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Fleet Electrification: Lowering operating costs with utility programs

Maximizing the financial benefits of operating your EV fleet

The first phase of fleet electrification, planning, was covered in the whitepaper titled ***"Accelerating fleet electrification with utility advisory programs"***. That gave an overview of everything a fleet needs to get started with fleet electrification, including the benefits of fleet electrification, tools to find available grid capacity, and how utility Fleet Advisory programs can help.

We covered the second phase, Infrastructure, in the "Using utility program incentives to lower project costs" whitepaper. That paper provided details for the infrastructure incentives available, which can cover a majority of project costs, as well as fleet customer case studies and an overview of Flexible Connections.

This whitepaper answers the question: ***"How can I unlock savings once my electric fleet vehicles are operational?"***

We'll describe available operational rebates and revenue opportunities, including:

- **demand charge reduction solutions**
- **off-peak rebates**
- **vehicle-to-grid revenue potential**

Utility EV operating cost programs can save

10-30%

(or more) below standard electricity costs

National Grid's MA Off-Peak Rebate and the Demand Charge Alternative can each save hundreds or even thousands of dollars per year per EV, leading to a "fueling" cost for EVs that can be

10-50%+

cheaper than diesel

Phase 3: Reducing fueling costs with your EV fleet

This whitepaper focuses on the opportunities to lower operating costs, once your EV project is operational. Electric vehicles are typically more energy efficient than their fossil fuel counterparts. Heavy-duty battery electric trucks, for example, are 55% more energy efficient than diesel trucks of the same size. This leads to cheaper operating costs, with electricity 10-50% cheaper than diesel, or potentially even more in some use cases or locations – the International Energy Agency finds that operating costs for a battery electric heavy-duty truck are about one third lower than diesel in the United States.[1]

In simple terms, kilowatt-hours of electricity are cheaper than a fossil fuel source for transportation. Using rough estimates for electricity rates and vehicle efficiency, a medium-duty EV can expect at least 10% savings vs. diesel fuel:

Approximate Fuel Savings, Medium-Duty Electric Delivery Truck vs. Diesel

$ / kWh[2]	kWh / Mile[3]	Miles / Gallon (Diesel)[4]	Electric $ / Gallon Eq.	Savings vs. Diesel ($3.75 / Gallon)
$0.25	1.7	7.7	$3.27	**~13%**
$0.20	1.7	7.7	$2.62	**~30%**
$0.15	1.7	7.7	$1.96	**~48%**

Note: Rough approximations only – electricity rates and vehicle efficiencies can vary due to many factors, e.g. the state, utility, charging behavior, and driving terrain.

The table above is just an estimate for a medium-duty electric truck – many use cases with higher efficiency vehicles, combined with utility operating cost savings programs, can increase the savings even more.

[1] IEA Global EV Outlook 2025, available at https://www.iea.org/reports/global-ev-outlook-2025/trends-in-heavy-duty-electric-vehicles

[2] Conservative estimate of Commercial electricity prices, from the EIA Electric Power Monthly, available at https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a.

[3] Conservative estimate of Medium-Duty BEV efficiency, from manufacturer data in the CALSTART Zero-Emission Technology Inventory (ZETI), available at https://globaldrivetozero.org/tools/zeti/.

[4] Estimate of Medium-Duty Diesel Truck Fuel Economy, from the Alternative Fuels Data Center's Average Fuel Economy by Major Vehicle Category, available at https://afdc.energy.gov/data/10310.

Demand charge reduction

What is a demand charge?

As you've considered electrifying your fleet, you've likely heard about electricity demand charges. A demand charge is a distribution delivery charge, designed to recover a utility's transmission and distribution costs. The demand on a customer bill uses the customer's highest (peak) measured demand during the billing period. The demand charge rate is typically displayed as dollars per kW ($ / kW) and is multiplied by the measured demand for the period to get the distribution delivery demand charge. For example, if a demand charge is $10.48 / kW, and the peak demand is 250 kW for the period, the total distribution delivery demand charge for that month would be $2,620.

Demand charge components change from month to month. The demand charge rate varies based on variations in the utility's distribution costs, and the peak demand can change dramatically for a customer site depending on the peak power demand of the EV chargers on site and/or other site loads during that month. This can lead to variation in a customer's total electricity costs from month to month or season to season.

Your total customer bill also has a supply charge in addition to the demand charge, along with other monthly charges. This is based on your total energy consumption for the period, in kilowatt-hours (kWh). Think of this like a "gallon" of electric energy — the more you drive, the more kWh you use. Utilities are providing both services — the available and reliable distribution infrastructure at your site (measured in kW), as well as the total energy delivered (measured in kWh). Your monthly electricity bill is the total of your demand charge plus your supply charge, as well as other monthly charges that vary by utility and customer type.

Because demand charges are based on your peak demand (kW) in a month, not your total energy consumption (kWh), they can be a big component of the bill — potentially even more than 50% of the electricity cost.

Fortunately, utilities have many solutions available to help lower these demand charge costs, potentially saving you hundreds of dollars per month per EV.

For example, **National Grid's Demand Charge Alternative offering in MA can save customers up to 70% on their monthly electricity bills by participating in the program.**

Our Demand Charge Alternative Program reduces EV operating costs by providing a tiered, load factor-based discount on their demand charges. As the EV Charging Station load factors increase over time with greater EV adoption and station usage, the demand charges will increase, and the energy charges will decrease.

Demand Charge Alternative Program is available through 2032.

The Demand Charge Discount will be automatically applied to a customer's bill based on the Load Factor ("LF") as calculated below. In the first year, the EV Charging Stations are eligible for a 100% demand charge discount. After the first year and continuing through year 10, the Demand Charge Discount will be based on the calculated LF for the previous 12 months of billing data.

Load Factor ("LF") Threshold	Enrollment Years	Demand Charge Discount
None	1	100%
LF <= 5%	2 to 9	100%
5% < LF <= 10%	2 to 9	75%
10% < LF <= 15%	2 to 9	50%
LF > 15%	2 to 9	0%

$$\text{Load factor} = \frac{\text{Billed Energy in kWh}}{\text{Billed Demand in kW x Hours in Billing Period}}$$

5 Medium-Duty Truck Example

- Driving ~59 miles per day, using ~100 kWh, on MA G-3 rates
- Peak demand: 250 kW (Five 50 kW chargers)
- Billed energy: 12,500 kWh (5 trucks* 100 kWh / day * 25 op. days)
- Load factor: 12,500 kWh / (250 kW* 730 hrs) = ~7%
- Demand Charge Discount: 75%
- Typical Demand Charge: 250 kW* $10.48 / kW = $2,620
- **Demand Charge Discount Savings: 75%* $2,620 = $1,965**

Learn more about the National Grid Demand Charge Alternative here:
https://www.nationalgridus.com/MA-Business/Commercial-and-Fleet-EV-Programs/Demand-Charge-Alternative

Off-peak rebates

In addition to saving money on demand charges, many utilities often offer load management incentives, which encourage customers to charge during off-peak times. Utility electricity costs vary a lot throughout the day, month, and season because of variable customer demand, and therefore utilities often have programs or rebates in place to encourage customers to avoid peak demand periods. This saves money for both the utility ratepayers and the customer.

National Grid, for example, offers a Fleet EV Off-Peak Charging Program that allows customers to earn rebates when charging commercial EVs during designated off-peak times.

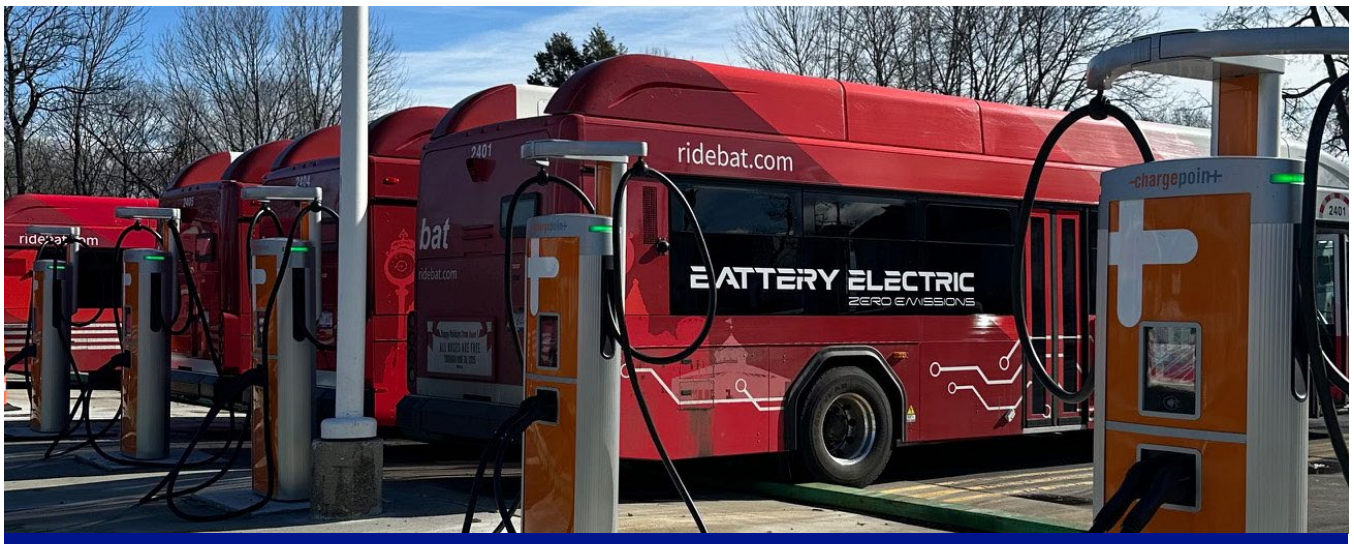
Participants are eligible to earn $0.05/kWh for EV charging during off-peak hours from June 1 to September 30 (“summer months”) and $0.03/kWh for EV charging during off-peak hours from October 1 through May 31 (“non-summer months”). Off-peak hours are 9:00 p.m. to 1:00 p.m.

The program is available to all fleets, including private and government-owned commercial vehicles using eligible networked EV charging stations.

Customers could save hundreds to thousands of dollars per vehicle per year — see estimated modeled savings by vehicle type below:

Fleet Type	kWh/Day (Conservative)	Op. Days Per Year	Total kWh	Off-Peak Rebate
LDV	25	300	7,500	$275
MDV	100	300	30,000	$1,100
HDV	300	300	90,000	$3,300

Learn more about the National Grid Off-Peak Rebate Program here:
https://www.nationalgridus.com/MA-Business/Commercial-and-Fleet-EV-Programs/Fleet-Programs



Brockton Area Transit (BAT), a public transit authority in Massachusetts, leveraged National Grid’s Off-Peak Charging Program for charging their 5 electric buses. BAT moved nearly 75% of its 48 MWh of charging to off-peak hours, saving over $1,000 in electricity costs in less than three months. See the full case study at ngrid.com/fleetcasestudies

Vehicle-to-grid

Fleet operators can also potentially earn additional revenue from their electric fleets by participating in grid services, including technologies such as Vehicle-to-Grid (V2G). V2G enables fleets to reduce the total cost of owning or operating electric vehicles, by providing an additional revenue stream to customers for using their vehicle's battery to provide power back to the grid. EVs are a mobile battery, and capable of providing power back to the grid exactly when utilities need it, playing a crucial role in providing electricity supply in conjunction with demand, while also balancing intermittent power generation sources such as wind and solar.

Vehicle-to-Grid remains in its early stages, but as more distributed energy resources (DERs) come onto the grid in the coming years, V2G is likely to continue to play a vital role in supporting the grid into a clean energy future.

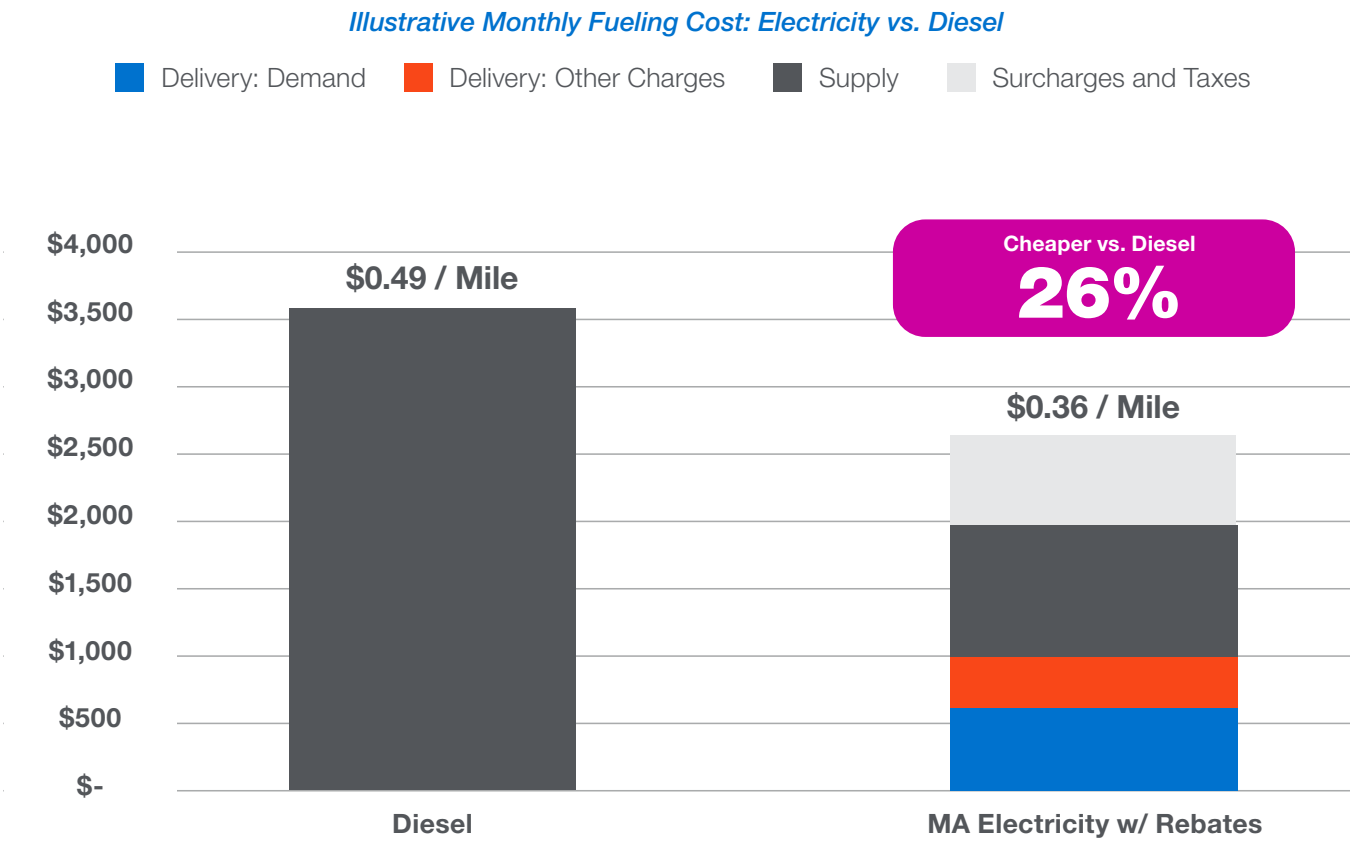
National Grid has supported V2G for years. As an example, its school bus project in Beverly, MA, operated by Highland Electric Fleet, provides >3 MWh per bus back to the grid each summer. That's enough to power approximately 100 homes for a day, just from one bus! See their video here: https://www.youtube.com/watch?v=Kau65fndlLY

The revenue impact from V2G can be huge for a fleet operator. The National Grid **ConnectedSolutions** program in MA provides an incentive of $200 per kW that is discharged back to the grid. **Using the 5 medium-duty truck example from page 5, if each truck uses 50 kW chargers, that fleet could potentially earn up to $50k in additional revenue from the ConnectedSolutions program per summer (250 kW * $200 / kW = $50,000).**

Learn more about the **ConnectedSolutions** program here: https://www.nationalgridus.com/MA-Business/Energy-Saving-Programs/ConnectedSolutions

Putting it all together: Fleets can save thousands per year per vehicle

As shown on previous pages, fleets have may ways to save money during the operation of their EV fleet. If the 5 medium-duty truck fleet example from page 5 participated in the two National Grid rate offerings, they could potentially save >$2,400 per month (~$29k per year): ~$2k from the Demand Charge Alternative, and ~$458 from the Off-Peak Rebate program. This lowers their electricity costs by nearly 50%, **and is ~26% cheaper than diesel per mile[5]:**



On top of these savings, this 5-truck fleet could also participate in the **ConnectedSolutions** V2G program, earning up to an additional $50,000 per summer for the 5 buses.

In total, the 3 National Grid Operating Cost Savings programs **could save nearly $80,000 per year for this fleet, substantially reducing the Total Cost of Ownership (TCO)**. As discussed in the prior two whitepapers, these electricity savings would be in addition to the make-ready infrastructure incentives available for the project, as well as any state vehicle rebates that may be available to the fleet. When all programs and rebates are combined, the TCO of the electric fleet becomes competitive with diesel, if not cheaper, over the life of the fleet.

[5] Assumptions: 5 Medium Duty trucks, traveling 59 miles per day.

Diesel: 7.7 MPG, for 953 monthly gallons. At $3.75 per gallon, the monthly fuel cost is $3,573, or $0.49 per mile for the 5-truck fleet.

Electric: 1.7 kWh per mile, for 12,500 kWh per month. The demand charge, prior to rebate, is 250 kW * $10.48 for $2,620. This becomes $655 after the 75% Demand Charge Discount. The Off-Peak Rebate saves $458 per month. Total monthly electric costs are 42,642, or $0.36 per mile for the 5-truck fleet.

Conclusion:

Utility operational cost savings programs help fleets substantially reduce their cost of electricity, lowering the TCO of the fleet. Electricity is typically already cheaper than diesel fuel, and the programs outlined above can increase total fueling cost savings even more. Combining state vehicle incentives with utility infrastructure incentives as well as operating incentives lowers the TCO below diesel or gasoline for many use cases.

Explore the resources available below or reach out to your local utility to get started.

- **EV Fleet Hub**
  nationalgridus.com/ev-fleet-hub/
- **EEI database of FASP programs**
  eei.org/en/issues-and-policy/electric-transportation/evprograms
- **Investigate your utility's website for EV Points of Contact**
- **EPRI GridFAST portal**
  gridfast.com/about?url=home