

# Fundamentals of Energy Efficient Building Operations



## Learning Activity #4A Interpreting Energy Bills

**Purpose:** In this exercise we will review a utility bill to determine the impact of rate structure on the total cost. If you brought an example of your own utility bill, please use that data. If you do not have your own utility bill, please use the example provided.

### Participant Directions

Review the utility bill and answer the questions below. Be prepared to present answers to the class.

Questions	Answers
What type of rate structure is the utility using?	
What rate is charged per kWh?	
What was the highest peak demand? What peak demand period was that part of?	
What rate was charged for that peak demand?	
Does this rate structure encourage or discourage energy conservation?	
What particular energy conservation method could be used?	



An Exelon Company

# Your electric bill - Nov 2024

for the period **October 14, 2024 to November 11, 2024**



**Account number:** [Redacted]  
**Your service address:** [Redacted]  
**Bill Issue date:** Nov 15, [Redacted]

### How to contact us

Customer Service (Mon-Fri, 7am - 8 pm) **202-833-7500**  
Hearing Impaired (TTY) **202-872-2369**  
¿ Problemas con la factura? **202-872-4641**  
Electric emergencies & outages (24 hours) **1-877-737-2662**  
Visit [pepco.com](http://pepco.com) for service, billing and correspondence information.

Pepco is regulated by - DC Public Service Commission, [dcpsc.org](http://dcpsc.org)  
1325 G St NW, Suite 800, Washington DC 20005, 202-626-5100

Consumer Advocate - Office of People's Counsel, [opc-dc.gov](http://opc-dc.gov)  
1133 Fifteenth St NW, Washington DC 20005, 202-727-3071

Information regarding rate schedules and how to verify the accuracy of your bill will be mailed upon request.

Follow us on Twitter at [twitter.com/PepcoConnect](https://twitter.com/PepcoConnect). Like us on Facebook at [facebook.com/PepcoConnect](https://facebook.com/PepcoConnect).

### Summary of your charges

Balance from your last bill	\$39,741.21
Your payment(s) - thank you	\$21,313.05-
Balance forward as of Nov 15	\$18,428.16
New electric distribution charges - Pepco	\$7,735.51
New WGL Energy Svcs supply charges	\$10,452.00
<b>Total amount due by Dec 6</b>	<b>\$36,615.67</b>

**After Dec 6, 2024, a Late Payment Charge of \$510.56 will be added, increasing the amount due to \$37,126.23.**

**A past due amount of \$18,428.16 remained on your account at the time your bill was prepared. If payment has been made, please disregard this notice. For bill payment options, visit [www.pepco.com](http://www.pepco.com).**

Visit [pepco.com/dctariffs](http://pepco.com/dctariffs) and click "DC Terms and Conditions" for information on how payments are applied to balances from Pepco and any competitive supplier.

Your smart electric meter is read wirelessly. Visit My Account at [pepco.com](http://pepco.com) to view your daily and hourly energy usage.

If you are moving or discontinuing service, please contact Pepco at least three days in advance.

8000027-0000159-0000001 of 0000004-C08-DV-4275-00027

DCG **Please tear on the dotted line below.** Invoice Number: 200610425927 Page 1 of 4

**Return this coupon with your payment made payable to Pepco**

Account number	<b>5501 6471 041</b>
Total amount due by Dec 6	<b>\$36,615.67</b>
Total amount due after Dec 6	<b>\$37,126.23</b>

8000027 NX 4275 -C08-P00027-1  
9VX00027

**Amount Paid:** \$

**ENERGY MGMT DIV**  
WASHINGTON DC 20001-2714



PO BOX 13608  
PHILADELPHIA PA 19101



700001550164710410000000018428160000018187510000036615670010

Account number: [REDACTED]

### Details of your Electric Charges

Non-Residential MPS-GT - service number 0550 1647 1041 7001 1755 10  
 Electricity you used this period

<u>Meter Number</u> <u>Energy Type</u>	<u>Current Reading</u>	<u>Previous Reading</u>	<u>Difference</u>	<u>Multiplier</u>	<u>Total Use</u>
KZD350746703 Use (kWh)	Nov 11 016933 (actual)	Oct 14 016665 (actual)	268	600	160800
On-Peak Use (kWh)	004648 (actual)	004564 (actual)	84	600	50400
Int-Peak Use (kWh)	004541 (actual)	004466 (actual)	75	600	45000
Off-Peak Use (kWh)	007743 (actual)	007634 (actual)	109	600	65400
On-Peak Demand (kW)	0.620 (actual)			600	372.00
Int-Peak Demand (kW)	0.640 (actual)			600	384.00
Off-Peak Demand (kW)	0.510 (actual)			600	306.00

**Total use-kWh** 160800

**Your next meter reading is scheduled for December 13, 2024**

**Delivery Charges:** These charges reflect the cost of bringing electricity to you.  
 Current charges for 29 days, **winter rates in effect.**

<u>Type of charge</u>	<u>How we calculate this charge</u>	<u>Amount(\$)</u>
Distribution Services:		
Customer Charge		379.03
Energy Charge	160800 kWh X \$0.0122000 per kWh	1,961.76
Maximum Demand	384.00 kW X \$9.2500000 per kW	3,552.00

### Electric Distribution Summary - Pepco

<b>Balance from your last bill</b>	<b>\$16,497.21</b>
Payment Oct 27	\$8,599.05-
<b>Total Payments</b>	<b>\$8,599.05-</b>
Electric Charges (Non-Residential MPS-GT)	\$7,735.51
<b>New electric charges</b>	<b>\$7,735.51</b>
<b>Total amount due by Dec 6, 2024</b>	<b>\$15,633.67</b>

**Check here to enroll in the Direct Debit plan** Sign and date here \_\_\_\_\_

By signing here, you authorize Pepco to electronically deduct the amount of your monthly bill from your checking account each month. The check you send with this signed authorization will be used to set up Direct Debit. You understand that we will notify you each month of the date and amount of the debit, which will be on or after the due date stated on your monthly bill. You understand that to withdraw this authorization you must call Pepco. You understand that Pepco does not charge for this service, but that your bank may have charges for this service.

#### Customer Service Centers

Washington DC		Maryland	
701 Ninth St NW	(Mon - Fri) 8:30am - 5:15pm	201 West Gude Dr, Rockville	(Mon - Fri) 10:00am - 2:00pm
2300 Martin Luther King Jr Ave SE	(Mon - Fri) 9:00am - 5:00pm	8300 Old Marlboro Pk, Forestville	(Mon, Wed, Fri) 10:00am - 2:00pm

Any inquiry or complaint about this bill should be made prior to the due date, in order to avoid late charges.

Electronic Check Conversion - When you provide a check as payment, you authorize us either to use information from your check to make a one-time electronic fund transfer from your account or to process the payment as a check transaction.

Account number: [REDACTED]

Your electric bill for the period  
**October 14, 2024 to November 11, 2024**



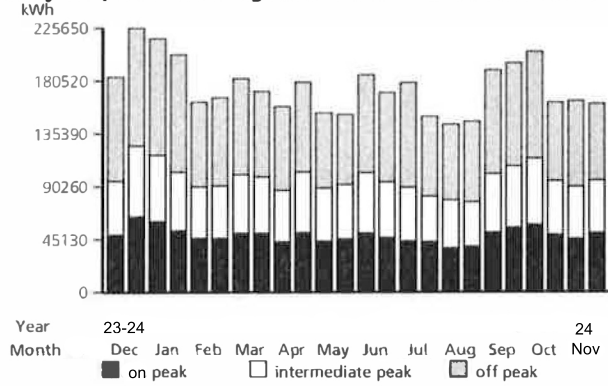
Residential Aid Discount		
Surcharge	160800 kWh X \$0.0001590 per kWh	25.57
Administrative Credit	160800 kWh X \$0.0000000 per kWh	0.00
<b>Subtotal (Set by DC PSC)</b>		<b>5,918.36</b>
Energy Assistance Trust Fund	160800 kWh X \$0.0000607 per kWh	9.76
Sustain Energy Trust Fund	160800 kWh X \$0.0015000 per kWh	241.20
Public Space Occupancy Surcharge	160800 kWh X \$0.0020400 per kWh	328.03
Delivery Tax	160800 kWh X \$0.0077000 per kWh	1,238.16
<b>Subtotal (Not set by DC PSC)</b>		<b>1,817.15</b>
<b>Total Electric Delivery Charges</b>		<b>7,735.51</b>

**Supply Charges:** These charges reflect the cost of producing electricity for you.

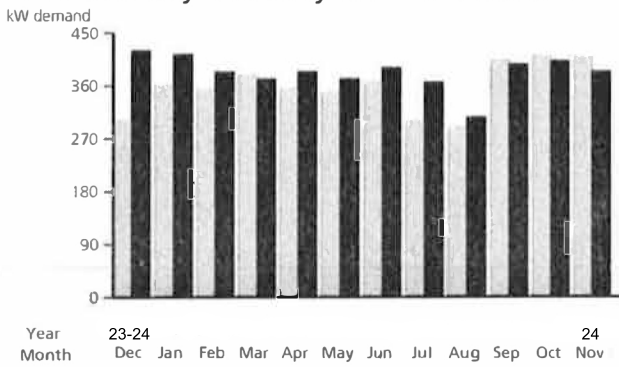
**Total Electric Charges - Non-Residential MPS-GT** **7,735.51**

*Your monthly Electricity use in kWh*

Daily temperature averages: Nov 2023 57° F Nov 2024: 60° F



*Your monthly Electricity use in kW demand*



8000027-0000154-0000003 of 0000004-C08-DV-4275-00027

Account number: [REDACTED]

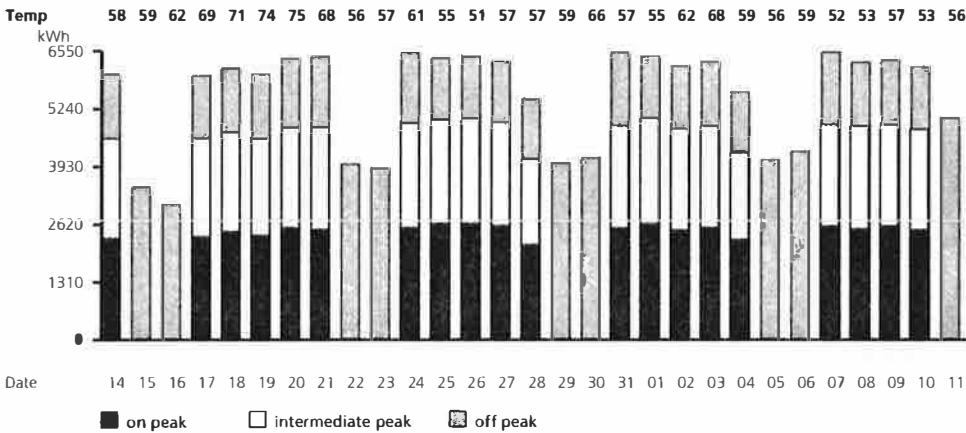
Your electric bill for the period  
**October 14, 2024 to November 11, 2024**

### Energy Usage History

	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24	Jul 24	Aug 24	Sep 24	Oct 24	Nov 24
Temp	57°	49°	47°	36°	43°	53°	60°	70°	78°	82°	81°	68°	60°
Days	28	30	33	28	30	33	29	32	31	28	34	29	29
kWh	162600	226200	203400	166200	171000	179400	151200	171000	150600	145800	195600	161400	160800
On Pk kWh	45600	64800	52800	46200	50400	51000	45600	46800	43200	39000	55200	49200	50400
Int Pk kWh	44400	60000	49800	44400	48000	51600	46200	47400	38400	37800	52200	45600	45000
Off Pk kWh	73200	100800	100200	75600	73200	76800	60000	76200	68400	69000	88200	67200	65400
kW Max	408.00	420.00	414.00	384.00	372.00	384.00	372.00	390.00	366.00	306.00	396.00	402.00	384.00
kW On Pk	408.00	414.00	414.00	378.00	366.00	384.00	360.00	384.00	366.00	306.00	396.00	396.00	372.00

Your daily electricity use for this bill period. Visit My Account at [pepco.com](http://pepco.com) to see your hourly electricity use.

Meter Number KZD350746703



### WGL Energy Svcs electric supply charges

Service number 0550 1647 1041 7001 1755 10

Your electricity is supplied by WGL Energy Services. If you have any questions about your electric supply charges, call WGL Energy Services at 1-888-236-9437.

Billing period: Oct 14, 2024 to Nov 11, 2024 (29 days)

Type of service: Non-Residential MPS-GT

Electricity Used: 160800 kWh

Usage 160800.0 kwh at 0.065 per kwh (10/14/2024)

\$10,452.00

Amount(\$)

10,452.00

### WGL Energy Svcs electric charges

Email [EMP@wglenergy.com](mailto:EMP@wglenergy.com) to access your free Energy Management Platform account

### WGL Energy Svcs Electric Supply Summary

Balance from your last bill	<b>\$23,244.00</b>
Payment Oct 27	\$12,714.00-
<b>Total Payments</b>	<b>\$12,714.00-</b>
Total Current Charges	\$10,452.00
<b>New WGL Energy Svcs electric supply charges</b>	<b>\$10,452.00</b>
<b>Total amount due by Dec 6, 2024</b>	<b>\$20,982.00</b>

8000027-0000154-0000004 of 0000004-C08-04-4275-0027



## U.S. Energy Use Intensity by Property Type

### OVERVIEW

This reference table is designed to help you to compare your property's energy use to the national median (or mid-point) energy use of similar properties.

#### Benchmarking your Property

When benchmarking in Portfolio Manager, we recommend that you focus on the primary function (or, main activity) in your building(s). Begin by selecting your primary function from the table below and then enter as few additional use types as possible. Benchmarking your building using a single use type will most closely approximate how your building would have been recorded in the reference data survey, and therefore yield the most accurate comparisons to median performance. In some cases, buildings may have multiple distinctly different uses. For example, an office and a hotel that share a common building. In these mixed-use settings, it is appropriate to enter multiple use types. Definitions of all property types are available at: [www.energystar.gov/PMGlossary](http://www.energystar.gov/PMGlossary).

#### Using Median Site and Source Energy Use Intensity (EUI)

The **national median source EUI** is a recommended benchmark metric for all buildings. The median value is the middle of the national population – half of buildings use more energy, half use less. The median works better than the mean (arithmetic average) for comparing relative energy performance, because it more accurately reflects the mid-point of energy use for most property types.

The table presents the median in both **site EUI** and **source EUI**. Site EUI is what you may be familiar with from your utility bills. Site EUI contains a mixture of what is called primary energy (i.e., a raw fuel like natural gas) and secondary energy (i.e., a converted product like electricity or district steam). Source energy provides the most equitable way to combine primary and secondary energy types into a single common unit, ensuring that no building receives either a credit or a penalty based on its energy source or utility. You can learn more about source energy and the way it is computed at [www.energystar.gov/SourceEnergy](http://www.energystar.gov/SourceEnergy). We strongly encourage you to use source EUI.

While almost all commercial building types have a national Median Source EUI, some (**presented in cyan**) will also have a 1-100 ENERGY STAR Score. The score evaluates a building relative to its peers, similar to the median energy use values, and also adjusts for climate and business activity. You can learn more about the score at: [www.energystar.gov/ENERGYSTARScore](http://www.energystar.gov/ENERGYSTARScore).

#### Understanding Reference Data

The right-most column in the table indicates the reference data source we use to determine the median performance of buildings in your peer group. To compute the national median, we always rely on nationally representative data. For the majority of property types, the reference data is from the Commercial Building Energy Consumption Survey (CBECS). This is a national survey conducted by the U.S. Department of Energy's Energy Information Administration (for more information visit: <http://www.eia.gov/consumption/commercial/>). Three additional surveys are referenced for data centers, wastewater treatment plants, and multifamily housing. Additional information on these surveys can be found in the technical reference document for each property type.

## U.S. National Median Reference Values for All Portfolio Manager Property Types

Broad Category	Primary Function	Further Breakdown (where needed)	Source EUI (kBtu/ft <sup>2</sup> )	Site EUI (kBtu/ft <sup>2</sup> )	Reference Data Source - Peer Group Comparison	
Banking/Financial Services	<b>Bank Branch *</b>		209.9	88.3	CBECS - Bank/Financial	
	<b>Financial Office*</b>		116.4	52.9	CBECS - Office & Bank/Financial	
Education	Adult Education		110.4	52.4	CBECS - Education	
	College/University		180.6	84.3	CBECS - College/University	
	<b>K-12 School*</b>		104.4	48.5	CBECS - Elementary/Middle & High School	
	Pre-school/Daycare		131.5	64.8	CBECS - Preschool	
	Vocational School		110.4	52.4	CBECS - Education	
	Other - Education					
Entertainment/Public Assembly	Convention Center		109.6	56.1	CBECS - Social/Meeting	
	Movie Theater		112.0	56.2	CBECS - Public Assembly	
	Museum					
	Performing Arts					
	Recreation	Bowling Alley		112.0	50.8	CBECS - Recreation
		Fitness Center/Health Club/Gym				
		Ice/Curling Rink				
		Roller Rink				
		Swimming Pool				
Other - Recreation						
Social/Meeting Hall		109.6	56.1	CBECS - Social/Meeting		

Broad Category	Primary Function	Further Breakdown (where needed)	Source EUI (kBtu/ft <sup>2</sup> )	Site EUI (kBtu/ft <sup>2</sup> )	Reference Data Source - Peer Group Comparison
Entertainment/Public Assembly	Stadium	Indoor Arena	112.0	56.2	CBECS - Public Assembly
		Race Track			
		Stadium (Closed)			
		Stadium (Open)			
		Other - Stadium			
	Other	Aquarium	297.0	130.7	CBECS - Bar/Pub/Lounge
		Casino			
		Zoo			
		Other - Entertainment/Public Assembly			
		Bar/Nightclub			
Food Sales & Service	<b>Convenience Store*</b>	Convenience Store with Gas Station	883.5	350.9	Industry Survey
		Convenience Store without Gas Station			
	Restaurant/Bar	Bar/Nightclub	297.0	130.7	CBECS - Bar/Pub/Lounge
		Fast Food Restaurant	886.4	402.7	CBECS - Fast Food
		Restaurant	573.7	325.6	CBECS - Restaurant/Cafeteria
		Other - Restaurant/Bar			
	<b>Supermarket/Grocery Store*</b>		444.0	196.0	CBECS - Grocery Store/Food Market
	<b>Wholesale Club/Supercenter*</b>		120.0	51.4	CBECS - Retail Store
	Other	Food Sales	592.6	231.4	CBECS - Food Sales
		Food Service	527.7	270.3	CBECS - Food Service

Broad Category	Primary Function	Further Breakdown (where needed)	Source EUI (kBtu/ft <sup>2</sup> )	Site EUI (kBtu/ft <sup>2</sup> )	Reference Data Source - Peer Group Comparison
Healthcare	Ambulatory Surgical Center		138.3	62.0	CBECS - Outpatient Healthcare
	Hospital	<b>Hospital (General Medical &amp; Surgical)*</b>	426.9	234.3	Industry Survey
		Other/Specialty Hospital	433.9	206.7	CBECS - Inpatient Healthcare
	<b>Medical Office*</b>		232.8	97.7	Industry Survey
	Outpatient Rehabilitation/Physical Therapy		138.3	62.0	CBECS - Outpatient Healthcare
	Residential Care Facility		213.2	99.0	Industry Survey
	<b>Senior Living Community*</b>		213.2	99.0	Industry Survey
	Urgent Care/Clinic/Other Outpatient		145.8	64.5	CBECS - Clinic/Outpatient
Lodging/Residential	<b>Barracks*</b>		107.5	57.9	CBECS - Dormitory
	<b>Hotel*</b>		146.7	63.0	CBECS - Hotel & Motel/Inn
	<b>Multifamily Housing*</b>		118.1	59.6	Fannie Mae Industry Survey
	Prison/Incarceration		156.4	69.9	CBECS - Public Order and Safety
	<b>Residence Hall/Dormitory*</b>		107.5	57.9	CBECS - Dormitory
	Residential Care Facility		213.2	99.0	Industry Survey
	<b>Senior Living Community*</b>		213.2	99.0	Industry Survey
	Single Family Home		N/A	N/A	None Available
	Other - Lodging/Residential		143.6	63.6	CBECS - Lodging
Manufacturing/Industrial	Manufacturing/Industrial Plant		N/A	N/A	None Available
Mixed Use	Mixed Use Property		89.3	40.1	CBECS - Other
Office	<b>Medical Office*</b>		232.8	97.7	Industry Survey
	<b>Office*</b>		116.4	52.9	CBECS - Office & Bank/Financial
	Veterinary Office		145.8	64.5	CBECS - Clinic/Outpatient

Broad Category	Primary Function	Further Breakdown (where needed)	Source EUI (kBtu/ft <sup>2</sup> )	Site EUI (kBtu/ft <sup>2</sup> )	Reference Data Source - Peer Group Comparison
Parking	Parking		N/A	N/A	None Available
Public Services	<b>Courthouse*</b>		211.4	101.2	CBECS - Courthouse
	Drinking Water Treatment & Distribution <i>(Average EUI presented in Energy per Flow in gallons per day)</i>		5.90	2.27	AWWA - Water Treatment Plant
	Fire Station		124.9	63.5	CBECS - Fire Station/Police Station
	Library		143.6	71.6	CBECS - Library
	Mailing Center/Post Office		96.9	47.9	CBECS - Service
	Police Station		124.9	63.5	CBECS - Fire Station/Police Station
	Prison/Incarceration		156.4	69.9	CBECS - Public Order and Safety
	Social/Meeting Hall		109.6	56.1	CBECS - Social/Meeting
	Transportation Terminal/Station		112.0	56.2	CBECS - Public Assembly
	<b>Wastewater Treatment Plant*</b> <i>(Average EUI presented in Energy per Flow in gallons per day)</i>		7.51	2.89	AWWA - Wastewater Plant
	Other - Public Services		89.3	40.1	CBECS - Other
Religious Worship	<b>Worship Facility*</b>		58.4	30.5	CBECS - Religious Worship
Retail	<b>Convenience Store*</b>	Convenience Store with Gas Station	883.5	350.9	Industry Survey
		Convenience Store without Gas Station			
	Mall	Enclosed Mall	170.7	65.7	CBECS - Enclosed Mall
		Lifestyle Center	228.8	103.5	CBECS - Strip Shopping Mall
		Strip Mall			
		Other - Mall	225.3	101.6	CBECS - Enclosed Mall and Strip Shopping Mall
	<b>Retail Store*</b>		120.0	51.4	CBECS - Retail Store
	<b>Supermarket/Grocery Store*</b>		444.0	196.0	CBECS - Grocery Store/Food Market
<b>Vehicle Dealership*</b>		138.2	71.9	Industry Survey	

Broad Category	Primary Function	Further Breakdown (where needed)	Source EUI (kBtu/ft <sup>2</sup> )	Site EUI (kBtu/ft <sup>2</sup> )	Reference Data Source - Peer Group Comparison
	<b>Wholesale Club/Supercenter*</b>		120.0	51.4	CBECS - Retail Store
Technology/Science	<b>Data Center*</b> <i>(Average PUE presented in place of EUI: PUE = Total Energy / IT Energy)</i>		1.82	1.82	EPA - Data Center
	Laboratory		318.2	115.3	CBECS - Laboratory
	Other – Technology/Science		89.3	40.1	CBECS - Other
Services	<b>Data Center*</b> <i>(Average PUE presented in place of EUI: PUE = Total Energy / IT Energy)</i>		1.82	1.82	EPA - Data Center
	Personal Services (Health/Beauty, Dry Cleaning, etc.)		96.9	47.9	CBECS - Service
	Repair Services (Vehicle, Shoe, Locksmith, etc.)				
	Other - Services				
Utility	Drinking Water Treatment & Distribution <i>(Average EUI presented in Energy per Flow in gallons per day)</i>		5.90	2.27	AWWA - Water Treatment Plant
	Energy/Power Station		89.3	40.1	CBECS - Other
	<b>Wastewater Treatment Plant*</b> <i>(Average EUI presented in Energy per Flow in gallons per day)</i>		7.51	2.89	AWWA - Wastewater Plant
	Other - Utility		89.3	40.1	CBECS - Other
Warehouse/Storage	Self-Storage Facility		47.8	20.2	CBECS – Non-refrigerated Warehouse
	Warehouse/Distribution Center	<b>Distribution Center*</b>	52.9	22.7	CBECS – Non-refrigerated Warehouse & Distribution Center
		<b>Non-Refrigerated Warehouse*</b>			
		<b>Refrigerated Warehouse*</b>	235.6	84.1	CBECS – Refrigerated Warehouses
Other	Other		89.3	40.1	CBECS - Other