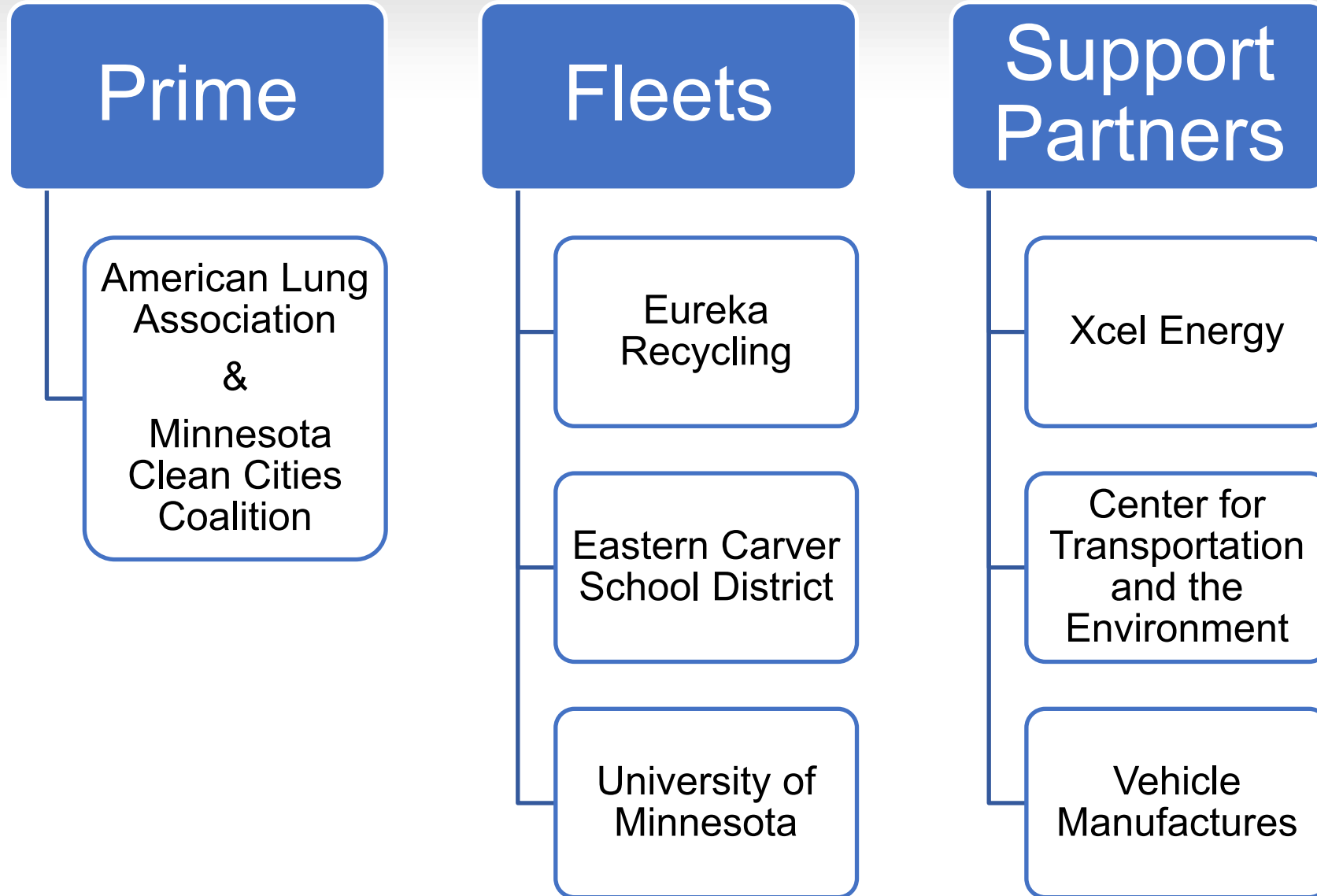
Fleet Outreach

- Eureka Recycling met with three fleets and 4 vendors to discuss needs

Changes

- Fleet cancellation in FOA led to new RFP. 12 fleets were interviewed

Collaboration among Project Team



Contribution to Energy Equity & Environmental Justice

- Vehicles to be deployed in 2 of 3 communities of low-income
- Case studies and demonstrations provided to underserved communities

Sustainability

- Long history of partners working to make fleets sustainable beyond the period of performance.
- Media support and presentations continues to grow interest.
- Key messaging, best practices and speaking opportunities will continue to be developed and shared with partners outside of region.

Summary

Approach

- Deploy four electric vehicles (EVs) and electric vehicle supply equipment (EVSE) infrastructure in three community fleets in Minneapolis/St. Paul metro area.
- Analyze extreme weather impacts to EV functionality and inform EV industry and fleet operators about lessons learned.

Collaborations

- Local governments, Community Based Organizations, Utilities, Private and Non-Profit Companies

Accomplishments

- Deployed 1 of 4 EVs and EVSE:
- Planning underway for Performance Monitoring Report, Community-based Outreach and Collaboration including first responder trainings, high voltage safety trainings, KPI workshop, ride and drives, case studies, and promotional, training and outreach materials for tradeshow and presentations.