


nationalgrid

Town of Athol

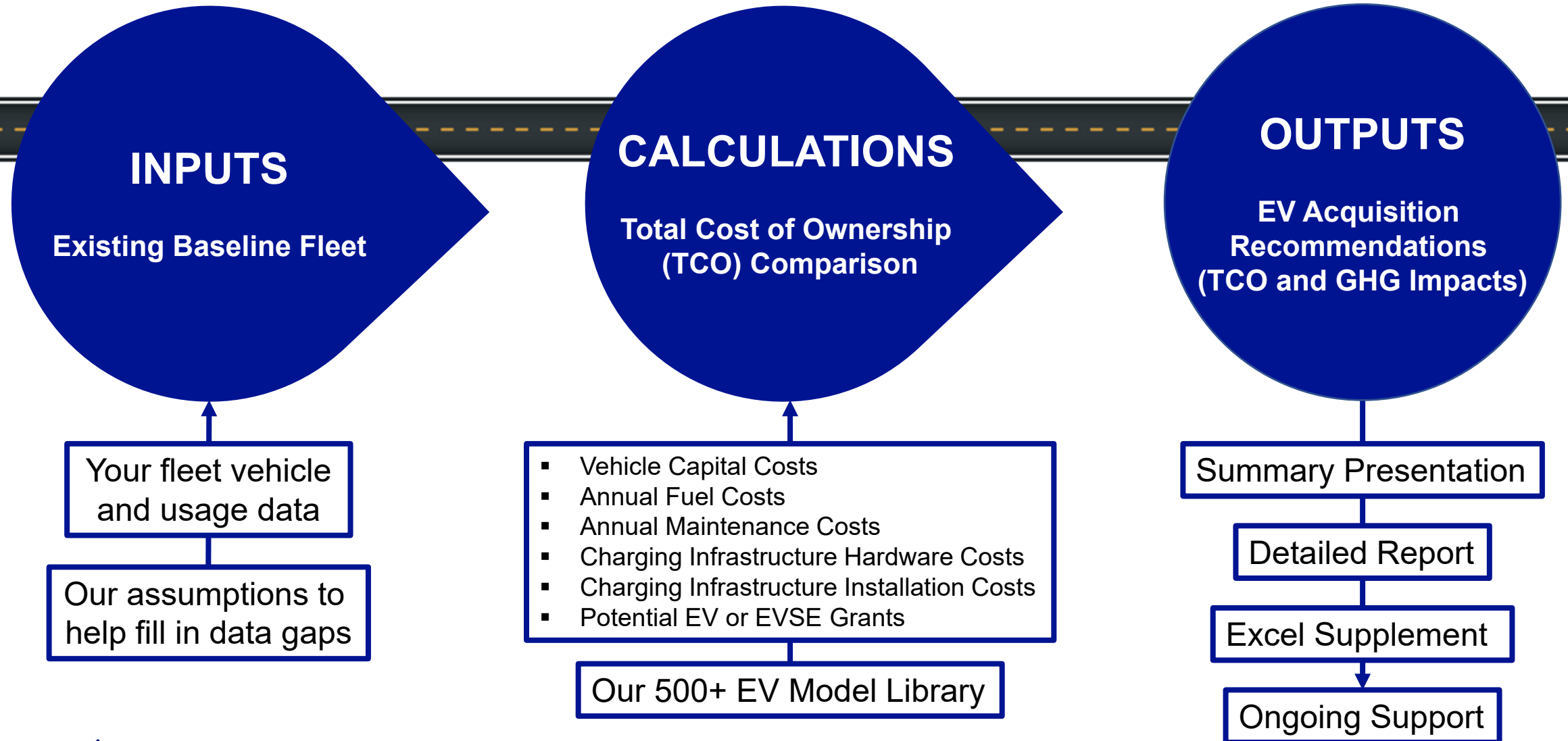
Fleet Electrification Assessment Summary
June 1, 2023
(presenting results from January, 2023)

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Fleet advisory
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Fleet Assessment Process



Key Assumptions*

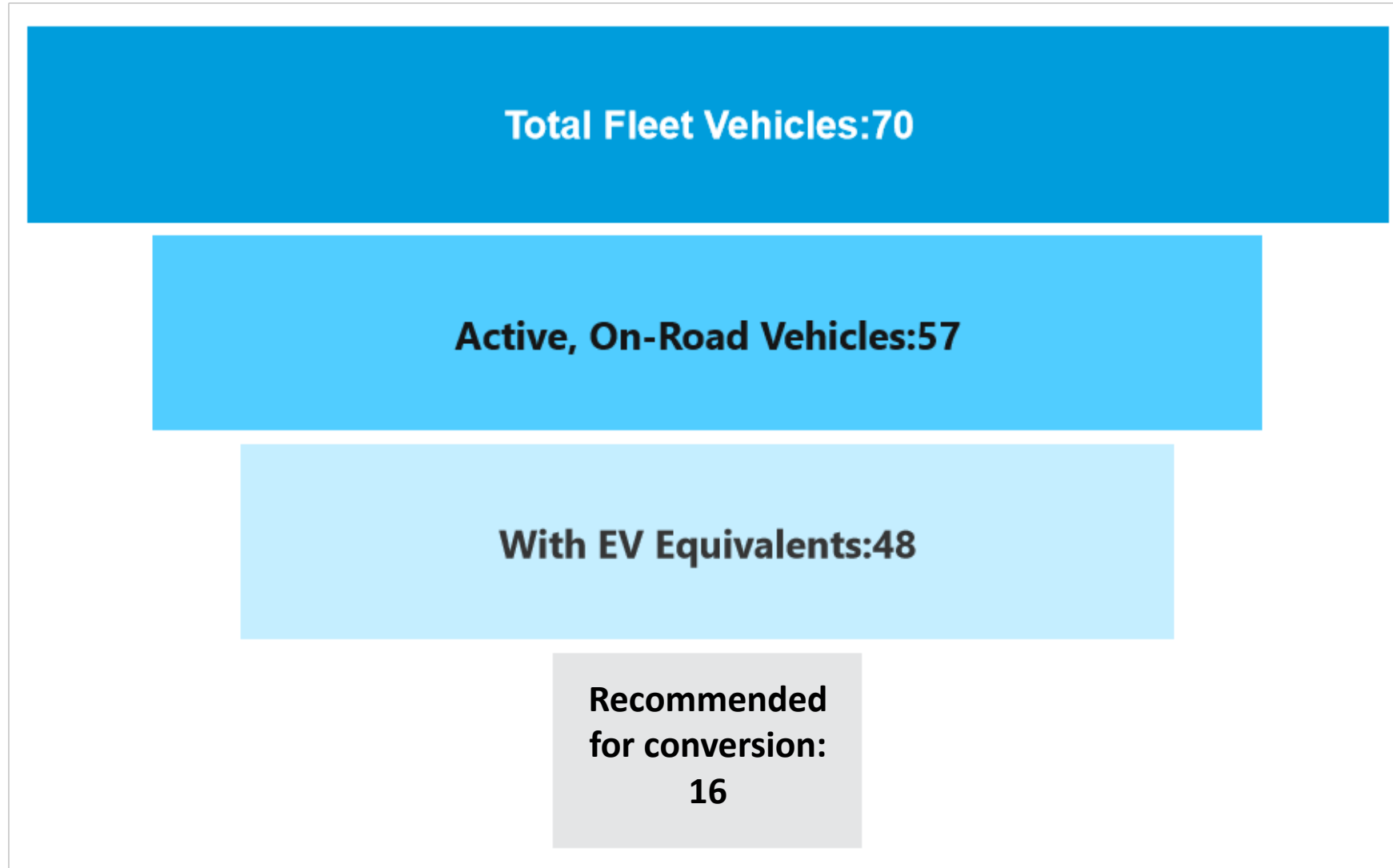
- **Recommendation Threshold:** EV TCO < ICE TCO.
- **Annual Mileage:** Mileage was provided for 21% of the vehicles. Where not provided by the fleet, the annual mileage was calculated using AFLEET assumptions based on vehicle type.
- **Vehicle Replacements:** The estimated retirement schedule is based on the vehicle model year and vehicle lifespan assumptions.
- **Available Time to Charge:** Assumed 6+ hours overnight and 2+ hours between shifts, except police vehicles
- **Return to Base site:** Assumed Yes unless otherwise provided
- **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.

Vehicle Type Assumptions

Vehicle Type	Vehicle Lifespan	Average Annual Vehicle Mileage
Sedan	15	12,400
Sedan (Police)	4	54,250
SUV	15	13,000
SUV (Police)	4	54,520
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.

Fleet Assessment Vehicle Breakdown



Recommended Replacement Timeline



Replacement Timeframe: 2023 - 2037
TCO Analysis Timeframe: 2023 - 2050

Electrification Recommendation Impacts

Based on our analysis, converting 16 vehicles to EVs is estimated to produce the following impacts:



\$419,985

TCO savings over **28** years*



\$161,871

fuel cost savings over **28** years*



\$120,413

maintenance savings over **28** years



1,710

metric tons (MT) of CO2 eliminated over **28** years

Over 28 years, those estimated CO2 reductions equate to:



eliminating **197** homes' energy use for one year, or:



switching **64,988** incandescent lamps to LEDs, or:



recycling **581** tons of waste instead of landfilling it, or:



planting **28,218** trees.

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 27 years)	GHG Emission Reductions (across 27 years, MT)	EVSE	
						L2	DCFC
Sedans	2	1	Chevrolet/ Bolt EV 1LT/ BEV	\$30,290	50	1	0
		1	Hyundai/ Ioniq Plug-In Hybrid/ PHEV*	\$6,393	17	1	0
SUVs	17	5	Kia/ Niro Plug-in Hybrid SUV/ PHEV**	\$85,667	304	5	0
		5	Chevrolet/ Bolt EUV LT/ BEV	\$133,939	385	5	0
Light-duty Pickups	2	1	Chevrolet/ Silverado EV/ BEV	\$28,591	86	1	0
Medium-duty Pickups	12	2	Atlis/ XT (300 mi) (Crew Cab)/ BEV	\$101,806	546	0	2

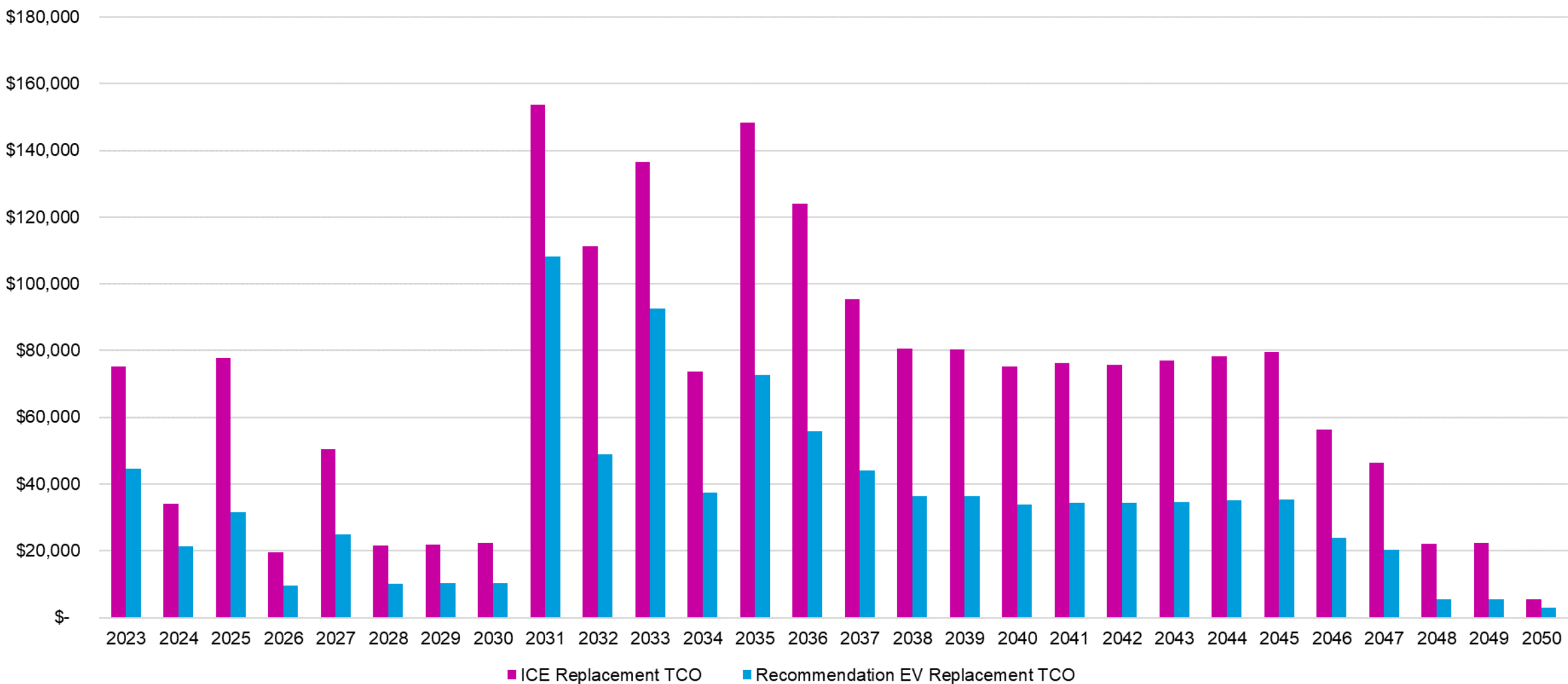
Electrification Recommendations (Slide 2 of 2)

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 27 years)	GHG Emission Reductions (across 27 years, MT)	EVSE	
						L2	DCFC
Vans	1	1	Canoo/ MPDV1/ BEV	\$33,299	323	0	1
Medium-duty Vocational Trucks	2	0	N/A	N/A	N/A	0	0
Heavy Trucks	12	0	N/A	N/A	N/A	0	0
Other	9	0	N/A	N/A	N/A	0	0
TOTAL	57	16		\$419,985	1,710	13	3

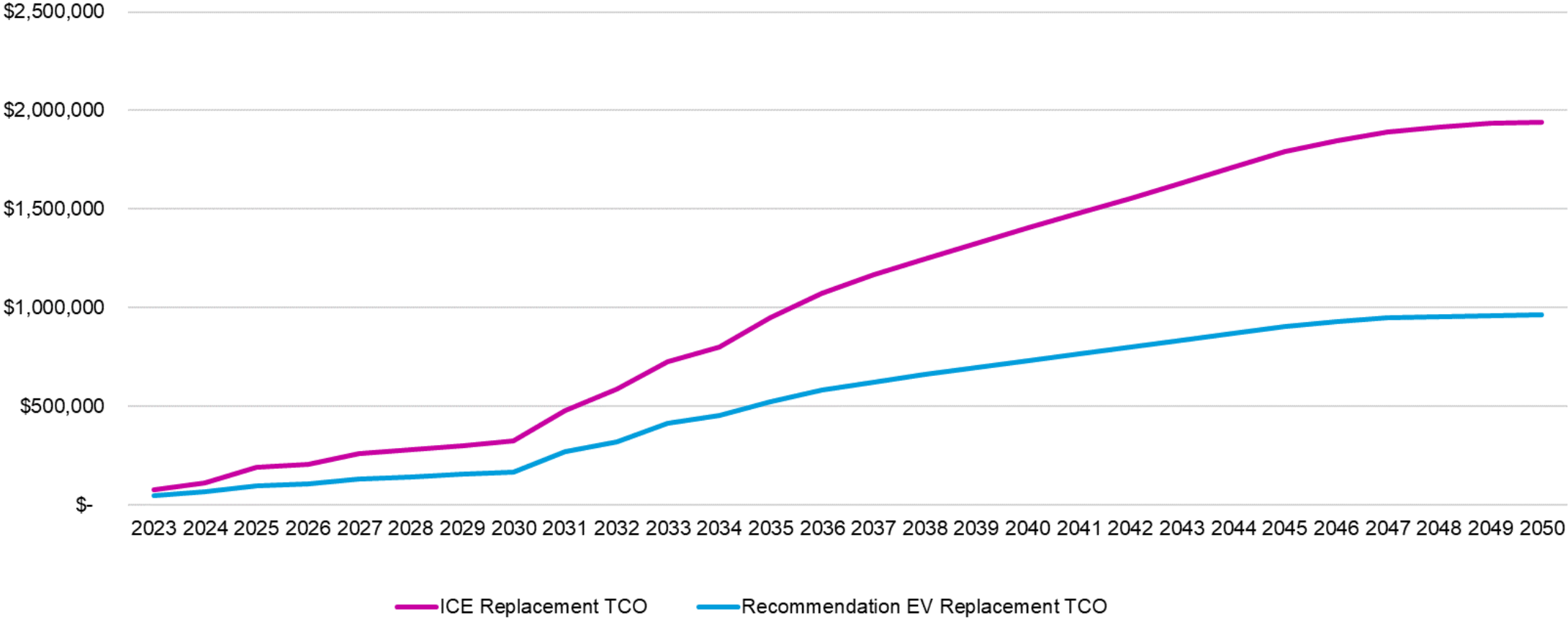
Charger Recommendations

Charger Recommendations					
Type	Number Recommended	Total Equipment Cost	Total Installation Cost	Description	Typical Light-Duty Range and Charge Times
Level 2	13	\$31,181	\$60,103	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)
DC Fast	3	\$52,360	\$59,996	Use 208 V or 480 V AC, three-phase service connection requiring a dedicated circuit	60-80 miles in 20 minutes of charging (~0.5 hours for full charge)

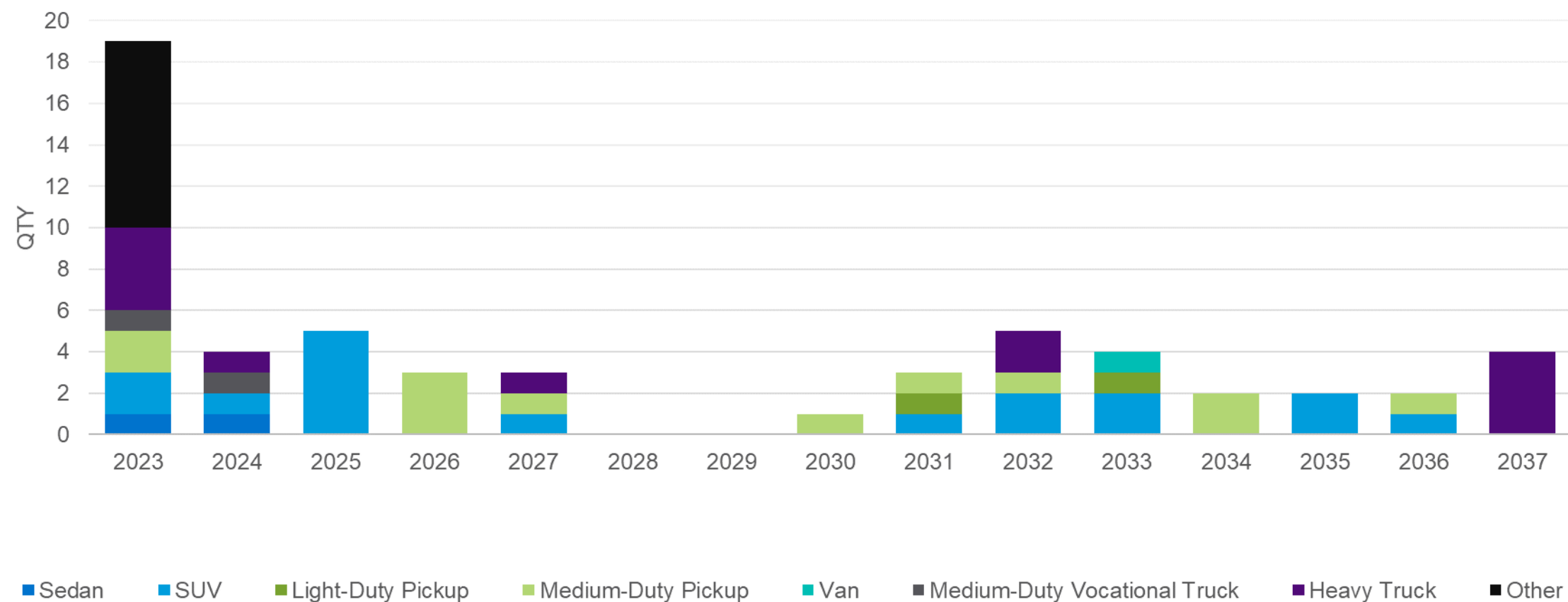
Total Cost of Ownership Comparison



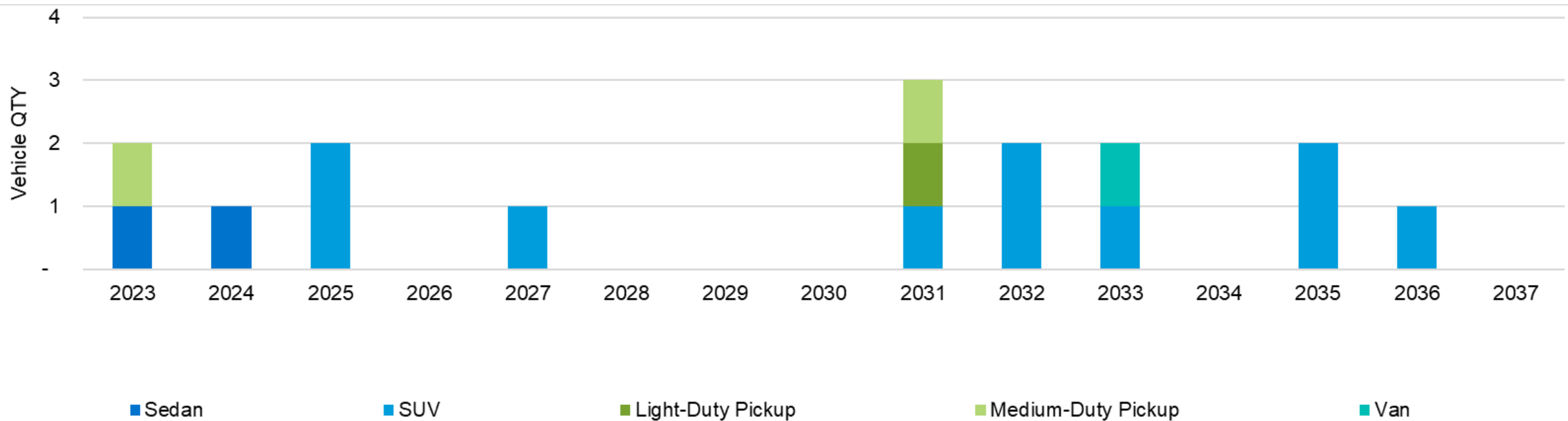
Total Cost of Ownership Comparison



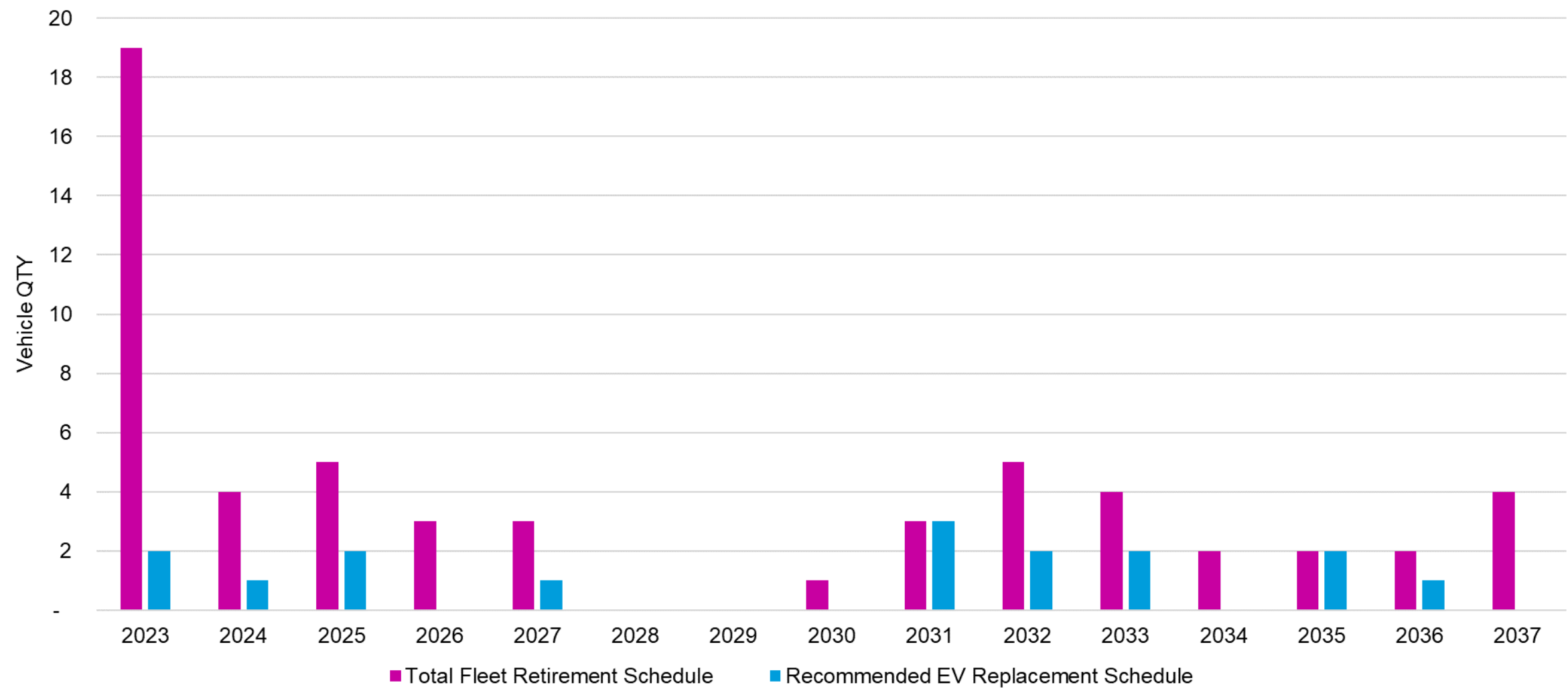
Existing Fleet Retirement Schedule



Recommended EV Replacement Timeline



Retirement and EV Replacement Timelines



Fleet Environmental Impact Analysis

By converting the 16 recommended vehicles to EVs:

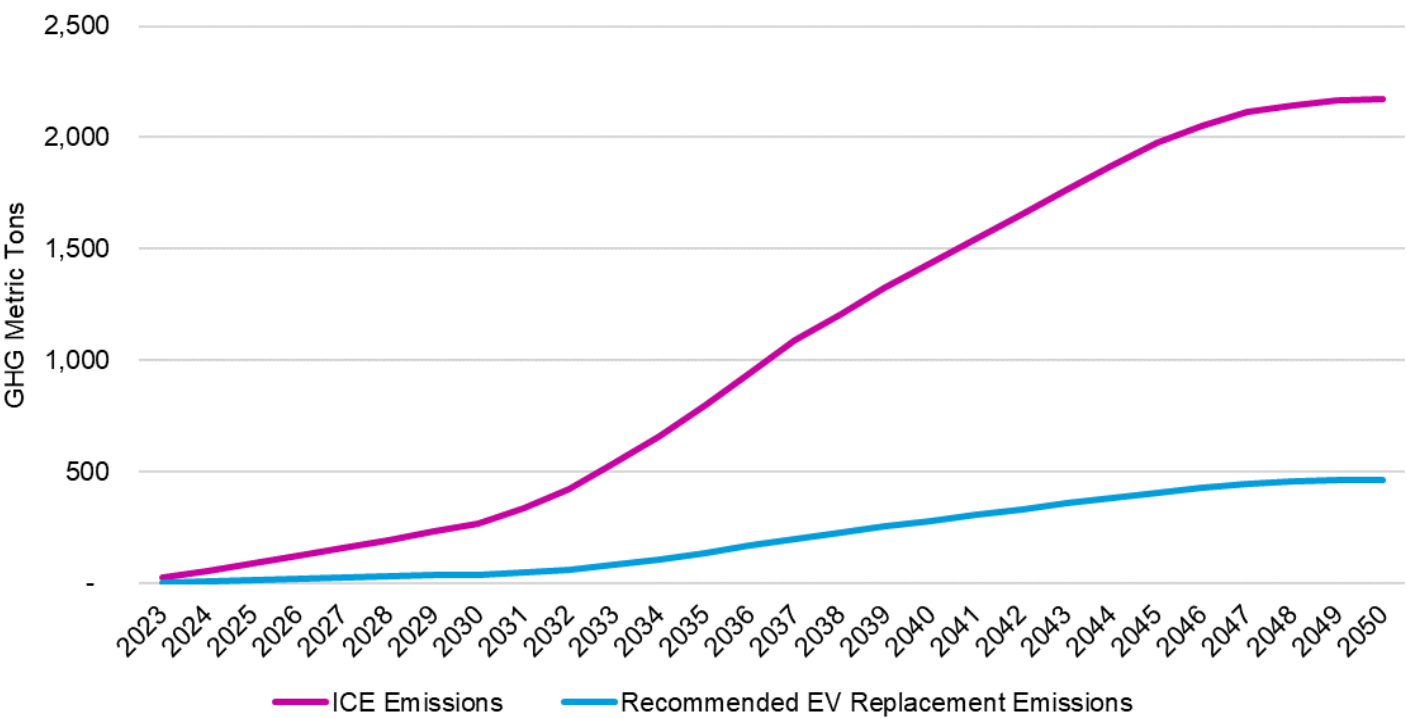
1,710 GHG Emission Reductions
(MT over 28 years)

4,495 NOx Emission Reductions
(Lbs. over 28 years)

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

28,218 Equivalent to tree seedlings
grown for 10 years

Cumulative Fleet Green House Gas Emissions



Non-Road Equipment Recommendations

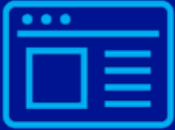
Non-Road Equipment					
Equipment Type	Total Fleet Quantity	Quantity Recommended to Convert to Electric	Financial Savings (across lifespan for all recommended equipment)	GHG Emission Reductions (across lifespan for all recommended equipment)	Sample Electric Manufacturers
ATV/UTV	4	4	\$38,687	152	Polaris, John Deere, Hisun
Floor Sweeper	1	1	\$3,040	36	Tennant, Karcher
Mower	1	1	\$5,066	65	Weibang, Ryobi, Cub Cadet
Backhoe	4	0	N/A	N/A	CASE, Volvo, John Deere, JCB, Multione
Other	3	0	N/A	N/A	N/A
Total	13	6	\$46,793	253	

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

Appendix

- Second Scenario: No 4WD Requirements and 10% TCO Threshold
- Incentive and Funding Sources
- EV Model Comparison

Appendix: No 4WD Requirements and 10% TCO Threshold

Scenario 1: EVs are only recommended if EV TCO is less than ICE TCO:



16

Vehicles converted over **14** years (10 BEV, 6 PHEV)



\$419,985

TCO savings over **28** years*



\$161,871

fuel cost savings over **28** years*



\$120,413

maintenance savings over **28** years*



1,710

metric tons (MT) of CO2 eliminated over **28** years

Scenario 2: EVs are recommended when EV TCO is within 10% of ICE TCO. Requirements for 4WD vehicles excluded**



30

Vehicles converted over **15** years (24 BEV, 6 PHEV)



\$1,325,715

TCO savings over **28** years*



\$505,740

fuel cost savings over **28** years*



\$662,183

maintenance savings over **28** years*



4,788

metric tons (MT) of CO2 eliminated over **28** years

* NPV assumes a 5% discount rate.

** There are limited electric models equipped with 4WD capability. Athol may consider vehicles which do not require 4WD functionality to see increased EVs in the fleet.

Incentive and Funding Sources (Slide 1 of 2)

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	✓	✓	✓	National Grid		✓	✓	Up to 50% of EVSE hardware and 100% of installation costs for BEV fleets	12/21/2021 (Have until 2023 to install)*	100% of installation costs for BEV EVSE installed before 2024
MassEVIP Fleet Incentives	✓			Massachusetts Department of Environmental Protection (MassDEP)	✓			Light-duty vehicles only. BEVs: \$7,500/purchase or \$5,000/lease; PHEVs: \$5,000/purchase or \$3,000/lease	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 PHEV EVSE

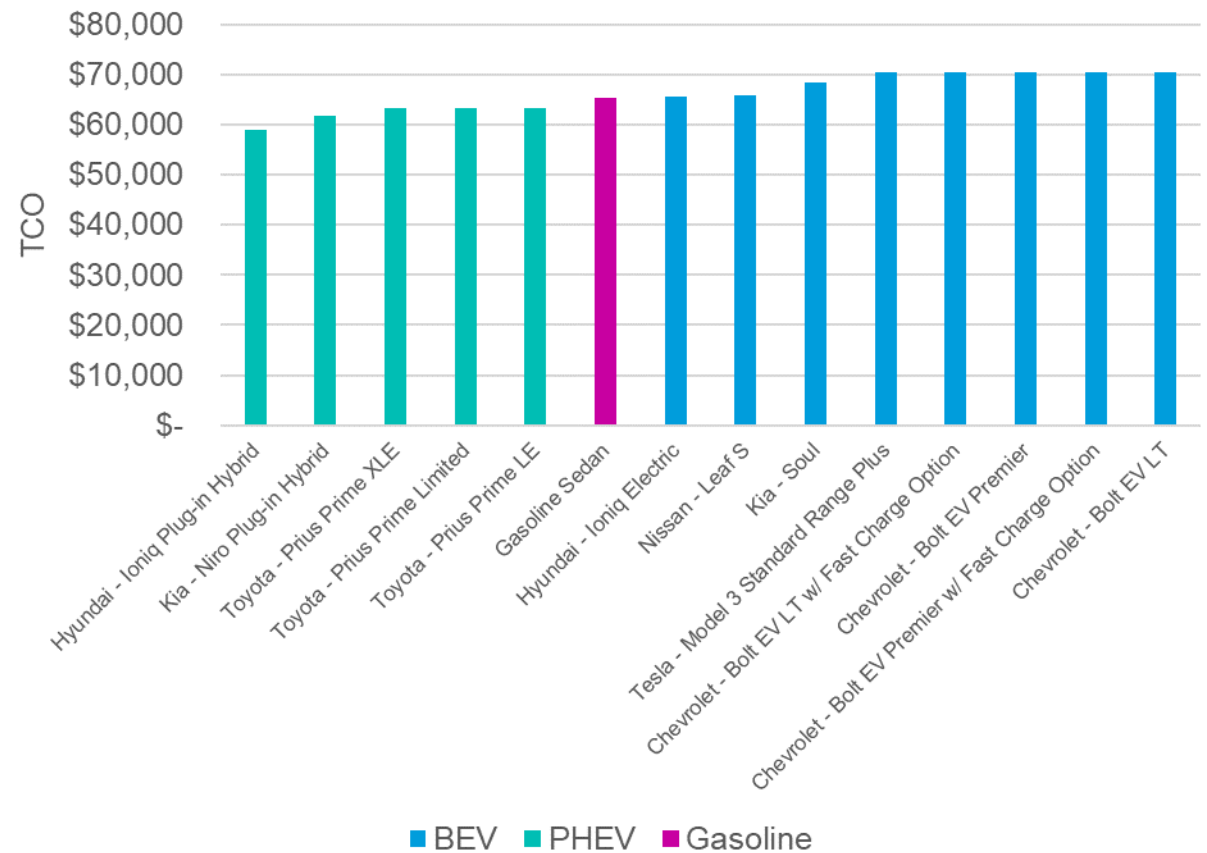
Incentive and Funding Sources (Slide 2 of 2)

Program	Light-Duty EVs	Medium-Duty EVs	Heavy-Duty EVs	Administrator	Vehicle Costs	EVSE Installation	EVSE Hardware	Program Offerings	Upcoming Deadlines	TCO Funding Assumptions
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 \$7,500 for vans
Green Communities Grant Program	✓	✓	✓	MA DOER	✓			BEVs: \$7,500/purchase PHEVs: \$5,000/purchase \$15,000 for specially eligible communities	Next deadline: TBA (program offered annually)	\$15,000 for BEVs and PHEVs purchased

EV Model Comparison

- Over 500 EV models in our EV library used for comparison
- Our EV acquisition recommendations are based on the model with the lowest TCO available that fits your fleet's needs
- The report provides additional EV models options for each vehicle type within the same price range

Sedan EV Model Total Cost of Ownership Comparison*



*Above TCO comparisons assume 5% discount rate and excludes EVSE costs and incentives.