



Electric School Bus Guidebook

Guide 11: ESB Charging Rates and Utility Bills



NEW
YORK
STATE

NYSERDA



Understanding your electric utility providers and their rate structures can help reduce charging costs and avoid unexpected bills.

This guide gives fleet managers and other stakeholders information about electric utility rates. It explains how rates are structured for different customer types. It also explains how those rates can impact electric school bus (ESB) operating costs.

This chapter of the *Electric School Bus Guidebook* answers these questions:

- How does my electric utility calculate my bill?
- How do electric utility companies determine how much to charge?
- How do I identify my rate structure and how do I know if it is the right one for me?
- What is a deregulated energy market for electricity and how does it benefit me?

How does my electric utility calculate my bill?

Your electricity bill has three main components: your **electricity demand** (measured in kilowatts, kW, or kilovolt-amperes, kVA); your **electricity consumption** (measured in kilowatt hours, kWh); and **fees and tariffs**.

The cost of powering ESB fleets is calculated differently than the cost of fueling internal combustion engine (ICE) bus fleets. This is because electric utilities must provide reliable customer service for both the total electricity demand (the “speed” of charging an EV, measured in kW), as well as the total electricity consumption (the kWh put into in the EV’s battery).

Diesel or gasoline pumps typically charge a dollar amount per gallon (similar to the electricity consumption). But fuel pumps don’t charge for the “speed” fuel is delivered at the nozzle. Paying for the speed of delivery is a new fee to be aware of as you electrify your fleet.

Glossary of Key Terms

Term	Definition
Deregulated Electricity Market	A deregulated electricity market is a type of market that allows customers to choose their electricity provider.
Energy Service Company (ESCO)	Energy service companies supply electricity to customers.
kVA	A kilovolt-amp is the unit of measurement for the total amount of power a system uses.
kW	A kilowatt (kW) is the unit of measurement of the rate at which electricity is used. It is a measure of speed of transfer, similar to gallons per minute.
kWh	A kilowatt-hour (kWh) is the unit of measurement for how much electricity you consume. It is a measure of volume, similar to gallons.
Rate Structure	A rate structure is the combination of charges and fees an electric utility uses to categorize and bill you based on your electricity usage. Utilities have multiple different residential and commercial rate structures.

Key Activities

Initial actions you can take after reading this chapter include:

- Look at your most recent utility bill to understand what your current rate structure is.
- Check what rates your electric utility provider may provide for electric vehicle fleets.
- Contact your utility provider if you think you are on the wrong rate structure, or if you would like to ask about how to switch rates in the future.
- Explore energy service company (ESCO) options.



An electric utility uses these three components to calculate your bill:

- 1. Electricity Demand**, or demand charges. Demand is based on the maximum amount of electricity that you use over a 15- or 30-minute period during the monthly billing period. For example, if during a billing month, you charge all your ESBs at the same time for only one hour, the demand charges on your electricity bill that month will be based on the total electrical demand when all ESBs were charged simultaneously. Electricity providers must prepare for the highest anticipated level of customer demand, based on peak historical consumption. For example, charging 5 buses for 1 hour at 50 kW ($5 \times 1 \times 50 = 250$) will result in a higher demand than charging 5 buses for 2 hours at 25 kW ($5 \times 2 \times 25 = 250$) because they were charged "faster." However, in this example the 5 buses receive the same total amount of energy (kWh) in both situations. Demand charge rates are typically shown on your electricity bill as \$/kW or \$/kVA. Demand charges can be reduced by spreading out charging and charging at slower speeds, when possible, to reduce the peak electricity demand. This practice is known as managed charging, or "flattening the peak." Some utility rate structures only assess demand charges for electricity used during peak periods, so charging overnight may not be subject to demand charges.
- 2. Electricity consumption** charges are based on the total amount of electricity you consume during your billing month, in kWh. Electricity consumption is determined by the amount of time (hours) you consume electricity throughout the month at a given power level. For example, if you consume electricity for two hours at 10 kW, you will be billed for a total of 20 kWh of electricity ($2 \text{ hours} \times 10\text{kW} = 20 \text{ kWh}$). Electricity consumption charge rates are represented on your electricity bill as \$/kWh. **Consumption charges can be reduced by improving route and driver efficiency, thereby reducing the amount of energy consumed by each bus.** If your utility uses a time-of-use (TOU) rate structure, these charges can also be reduced by shifting charging activity to times when rates are lower, typically overnight (the following sections provide more information on rate structures).
- 3. Fees and tariffs** can be flat fees such as a monthly customer fee or can be based on electricity consumption or demand. For example, on your electricity bill you may see a recurring \$25 Customer Charge. This is a flat fee for being a customer. An example of a tariff you might see on your electric bill is a Clean Energy Standard Delivery Surcharge. This tariff will apply if you receive electricity from a renewable energy source such as solar or wind and helps pay for the development of renewable energy statewide. There could be several fees and tariffs present on your electric bill. Some fees may be negotiable based on your individual utility contract and rate structure.

How do electric utility companies determine how much to charge?

Electric utility companies charge their customers using different rate structures. **Rate structures** are electricity pricing options that allow electric utilities to charge customers differently based on their electricity use. There are rate structures for all types of customers including residential housing, street lighting, and industrial facilities, among others. For example, National Grid's Small General (SC-2) rate structure is limited to customers whose monthly demand is less than 100 kW, while their Large General (SC-3) rate structure is for customers that exceeded 100 kW of demand in each of the last 12 months.¹

The use of different rate structures helps electric utilities anticipate and manage electricity use among different customer groups, an important tool in their ability to provide uninterrupted electricity. For ESB charging it is important to note that all electricity use on a service (e.g., that is measured through one meter) is billed according to the same rate structure. For your first few buses you may be connecting chargers through your existing service. However, if substantial upgrades are needed, a new service may be required, which can result in new rate structures being used. The [Fleet Electrification Plan](#) process includes a site-specific review of how ESB charging will be measured and what rate structures may apply, along with strategies to minimize electricity costs.

Customers who consume electricity outside of the demand and/or consumption limits specified by their rate structures can be hit with higher-than-expected electricity costs. Exceeding the demand limit agreed upon with the electric utility may also result in financial penalties. Using a Charge Management System (CMS) for your ESB fleet will help avoid this.

How do I identify my rate structure?

There is a line item on your utility bill that states your rate structure. The names of rate structures differ by utility. Examples you could see on your electric bill are "Electric SC2" or "Electric SC3 T&D." Electric utilities post their rate structures on their websites for customers to identify and understand their pricing terms and constraints.

Figure 1 shows an example electric utility bill with the rate structure highlighted in orange.

METER NUMBER	██████████	NEXT SCHEDULED READ DATE ON OR ABOUT	Aug 21		
SERVICE PERIOD	Jun 21 - Jul 23	NUMBER OF DAYS IN PERIOD	33	METERING TYPE	Secondary
RATE	Electric SC3 T&D	VOLTAGE DELIVERY LEVEL	0 - 2.2 kv		

Figure 1: Example Electricity Bill Rate Structure Identification²

¹ <https://www.nationalgridus.com/Upstate-NY-Business/Rates/Service-Rates>

² <https://www.nationalgridus.com/MA-Business/Help-Read-Your-Bill/How-to-Read-Your-Bill>

How do I know if my rate structure is right for me?

If your school district or bus contractor is working with your utility provider's Fleet Advisory Services (FAS) and/or NYSERDA's Fleet Electrification Plan (FEP) program, a rate analysis will be conducted as part of this process. However, you can also call your utility service representative, or the customer service number on your electric utility bill and ask which rate structure is most appropriate for your operation. Your electricity usage and electricity rates may change once you start charging buses, and continue to change as you continue to add buses. Maintaining communication with your utility representative throughout this process is essential to optimizing your ESB charging costs.

You can also find information about your rate structure on the section of your utility's website that provides information on the requirements and charges associated with each rate structure. It is a good idea to get in the habit of checking with your utility when adding ESBs to your fleet to ensure your rate structure is still the best fit for you. For example, if you use charge management strategies for your ESBs (see [NYSERDA Electric School Bus Guidebook Guide 8](#) for more information), you may benefit from a time-of-use (TOU) rate structure in which you are charged less for consuming electricity during "off-peak" times (i.e., times of low electricity demand), but charged more during "on-peak" times (i.e., times of high electricity demand).

Most utilities offer a TOU rate structure. For example, Table 1 presents the price differences between on-peak and off-peak electricity use for the Con Edison TOU rate structure. The off-peak rates (2.33 ¢/kWh) can be more than 10 times lower than the highest on-peak rates (33.05 ¢/kWh).

Table 1: Electricity Costs for Con Edison's Residential Time-of-Use Rate³

Time-of-Use Periods	On-Peak Rates (8 am – Midnight)	Off-Peak Rates (Midnight – 8 am)
June 1 to September 30	33.05¢ per kWh	2.33¢ per kWh
October 1 to May 31	12.23¢ per kWh	2.33¢ per kWh

Are there incentives that reduce the impact of demand charges?

In early 2023, the New York State Public Service Commission (PSC) approved a series of incentives, programs, and tariffs designed to reduce the impacts and costs of demand charges associated with operating an EV fleet. The approved programs provide EV fleet owners with **three alternatives** to traditional demand-based rates.

First alternative:

The first alternative is the development of a "demand charge rebate." The rebate provides "a 50% demand charge credit for all commercial EV charging-use cases at National Grid, Central Hudson Gas & Electric Corp., New York State Electric and Gas Corp., (NYSEG) and Rochester Gas & Electric Corp. (RG&E), and for public direct current fast charging (DCFC) at Consolidated Edison Company of New York, Inc. (Con Edison) and Orange and Rockland Utilities, Inc. (O&R)."⁴

Demand charges can be a substantial portion of your monthly electricity bill. They range from approximately 20% of the bill to 50%, or more. A 50% reduction of the demand charge can therefore reduce total electricity costs by 10-15%, which can easily add up to thousands of dollars in savings per month.

Second alternative:

The second alternative requires utilities to implement a "commercial managed charging program." This program provides "use-case specific incentives in lieu of the demand charge rebate, as well as value-based bill credits that provide operating costs relief for EV charging stations that are able to avoid charging during the costliest times for the grid."⁴ This means that electric utilities create programs that reward customers for charging during specific times. Some examples of existing charge management programs and rates are detailed in Table 2 on the next page.

The PSC will be issuing an order in the near future that will charge electric utility providers with further enhancing these programs to provide additional savings for commercial customers, including school bus fleet owners. As currently proposed, the programs will offer incentives to participating customers to shift their EV loads to off-peak times, offering a Peak Avoidance Incentive to encourage participants to reduce their EV charging demands during the program's peak window.

Third alternative:

The third solution proposed **blending time-of-use rates with a demand charge** as EV charger utilization improves over the coming years. This EV phase-in rate will provide short-term cost relief to EV charger operators while utilization rates are low. As EV utilization rates increase over time, the EV phase-in rates will become more sustainable for both the owners and the utility and are "expected to result in costs 30% less expensive than the equivalent cost of gasoline."⁴

³ <https://www.coned.com/en/accounts-billing/your-bill/time-of-use>

⁴ <https://dps.ny.gov/system/files/documents/2023/01/pr23008.pdf>

Is there a rate structure specifically for charging ESBs?

Some utilities will have rate structures specifically designed for metering charging infrastructure, although this is not yet a widely adopted practice. Speak with your utility customer service representative or visit their website to find out more information about available rate structures.

Table 2 summarizes the available TOU and Demand Charge Management Rebates Programs for seven major New York electricity utilities.

Table 2: Demand Charge Rebates and TOU Rates for the seven major New York Electric Utilities

Utility Company	Rate Structure or Program	Rate Benefits
National Grid	Demand Charge Rebate (DCR) Program⁵	<p>The Demand Charge Rebate Program (DCR Program) provides eligible commercial EV charging customers with a 50% rebate of their billed demand charges. Demand Charges are billed on a per kW basis, based on the peak demand usage in the billing period.</p> <p>Customers will receive their rebates approximately every 6 months, with the total of their rebates from the previous 6 billing periods.</p>
Orange & Rockland	SmartCharge Commercial Incentive Program	<p>\$0.03 per kWh for charging from 12 (midnight) to 8 a.m. EST all days, year-round.</p> <p>\$7 per kW for reduced charging during the substation peak between June and September</p> <p>\$1 per kW for not charging during the network peak between October and May</p>
ConEdison	SmartCharge New York Business Incentive Rate	<p>\$25 3-Month Bonus: Earned per vehicle or charging station after 3 months of charging (does not need to be consecutive).</p> <p>10 cents per kWh Off-Peak Charging Incentive: Earned for charging at off-peak times.</p> <p>\$35 per month Avoided Summer Peak Incentive: Earned per vehicle or charging station for avoiding charging weekdays 2 p.m. to 6 p.m. EST, June 1 through September 30.</p> <p>\$35 Avoided Summer Peak Bonus Incentive: Earned per vehicle or charging station for avoiding all charging weekdays 2 p.m. to 6 p.m. EST, June 1 through September 30.</p>
NYSEG	Demand Charge Rebate Program	Provides eligible commercial EV charging customers up to a 50% rebate on their billed demand charges.
Rochester Gas & Electric	Demand Charge Rebate Program	Provides eligible commercial EV charging customers up to a 50% rebate on their billed demand charges.
Central Hudson	Demand Charge Rebate Program	Provides eligible commercial EV charging customers up to a 50% rebate on their billed demand charges.
PSEG Long Island Power Authority	PSEG Long Island Time-of-Day Rate	<p>Power supply charges range from 60% of the monthly published rate during super off-peak hours, to 100% of the monthly published rate during off-peak hours, to 164% of the published rate during peak hours.</p> <p>Super off-peak hours are from 11 p.m. to 6 a.m. every day, peak hours are from 3 p.m. to 7 p.m. weekdays (except Federal holidays), and off-peak hours are all hours outside of super off-peak hours and peak hours.</p>

⁵ The DCR is the only commercial program available now. After the PSC order, additional programs for commercial customers will become available.

What is a deregulated energy market for electricity and how does it benefit me?

New York State has a deregulated energy market. This means that customers aren't required to have their electricity supplied by the utility serving their service territory (see Figure 2). Instead, customers can "shop around" to find an electricity service company (ESCO) that is a better fit for their needs.

In a deregulated energy market, ESCOs can compete for your business, which can lead to more favorable electricity consumption pricing as well as a diversity of product offerings (e.g., 100% renewable supply).⁶ If you are not fully satisfied with your electricity service provider, whether it be the utility serving your service territory or an ESCO that you might have chosen (e.g., dissatisfied with the electricity consumption rates they charge or other aspects of their service offerings), you can engage with other ESCOs to find a service that is right for you.

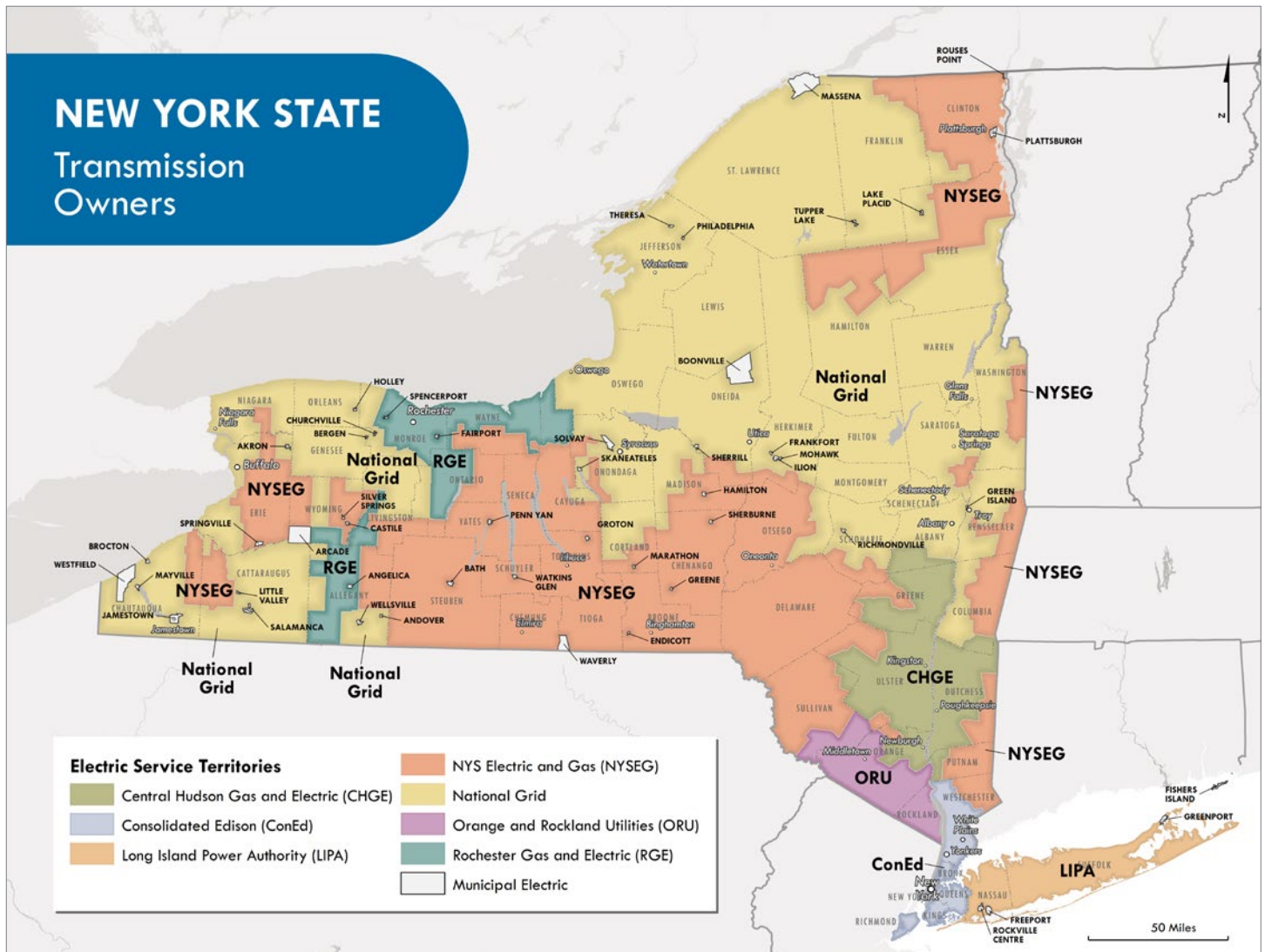


Figure 2: New York Energy Service Area Map for the seven major electric utility providers and local municipal electricity providers⁷

How do I choose an ESCO or utility service provider?

New York State customers can use the New York State Power to Choose⁸ website/tool to identify and compare prices for available ESCOs in their service territory. Users can refine their searches by entering common electricity usage data such as monthly consumption (kWh) and electricity demand (kW), as well as preferences such as contract length and renewable energy use. It is important to work with the utility serving your service territory to understand if you will incur additional costs for switching electricity providers, such as fees for ending a contract early.

⁶ <https://dps.ny.gov/energy-competition>

⁷ <https://www.rtoinsider.com/29331-ny-tos-new-public-policy-tx-category/>

⁸ <https://documents.dps.ny.gov/PTC/home>

Additional Resources

[Alternative Fuels Data Center Total Cost of Ownership Calculator](#)

[Central Hudson Demand Charge Rebate Program](#)

[Con Edison EV Cost Calculator](#)

[Con Edison Rate Information](#)

[DOE's Understanding Your Electricity Bills Webinar](#)

[National Grid Demand Charge Rebate FAQs](#)

[National Grid Demand Charge Rebate Program](#)

[National Grid EV Fleet Hub](#)

[New York Electric Utility Service Territories by County](#)

[New York Power to Choose Webpage](#)

[NYSEG EV Charging Incentives](#)

[Orange & Rockland \(O&R\) EV Cost Calculator](#)

[Orange & Rockland \(O&R\) SmartCharge Incentive Program](#)

[PSEG Fleet Calculator](#)

[Rochester Gas & Electric \(RG&E\) EV Charging Incentives](#)