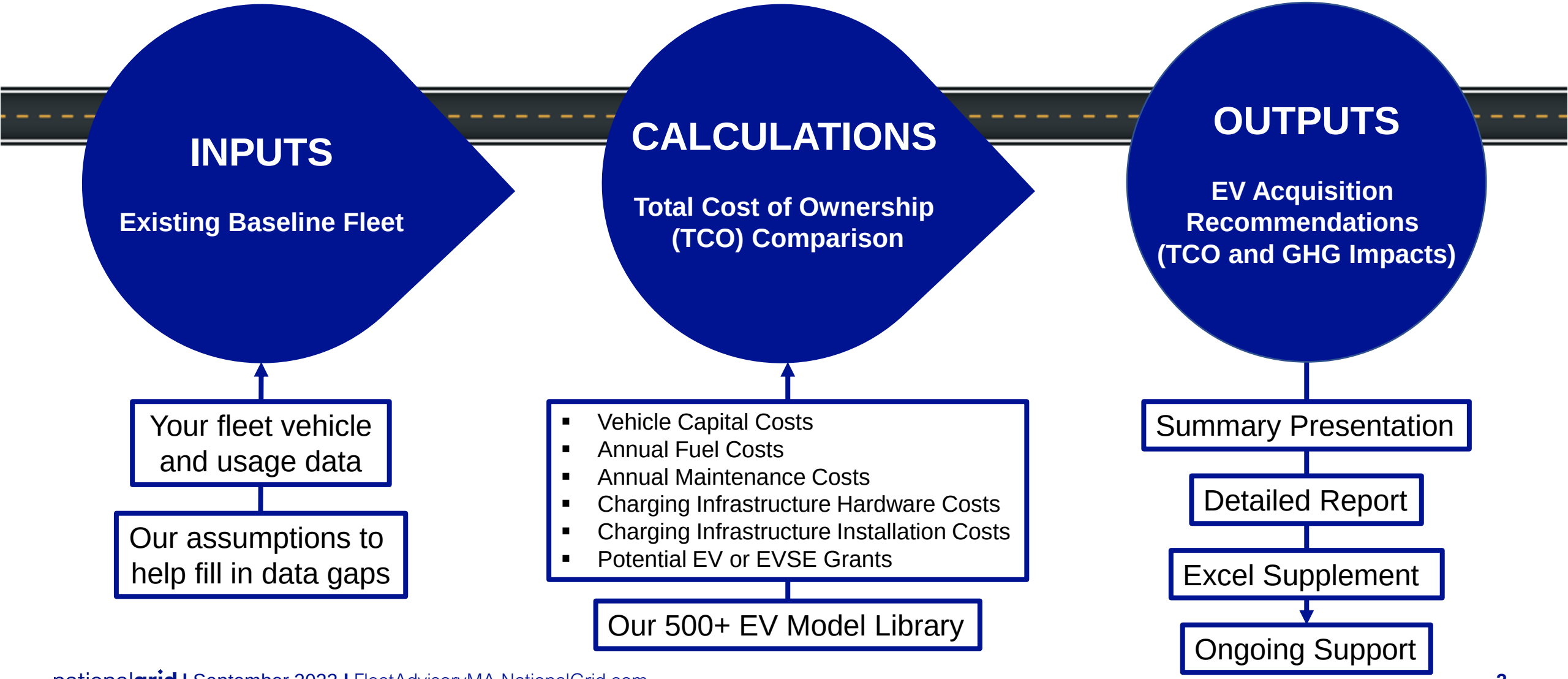
nationalgrid

Town of Athol

Fleet Electrification Refresh Assessment
September 11, 2023

Fleet advisory services provided by ICF

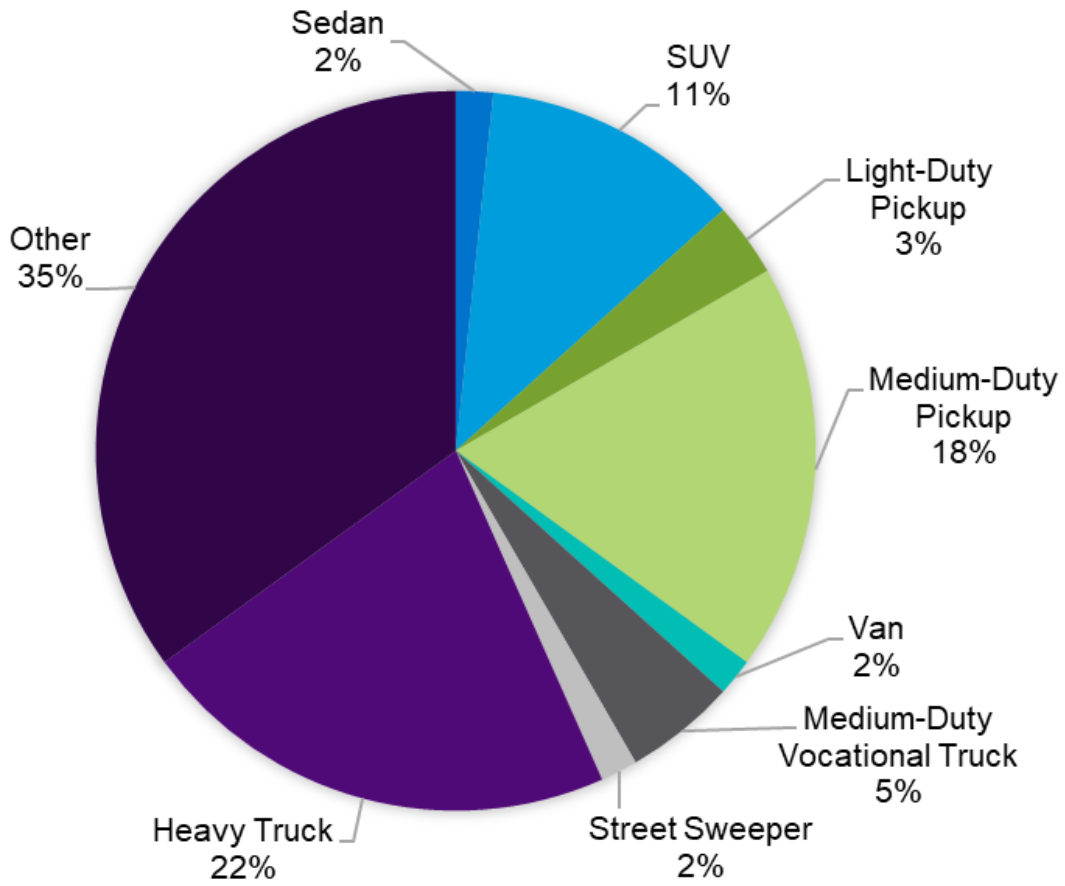
Fleet Assessment Process



Existing Fleet

Existing Fleet Fuel Type Distribution		
Vehicle Type	**Gasoline**	**Diesel**
Sedan	1	0
Sports Utility Vehicle (SUV)	7	0
Light-Duty Pickup	2	0
Medium-Duty Pickup	3	8
Van	1	0
Medium-Duty Vocational Truck	0	3
Heavy Truck	0	13
Street Sweeper	0	1
Other	13	8
TOTAL	**27**	**33**

Existing Fleet – Vehicle Types



Excluded Vehicles

Vehicle Types Excluded from Analysis		
Vehicle Type	**Quantity**	**Reason for Exclusion**
Non-Road Equipment	12	See Non-Road Equipment section for more information
Police Department SUVs	12	Police Department reported zero hours to charge
Ambulance	3	Limited EV models commercially available
Fire Truck	5	
Brush Truck	1	
TOTAL	**33**	

Key Assumptions*

- **Recommendation Threshold:** EV TCO < ICE TCO.
- **Vehicle Replacements:** The estimated retirement schedule is based on the vehicle purchase date or model year and vehicle lifespan assumptions.
- **Vehicle Ranges:**
  - Average daily mileage = annual mileage/250 days
  - Average temperature range of 22 to 88°F to assess potential temperature impact on EV ranges = reduced EV model ranges to 80% of their maximum mileage range.
- **Annual Mileage:**
  - Annual mileage data was provided by the fleet for 18% of the vehicles. For all other vehicles, annual mileage was calculated using AFLEET assumptions based on vehicle type.

Vehicle Type Assumptions

Vehicle Type	Vehicle Lifespan	Average Annual Vehicle Mileage
Sedan	15	12,400
SUV	15	13,000
Light-Duty Pickup	15	11,400
Medium-Duty Pickup	15	24,000
Van	15	25,000
Medium-Duty Vocational Truck	15	24,000
Heavy Truck	15	10,350

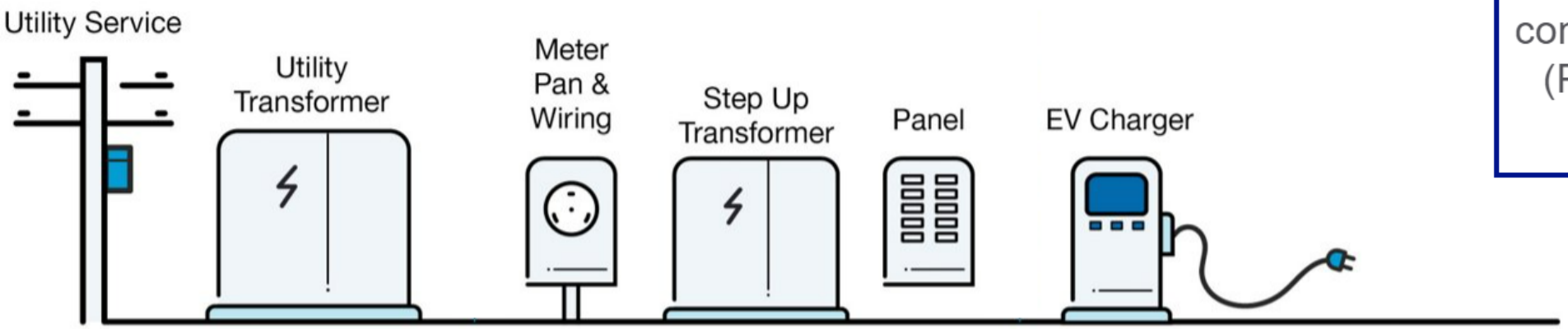
*Additional assumptions detailed in the report.

Incentive and Funding Sources

Program	Light-Duty EVs	Medium-Duty EVs	Heavy-Duty EVs	Administrator	Vehicle Costs	EVSE Installation	EVSE Hardware	Program Offerings	Upcoming Deadlines	TCO Funding Assumptions
EV Charging Station Program: Public Fleets	✓	✓	✓	National Grid		✓	✓	Up to 50% of eligible EVSE hardware costs and up to 100% of installation costs for public fleets	First come, first-serve through 2026	50% of hardware costs and 100% of installation costs for BEV EVSE installed
MassEVIP Fleet Incentives	✓			Massachusetts Department of Environmental Protection (MassDEP)	✓			Light-duty vehicles only. BEVs: $7,500/purchase; PHEVs: $5,000/purchase.	First-come, first-serve	BEVs: $7,500/ purchase; PHEVs: $5,000/purchase
MassEVIP EVSE	✓	✓	✓	MassDEP		✓	✓	Up to 60% of EVSE hardware and installation costs	First-come, first-serve	60% of EVSE installation costs for EVSE
MOR-EV Trucks		✓	✓	Massachusetts Department of Environmental Resources (MA DOER)	✓			$7,500 - $90,000 per vehicle over 8,501 GVWR (lbs.)	First-come, first-serve	$15,000 for medium duty pickups and vocational trucks, $75,000 for street sweepers, $90,000 for heavy trucks
Green Communities Grant Program	✓	✓	✓	MA DOER	✓			For specially eligible communities, BEVs: $15,000/purchase or $10,000/lease; PHEVs: $10,000/purchase or $6,000/lease	Next deadline: Fall 2023 (program offered annually)	$15,000 for BEVs purchased

Deeper Dive: National Grid Fleet Incentive Offerings

What's Eligible?



Applies to all commercial customers (Public, Workplace, MUDs, Fleets)

Eligible for EV Charging Program Incentives

- Customers may be required to pay for grid upgrades in excess of utility's design requirements
- Panel
- Conduit
- Trenching
- Design
- Permitting
- Step Up Transformers
- Wiring
- Customer Switchgear
- Charging Station (public only)
- Networking (comm. & MUD - public only)

Not Eligible

- Station Installation
- Signs
- Bollard
- Maintenance

Utility Constructs

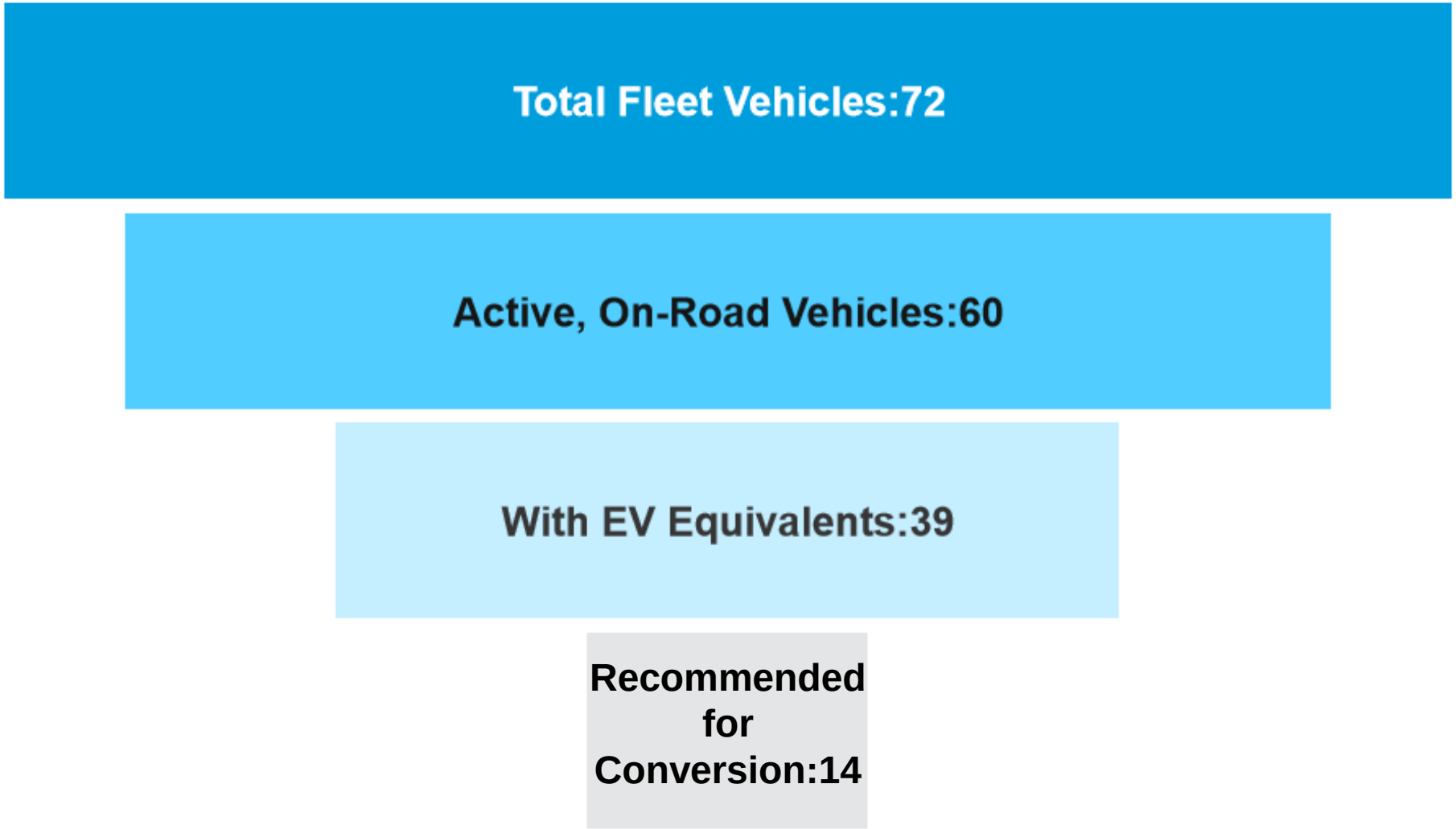
Customer Constructs

Deeper Dive: National Grid Fleet Incentive Offerings

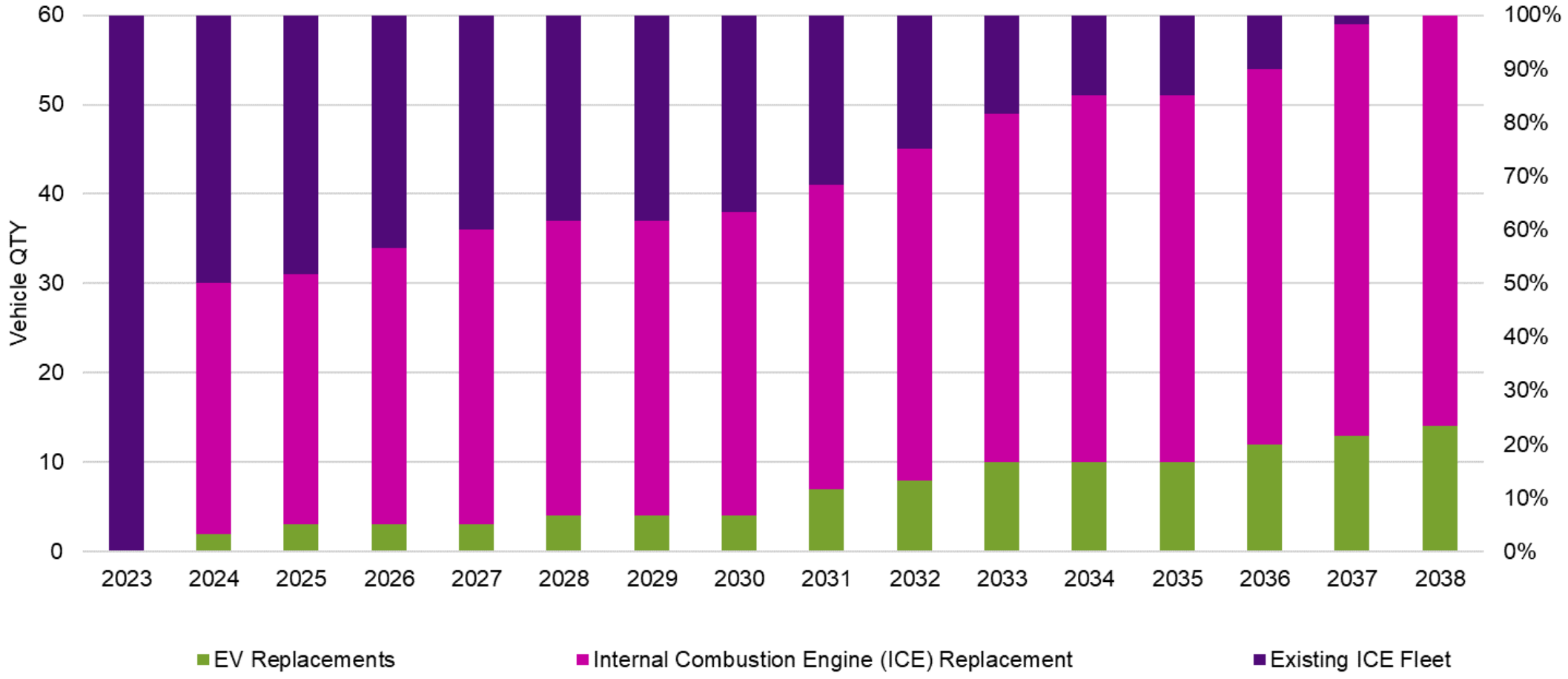
National Grid offers incentives designed to support light-, medium-, and heavy-duty vehicle fleet electrification by providing utility and customer-side EV infrastructure rebates for private and publicly owned fleets. The Charging Station program offers funding towards the purchase and installation of EV chargers, while the Make-Ready Program offers funding to cover utility-side and customer-side make-ready infrastructure costs.

Customer Segment Eligibility	Charger Type	Utility-Side Infrastructure Incentives	Customer-Side Infrastructure Incentives	Charger Rebates	Networking Incentives
Public Fleets (non-EJC)	L2, DCFC	Up to 100%	Up to 100%	Up to 50%	Not Offered
Public Fleets (EJC)*	L2, DCFC	Up to 100%	Up to 100%	Up to 100% in Income-EJC. Up to 75% in other EJC	Not Offered

Fleet Assessment Vehicle Breakdown



Recommended Replacement Timeline



Replacement Timeframe: 2024 - 2038
TCO Analysis Timeframe: 2024 - 2052

Electrification Recommendation Impacts

Based on our analysis, converting 14 vehicles to EVs is estimated to produce the following impacts:

$519,416
TCO savings over **29** years*

$400,018
fuel cost savings over **29** years*

$141,073
maintenance savings over **29** years

4,167
metric tons (MT) of CO2 eliminated over **29** years

Over 29 years, those estimated CO2 reductions equate to:

eliminating **479** homes' energy use for one year, or:

switching **158,358** incandescent lamps to LEDs, or:

recycling **1,417** tons of waste instead of landfilling it, or:

planting **68,761** trees.

* NPV assumes a 5% discount rate.

Electrification Recommendations (Slide 1 of 2)

15-Year Electrification Recommendations							
Vehicle Type	**Quantity Up for Retirement** (in 15 Years)	**Quantity Recommended to Convert to Electric**	**Recommended Make/ Model/ EV Type**	**Financial Savings** (across 29 years)	**GHG Emission Reductions** (across 29 years, MT)	**EVSE** L2	DCFC
Sedans	1	1	Nissan/ Leaf/ BEV	$27,724	49	1	0
SUVs	7	1	Fisker/ Ocean Sport/ BEV	$13,209	31	1	0
		1	Chevrolet/ Equinox EV 1LT/ BEV	$36,832	73	1	0
		4	Hyundai/ Kona Electric SE/ BEV	$97,261	313	4	0
Light-duty Pickups	2	1	Chevrolet/ Silverado EV/ BEV	$29,275	83	1	0

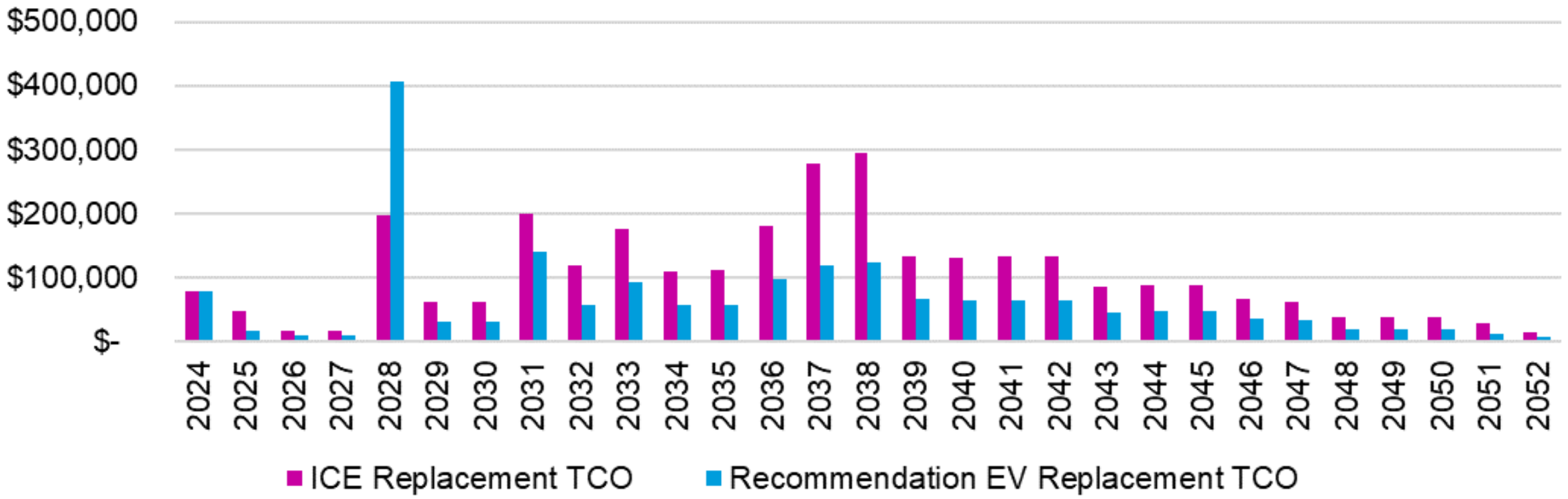
Electrification Recommendations (Slide 2 of 2)

15-Year Electrification Recommendations							
Vehicle Type	**Quantity Up for Retirement** (in 15 Years)	**Quantity Recommended to Convert to Electric**	**Recommended Make/ Model/ EV Type**	**Financial Savings** (across 29 years)	**GHG Emission Reductions** (across 29 years, MT)	**EVSE** L2	DCFC
Medium-duty Pickups	11	2	ZEVx – Ford/ F-450 (Pickup)/ BEV	$56,324	500	2	0
Vans	1	1	Maxwell Vehicles/ ePro LR Cargo Van/ BEV	$49,708	323	1	0
Medium-duty Vocational Trucks	3	0	N/A	N/A	N/A	N/A	N/A
Heavy Trucks	13	2	Xos/ MDXT SR (Class 7)/ BEV	$174,970	868	2	0
Street Sweeper	1	1	Global/ M3 Supercharged/ BEV	$32,750	1,929	0	1
TOTAL	**39**	**14**		**$519,416**	**4,167**	**13**	**1**

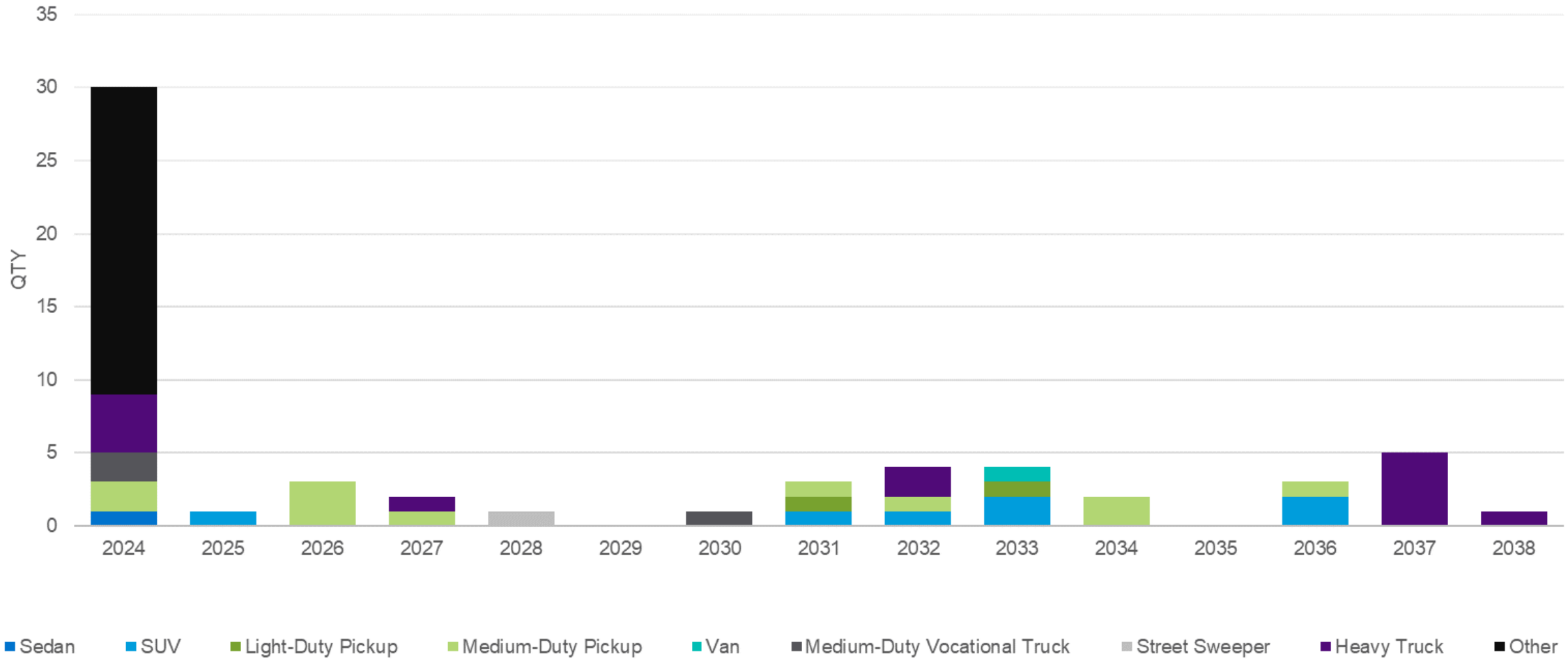
Charger Recommendations

Charging Level	Charger Nameplate Demand (kW) Range	Number Recommended	Total Equipment Cost	Total Installation Cost	Description	Typical Light-Duty Range and Charge Times
Level 2 Chargers (L2)	3-6 kW	8	$2,766	$19,363	Use a 208 V (commercial) or 240 V (residential) AC split phase service	10-20 miles of range per hour (4-6 hours for full charge)
	6-8 kW	2	$1,629	$5,702		
	8-11 kW	1	$921	$2,149		
	12-15 kW	2	$1,972	$3,451		
DCFC	150 kW	1	$39,176	$33,065		
Total		**14**	**$46,465**	**$63,730**		

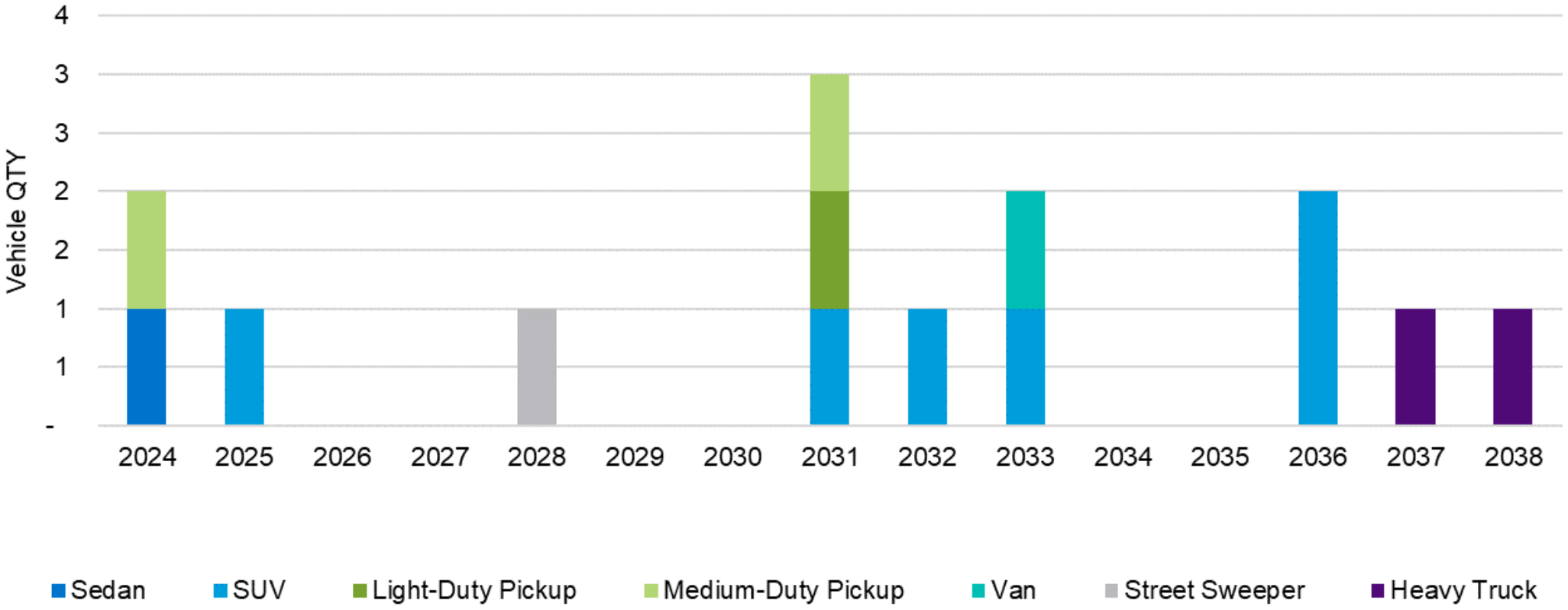
Total Cost of Ownership Comparison



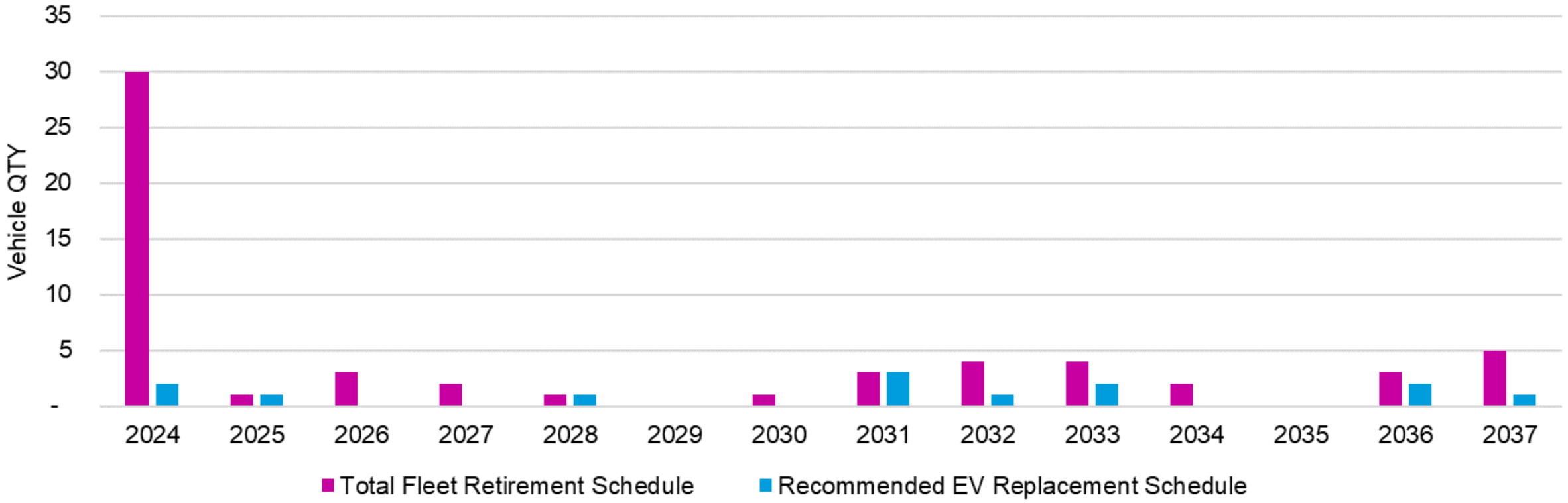
Existing Fleet Retirement Schedule



Recommended EV Replacement Timeline



Retirement and EV Replacement Timelines



Vehicles Retired By Year

Retirement year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
SUV															
Number of SUVs retired		1						1	1	1			2		
IDs		AFD Fire Prevention						Town Manager 2	AFD Deputy Chief	M-1			M-2		
													AFD Chief		
Van															
Number of Vans retired										1					
IDs										ACO 2018					
Heavy Truck															
Number of Heavy Trucks														1	1
IDs														VAC 1	VAC 2
Light Duty Pickup															
Number of Light-Duty Pickups retired								1							
IDs								AFD Utility 1							
Medium Duty Pickup															
Number of Medium Duty Pickups retired	1							1							
IDs	AFD Utility 2							AFD r-2							
Sedan															
Number of Sedans Retired	1														
IDs	Town Manager														
Street Sweeper															
Number of Street Sweepers Retired					1										
IDs					Street Sweeper										

Fleet Environmental Impact Analysis

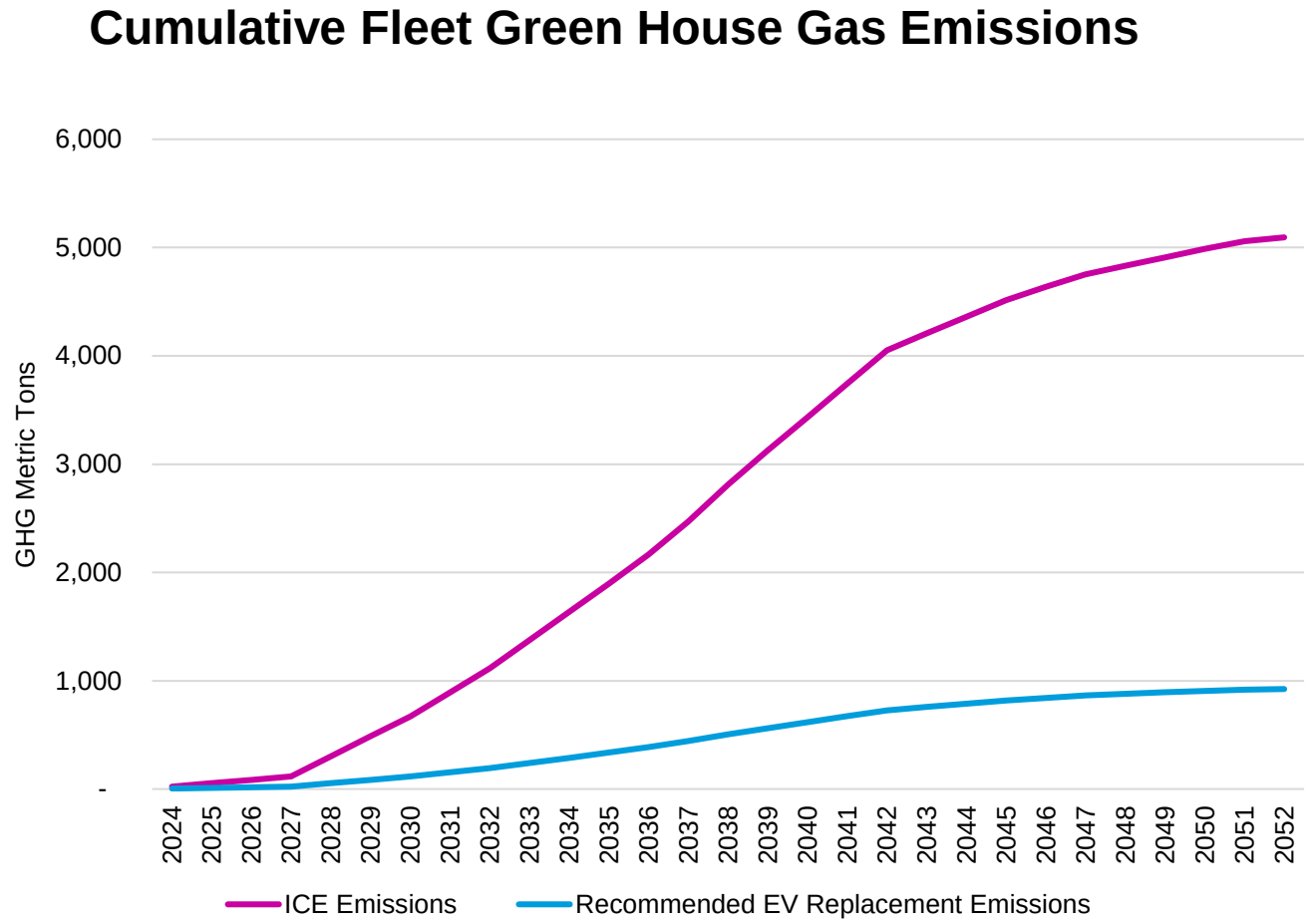
By converting the 14 recommended vehicles to EVs:

4,167 GHG Emission Reductions (MT over 29 years)

9,008 NOx Emission Reductions (Lbs. over 29 years)

900 Equivalent to removing passenger vehicles from the road for one year

68,761 Equivalent to tree seedlings grown for 10 years



Non-Road Equipment Recommendations

Non-Road Equipment					
Equipment Type	**Total Fleet Quantity**	**Quantity Recommended to Convert to Electric**	**Financial Savings** (across lifespan for all recommended equipment)	**GHG Emission Reductions** (across lifespan for all recommended equipment)	**Sample Electric Manufacturers**
ATU/UTV	4	4	$38,687	152	Polaris, John Deere, Hisun
Mower	1	1	$5,066	65	Weibang, Ryobi, Cub Cadet
Backhoe	4	0	N/A	N/A	CASE, Volvo, John Deere, JCB, Multione
Other (Loader)	3	N/A	N/A	N/A	N/A
Total	12	5	$43,754	217	

Next Steps

Get Support

Have questions about this report? Contact your Account Manager to discuss challenges and answer questions.

Explore Resources for Electrifying.

Log onto the MA Fleet Advisory Services Program's online portal to find resources about available incentives, trainings, news and updates, and more.

Move Forward with Electrifying Your Fleet.

Circulate the findings of this report with key stakeholders in your organization. Contact your Account Manager for additional support in preparing to present these findings and incorporate them into your planning.

Your Fleet Advisory Portal has the tools you need to succeed.

Log in at www.FleetAdvisoryMA.NationalGrid.com and you can:

- See your MA Fleet Advisory Services reports
- Explore funding opportunities
- Find RFP language to help your fleet acquire EVs
- Find partners that can support your transition to EVs
- Find information about EV and EVSE operation and maintenance
- Identify trainings
- Stay up to date on the latest industry news

We're here to help. Contact us for help with your report, support navigating next steps, or just to speak with an expert.

Web: www.FleetAdvisoryMA.NationalGrid.com **Email:** FleetAdvisoryMA@icf.com **Phone:** 617-218-2100

Appendices

- Alternate Scenario: No AWD Requirement
- Alternate Scenario: High EV Conversion

Appendix A: No AWD Requirement

Recommendations if DPW vehicles require AWD (main scenario:

14
Vehicles converted over **15** years

$519,416
TCO savings over **29** years*

$400,018
fuel cost savings over **29** years*

$141,073
maintenance savings over **29** years*

4,167
metric tons (MT) of CO2 eliminated over **29** years

Recommendations if DPW vehicles do not require AWD:

27
Vehicles converted over **15** years

$1,255,384
TCO savings over **29** years*

$667,879
fuel cost savings over **29** years*

$688,502
maintenance savings over **29** years*

6,963
metric tons (MT) of CO2 eliminated over **29** years

* NPV assumes a 5% discount rate.

Appendix B: High EV Conversion Scenario

TABLE J. Non-Road Equipment, High Conversion				
Equipment Type	**Quantity**	**Quantity Recommended to Convert to Electric**	**Financial Savings** (across vehicle lifespan)	**GHG Emission Reductions** (across vehicle lifespan)
ATV/UTV	4	4	$38,687	152
Mower	1	1	$5,066	65
Backhoe	4	4	($315,160)	103
Loader	3	N/A	N/A	N/A
Total	**12**	**5**	**($271,406)**	**321**