
A GUIDEBOOK ON NET METERING IN MARYLAND

JUNE 2013

Developed by

Maryland Public Service Commission's Net Metering Working Group

And

Maryland Energy Administration

What is Net Metering?

Net metering is a billing mechanism that credits a customer-generator for the electricity exported onto the electricity grid. When a customer generates more electricity than he or she needs, the customer receives net metering bill credits. When the customer needs more electricity than they generate, the customer can use those credits to lower his or her electricity bills. This simple billing arrangement can make a significant impact on the economic viability of a renewable energy system.

Net metering became an option for customers who also wanted to generate onsite electricity with the passage of the Federal Energy Policy Act of 2005 by mandating that “[e]ach electric utility shall make available upon request net metering service to any electric consumer that the electric utility serves,”¹ as well as install a bi-directional flow of electricity to measure net energy. Today, net metering policies have been widely adopted, and net metering is currently supporting customer-sited generation of renewable energy in 43 states, the District of Columbia, and 4 U.S. territories.

For electric customers that have installed onsite energy generation technologies, net metering allows the customer’s electric meter to “spin backwards” ensuring that they receive credit for any electricity that they put back on the electricity grid rather than using themselves.

Older analog meters could literally be seen spinning backwards when onsite energy was making more electricity than was needed at the house or business. The meter would spin forward as it measured the kilowatt-hours (kWh) a customer consumed; then spin backward when a solar customer generated more electricity than the customer was currently consuming, and the excess electricity is diverted back onto the grid.



Modern digital meters accurately record electricity flow in both directions. Even more modern “smart meters” employ advanced metering infrastructure (AMI) architecture, enabling two-way communications back to the utility company, as well as variable tariffs, outage monitoring, prepayment and remote disconnect.²



- To learn more about net metering in Maryland, browse (on the Internet) to http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MD03R&re=0&ee=0
- Also browse the PSC site at http://webapp.psc.state.md.us/intranet/ElectricInfo/netmetering_new.cfm
- *Freeing the Grid* is a comparison of net metering and other policies by state available at <http://freeingthegrid.org/>

Why is Net Metering Important to Renewable Energy Systems?

Retail vs. Wholesale Electricity Rates

Consumers with net-metered generation systems benefit financially by being able to offset conventional electricity with clean, onsite energy at full retail electric rates. This seemingly simple benefit is often cited as one of the key financial underpinnings of successful distributed, renewable energy generation systems.

¹ <http://www.mtpleasantsolarcoop.org/pdfs/post-installation-guide.pdf>

² http://www.atmel.com/applications/metering/electricity_meters/default.aspx

In some months, a customer’s renewable energy system may produce more electricity over the course of the billing period than the customer uses onsite. This is typically called “net excess generation” (NEG), which is carried over as a kWh credit at the customer’s full retail rate for 12 months. Compensation for any NEG remaining in a customer’s account after a 12-month period ending in April of each year is paid to the customer at the commodity energy supply rate, which is lower than retail rates. Most customers end up with little or no NEG at the end of the year because their on-site system closely matches their demand for electricity.

Accounting for the Difference between On-site Generation and Consumption

The below chart from Southern California Edison³ illustrates a typical net metering month-by-month accounting.

Your bi-directional meter will continue to be read once each month. The meter measures the energy generated by your solar system and the energy consumed by you over a month’s time, and will display the net difference. Over a year, your energy usage totals may look something like the example below.

Relevant Period: August to July

Month 1 (Aug)	Month 2 (Sept)	Month 3 (Oct)	Month 4 (Nov)	Month 5 (Dec)	Month 6 (Jan)	Month 7 (Feb)	Month 8 (Mar)	Month 9 (Apr)	Month 10 (May)	Month 11 (June)	Month 12 (July)
<i>Generated</i> 550 kWh	<i>Generated</i> 520 kWh	<i>Generated</i> 420 kWh	<i>Generated</i> 200 kWh	<i>Generated</i> 155 kWh	<i>Generated</i> 190 kWh	<i>Generated</i> 185 kWh	<i>Generated</i> 215 kWh	<i>Generated</i> 395 kWh	<i>Generated</i> 410 kWh	<i>Generated</i> 465 kWh	<i>Generated</i> 550 kWh
<i>Consumed</i> 500 kWh	<i>Consumed</i> 510 kWh	<i>Consumed</i> 500 kWh	<i>Consumed</i> 400 kWh	<i>Consumed</i> 475 kWh	<i>Consumed</i> 415 kWh	<i>Consumed</i> 395 kWh	<i>Consumed</i> 405 kWh	<i>Consumed</i> 420 kWh	<i>Consumed</i> 405 kWh	<i>Consumed</i> 410 kWh	<i>Consumed</i> 525 kWh
Energy Charges = - 50 kWh (energy usage credit)	Energy Charges = - 10 kWh (energy usage credit)	Energy Charges = 80 kWh (energy usage charge)	Energy Charges = 200 kWh (energy usage charge)	Energy Charges = 320 kWh (energy usage charge)	Energy Charges = 225 kWh (energy usage charge)	Energy Charges = 210 kWh (energy usage charge)	Energy Charges = 190 kWh (energy usage charge)	Energy Charges = 25 kWh (energy usage charge)	Energy Charges = - 5 kWh (energy usage credit)	Energy Charges = - 55 kWh (energy usage credit)	Energy Charges = - 25 kWh (energy usage credit)

This customer’s **annual energy bill** will be tallied as follows= (50) + (10) + 80 + 200 + 320 + 225 + 210 + 190 + 25 + (5) + (55) + (25) x Domestic Energy Rate per kWh

Sizing

Many renewable energy developers recommend sizing systems to meet all or most (e.g. 90%) of a home or building’s annual energy load to maximize the customer’s return on investment through full retail rate offsets. Net excess generation, sold at wholesale rates, is typically valued at 2/3rd of the value of full retail and may not make economic sense for many home and business owners.

What are the Specifics of Net Metering in Maryland?

Models

Maryland’s “traditional” net metering law was originally enacted in 1997 and has been expanded several times since. Net metering models have evolved to include physical and virtual aggregate net metering and other innovative community solar models that go beyond the traditional relationship between the meter and the renewable energy system. These newer models are designed to allow greater flexibility and empower more energy customers to participate in the new energy economy.

Meter aggregation, sometimes called or aggregated net metering (ANM—also synonymous with “physical” aggregated net metering), and “virtual” net metering (VNM) can expand participation in net metering to more customers. Specifically, these policies extend net metering eligibility to certain

³ Understanding Your Domestic Energy Bill for Solar Customers, SCE 2013

customers that want to offset a larger electricity demand from multiple meters with a single generation system.

Meter aggregation allows a single customer with multiple meters, and therefore multiple utility accounts, to offset his aggregate load with a single renewable energy system. In Maryland, meter aggregation is available to agricultural customers, non-profit organizations, and municipal governments or their affiliates. In some cases, a customer physically connects his or her meters together in order to distribute the energy from a single system to multiple accounts, e.g. connecting 5 meters on one farm. More typically, a customer accomplishes this distribution virtually, by allocating net metering credits from a single renewable energy system to that customer’s multiple utility bills, through VNM.

VNM can also allow multiple customers, with multiple meters and associated utility accounts, to receive the benefits of a single renewable energy system. VNM (multiple customers, multiple meters) is increasingly distinguished from meter aggregation (single customer, multiple meters). With VNM, the net-metered generation facility is behind one of the customer’s meters and the customers’ utility distributes the resulting net metering credits on the participating customers’ bills. In this way, VNM can facilitate shared renewable energy, where multiple customers have “shares” or interests in a single renewable energy system and receive bill credits based on that share.

Eligibility

Specific attributes related to eligibility and other parameters of net metering in Maryland are detailed in the table below:

Eligible Customers	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Federal Government, Agricultural, Institutional.
Eligible Generation Technologies	Photovoltaics (PV), Wind, Biomass, Fuel Cells, CHP/Cogeneration, Anaerobic Digestion, Small Hydroelectric, Fuel Cells using Renewable Fuels.
System Capacity Limit	2 MW for all technologies except 30 kW for micro-CHP, and limited to that needed to meet 200% of baseline customer electricity usage. And, the eligible customer-generator’s proposed electric generating system may not exceed 200 percent of the eligible customer-generator’s baseline annual usage. ⁴
System Ownership	The law permits outright ownership by the customer-generators as well as third-party ownership structures (e.g., leases and power purchase agreements (PPAs), which are discussed later in this Guide.
Electric Utility Role	Net metering rules apply to all electric utilities—investor-owned utilities (IOUs), electric cooperatives and municipal utilities. Electric utilities must make net metering available to eligible customers until the aggregate capacity of all net-metered systems statewide reaches 1,500 megawatts MW.

Tariff Oversight

State lawmakers and utility regulators generally set the rules for which types of renewable energy systems get net metering credit and how they are credited through tariffs. In Maryland, the Public Service Commission (PSC) oversees electric utilities and is responsible for administering the net metering program.

⁴ <http://www.dsd.state.md.us/comar/getfile.aspx?file=20.50.10.01.htm>

Specifically, the PSC develops rules and regulations for net metering, and otherwise implements the State’s net metering program at the utility level. Each utility has a net metering tariff at the utility level. Links to each of the Maryland utilities’ tariffs can be accessed on their websites noted in the table below.

Electric Utility/Contact Information	Tariff Website Addresses
Allegheny Power/FirstEnergy (800) 255-3443 www.alleghenypower.com	https://www.firstenergycorp.com/customer_choice/maryland/maryland_tariffs.html
Baltimore Gas and Electric Company (410) 470-5804 Ext: 5914 www.bge.com	http://www.bge.com/myaccount/billsrates/ratestariffs/electricservice/pages/electric-services-rates-and-tariffs.aspx
Choptank Electric Cooperative (410) 479-0380 http://www.choptankelectric.coop/	http://www.choptankelectric.coop/meminfo/rates/rates.html
Delmarva Power (800) 375-7117 www.delmarva.com	http://www.delmarva.com/home/choice/md/tariffs/
Easton Utilities Commission (410) 822-6110 Ext: 1279 http://www.eastonutilities.com/SitePages/default.aspx	http://www.eastonutilities.com/SiteAssets/documents/electric_tariff_july_2009.pdf
Hagerstown Municipal Electric Light Plant (301) 790-2600 http://www.hagerstownmd.org/index.aspx	http://www.hagerstownmd.org/DocumentCenter/Home/View/688
Potomac Electric Power Company (202) 833-7500 (202) 872-4641 Spanish-Speaking Line www.pepco.com	http://www.pepco.com/home/choice/md/tariffs/
Southern Maryland Electric Cooperative (888) 440-3311 http://www.smeco.com/	http://www.smeco.coop/yourAccount/tariff.aspx
Thurmont Municipal Light Company (301) 271-7313 http://www.thurmont.com/html/electric_department.html	http://www.thurmont.com/20110415_Thurmont_Clean_Tariff_Rate_Schedules_after_June_1_2011.pdf
Williamsport Municipal Light Plant (301) 223-7711	http://www.williamsportmd.gov/NEM.html http://williamsportmd.gov/residential_retail_rate_comparison.html

What Other Policies are related to Renewable Energy?

There are a variety of other policies—financial incentives, business models, compliance requirements, processes, etc.—related to renewable energy. They include the below.

Renewable Portfolio Standard (RPS) and Solar Renewable Energy Credits (SRECs)

In 2008 the General Assembly doubled Maryland's Renewable Portfolio Standard to require that 20% of Maryland's energy will be created by renewable resources by 2022, including 2% from solar energy. In

2011, the Governor decided to focus on in-state renewable generation. Maryland's Renewable Portfolio Standard includes a goal of 2% for solar (electric or thermal) energy generated in-state. For each MWh of solar energy generated, a Solar Renewable Energy Credit (SREC) is also generated.

In Maryland, net metering customers own and have title to all SRECs associated with electricity generation by their net-metered systems.

SRECs have a useful life of three years, e.g. the year of generation and the following two years, during which the solar generator can sell the SREC to qualified electricity suppliers. SRECs provide a valuable income stream to owners of solar energy facilities, small and large, and can contribute to off-setting investment costs. Electricity suppliers must purchase and retire SRECs in order to meet their compliance obligations under the law, or pay a Solar Alternative Compliance Payment (SACP) for any shortfalls in SREC purchases. An SREC could be defined as a tradable attribute associated with one MW of electricity generation that can be sold; in early 2013, each SREC had a value ranging from \$120-135/SREC, which translates, roughly, to 12-13.5¢/kWh.

Once a solar system is installed, home or business owners can work with their installers to connect the net metered system to the grid (see above) and then submit an application for certification with the Maryland Public Service Commission, called the Application for MD Certification Excel file, at [http://webapp.psc.state.md.us/intranet/SiteSearch/Electic%20Info/EN73%20Solar%20REF%20Applicati on.xls](http://webapp.psc.state.md.us/intranet/SiteSearch/Electic%20Info/EN73%20Solar%20REF%20Applicati%20on.xls) . Instructions for certification can be found on the first tab of the application titled "Instructions" and the second tab "[Solar REF Application](#)" is to be completed and submitted via Maryland's online portal. When the application is approved, you will get a state certification number that looks like: MD-70302-SUN-01.

Home or business owners can then register their system in the PSC's Generator Attribute Trading System (GATS) within 30 days of obtaining a state certification number. The solar system then generates SRECs which can be placed into auction and transferred to buyers. Certain "SREC brokers" or "SREC aggregators" also offers SREC management services.⁵

Home and business owners can sell SRECs into other states that allow PV systems to be cross-certified between states. For most Maryland generators, Pennsylvania is a viable market in mid-2013. However, home and business owners cannot sell SRECs from an out-of-state system into Maryland. Maryland recently changed the RPS to close the state off to out-of-state generators.

- To learn more about Maryland's RPS goals and progress, browse to
- <https://data.maryland.gov/goals/renewable-energy>
- To learn more about SREC goals and prices, browse the MEA website at <http://energy.maryland.gov/solar.html>
- To learn more about SRECs legislation, browse the DSIRE USA's website at http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MD55F&re=0&ee=0

Renewable Energy Incentive Programs

There are a variety of Federal, State, Local, and Utility renewable energy incentives available, including the 30% Investment Tax Credit for home and business owners.

⁵ <http://www.srectrade.com/blog/srec-markets/maryland/md-srec-registration>

- To learn more about Federal incentives, browse to the Database of State Incentives for Renewables & Efficiency (DSIRE) website at <http://www.dsireusa.org/incentives/index.cfm?State=US&ee=0&re=0>
- For a comprehensive overview of other incentives, browse the following DSIRE website, specific to Maryland, at <http://www.dsireusa.org/incentives/index.cfm?re=0&ee=0&spv=0&st=0&srp=1&state=MD>

MEA offers Clean Energy Grants for residential and small business applications—for more information please access websites noted below. The Administration calculates incentives based on several factors including available funds, economies of scale, a desire for more equitable distribution of funds, the cost of clean energy technologies, capacity factors, potential annual production, and data analysis from past awards.

- To learn more about residential-scale renewable energy grants, browse the MEA website at <http://energy.maryland.gov/Residential/cleanenergygrants/index.html>
- To learn more about commercial building-scale renewable energy grants, browse the MEA website at <http://energy.maryland.gov/Business/cleanenergygrants/index.html>

For these grants, solar PV projects that are installed on or after July 1, 2014, have to be completed by installation contractors who maintain at least one staff member with a [North American Board of Certified Energy Practitioners \(“NABCEP”\)](#) Installation Certification; or, for companies with at least 50 employees, at least one staff member with a NABCEP Installation Certification for every 25 non-administrative employees, except if an installation contractor has been registered to do business in Maryland for less than 12 months prior to the submission of an application for a grant.

- To learn more about available tax credits based on the actual production of renewable energy systems over 20 kW, browse the MEA Clean Energy Production Tax Credit website at <http://energy.maryland.gov/Business/CleanEnergyTaxCredit.html>

Third-Party Ownership

Maryland law permits outright ownership by the customer-generators as well as third-party ownership structures, including leases and power purchase agreements (PPAs). Third-party ownership is a financing arrangement that allows a net-metering customer to host a renewable system that is owned by a separate investor which can take advantage of tax credits which non-tax-paying entities—such as governments, schools and nonprofits—cannot. They can also be attractive to entities that either lack initial investment capital to purchase a renewable system, or the desire to own and maintain a system.

Under a third-party financing arrangement, an investor monetizes available incentives, such as tax credits, rebates and depreciation deductions. The investor then sells electricity produced by a system to the host customer at lower rates than the host customer may otherwise receive. When the third-party ownership arrangement involves a PPA, the host customer agrees to purchase all the energy produced onsite.

- To learn more about how MEA helped mainstream PPAs with its Sunburst initiative, browse <http://energy.maryland.gov/Govt/sunburst.html>
- To learn more about PPAs, browse the Rhaus Institute’s *The Customer’s Guide to Solar Power Purchase Agreements* at <http://www.californiasolarcenter.org/sppa.html>

Interconnection

Interconnection standards are the legal rules and procedures for “plugging” a renewable energy system into the grid. This includes the technical and contractual terms that both system owners and utilities must follow. Generally, the utility must study and approve a proposed renewable energy system within the interconnection framework established by the PSC.

The first step in determining whether interconnect is required is to contact the local distribution company (LDC) where the project will be installed. The LDC will determine if an interconnection, operation and maintenance agreement is necessary and will then provide a letter to you indicating that an interconnection, maintenance and operation agreement is not necessary or will provide information that will allow you to complete such an agreement. If the local distribution company determines that an interconnection agreement is not necessary for your unit, documentation from PJM is not necessary.

Home and business owners may wish to contact the representative of the LDC as soon as information regarding the project is available to learn of the specific steps required.

LDCs each have interconnection processes and application form, which can be found on their websites noted in the table below.

Electric Utility/Contact Information	Interconnect Website Addresses
Allegheny Power/FirstEnergy (800) 255-3443 www.alleghenypower.com	https://www.firstenergycorp.com/feconnect/potomacedison.html
Baltimore Gas and Electric Company (410) 470-5804 Ext: 5914 www.bge.com	http://www.bge.com/myaccount/choosingsupplier/energysupplyoptions/customergenerated/interconnection/pages/default.aspx
Choptank Electric Cooperative (410) 479-0380 http://www.choptankelectric.coop/	http://www.choptankelectric.coop/meminfo/index.html
Delmarva Power (800) 375-7117 www.delmarva.com	http://www.delmarva.com/energy/renewable/connection/
Easton Utilities Commission (410) 822-6110 Ext: 1279 http://www.eastonutilities.com/SitePages/default.aspx	http://www.eastonutilities.com/SitePages/electric.aspx
Hagerstown Municipal Electric Light Plant (301) 790-2600 http://www.hagerstownmd.org/index.aspx	http://www.hagerstownmd.org/DocumentCenter/Home/View/684
Potomac Electric Power Company (202) 833-7500 (202) 872-4641 Spanish-Speaking Line www.pepco.com	http://www.pepco.com/_res/documents/pepcoapplicationform25kworlessshortformrev83107.pdf http://www.pepco.com/_res/documents/pepcoapplicationform100kworlessshortform.pdf
Southern Maryland Electric Cooperative (888) 440-3311 http://www.smeco.com/	http://www.smeco.coop/yourEnergy/netMetering.aspx

Thurmont Municipal Light Company (301) 271-7313 http://www.thurmont.com/html/electric_department.html	http://www.thurmont.com/html/electric_department.html
Williamsport Municipal Light Plant (301) 223-7711	http://www.williamsportmd.gov/NEM.html

Under Maryland’s interconnection rules, customers with systems that meet all applicable safety and performance standards established by the National Electrical Code (NEC), the Institute of Electrical and Electronics Engineers (IEEE), Underwriters Laboratories (UL) and any other PSC requirements may not be required by utilities to install additional controls, to perform or pay for additional tests, or to purchase additional liability insurance.

- To learn more about interconnection, browse to the appropriate DSIRE website at http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MD06R&re=0&ee=0
- Also browse the Interstate Renewable Energy Council (IREC) website at www.irecusa.org
- You may also want to download *Connecting to the Grid: A Guide to Distributed Generation Interconnection Issues* at <http://irecusa.org/wp-content/uploads/2009/11/Connecting-to-the-Grid-Guide-6th-edition.pdf>

Certificate of Public Convenience and Necessity (CPCN)

The PSC has the authority to issue a Certificate of Public Convenience and Necessity (CPCN), which provides authority for a person to construct a new distributed generator, such as solar PV, of less than 1,500 kW. The exemption process allows an owner of a distributed generator to bypass the process utilized to certify large central generation stations.

There are three types of distributed generators:

- A *Type I Generator* is one that:
 - Is stand-alone [not connected to the transmission and distribution (T&D) grid],
 - Will not export electricity to the T&D grid, and
 - Is often used as an emergency back-up generator.
- A *Type II Generator* is one that:
 - Is connected to the T&D grid,
 - Can export electricity to the T&D grid, and
 - Can generate electricity to meet local electricity loads or to provide load relief to the local electricity company or PJM (the entity in charge of balancing electricity generation and load in the Pennsylvania, New Jersey and Maryland) at peak load periods.
- A *Type III Generator* is one that:
 - Is connected to the T&D grid,
 - Can export electricity to the T&D grid for sale on the wholesale electric market under the terms and conditions of interconnection agreements with the local utility and wholesale sales agreements with PJM.

Two types of projects are exempted from the CPCN process.

- The first exemption applies to distributed generators that generate on-site electricity, and if its capacity is less than 70 MegaWatts (MW), and if less than 20% of the annual energy generated is exported or sold on the wholesale market.
- The second exemption applies to distributed generators whose capacity is less than 25 MW, and if at least 10 percent of its electricity generated each year is consumed on-site.

Regardless of the type of project, the first step is to contact the local distribution company (LDC) where the project will be installed. You may wish to contact the representative of the local electricity distribution company as soon as information regarding the project is available to learn of the specific steps required. The cost for processing an exemption application is \$500 and must be made payable to the Maryland Public Service Commission. The exemption should be included with your application for permits from the Maryland Department of the Environment.

The recommended CPCN exemption does not constitute an exemption from the Maryland Department of the Environment's requirement to obtain an air quality permit to construct and operate the exempted unit(s). Distributed generator owners can contact the Maryland Department of the Environment before construction starts to determine what requirements are needed.

- To learn more about the CPCN exemption process, browse to http://webapp.psc.state.md.us/intranet/ElectricInfo/CPCNExemptions_FAQ_new.cfm or call the PSC's Energy Resources and Markets Division at 410-767-8085.
- To learn more about the Department of the Environment's requirements, browse to www.mde.state.md.us.

Who Do I Call to Get More Information?

Maryland Public Service Commission (PSC)

- (410) 767-8114

Maryland Energy Administration (MEA)

- (410) 260-7655