

1.1. Existing Pennsylvania Electricity Rates

Residential

The sections below summarize the current residential electric rate designs for four of Pennsylvania's largest electric utilities: PECO, Duquesne Light Company, PPL Electric Utilities (PPL), and Metropolitan Edison Company (Met-Ed). Each of these utilities offers an optional TOU rate for generation supply service (i.e., energy purchased from the wholesale market), but not for the distribution portion of the bill. We present the volumetric rates as the bundled distribution, transmission, and generation supply rates current as of May 2022.

In addition to describing each rate, we quantify the potential cost savings for an EV customer who uses 300 kWh/month¹ during the off-peak period on the TOU rate as compared to the same usage on the standard residential tariff. This potential savings offers an indication of the strength of the incentive provided by TOU rates for customers to shift load to off-peak hours, as well as the relative attractiveness of TOU rates for EV drivers.

PECO

Out of the four largest Pennsylvania utilities' residential rates, PECO's TOU rate has the highest on-peak to off-peak price ratio, which provides the greatest incentive for customers to shift load to off-peak hours and the highest potential bill savings for customers who shift load.

PECO's TOU rate has three prices: an on-peak rate from 2 pm – 6 pm Monday to Friday (\$0.28/kWh), an off-peak rate (\$0.12/kWh), and a super-off-peak rate (\$0.11/kWh). The on-peak to off-peak price ratio is approximately 2.7 to 1, meaning on-peak rates are almost three times higher than charging during the super-off-peak window.² This price ratio results in potential annual savings for EV customers of \$116 from charging during the super-off-peak period compared to the standard flat rate – the most out of any Pennsylvania utility surveyed. As of May 31, 2022, 906 residential customers were enrolled in PECO's TOU rate.³ At least 123 of those customers were EV customers.⁴

PPL

The TOU option for PPL's residential customers features rates that vary by season and by on-peak and off-peak period. In the summer, the off-peak rate is three cents lower (\$0.09/kWh) than the on-peak

¹ A full battery electric vehicle is assumed to consume approximately 300 kWh per month, although this can vary significantly based on a customer's driving patterns and the efficiency of the EV.

² Rates are rounded to the nearest cent in the text, but the on-peak to off-peak price ratios are calculated using rates expressed to the fifth decimal place.

³ PECO Energy Company. 2021-2022 Default Service Program Time-of-Use Annual Report. Docket Number P-2020-3019290. October 21, 2022.

⁴ As evidenced by having previously applied for an EV-related rebate.

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rate (\$0.12/kWh) for an on-peak to off-peak price ratio of 1.3 to 1. In the winter, the off-peak rate is just one cent lower than the on-peak rate (\$0.11/kWh versus \$0.12/kWh). In the summer, the on-peak period is from 2 pm – 6 pm, whereas during the winter, the four-hour peak window is from 4 pm – 8 pm.

Assuming an EV customer charges 300 kWh per month off-peak, PPL's TOU rate could provide \$60 in savings annually relative to the standard residential service rate. PPL estimates that between 10,000 and 15,000 customers in its territory have EVs as of June 2022. As of August 2022, 684 customers had enrolled in PPL's TOU rate.⁵

Met-Ed (First Energy)

Met-Ed's residential TOU option only applies during the summer months from June to August. During these months, the off-peak rate is three cents less than the on-peak rate for an on-peak to off-peak price ratio of 1.3 to 1. The on-peak period in the summer lasts 12 hours each day from 8 am – 8 pm weekdays. Because of the short duration of the TOU rates, this rate structure provides customers with savings opportunities of just \$11 for charging off-peak compared to charging under the standard service supply pricing.

Duquesne Light Company

Since June 2021, Duquesne Light Company has offered an Electric Vehicle Time-of-Use Pilot rate (EV-TOU) which provides time-differentiated supply charges. This rate allows customers to save six cents if they charge during the super off-peak period (\$0.10/kWh) relative to the on-peak period (\$0.16/kWh) for an on-peak to off-peak price ratio of 1.7 to 1. The on-peak duration is eight hours from 1 pm – 9 pm on weekdays. This rate offers \$90 in annual savings compared to charging under the standard residential rate.

Approximately 6,000,300 EV customers take service from Duquesne Light Company, as of November 2022. The utility offers a \$50 incentive for customers with EVs to register with the utility, which enables the utility to provide education and outreach on EV rates to these customers through mail or email. Although 1,500,1,644 customers have claimed the registration incentive, only 300-522 customers have enrolled in the EV-TOU rate as of December/June 2022.⁶

Residential Rate Summary

All of the Pennsylvania utilities surveyed offer whole-home TOU rates for residential customers, and none impose demand charges on these customers. While the TOU rates offer potential savings relative to the flat rate for customers who charge during off-peak hours, these savings total less than \$10 per

⁵ PPL Electric Utilities. PPL Electric's Default Service Program, Billing & Load Data, Available at: <https://ppldsp.com/wp-content/uploads/2022/09/BillingData-2010Updated13Sept2022.xlsx>.

⁶ Personal communication with Emily Phan-Gruber of Duquesne Light Company on June 27, 2022.

Commented [BL3]: Emily comment: Might be helpful to clarify that this rate is for EV drivers but applies to the entire premise.

Commented [ODB4]: As defined within the Company's Rider No. 8, Default Service rates are adjusted on a biannual basis, for rates effective 6/1 and 12/1 of each year.

Commented [LNL5]: This should be seven... as of May-22 DSS EV TOU Peak: 9.9468 and DSS EV TOU Super Off: 2.8268

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Commented [ODB7]: Can't validate. Current RS Base: 7.0993 RS T: 1.9523 G (EV TOU Peak): 9.9468 = \$0.19 without surcharges and \$0.20 with surcharges

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month for an EV customer charging 300 kWh/month off-peak. In one case, the potential savings amount 7.90993+1.9523+2.8268

to less than \$1 per month. It is unlikely that this magnitude of savings will drive high levels of customer enrollment in the TOU rates or provide noticeable additional cost savings for EV customers. The rates offered as of summer 2022 are summarized in [Table 1Table-3](#), below.

Table 13. Pennsylvania Utilities Residential TOU and Savings Comparison

	<i>PECO</i>	<i>PPL</i>	<i>Met-Ed (FirstEnergy)</i>	<i>Duquesne Light Co</i>
Fixed Charge (\$/month)	\$ 10.51	\$ 16.50	\$ 11.25	\$ 12.50
Bundled TOU Rates (\$/kWh)				
Non-Summer - On-Peak	\$ 0.28	\$ 0.12	\$ 0.12	\$ 0.16
Non-Summer - Off-Peak	\$ 0.12	\$ 0.11	\$ 0.12	\$ 0.11
Non-Summer Super Off-Peak	\$ 0.11	n/a	n/a	\$ 0.10
Summer - On-Peak	\$ 0.28	\$ 0.12	\$ 0.14	\$ 0.16
Summer - Off-Peak	\$ 0.12	\$ 0.09	\$ 0.10	\$ 0.11
Summer - Super Off Peak	\$ 0.11	n/a	n/a	\$ 0.10
Standard Flat Rate (\$/kWh)	\$ 0.14	\$ 0.12	\$ 0.12	\$ 0.13
Potential annual savings for charging 300 kWh/month on off-peak vs. flat	\$ 115.78	\$ 60.21	\$ 11.07	\$ 89.60

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Commented [LNL11]: RS Base: 7.0993 RS T: 1.9523 G (EV TOU Off Peak): 3.9077 = \$0.13 without surcharges and \$0.14 with surcharges

Commented [LNL12]: RS Base: 7.0993 RS T: 1.9523 G (EV TOU Super Off Peak): 2.8268 = \$0.12 without surcharges and \$0.13 with surcharge

Commented [LNL13]: RS Base: 7.0993 RS T: 1.9523 G (Regular): 6.0286 = \$0.15 without surcharges and \$0.16 with surcharge

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None of the utilities surveyed offer EV-only TOU rates for residential customers. Although it may be technically possible for some residential customers to separately meter their garage or other parking area, the cost of doing so likely presents a significant barrier. The costs of installing a second meter may include electrician labor and materials as well as an additional service charge from the utility.

Based on the available data, we note that enrollment in whole-home TOU rates is low in Pennsylvania. 89.60Low enrollment could be due to a variety of factors, including the relative newness of the rates, impacts of COVID (with customers home more, they may be less willing to switch to a TOU rate), as well as minimal potential savings from shifting load.

Commercial Rates

Most Pennsylvania utilities provide a TOU option for supply service for commercial and industrial customers, but not for distribution rates. The distribution rates typically feature a form of non-coincident demand charges, although some utilities are piloting programs to mitigate these charges for DCFC customers.

For each of these rates, we estimated the potential annual savings from shifting 300 kWh to off-peak TOU rates, where TOU energy rates are available. Separately, we estimated the monthly distribution bill and effective \$/kWh distribution rate for several different types of vehicles and charging configurations, as shown in the table below. Our estimated demand for each scenario assumes that vehicles can stagger charging so that not all vehicles begin charging at the same time. We report the cost of DCFC charging at 5 percent load factor for each utility and present the full results of all scenarios at the end of this section.

Table 24. Scenarios Modeled

	Load Factor	Number of Vehicles at Site	Max Simultaneous Demand / Vehicle	Monthly Energy (kWh)
DCFC	5%	4	150	21,900
	10%	4	150	43,800
Transit Bus	10%	25	49	89,608
	37%	25	13	89,608
School Bus	10%	20	48	70,082
	34%	20	14	70,082
Medium Duty Truck	10%	30	18	39,364
	23%	30	8	39,364
Tractor-Trailer	25%	10	150	275,180
	61%	10	62	275,180

PECO

PECO's General Service rate includes a non-coincident demand charge of \$8.81/kW assessed based on the customer's maximum demand during the month. The optional volumetric TOU rate has three periods: an on-peak, off-peak, and super-off-peak period, with a large on-peak to off-peak price ratio of 5 to 1 (approximately \$0.16 to \$0.03/kWh). This is the largest price ratio of any of the Pennsylvania utilities' TOU rates. For comparison, the standard supply volumetric supply charge is \$0.06/kWh.

Under this schedule, customers could save approximately \$117 per year on a per-vehicle basis by charging during the super-off-peak hours, assuming 300 kWh/vehicle/month.

The non-coincident demand charge encourages customers to flatten their load profiles, but, by itself, does not encourage customers to shift that load to off-peak hours. To mitigate the impact of the demand charges, PECO implemented a temporary demand charge discount for public DCFC providers available until June 2024. This discount provides an on-bill credit equivalent to 50 percent of the customer's connected DCFC nameplate capacity.⁷ This rider helps to alleviate some of the operating cost hurdles from demand charges, faced by DCFC providers, but its expiration in 2024 means that new DCFC stations will not benefit from the discount for long.

We estimate that a DCFC station with a 5 percent load factor would face an effective distribution rate of \$0.24/kWh without the DCFC discount and an effective distribution rate of \$0.12/kWh with the DCFC discount. If coupled with the standard (flat) supply charge, this would result in an effective bundled rate of \$0.31/kWh without the DCFC discount and \$0.19/kWh with the DCFC discount.

PPL

Under PPL's Rate Schedule GS-1 customers pay a non-coincident demand charge of \$4.36/kW⁸ alongside either the schedule's standard supply rate or the optional TOU rates. The summer TOU on-peak rate (\$0.07/kWh) is in effect from June through November and is only three cents higher than the summer off-peak rate (\$0.04/kWh), while the winter on-peak rates (\$0.08/kWh) (effective from December through May) is only one cent higher than the off-peak winter rate (\$0.07/kWh). For comparison, the standard supply volumetric supply charge is approximately \$0.08/kWh.

Over the course of a year, customers who switch from charging under the standard supply rate to charging during an off-peak TOU rate would save \$75 annually/vehicle, assuming 300 kWh/vehicle/month. We estimate that a DCFC station with a 5 percent load factor would face an effective distribution rate of \$0.12/kWh under PPL's GS-1 rate schedule. If coupled with the standard (flat) supply charge, this would result in an effective bundled rate of \$0.20/kWh.

Met-Ed (First Energy)

Met-Ed offers two general service rates that are most applicable to EV customers: GS-Medium (up to 400 kW of demand) and GS-Large (demand greater than or equal to 400 kW). GS-Medium features a demand charge of \$5.11/kW. GS-Large has a \$4.16/kW demand charge. For both rate schedules, the demand charge is assessed based on the greater of the customer's maximum 15-minute measured demand during on-peak hours, 40 percent of the maximum demand during off-peak hours, or 50 percent of the highest billing demand during the preceding eleven months.

⁷ For example, a DCFC station with a nameplate charging capacity of 200 kW would receive a demand credit each month of 100 kW. Since, the station's billed distribution demand may not reach 200 kW in any month, this program could provide more than a 50% reduction in distribution demand charges.

⁸ A customer's monthly demand is assessed on a 15-minute basis.

Met-Ed does not offer TOU supply rates to its general service customers. Instead, GS-Medium customers with demand less than 100 kW⁹ may choose to take supply service on the Company's flat default supply rate (approximately \$0.10/kWh) or on its hourly pricing default service rider. All GS-Large customers taking supply service from the utility are served on the hourly pricing default service rider.

We estimate that a DCFC station with a 5 percent load factor would face an effective distribution rate of \$0.13/kWh under Met-Ed's GS-Large rate schedule. There is no flat default supply rate available to GS-Large customers for estimating a bundled rate. However, if the flat default supply rate were the same as for GS-Medium (approximately \$0.10/kWh), the effective bundled rate would be \$0.22/kWh.¹⁰

Duquesne Light Company

Duquesne Light Company offers two commercial and industrial rate schedules most applicable to EV customers: Rate GM for medium general service customers with demand less than 300 kW, and Rate GL for large general service customers (demand at or exceeding 300 kW but less than 5,000 kW).

Rate GM has a \$7.26/kW non-coincident demand charge (measured as the maximum 15-minute usage in the billing period). Rate GL assesses a minimum demand charge of \$3,500 applicable to the first 300 kW or less of demand. Once a customer's demand passes 300 kW, there is an additional \$9.80/kW non-coincident demand charge (also assessed on a 15-minute basis).

Only customers on the GM rate schedule are eligible to take supply service under the Company's EV-TOU pilot rate. Large general service customers who take supply service from the utility are required to do so on the day-ahead hourly price rider.

For GM customers on the EV-TOU supply rate, the bundled on-peak rate is approximately 6 cents higher than the super-off peak rate during both seasons (although the rates are slightly lower during the summer than the winter). The on-peak period is from 1 pm – 9 pm Monday through Sunday. If customers charge during the super-off-peak under this TOU option, they would save \$54 annually/vehicle relative to the flat rate (which is priced at approximately \$0.07/kWh).

We estimate that a DCFC station with a 5 percent load factor would face an effective distribution rate of \$0.29/kWh under Duquesne Light Company's GL rate schedule. There is no flat default supply rate available to GL customers for estimating a bundled rate. However, if the flat default supply rate were the same as for GM, the effective bundled rate would be \$0.36/kWh.

Commercial Rates Summary

All of the Pennsylvania electric utilities impose non-coincident demand charges on commercial customers, although Met-Ed's rates only measure 40 percent of the demand during off-peak hours. Non-coincident demand charges can be challenging for customers who seek to electrify their fleets, as

⁹ As measured in any month from April 1 – March 31 of the preceding year.

¹⁰ Values may not add due to rounding.

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Commented [BL16]: Emily comment: is there seasonality to this?

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the charges apply regardless of the time of day when a customer's maximum demand occurs. Thus, fleets that charge overnight are charged the same as those that charge during the middle of the day. For distribution equipment shared by many customers, such as feeders and substations, non-coincident demand charges may poorly reflect the actual costs caused by these customers. In addition, non-coincident demand charges do not provide price signals that encourage customers to shift their load to off-peak hours.

Several Pennsylvania utilities offer TOU supply rates to commercial customers, which provide moderate savings for customers who charge off-peak. Met-Ed and Duquesne Light require their larger customers to take supply service on hourly pricing rates, which can introduce significant volatility to customers' bills, but may offer greater savings than TOU rates for customers who charge overnight. Such hourly rates can pose a challenge to customers who are considering electrifying their fleets due to the potential risk of price spikes, but may also provide substantial cost savings.

Table 35. Pennsylvania utilities commercial rate comparison

	PECO	PPL	Met-Ed		Duquesne Light	
	GS	GS-1	GS-Medium	GS-Large	GM	GL
Customer or Min. Charge (\$/month)	24.21	22.00	24.07	270.09	60.00	3,500
Demand Charge (\$/kW)	8.81 (50% DCFC credit)	4.36	5.11	4.16	7.26	9.80 >300 kW
Bundled TOU Rates (\$/kWh)						
Non-Summer Peak	0.16	0.08	n/a	n/a	0.10	n/a
Non-Summer Off-Peak	0.05	0.07	n/a	n/a	0.05	n/a
Non-Summer Super Off Peak	0.03	n/a	n/a	n/a	0.04	n/a
Summer Peak	0.16	0.07	n/a	n/a	0.10	n/a
Summer Off-Peak	0.05	0.04	n/a	n/a	0.05	n/a
Summer Super Off Peak	0.03	n/a	n/a	n/a	0.04	n/a
Non-TOU Flat Rate (\$/kWh)	0.06	0.08	0.10	Hourly	0.07	Hourly

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