

## **Green Power Connection™**



# Overview of Pepco's Net Energy Metering and Interconnection Process for the DC Sustainability Energy Utility

Presented by: Michelle Ware, C.E.M.

Date: April 29, 2015

#### **Overview**

- Pepco's Role in Net Energy Metering
- 2014 Annual Interconnections Report DCPSC FC1050
- NEM and Small Generator Interconnection Application Process
  - Detailed Steps in the Application and Screening Process
- Frequently Asked Questions
  - Application and System
  - NEM Billing and Bill Samples
- Lessons Learned
- Contact Us

We support renewable energy and partner with our customers to ensure safe and reliable interconnection of renewable energy into the electric grid.



### Pepco's Role in Net Energy Metering

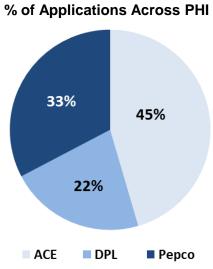
- Customers who generate their own electricity with renewable energy sources
  can interconnect with the electric grid and receive bill credits for excess
  generation. A special net-capable meter at the customer's premise measures
  the energy a customer uses off the grid and the excess generation the
  renewable system provides onto the grid, and calculates the difference or "net."
- Green Power Connection™ (GPC) is Pepco's process for facilitating small generator interconnection and net energy metering (NEM) requests
- Small generator technologies that qualify for interconnection with our system include solar, wind, biomass, ocean, geothermal electric, hydro-electric, anaerobic digestion, fuel cells, and CHP
- Our GPC team:
  - receives interconnection applications and requests
  - manages the NEM application process from initial inquiry to the Authorization to Operate
  - is Pepco's net energy metering and interconnection subject matter experts
  - is the centralized point of contact for non-PJM net energy metering and interconnection projects
  - ensures compliance with NEM and interconnection rules and regulations
  - manages the NEM project database and performance statistics
  - resolves NEM-related customer inquiries



# **2014 Annual FC1050 Interconnection Report** for the District of Columbia



2014 App	olication Statistics in D.C.	for Solar (or PV)	<b>Generation Syst</b>	ems	
Generator System Type	Nameplate Capacity	System Size in kW AC Inverter Rating	Number of Applications	% of Total Applications	
Level 1	10 kW or less and inverter based	2,042.354 kW	487	93.67%	
Level 2	2 MW or less radial distribution circuit or spot network serving <b>one</b> customer	1,378.150 kW	33	6.33%	
Level 3	50 kW or less (area network) 10 MW or less (radial distribution circuit)	0.000 kW	0	0.00%	
Level 4 less than 10 MW and not level 1, 2, or 3		60.000 kW	1	0.10%	
	Total	3,480.504 kW or 3.480 MW	521	100.00%	



# **Net Energy Metering and Small Generator Interconnection Application Process**

#### **Using GPC Website as a Resource**

#### http://www.pepco.com/gpc









#### MY HOME

MANAGE MY ACCOUNT ONLINE

- PAY YOUR BILL
- REPORT AN OUTAGE OR SAFETY HAZARD
- SAVE MONEY AND CONSERVE ENERGY
- Efficiency Rebates, Incentives and Programs

Understanding the Cost of Energy

Request Energy Consultation

Home Energy Saving Tips

- Net Metering and Small Generator Interconnections
  - ▶ District of Columbia
  - Maryland

Contact Us

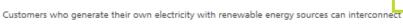
Renewable Energy

Smart Meters

# green power connection

# NET ENERGY METERING AND SMALL GENERATOR INTERCONNECTIONS

We support renewable energy and partner with our customers to ensure safe and reliable interconnection of renewable energy into the electric grid.



with the electric grid and receive bill credits for excess generation. A special the customer's premise measures the energy a customer uses off the grid a generation the renewable system provides onto the grid, and calculates the

Green Power Connection™ is our process for facilitating Net Energy Met interconnections. Our dedicated team of consultants and account coordina customer's experience – from processing applications to resolving issues – 1 smaller commercial interconnection projects. Recently, new and innovative become available for aggregated net energy metering in Maryland and for metering in the District of Columbia. More information will be available on



#### **District of Columbia**

- Interconnection Application and Agreement Forms
- Links to Applicable Regulations,
   Rules, Tariffs, Guidelines, and Maps
- Renewable News and Useful Links
- Frequently Asked Questions

#### NOT SURE WHERE TO START? SELECT YOUR REGION:

District of Columbia

Maryland



## Pepco's DC NEM & Interconnection Application Checklist



Steps	Actions To Take	Responsible Party
1. Research	Research the various types of renewable energy systems available and decide which system best fits your consumption needs. Renewable energy-generating systems should be sized to meet part or all of your energy needs     Understand your electrical load and energy consumption	Customer
2. Select	Interview and select a reputable and licensed installing contractor	Customer
3. Apply	<ul> <li>Understand the documentation needed with the interconnection agreement (e.g., rebate forms, permit applications, inspection forms)</li> <li>Apply and submit Part I of Pepco's interconnection application and agreement along with the application fee and supporting documentation. For applicants in the District of Columbia that wish to net meter, a signed NEM Contract is also required</li> <li>Applications without supporting documentation will be delayed. You can re-submit a corrected application and documentation</li> </ul>	Customer  Apply for DC Building Perr
4. Approval	<ul> <li>Wait for Pepco's Approval to Install before installing any renewable generator equipment</li> <li>Pepco will provide you a written screening result letter or an Approval to Install letter</li> </ul>	Customer     Pepco
5. Install	Begin constructing and installing your renewable generator facility	Customer
6. Inspect	After installation, submit Part II of our interconnection agreement, including a copy of the certificate of completion and the inspection certificate     We will review your documentation to verify the interconnection application meets regulatory requirements	Customer     Pepco
7. Meter	We will install your net-capable meter	• Pepco
8. Authorization	We will send you an Authorization to Operate letter	• Pepco
9. Operate	Receipt of the authorization letter means you can <b>operate</b> your renewable system	Customer

#### **Customers Research**



- Customers research and investigate their own contractor to help research the eligible technologies in their service area
- Customers should understand their current energy use
- Customers should select and work with their own contractor throughout the NEM application process
- Customers should understand what happens to their system capacity during seasonal and environmental conditions

Pepco does not recommend contractors or installers or directly install any renewable technologies at customer's premises

### **Interconnection Application and Fees**

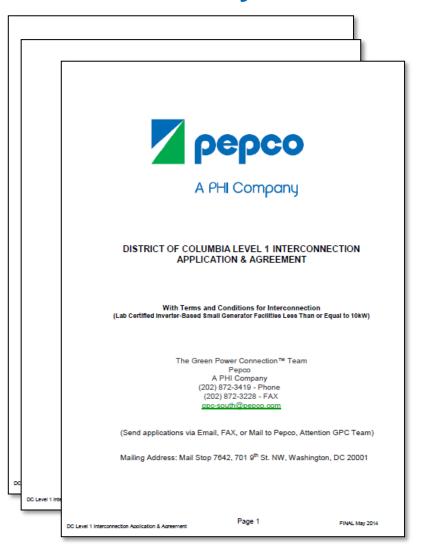


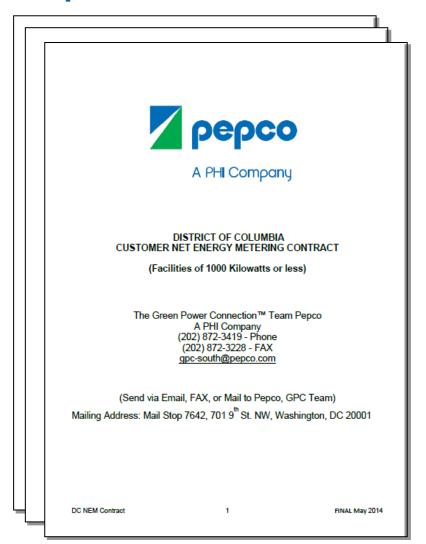
- Applicants must complete all required fields on the application agreement
- The name must match the customer's name of record on the utility account
  - Note: use the exact name as on the customer's Pepco bill
- The appropriate application fee must be included when submitting the application

Nameplate Capacity	Application Fee
<b>Level 1</b> 10 kW or less and invertor-based	\$100
Level 2 2 MW or less radial distribution circuit or spot network serving one customer	\$500
Level 3 area network (50 kW or less) radial distribution circuit (10 MW or less)	\$500
Level 4 less than 10 MW and not Level 1, 2, or 3	\$1,000

- Note: write the customer's name, Pepco account number, and "Interconnection Fee" in the notes section of the check
- An application with missing information or fee will delay the approval process

#### What Forms do you Need to Complete?





http://www.pepco.com/greenpowerconnection



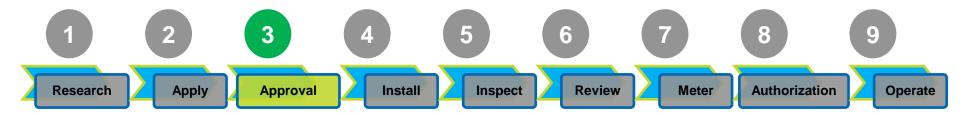
## **Application Acknowledgement Receipt**



- Once Pepco receives the application, our GPC team will email an Acknowledgement of Receipt indicating whether the application is complete or incomplete
- A complete application will move to next step: review by our engineers (System Protection, Distribution Engineering, and Distributed Energy Resources) to determine circuit impact, specific operating conditions, etc.
- An incomplete request will generate a notification to the customer of the required missing information before GPC will process the application

Acknowledgement of Receipt (b	usiness days)
Nameplate Capacity	District of Columbia
<b>Level 1</b> 10 kW or less and inverter-based	10
Level 2 2 MW or less radial distribution circuit or spot network serving one customer	10
Level 3  area network (50 kW or less) radial distribution circuit (10 MW or less)	10
<b>Level 4</b> less than 10 MW and not Level 1, 2, or 3	10

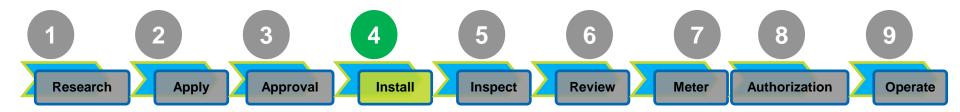
## **Interconnection Application Screening Process and Results**



- After engineering screening of the application, our GPC team will email results to the customer and contractor. Screening results could include:
  - an approval to install or denial
  - a notification that a study is needed
  - a request for additional operating requirements
  - a requirement for necessary distribution circuit upgrades at the customer's expense

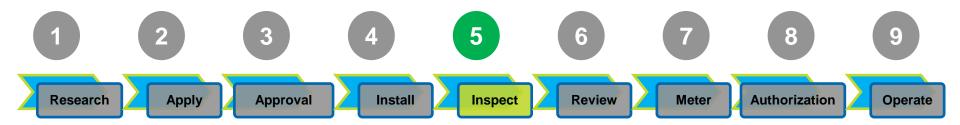
Application Review Notification (	business days)
System Capacity	District of Columbia
<b>Level 1</b> 10 kW or less and invertor-based	15
Level 2 2 MW or less radial distribution circuit or spot network serving one customer	20
<b>Level 3</b> area network (50 kW or less) radial distribution circuit (10 MW or less)	25
<b>Level 4</b> less than 10 MW and not Level 1, 2, or 3	study

## **Approval to Install**



- Once Pepco reviews and approves the interconnection application, the GPC team will email the applicant an Approval to Install notification
- Customers and contractors should not install any renewable generating system or component until they have received Pepco's Approval to Install notification
- It is the customers' responsibility to request the building permit from DCRA

## **Certificate of Completion and Inspection Certificate**



- After installing the renewable generating system the applicant should send our GPC team the Certificate of Completion (COC) found in Part II of the *Interconnection Application and Agreement* along with the FINAL electrical inspection certificate (a.k.a. DC approved job card)
- These documents attest that the system was properly installed

### **Final Interconnection Application Review**



 GPC team does a complete review of the entire interconnection application and supporting documents

## **Meter Exchange**



- GPC team notifies the customer the application is complete
- Pepco's Metering Department will schedule a net-capable meter exchange

## **Final Authorization to Operate**



- GPC codes customers' Pepco accounts for net metering and records the net-capable meter data
- GPC sends the customer the final written Authorization to Operate, which is permission to begin operating the renewable generating system
- The generating system should not be turned on until the customer receives the final Authorization to Operate

### **Delay or Denial of Interconnection Applications**

- During the screening of applications, customers may have a delay in processing because:
  - missing customer or contractor information
  - information found in the Part II submission varies from the Part I submission (i.e., number of inverters has changed, system kW or voltage has changed, etc.)
  - type of generating system (*i.e.*, solar, wind) is not clearly identified on the inspection certificate
- In some cases, our electric grid circuit may be at capacity and closed to additional interconnections. In these cases, the interconnection request cannot be approved until a circuit is available

Customers can correct a deficiency and resubmit their interconnection application

#### **Unauthorized Small Generator Interconnections**

- Include operating equipment that has not passed an electrical inspection or received approval from a local, county, or jurisdictional inspector
- Include operating equipment that does not comply with:
  - applicable jurisdictional regulatory rules
  - Institute of Electrical and Electronics Engineer (IEEE) Standards for Distributed Energy Resources
  - Underwriters Laboratory (UL) Certification
- Include renewable energy systems that have been installed or are operating without written approval from utility
- Increase your project costs if the design fails to meet our jurisdictional and utility interconnection requirements
- Potential Hazards:
  - Endanger utility workers, who will not have a record of the system
  - Pose a safety risk to the customer, system components, facility, and general public
  - Can cause voltage overload problems on the grid, preventing safe and reliable electric service
  - Can lead to a cease-and-desist notification

The D.C. Public Service Commission prohibits the interconnection of generation facilities to the electric grid without our written approval

### **How Can You Ensure Your System is Authorized?**

- Review, understand, and comply with the regulations and documents discussed herein. Our utility prohibits the interconnection of generator facilities that do not comply with these regulations
- Sign and submit the appropriate documentation and pay the application fee. If you are interconnecting a small generator, sign and submit the Interconnection Application and Agreement and the application fee. Refer to our Small Generator Interconnection Application Checklist or our Net Energy Metering and Small Generator Interconnection Application Checklist for more details
- Obtain written approval from Pepco. We will review your application and, once all required components have been received, send you an Approval to Install. Only then can you install your system. Prior to operating your system, wait for us to send you an Authorization to Operate

Pepco prohibits the interconnection of generation facilities to the electric grid without our written approval

# Frequently Asked Questions Net Energy Metering and Interconnection Requests

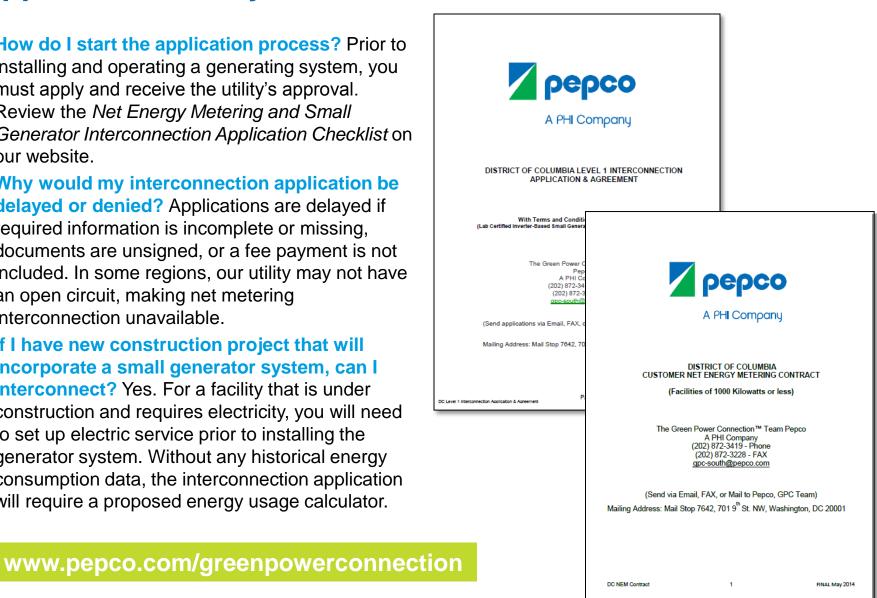
#### **Net Energy Metering FAQs**

- What is Net Energy Metering? Customers who generate their own electricity with renewable energy sources can interconnect with the electric grid and receive bill credits for excess generation. A special net-capable meter measures the energy a customer uses off the grid and the excess generation the renewable system provides onto the grid, and calculates the difference or "net."
- What is Green Power Connection? Green Power Connection (GPC) is our process for facilitating net energy metering (NEM) and small generator interconnections.
- What is a net-capable meter? A net-capable meter measures energy that flows in both directions between the customer-generator and the electric grid.
- Are customers with third party energy suppliers eligible? Yes.
- I want to install a large generation facility and sell power directly to the grid. Do I work with the GPC team? No. Another department within Pepco administers these large wholesale power purchase agreements. The GPC team will be glad to refer you to that department.
- What technologies qualify for net energy metering? Small generator technologies that

- qualify for NEM and interconnecting with our system include solar (photovoltaic or "PV"), wind, biomass, anaerobic digestion, fuel cells using renewable sources, hydro, and micro-combined heat and power (up to 30 kW).
- Do I have to apply for interconnection of my customer generator system to the grid? Most customers install renewable generator systems to reduce their use of utility-supplied electricity. For these behind-the-meter systems to be able to draw energy off the grid when needed, the system must be interconnected to a utility-supplied, net-capable meter. You must apply for this interconnection.
- Does the net-capable meter measure total generation? No. Generation occurs on the customer side of the meter. Any energy generated is first fed inside the premise for use by the appliances, electronics, lights, etc.
- How does the meter show when energy is fed or received? A net energy meter has dashes under the display that move in the direction of the energy flow. When the dashes move from left to right, energy is flowing from the grid to the customer's premise. When the dashes move from right to left, energy is flowing from the customer to the grid.

#### **Application and System FAQs**

- How do I start the application process? Prior to installing and operating a generating system, you must apply and receive the utility's approval. Review the Net Energy Metering and Small Generator Interconnection Application Checklist on our website.
- Why would my interconnection application be delayed or denied? Applications are delayed if required information is incomplete or missing, documents are unsigned, or a fee payment is not included. In some regions, our utility may not have an open circuit, making net metering interconnection unavailable.
- If I have new construction project that will incorporate a small generator system, can I interconnect? Yes. For a facility that is under construction and requires electricity, you will need to set up electric service prior to installing the generator system. Without any historical energy consumption data, the interconnection application will require a proposed energy usage calculator.



## **Application and System FAQs**

- Will my system generate power during a utility power outage? No. If your system is interconnected to the grid, do not attempt to use it during a power outage. The electric inverter immediately shuts down to prevent power from back-feeding to the grid and injuring nearby utility workers. The inverter is the component that converts direct current (DC) power from the renewable generator into alternating current (AC) power used at your premise.
- How is the size of the renewable system determined? The size of the renewable system is determined by dividing the total energy consumption (in kWh) from the past 12 months by 1,200. The AC inverter rating has to be equal to or less that number. We use this formula to comply with state rules, meet all or part of your electrical needs, and follow our net metering regulatory requirements.
- What is the maximum size of a renewable generating system that I can install? Customers who install a renewable generating system can offset all or part of their energy consumption. In the District of Columbia the system capacity can be up to 100% of the12-month historical energy consumption.

How can I see how much energy my system generates? The installer of your renewable system can provide details on obtaining a generation monitoring device compatible with your system.



#### **NEM** and Interconnection Billing FAQs

- Why did the customer receive a bill if they expected a credit? Providing electricity is our function as a public service utility. We are required to serve a utility customer even if they generate their own electricity. The electric grid is the customer's energy supply during night hours and at times when there is limited sunlight. The customer is charged service fees for maintaining our capability to provide them with electricity
- What is the anniversary month? The date the NEM meter was exchanged
- Why does my bill still show charges, if I had excess generation credits? Customer service charges apply to all invoices, regardless of energy charges or excess generation credits. If the service charges are more than the generation credits, your account would show a balance due
- How is excess generation shown on my utility bill? Pepco's bill shows the excess generation in the Details of Your Energy Charges section. The energy usage history shows the excess carryover which is carried over month to month until used or until the customer's anniversary pay out



Your electric bill - Mar 2015 for the period February 24, 2015 to March 24, 2015











#### Summary of your charges

Total amount due by Apr 28, 2015	\$12.62
New EthicalElectric supply charges	\$0.00
New electric distribution charges - Pepco	\$12.62
Balance forward as of Apr 7, 2015	\$0.00
Your payment(s) - thank you	\$24.05-
Balance from your last bill	\$24.05

#### After Apr 28, 2015, a Late Payment Charge of \$0.13 will be added, increasing the amount due to \$12.75.

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

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

Pepco was unable to put the Supplier charges on your bill this month. Please expect the Supplier charges to be included on your next month's bill.

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. Like us on Facebook at facebook.com/PepcoConnect.

#### How to contact us

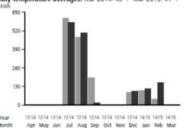
Customer Service (Mon-Fri, 7am - 8 pm)	202-833-7500
Hearing Impaired (TTY)	202-872-2369
¿Problemas con la factura?	202-872-4641
Electric emergencies & outages (24 hours)	1-877-737-2662
Visit pance com for sanica hilling and corres	nandanca informativ

Pepco is regulated by - DC Public Service Commission, dcpsc.org 1333 H St NW, Washington DC 20005, 202-626-5100

Consumer Advocate - Office of People's Counsel, opc-dc.gov 1133 Fifteenth St NW, Washington DC 20005, 202-727-3071

#### Your monthly Electricity use in kWh

Daily temperature averages: Mar 2014: 43° F Mar 2015: 41° F



Please tear on the dotted line below.

Page 1 of 3

Sample Page 1

#### **NEM** and Interconnection Billing FAQs



Your electric bill for the period

February 24, 2015 to March 24, 2015

#### **Details of your Electric Charges**

Residential-R - service number Electricity you used this period

Meter Number Previous **Energy Type** Reading NXA108137450 Feb 24 Mar 24 Use (kWh) 008026 008076 (actual) (actual)

	Difference	Multiplier	Total Use
1	-50	1	-50

Your next meter reading is scheduled for April 23, 2015

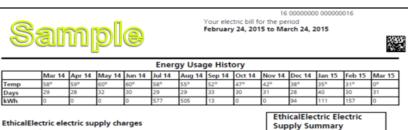
Delivery Charges: These charges reflect the cost of bringing electricity to you. Current charges for 29 days, winter rates in effect.

How we calculate this charge	Amount(\$)
	13.00
50- kWh X \$0.0075900 per kWh	0.38-
50- kWh X \$0.0000000 per kWh	0.00
SC)	12.62
Charges	12.62
	50- kWh X \$0.0075900 per kWh 50- kWh X \$0.0000000 per kWh iC)

Supply Charges: These charges reflect the cost of producing electricity for you. You can compare this part of your bill to offers from competitive suppliers. Your electricity is supplied by EthicalElectric - call 1-888-444-9452. Based on your average rate class use, the annual price to compare is 8.23 cents per

Total Electric Charges - Residential-R 12.62

Electric Distributio	n
Summary - Pepco	646.30
Balance from your last bill	\$16.20
Payment Mar 20	\$16.20-
Total Payments	\$16.20-
Electric Charges (Residential-R)	\$12.62
New electric charges	\$12.62
Total amount due by Apr 28, 2015	\$12.62



Your electricity is supplied by Ethical Electric. If you have any questions about your electric supply charges, call Ethical Electric at 1-888-444-9452.

EthicalElectric electric charges

**Supply Summary** Balance from your last bill \$7.85 Payment Mar 20 Total Payments \$7.85-This Month's Supplier Charges Are Not Included
New EthicalElectric \$0.00 electric supply charges Total amount due by \$0.00 Apr 28, 2015 \$0.00

Sample – Page 2

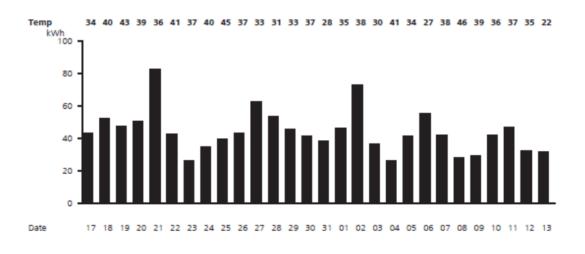
Sample – Page 3

Page 3 of 3

### **NEM** and Interconnection Billing FAQs

chergy usage history	Energy	Usage History	
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	Feb 14	Mar 14	Apr 14	May 14	Jun 14	Jul 14	Aug 14	Sep 14	Oct 14	Nov 14	Dec 14	Jan 15	Feb 15
Temp	56°	58°	59°	60°	59°	56°	53°	49°	44°	39°	37°	33°	30°
Days	28	31	29	31	30	30	31	62	29	31	29	38	28
kWh	1689	1692	1438	1176	1417	2216	0	2839	1112	1251	1386	1840	1245
On Pk kWh	439	465	387	294	370	662	0	784	303	325	365	0	0
Int Pk kWh	439	474	448	311	382	569	0	669	328	303	330	0	0
Off Pk kWh	811	753	603	571	665	985	0	1386	481	623	691	0	0





Some DC customer's 4<sup>th</sup> page will show a bar graph of history Sample – Page 4

#### **Lessons Learned**

- Inform customers of the complete process, including the DCRA building permit
- Customer's SIGNED interconnection application + D.C. NEM contract + application fee
- All applicant information (name, account number, address) should be written as shown on Pepco bill
- Inform customers to wait until GPC send them the Authorization to Operate before turning on generating system
- Federal Renewable Tax Credits expire in 2016, Pepco anticipates growth in interconnection requests over the next two years

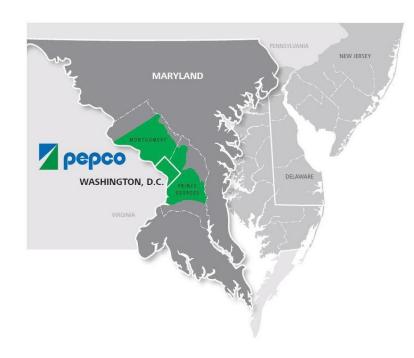
#### **Pepco's Green Power Connection Team**

#### **Contact Us**

www.pepco.com/gpc gpc-south@pepco.com

Pepco Holdings, Inc. Green Power Connection Mailstop 7642 701 9th Street, NW, Washington, D.C. 20001

(202) 872-3419 (202) 872-3228 (fax)



We support renewable energy and partner with our customers to ensure safe and reliable interconnection of renewable energy into the electric grid.

