

Certificate No. HXXXXX



Certification Date: March 21, 2018

High-Performing Home Certificate

3028 South Glebe Road, Arlington, VA 22206

Certified Solar

This home's high-performing asset specifications can be found in the Pearl Certification Report and Appraisal Institute's *Residential Green and Energy Efficient Addendum* that accompany this certificate.

A handwritten signature in cursive script that reads "W. Casey Murphy".

W. Casey Murphy
Pearl VP of Quality Management
888-557-5543



Pearl Solar Certification Report



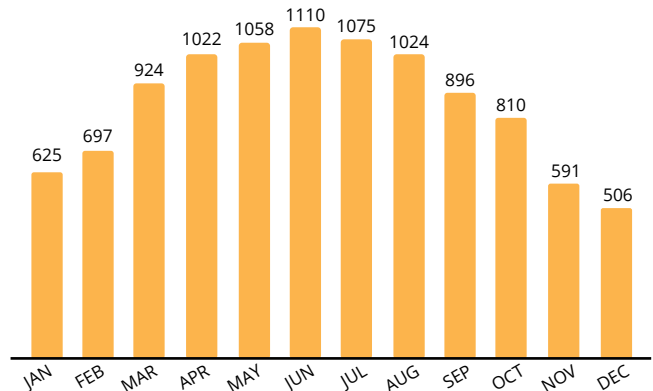
What You Need to Know

This home is one of 2% of US homes which have solar panels. These panels are owned outright instead of leased, studies have shown that solar panels add an average of \$4/watt to a home's value. Your Appraiser should not rely on this average value, but should use the data in this report to develop an accurate value of this photovoltaic system.

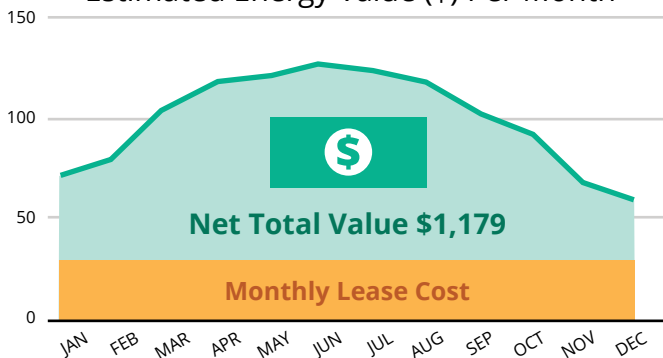


This chart shows an estimate of the energy that your photovoltaic system will produce over the course of a year. Results are shown in kWh of AC (alternating current) power – the electricity you use in your home. The estimate is calculated by the National Renewable Energy Laboratory's PV Watts calculator. Your solar panels may actually produce more or less energy.

Projected AC Energy (kWh) Per Month



Estimated Energy Value (\$) Per Month*



This chart shows how much the estimated energy production shown in the previous graph would cost if you had to buy it from your utility. In other words, this is the amount of money you should save in utility costs this year. The estimate assumes a single utility rate: if your utility charges residential customers different rates depending on the time of day or the customer's use, your savings may be larger.

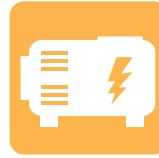
The data in the charts above is provided by the National Renewable Energy Laboratory's PV watt calculator and is based on the data in this report.

Special Renewable Features of This Home



Solar Panels Top 1% of U.S. Homes

Energy reliance, energy security, and sustainable living are three reasons why solar panels are gaining in popularity. They also keep energy costs down for the homeowner particularly when utility bills keep rising.



Solar Inverter

The inverter converts the electricity generated by the panels from direct current (DC) to alternating current (AC), allowing it to be used in the home. The manufacturer supports this system's inverter(s) with a 25-year warranty, which far exceeds industry standards, and is a good indication of its quality.



Power Production Warranty

Your solar panels are designed to continue to deliver power over a long period of time. The manufacturer guarantees that after 25 years that panels will still be producing 87% of its nameplate power output rating. This is higher than the industry average of 80.6%



Materials Warranty

Top 1% of all warranties: The materials warranty, sometimes referred to as the product or equipment warranty, provides peace of mind that the manufacturer will replace your panels in the rare event that they stop functioning. The majority of solar materials warranties are for 10 to 15 years. This panel's 25-year warranty puts it in the top tier of panels.



Inverter Warranty

Top 5% of all warranties: The inverter converts the power captured by the panel into a form that is usable within your home. The inverter warranty ensures that if the inverter fails during its expected lifetime the manufacturer will replace it. Most inverter warranties cover a five or ten-year period. This home's 25-year inverter warranty indicates a superior product.



Installation Warranty

The quality of the installation of the solar panels on a home's roof is important: a poor quality job can cause serious long-term damage to the roof. The ten-year workmanship warranty offered on this home's photovoltaic system indicates that the installer has confidence in the quality of their work.



About Pearl Certification

Pearl Certification is a national firm that provides third-party certification of **high-performing homes**: homes with “performance assets” that make them healthy, safe, comfortable, energy and water efficient.

Pearl’s certification system enables home buyers to see and understand the value of a home’s high-performing assets when the home is sold. Research from across the U.S. shows that third-party home performance certifications like Pearl’s add an average of 4% to the sale price of high-performing homes, compared to similar homes lacking these assets.

Pearl is the only private certification firm to sponsor the U.S. Department of Energy’s prestigious Home Performance with ENERGY STAR program.

Pearl is a National Association of Realtors (NAR) REach Accelerator company.

The Science Behind Pearl Certification

Pearl’s certification system is based on building science. It was developed in consultation with national experts on energy efficiency and home performance, and with technical assistance from the National Renewable Energy Laboratory (NREL). This system is approved for use in the Department of Energy’s Home Performance with ENERGY STAR program.

Pearl’s certification system takes into account how well an asset like insulation or a cooling system was installed. It also takes into account tools that allow a homeowner to view, understand, and improve their home’s performance.

For more information on Pearl’s certification, please email us at: info@pearlcertification.com, or visit our website at www.pearlcertification.com

PEARL’S PARTNERS

Pearl works in partnership with the U.S. Department of Energy and many of the nation’s leading real estate, appraisal, contracting, and building science organizations.



OVERVIEW OF PEARL CERTIFICATION SYSTEM

Pearl certifies a home's performance assets, such as insulation, heating and cooling, lighting, appliances, smart home devices, and solar energy.

Solar, Batteries, and Electric Vehicle Readiness

Solar panels, batteries, and electric vehicle charging: Pearl certifies if a home is pre-wired for these high-performing assets or has them installed. Our system captures critical information needed for appraisers. Pearl points are not awarded for these assets.



Solar Photovoltaic



Solar Inverter



Electric Vehicle Ready Home



Batteries

Building Shell

The building shell consists of the roof and attic, exterior walls, windows, doors, and basement or crawlspace. These assets provide an air, moisture, and thermal barrier that separates the inside from the outside.



Attic



Wall



Rim Joist



Floors & Foundation



Windows



Doors



Air Sealing



Roofs

Heating and Cooling

A home's heating and cooling systems include furnaces, air conditioners, and heat pumps. This equipment heats and cools air, water, or steam. The ducts or pipes that circulate the air, water or steam through the home are also a part of the heating and cooling system.



Cooling



Heating



Heat Pump



Distribution System

Baseload

A home's baseload includes devices that run year-round, not just in the heating or cooling season. Water heaters, refrigerators, dishwashers, clothes washers, lighting, and other features contribute to a home's baseload.



Ventilation



Water Heating System



Clothes Dryer



Dishwasher



Clothes Washer



Refrigerators



Lighting

Home Management

A home's management assets include "smart" devices that control heating and cooling systems, lighting, and other technologies: dashboards that provide information about energy use; and plans for improving the home's performance assets.



Controls



Planning



HOME ASSET DETAILS

Photovoltaic System



Type of Ownership:	Owned
Utility Name:	Dominion
Utility Rate:	\$.114 kWh

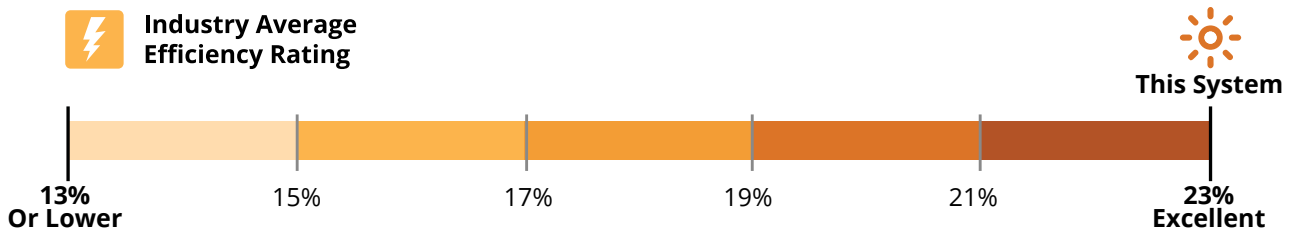
Panel Specifications



System Size (kWh)	7.84
Age of Panels (Years)	0
Energy Production Estimate (kWh)	10610
Source of Energy Production Estimate	Aurora
Manufacturer	Sunpower
Warranty on Panels (Years)	25
Offered by	Sunpower
Location	Roof
Mount	Fixed Mount
Efficiency Rating	23%
Manufacturer Years in Business	35

Your solar array is made up of one or more solar panels, which absorb the sun's energy and transform it into electrical energy. Your inverter transforms the direct current (DC) power generated by the panel into alternating current (AC) power that you can use in your home. Your panel's efficiency rating indicates the percentage of the sun's energy falling on your panels that is converted into usable electric energy under specified conditions. The higher your panel's efficiency rating, the more effective they are at converting sunlight into energy.

Panel efficiency ratings have been increasing due to technological innovation. Most panels have efficiencies in the 12% to 15% range, although top performing panels may have an efficiency above 20%. (Note that a high-efficiency panel may not be the right solution for all homeowners; a home with a large available roof space may be able to obtain all the solar energy it needs from a large number of lower-efficiency panels.)



HOME ASSET DETAILS

Photovoltaic System



Type of Ownership:	Owned
Utility Name:	Dominion
Utility Rate:	\$.114 kWh

Inverter Specifications



Number of Inverters Per Array	1
Age (Years)	0
Wattage	7600
Inverter Manufacturer	Solar Edge
Warranty Term (Years)	25
Offered By	Solar Edge

The inverter is less visible than the solar panels, but it's just as important. The inverter converts the electricity generated by the panels from direct current (DC) to alternating current (AC), allowing it to be used in the home. Inverters typically have a shorter life than panels. The length of a warranty is one indication of its quality. Manufacturers typically offer five- to ten-year warranties on inverters, although some offer longer warranties of up to twenty-five years.



**Inverter
Warranty**



This System





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HOME ASSET DETAILS

Photovoltaic System



Type of Ownership:	Owned
Utility Name:	Dominion
Utility Rate:	\$.114 kWh

Installation Warranty



Years in Business	10
Publicly Traded	Yes
NABCEP Certified	Yes
Installation Warranty (Years)	10
Offered By	Green Convergence

The quality of the work used to install solar panels on the roof is an important and often overlooked feature of a home's PV system. A poor installation job can damage the roof or even result in loss or damage to the solar panels. High-quality contractors stand behind their installation with a warranty. A ten-year warranty is generally a good one and indicates that the installer has confidence in the quality of their work.



This System





HOME ASSET DETAILS

Photovoltaic System



Type of Ownership:	Owned
Utility Name:	Dominion
Utility Rate:	\$.114 kWh

Power Production Warranty

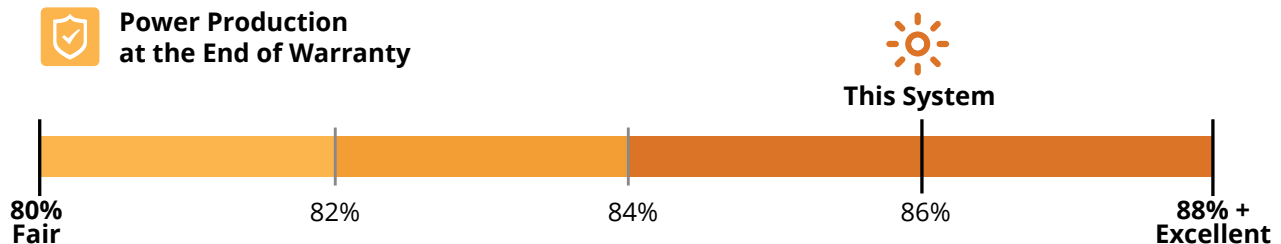


Warranty Length (Years)	25
Power at End of Warranty	85%
Annual Degradation Factor	0.3%

All solar panels have a nameplate which states how much power they will produce under ideal conditions. The ability of a panel to produce power deteriorates slowly over time, but even after decades they should still be generating electricity. The Power Production warranty is the manufacturer's guarantee that the panels will produce at least a minimum amount of power each year. This warranty has two components: the Degradation Factor and the Power at End of Panel's Life

The Degradation Factor guarantees that the performance of the panels will not decline by more than a specific proportion (typically less than 1%) in any given year.

The power at the end of a panel's life guarantees that a panel will produce at least a certain percentage of the nameplate power, typically between 70% and 80%, after a 25 or 30-year period.





Appendix A: Appraisal Institute's Green and Energy Efficiency Appraisal Addendum

Instructions to homeowner or listing agent:

High-performance features can add significant value to a home. Recent studies have indicated that improvements such as air sealing and insulation, high efficiency heating and cooling systems, and other "green" and energy efficient features can add 3-9% onto a home's value, if verified by a third party.

A home may be appraised for different reasons:

- Mortgage refinance
- To discontinue mortgage insurance - if the home's value has increased enough, the homeowner may have sufficient equity in the home to no longer need insurance
- Immediately prior to selling a home to assist in pricing the home
- As part of the home sale process to meet the buyer's lending requirements

Pearl Certification has an AI REPORTS® License Agreement with the Appraisal Institute.

The following appendix can be provided to an appraiser to assist him or her in valuing the home. As stated in the Addendum:

"The objective of this Addendum is to standardize the communication of the high performing features of residential properties. Identifying the features not found on the 1004 form provides a basis for comparable selection and analysis of the features. Builders, contractors, homeowners, and third party verifiers are encouraged to complete this Addendum and present to appraisers, agents, lenders, and homeowners."

The Appraisal Institute makes no representations, warranties or guarantees as to, and assumes no responsibility for, the data, analysis or work product provided by the individual appraiser(s) or any other individual in the specific contents of the AI Reports®

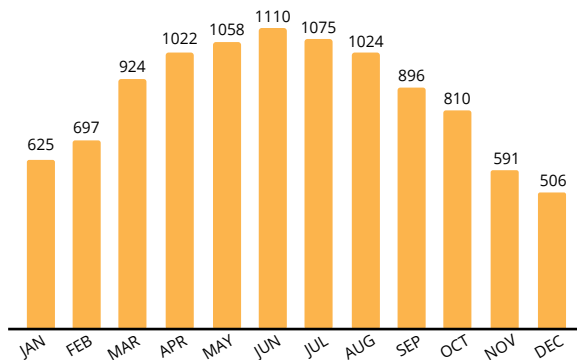
Appendix C: Solar Addendum

The charts below show an estimate of the energy that your photovoltaic system will produce over the course of a year and how much money you should save in utility costs this year. Results for energy production are shown in kWh of AC (alternating current) power – the electricity you use in your home. The estimate for money saved assumes a single utility rate: if your utility charges residential customers different rates depending on the time of day or the customer’s use, your savings may be larger. The estimates are calculated by the National Renewable Energy Laboratory’s PV Watts calculator. Your solar panels may actually produce more or less energy.

Month	AC Energy (kWh)	Energy Value (\$)
January	625	71
February	697	79
March	924	105
April	1,022	117
May	1,058	121
June	1,110	127
July	1,075	123
August	1,024	117
September	896	102
October	810	92
November	591	67
December	506	58
Annual	10,338	\$1,179



Projected AC Energy (kWh) Per Month



Estimated Energy Value (\$) Per Month*

