Certificate No. H-045286

Certified Date: Aug. 19, 2024

Pearl™ CERTIFIED

HIGH-PERFORMING HOME CERTIFICATION

Silver

123 MAIN ST,
CHESAPEAKE, VA 23320

SOLAR

This home has met Pearl Certification's nationally recognized performance standards for whole-house energy efficiency.

Casey Murphy

W. Casey Murphy
Senior VP of Quality and Standards

Perfect Home Solutions

Perfect Home Solutions
Certifying Contractor

pearlcertification.com

Dear Sample,

Congratulations on your installation with Perfect Home Solutions! As a Pearl Certification partner, Perfect Home Solutions is proud to offer a third-party certification of this asset's energy efficiency, quality, and performance.

The enclosed Certification Report provides a detailed look at the high-performing attributes of your new asset(s). But there's much more to it than that.

Your Pearl Certification Report captures the resale value that these often "invisible" assets add to your home and translates that value into language that appraisers, buyers, and lenders can understand. This helps you build equity in your home and get a higher return on your investment when it's time to sell or refinance. To that end, enclosed in your Certification Report you'll find the following:

- An overview of the assets you had installed and your home's anticipated energy performance based on that installation
- Technical specifications for each asset
- Appraisal Institute Green and Energy Efficient Addendum
- Letter for lenders on the home's performance
- Marketing packet with home tour cards and other tools to show potential buyers the value you've added with your smart investments

We also recognize that achieving high home performance is a journey, not a destination. That's why we stay connected with you on our free, award-winning **Green Door** app to provide you with the tools, resources, and education you need to continue your home improvement journey.

Congratulations, and we look forward to seeing you in Green Door.



W. Casey Murphy
Senior VP of Quality and Standards
Pearl Certification

Pearl proudly works in partnership with

U.S. DEPARTMENT OF ENERGY

ENERGY STAR PARTNER

NATIONAL ASSOCIATION OF REALTORS® OFFICIAL DESIGNATION

green

Appraisal Institute

NASEO National Association of State Energy Officials

RESNET RESIDENTIAL ENERGY SERVICES NETWORK

NREL Transforming ENERGY

Pearl Home Certification Report



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Home Address

123 Main St,
Chesapeake, VA 23320

Homeowner

Sample Customer

Certification Partner

PERFECT HOME Solutions

Pearl Score

762

Your Home's Pearl Performance

This page shows how Pearl assesses your home's high-performing assets. Your Pearl score captures how well your home is doing in terms of energy efficiency, comfort, health, resilience, and home value. The higher the score, the higher your home's performance.

Building Shell — 186/272 Points
Assets that provide air, moisture, and a thermal barrier for the home.

Heating & Cooling — 281/334 Points
This equipment heats and cools air, water, or steam, then circulates it through the home.

Solar, EV & Enery Storage — Asset Present
Pre-wired or installed. Pearl Points are not yet awarded for these assets.

Home Management — 175/300 Points
Smart devices and energy-use dashboards.

Baseload — 120/294 Points
Devices that run year-round, not just in the heating or cooling season.

Badges

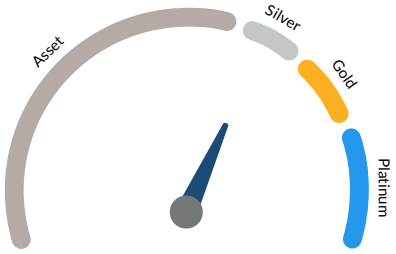
A badge affirms that a home excels in a particular area such as sourcing solar energy or operating solely on electricity.



Electrified Home

Certification Level

The certification tier reflects the home's performance level. The more categories in which a home excels, the higher the certification tier it earns.



SILVER

Continue Your Journey

Find out how to increase your Pearl Score and Certification Tier — even earn badges using Pearl's Green Door app.

Learn more >

Special Performance Features of Your Home

Attic Insulation:
Top 6% of VA homes

This home's attic is very well-insulated, which means lower utility bills and greater comfort - particularly in rooms located directly under the attic. Good attic insulation also protects against excessive heat loss in winter that can cause roof damage from snow melt.

Attic Hatch:
Very Well-insulated

This home's attic hatch has been insulated. Attic hatches are often the weakest link in a home's attic insulation, and can disproportionately impact a home's heat loss and heat gain. If an uninsulated attic hatch represents only 1% of an attic's surface area, it can decrease the attic's overall R-value by 27%.

Wall Insulation:
Top 6% of VA homes

At least some of this home's wall insulation is outstanding and better than most homes. It will be more energy efficient and quieter as a result. The additional insulation acts as a sound as well as a temperature barrier.

Heat Pump:
Top 3% of electric-heated homes

This home's heat pump is one of the most energy efficient sold. Its year round energy savings will be significant compared to most homes' heating and cooling equipment.

Gas Furnace:
Top 2% of gas heated homes

This home's heating equipment is extremely efficient. It saves the homeowner money during cold winter months while providing comfort. The furnace also has a safer venting system, preventing dangerous combustion gases from entering into living spaces.

Solar Water Heater:
Top 1% of VA homes

This home has a solar water heater. A solar water heater typically costs half as much or less in energy costs than a standard gas or electric water heater. And because the sun's energy is free, the home is protected from spikes in fuel costs.

Special Performance Features of Your 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.

Efficiency:
Top 1% of Efficiency

A solar panel's efficiency rating indicates the percentage of the sun's energy falling on the panels that is converted into usable electric energy. Your panels greatly exceed the industry average of 16.6% efficiency, placing them at the very top of available technology.

Installation Warranty:
Above Average 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 PV system indicates that the installer has confidence in the quality of their work.

Inverter:
Above average warranty

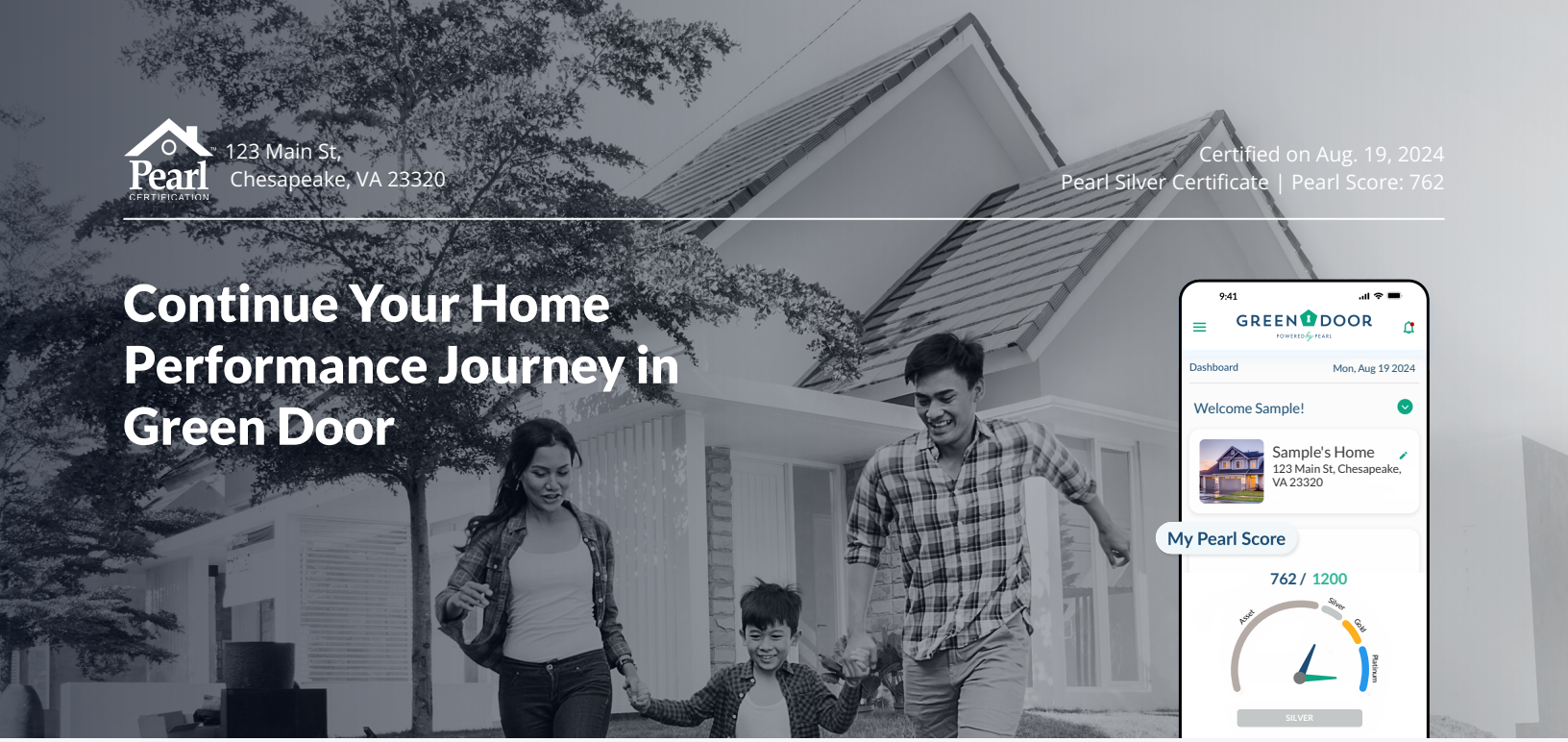
The inverter converts the electricity generated by the panels from direct current (DC) to alternating current (AC), allowing it to be used in the home. The manufacturer supports this system's inverter(s) with a warranty that meets or exceeds industry standards.

Electric Vehicle Charger:
Top 1% of U.S. homes

This home has an ENERGY STAR certified electric vehicle charger. The charger not only provides a convenient way to charge certain models of electric and plug-in hybrid vehicles, but ENERGY STAR certified chargers use 40% less energy than a standard EV charger in standby modes.

Energy Storage:
Top 1% of U.S. homes

Batteries enhance this home's resiliency by providing clean, quiet backup power. Batteries can also significantly reduce energy costs, especially when paired with a solar system or when the local utility has a variable rate structure. Batteries can also help to maintain power quality, protecting electronic devices within the home.



Stay Connected with Your Contractor

Save on New Upgrades

Level-up Your Certification

Plan Your Next Home Investment

- Set some performance goals for your home, like comfort, health, cost, or added value.
- Understand what your existing home assets can do.
- Identify top priorities based on home performance impact.
- Find rebates, tax credits, and other discounts to help defray cost.



Take care of all this and more with a **Home Investment Plan** in Green Door.

Get Ready to Sell Your Home

- Add other high-performing home features to your home's profile and generate an updated Pearl Certification.
- Share with your real estate agent.
- Don't have an agent? Use the **Find Pros** tool in Green Door to connect with a Pearl Real Estate Network member who can market your high-performing home for maximum resale value.



Get the Mobile App

Download on the App Store

GET IT ON Google Play

OR

Sign Up on the Web

Set up account

Home Technical Specifications

Note: remember to show the following pages to your home appraiser.

The following pages highlight:

- Special performance features of your home
- Details about your high-performing home assets
- Everything that you can certify with Pearl
- Science and industry standards behind Pearl's certification

What do I do with these tech specs?
Scan QR code with your phone camera to find out.

HOME ASSET DETAILS

Building Shell

My Pearl Score:

762



Attic and Roof

Last updated: Aug. 19, 2024

Attic Hatch
Greater than or equal to surrounding insulation

R-Value
R-49

Insulation Type (predominant)
Cellulose - Loose Fill

Installation Quality
Grade I



Wall Insulation

Last updated: Aug. 19, 2024

R-Value
R-39

Insulation Type (predominant)
Fiberglass - Batt

Installation Quality
Grade I

HOME ASSET DETAILS

Heating And Cooling

My Pearl Score:

762



Heat Pump

Last updated: Aug. 19, 2024

Type
Air Source Heat Pump

Outdoor Unit Model Number
BRBA-60HWD1N1-M18

HSPF2
10

Compressor
Variable-speed

SEER2
18

Maintenance Schedule
Maintenance Contract

Outdoor Unit Manufacturer
Bosch

ENERGY STAR®
Yes



Heating System

Last updated: Aug. 19, 2024

Type
Gas central furnace

Maintenance Schedule
Maintenance Contract

AFUE
96

ENERGY STAR®
Yes

Motor
Full ECM

Manufacturer
Trane

Gas Valve Type
Fully Modulating

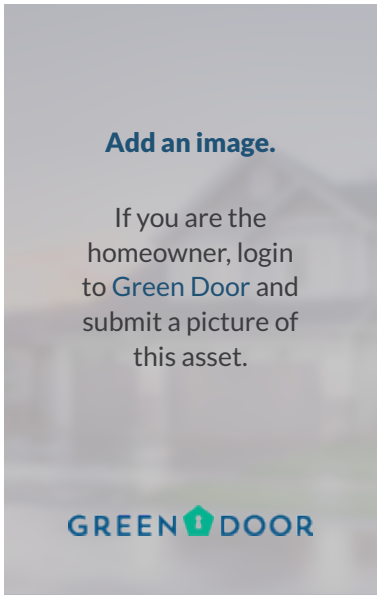
Model Number
S9X1B080U4PSB

HOME ASSET DETAILS

Baseload

My Pearl Score:

762



Water Heating

Last updated: July 25, 2024

Fuel
Solar

Solar Uniform Energy Factor
3.55

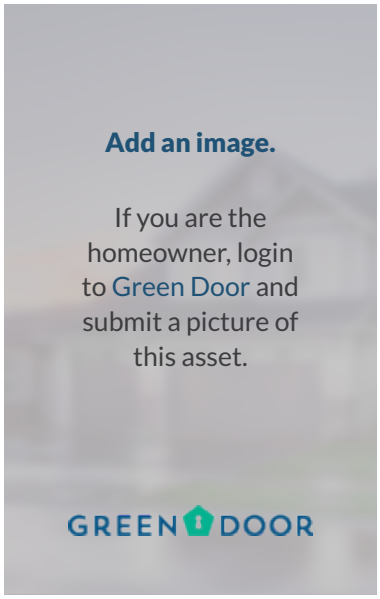
Back-up system fuel
Electricity

HOME ASSET DETAILS

Home Management

My Pearl Score:

762



Planning

Last updated: Jan. 5, 2024

Green Door Account

Yes

HOME ASSET DETAILS

Photovoltaic System

My Pearl Score:

762



Panel Specifications

Last updated: July 12, 2024

System Size (kW)
8.5

Manufacturer
Hanwha Q CELLS

Panels Installation Date
01/2024

Model Number
Q.PEAK DUO BLK ML-G9+ 390

Annual Energy Production (kWh)
6,500

Charge /kWh from Utility
$0.2200 kWh

Electricity Offset
98 %

Efficiency Rating
21.430 %



Inverter Specifications

Last updated: July 12, 2024

Inverter Installation Date
01/2024

Warranty Term (years)
12

Wattage
9994

Warranty Offered By
SolarEdge Technologies Ltd.

Inverter Manufacturer
SolarEdge Technologies Ltd.

Inverter Type
String Inverter

Inverter Model Number
SE10000H-US [240V]

HOME ASSET DETAILS

Photovoltaic System

My Pearl Score:

762

Installation Warranty

Last updated: July 12, 2024

Years in business
15

Workmanship Warranty (years)
15

Installer NABCEP Certified ?
Yes

Warranty Offered By
Perfect Home Solutions

Energy Storage/Batteries

Last updated: July 12, 2024



Battery Type
Lithium-ion

Installer
Perfect Home Solutions

Battery Manufacturer
Tesla Inc.

Installation Warranty Term (years)
15

Model Number
AC Powerwall 1092170-xx-y

Storage Capacity (kWh)
13.5

Manufacturer Warranty Term (years)
10

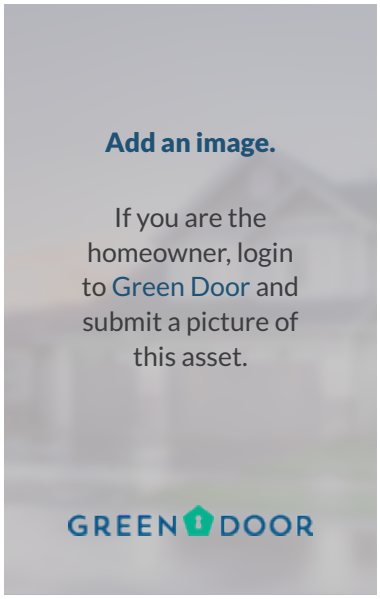
Power Rating (kW)
5

HOME ASSET DETAILS

Photovoltaic System

My Pearl Score:

762



Electric Vehicle Readiness

Last updated: July 12, 2024

Electric Vehicle (EV) Ready
Yes

Electric Vehicle (EV) Charger Installed
Yes

Charger Manufacturer
Tesla

Charger Installation Date
01/2024

ENERGY STAR
Yes

What Can I Certify with Pearl?

Pearl Certification can certify all the assets listed below; plus our certification system is always evolving and adding new certifiable categories.

Building Shell

- Attic/Roof Insulation
- Wall Insulation
- Rim Joist
- Floors & Foundation
- Windows
- Doors
- Air Sealing

Baseload

- Ventilation
- Water Heating System
- Clothes Dryer
- Clothes Washer
- Dishwasher
- Refrigerator
- Lighting
- Pool Equipment
- Cooking Appliances
- Kitchen Fixture
- Indoor Air Quality
- Fireplace
- Bathroom Fixture

Heating & Cooling

- Cooling
- Heating
- Heat Pump
- Distribution Systems

Home Management

- Smart Home Devices
- Planning

Solar, Batteries, and Electric Vehicle Readiness

Pearl Points are not yet awarded for these assets.

- Solar Photovoltaic
- Solar Inverter
- EV Ready Home
- Home Batteries
- Solar Installation
- Power Production Warranty
- Solar Incentives

About Pearl Certification

Your home is your biggest investment. Pearl Certification helps you earn a higher return on that investment.

Pearl's mission is to give homeowners the tools to improve their homes' health, comfort, efficiency, resilience, and value. Pearl's nationally recognized certification captures the value that high-performing and energy- efficient assets like heat pumps, insulation, and ENERGY STAR® windows can add to your home's resale value. It then translates that value into language that homebuyers, lenders, and appraisers can understand. In doing so, we're building a market that rewards energy efficiency.

Sell Your Home for More

Not only do high-performing homes cost less to operate, but high-performing homes with Pearl Certification can also earn a premium of up to 5% on average when marketed properly.

Continue Your Home Performance Journey

Whether you're focused on comfort, health, savings, or home equity, Pearl's free, award-winning Green Door app has tools to help you get there. From customized home improvement plans to maintenance reminders to a rebates and tax credits search, Green Door can help you make smarter home investments for years to come.

Names You Recognize

Founded in building science, Pearl Certification is the only national sponsor of the U.S. Department of Energy's Home Performance with ENERGY STAR® program and partners with the National Association of REALTORS® Green Resource Council.

Pearl proudly works in partnership with

U.S. DEPARTMENT OF ENERGY

ENERGY STAR PARTNER

NATIONAL ASSOCIATION OF REALTORS® OFFICIAL DESIGNATION

green

Appraisal Institute

NASEO National Association of State Energy Officials

RESNET RESIDENTIAL ENERGY SERVICES NETWORK

NREL Transforming ENERGY

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®

AI Reports®
Form 820.05*

Client File #:		Appraisal File #:	

Residential Green and Energy Efficient Addendum

Client: Sample Customer

Subject Property: 123 Main St

City: Chesapeake	State: Virginia	Zip: 23320

Additional resources to aid in the valuation of green properties and the completion of this form can be found at
http://www.appraisalinstitute.org/education/green_energy_addendum.aspx

The appraiser hereby certifies that the information provided within this addendum:

- Has been considered in the appraiser's development of the appraisal of the subject property only for the client and intended user(s) identified in the appraisal report and only for the intended use stated in the report.
- Is not provided by the appraiser for any other purpose and should not be relied upon by parties other than those identified by the appraiser as the client or intended user(s) in the report.
- Is the result of the appraiser's routine inspection of and inquiries about the subject property's green and energy efficient features. Extraordinary assumption: Data provided herein is assumed to be accurate and if found to be in error could alter the appraiser's opinions or conclusions.
- Is not made as a representation or as a warranty as to the efficiency, quality, function, operability, reliability or cost savings of the reported items or of the subject property in general, and this addendum should not be relied upon for such assessments.

Green Building: The practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classic building design concerns of economy, utility, durability, and comfort (US EPA). High Performance building and green building are often used interchangeably.

Six Elements of Green Building: A green building has attributes that fall into the six elements of green building known as (1) site, (2) water, (3) energy, (4) materials, (5) indoor environmental quality, and (6) maintenance and operation. The energy and water elements are the most measurable elements of green or high performance housing. Appraisers need savings amounts to develop an income approach to support energy efficient contributory value.

THIRD-PARTY VERIFICATIONS (See types defined in glossary).

The following verified items are considered within the appraisal analysis of the subject property:

Green Certification
Certifications attest that the home meets certain minimum thresholds.

Environmental Protection Agency (EPA):	☐ Indoor airPLUS ☐ WaterSense ☐ ENERGY STAR
Energy Department (DOE):	☐ Zero Energy Ready Home (ZERH)
Home Innovation Research Labs NGBS Home Remodel: Home Innovation Research Labs NGBS New Home:	☐ Bronze ☐ Silver ☐ Gold ☐ Emerald
Living Building Challenge (LBC):	☐ Living Building Certified ☐ Petal Certification
Passivhaus Standard:	☐ PHI Low Energy ☐ EnerPhit ☐ Passive House
Passivhaus Institute US:	☐ PHIUS+ 2015
USGBC LEED:	☐ Certified ☐ Silver ☐ Gold ☐ Platinum
Other: **Pearl Certification**	

Date Verified: 08/19/2024	Certificate of Efficiency Improvements Version: Organization URL: ☑ Other: www.pearlcertification.com	**ABOVE VALID ONLY IF CHECKED:** ☐ Verification reviewed on site ☑ Verification attached to this report

Energy Label
Labels disclose the state of the home's energy assets.

RESNET's HERS Rating (0 to 150): ☐ Sampling Rating ☐ Projected Rating ☐ Confirmed Rating	Estimated energy savings for this home: $ /year ¢kWh rate dated Energy Savings includes electricity, heating & cooling. Score below 100 indicates energy costs are expected to be lower than average code-built home. HERS Index Report occupancy estimates energy cost based on number of bedrooms plus one. Only a "confirmed rating" is diagnostically tested.
DOE's Home Energy Score Score (1 to 10): ☐ Official Score ☐ Unofficial Score	Estimated energy savings for this home: $ /year ¢kWh rate dated Energy Savings includes electricity, heating & cooling. Score above five indicates energy costs are expected to be lower than average local home. Home Energy Score estimates energy cost based on state average energy rates and the home's energy features.
Other Energy Score: Pearl Score Range (0 to 1200): **762**	Estimated energy savings for this home: $ /year ¢kWh rate dated Describe energy label system: Pearl's score is approved for use in the Department of Energy's Home Performance with ENERGY STAR program.

Date Verified: 08/19/2024	Score or Rating Version: Organization URL: ☐ www.resnet.us ☐ www.homeenergyscore.gov ☑ www.pearlcertification.com	**ABOVE VALID ONLY IF CHECKED:** ☐ Verification reviewed on site ☑ Verification attached to this report

Verified Energy Improvements
Only include improvements with verified documentation.

Explain energy-related improvements: Detailed in attached "Pearl Home Certification Report"
Cost of improvements: $

Date Verified: 08/19/2024	Certificate of Efficiency Improvements Version: Organization URL: ☐ www.energystar.gov/homeperformance ☐ Other: www.pearlcertification.com	**ABOVE VALID ONLY IF CHECKED:** ☐ Verification reviewed on site ☑ Verification attached to this report

Completed by: W. Casey Murphy	Title: Vice-President of Quality Systems	Date: 08/19/2024

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Client:	Sample Customer	**Client File #:**	
Subject Property:	123 Main St, Chesapeake, VA 23320	**Appraisal File #:**	

EFFICIENCY FEATURES (Water, Energy, and Environmental. See types defined in glossary).

The following items are considered within the appraisal analysis of the subject property:

Insulation	☐ Fiberglass Blown-In ☐ Foam Insulation ☑ Cellulose ☑ Fiberglass Batt Insulation ☑ R-Value Wall **R-39** Ceiling **R-49** ☐ Other						
Building Envelope	Envelope Tightness: Unit: ☐ CFM25 ☐ CFM50 ☐ ACH50 ☐ ACH natural Instructions: Insert the rating as a number that could be 0.5 to 7ACH50 or higher. The lower the number, the more air tight the envelope. Building Codes for area show maximum Envelope Tightness allowed based on the climate zone. Not all areas have adopted a building code. http://bcap-energy.org/						
Windows	☐ ENERGY STAR®	☐ Low E	☐ High Impact	☐ Storm	☐ Double Pane ☐ Triple Pane	☐ Tinted	☐ Solar Shades
Day Lighting	☐ # of Skylights:		☐ # of Solar Tubes:	☐ Other (Describe): % of lighting LEDs:			
ENERGY STAR® Appliances	ENERGY STAR®:: ☐ Dishwasher ☐ Refrigerator ☐ Washer/Dryer ☐ Other Energy Source: ☐ Propane ☐ Electric ☐ Natural Gas ☐ Other (Describe): **Note:** ENERGY STAR® appliances do not result in an ENERGY STAR® Home.						
Water Heater	☐ ENERGY STAR®		Size: gallons ☐ Tankless	☑ Solar (next page) ☐ Heat Pump ☐ Coil			
HVAC & Related Equipment Describe in comments area.	☑ High Efficiency HVAC SEER Efficiency Rating % AFUE* **96.0%** *Annual Fuel-Utilization Efficiency	☑ Heat Pump Efficiency Rating: COP: HSPF: **10.0** SEER:**18.0** EER:	Thermostat/Controllers? ☐ Yes ☐ No Programmable Thermostat? ☐ Yes ☐ No Auxiliary Heat Source? ☐ Yes ☐ No Radiant Floor Heat? ☐ Yes ☐ No Geothermal? ☐ Yes ☐ No Electric Vehicle Ready? (car charger) ☑ Yes ☐ No				
Indoor Environmental Quality	☐ Energy (ERV) or Heat Recovery Ventilator (HRV) ☐ Other Measured Whole-House Ventilation Device (See glossary) ☐ Humidity Monitoring Device installed			☐ Non Toxic Pest Control ☐ Radon System: ☐ Active ☐ Passive			
Water Efficiency	☐ Reclaimed Water System (Describe): ☐ Greywater reuse system ☐ Water Saving Fixtures			☐ Rain Barrels Used in Irrigation ☐ Cistern size: gallons ☐ Location of cistern:			
Utility Costs	Annual Utility Cost: $ /year, based on: to (full year). Includes (check all that apply): ☐ Electric ☐ Heating ☐ Water ☐ Other:				# Of Occupants:		
Comments Include source for information provided in this section.	The following property has a number of high-performing features as detailed in the Pearl Certification report. With the cooperation and approval of the Appraisal Institute, Pearl Certification has an AI REPORTS® License Agreement. 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®						

Completed by: W. Casey Murphy	Title: Vice-President of Quality Systems	Date: 08/19/2024

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 appraisal 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. Complete the pages that apply to the property appraised and provide to appraiser prior to the completion of an appraisal. Provide the Addendum to the lender at the time of loan application to assist them in understanding the property type so an appraiser with sufficient knowledge of this property type will be engaged to provide an appraisal to meet secondary mortgage market guidelines.

*NOTICE: The Appraisal Institute publishes this form for use by appraisers where the appraiser deems use of the form appropriate. Depending on the assignment, the appraiser may need to provide additional data, analysis and work product not called for in this form. The Appraisal Institute makes no representations, warranties or guarantees as to, and assumes no responsibility for, the data, analysis or work product, or third party certifications, verifications, data specifications, scores, indexes, or valuation tools, used or provided by the individual appraiser(s) or others in the specific contents of the AI Reports®. AI Reports® AI-820.05 Residential Green and Energy Efficient Addendum. ©Appraisal Institute 2017, All Rights Reserved. (May 2017)

Client:	Sample Customer	**Client File #:**	
Subject Property:	123 Main St, Chesapeake, VA 23320	**Appraisal File #:**	

Solar Panels

The following items are considered within the appraisal analysis of the subject property:

Solar Photovoltaic (Electric) System

	Array #1	**Array #2 (if applicable)**
Type of Ownership	☐ Leased ☑ Owned ☐ *Solar Loan with UCC Filing ☐ Purchase Power Agreement (PPA)	☐ Leased ☐ Owned ☐ *Solar Loan with UCC Filing ☐ Purchase Power Agreement (PPA)
Panel Specifications	System Size: **8.5000** kW (1kW = 1000 Watts) Age of Panels: **8 months** Energy Production: **6500** kWh Source of Energy Production Estimate: Manufacturer: **Hanwha Q CELLS** Warranty on Panels: years	System Size: kW (1kW = 1000 Watts) Age of Panels: Energy Production: kWh Source of Energy Production Estimate: Manufacturer: Warranty on Panels: years
Array Placement Affects energy production. *Orientation	Location (roof, ground, etc.): roof ☑ Fixed Mount ☐ Tracking Mount Tilt / Slope: *Azimuth:	Location (roof, ground, etc.): ☐ Fixed Mount ☐ Tracking Mount Tilt / Slope: *Azimuth: *Orientation (direction panels face):
Inverter Specifications	Number of Inverters per Array: Age: **8 months** Wattage: **9994** watts Manufacturer: **SolarEdge Technologies Ltd.** Warranty Term: **12** years	Number of Inverters per Array: Age: Wattage: watts Manufacturer: Warranty Term: years
Energy Storing Batteries	Battery Type: ☑ Lithium-ion ☐ Lithium-ion Polymer ☐ Lithium Iron Phosphate ☐ Lead Acid ☐ Lead Calcium ☐ AGM ☐ GEL Manufacturer: **Tesla Inc.** Storage Capacity: **13.5** kWh Warranty Term: **10** years Battery age: **8 months**	

Name of Utility Company:		**Charge / kWh from Utility**	**$.22/ kWh**

Solar Thermal Water Heating System

Type of System:	Active: ☐ Direct ☐ Indirect Passive: ☐ Integral collector ☐ Thermo-syphon	**Storage Tank Size**	Gallons:
Collector Type:	☐ Flat-Plat ☐ Integral ☐ Evacuated-Tube Solar	**System Age**	Years:
Back-Up System:	☐ Conventional Water Heater ☐ Tankless On Demand ☐ Tankless Heat Pump	**Warranty Term**	
Solar Uniform Energy Factor (SUEF):	**3.55** *Rating ranges 1 to 11. Higher number is more efficient.	**Manufacturer**	

Comments Discuss incentives available for new panels, condition of current panels, and any maintenance issues. If leased, provide the lease terms.

Note: Leased solar PV systems and Power Purchase Agreements
should not be included in the value of the real property as these systems generally are considered personal property. If a system is a lease or a PPA the terms must be provided to the appraiser for analysis. Appraisers must analyze the effect any of the terms of the lease or PPA have on the price buyers are willing to pay for the property.

Note: Solar loan with UCC filing
If the solar installation is funded by a loan that is secured by UCC filing, the loan must be paid off, or the appraiser must indicate a value for the solar panels that is conditional upon the removal of the UCC.

Please reference appendix C following the AI addendum for a detailed discussion on the valuation of this photovoltaic system. This includes the calculated value of the system based on the income based appraisal method.

Completed by: W. Casey Murphy	Title: Vice-President of Quality Systems	Date: 08/19/2024

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Client:	Sample Customer	**Client File #:**	
Subject Property:	123 Main St, Chesapeake, VA 23320	**Appraisal File #:**	

Location - Site

The following items are considered within the appraisal analysis of the subject property:

Walk Score	Score	Source: ☐ http://www.walkscore.com ☐ Other:	
Public Transportation	☐ Bus Distance: Blocks	☐ Train Distance: Blocks	☐ Subway Distance: Blocks
Site	Orientation (front faces): ☐ East/West ☐ North/South	Landscaping: ☐ Water Efficient ☐ Natural ☐ Pond/Lake on site ☐ Rain Garden	
Comments			

Incentives – Amount of Incentive and Terms

The following items are considered within the appraised value of the subject property and based on effective date of value.

Federal	
State	
Local	
Comments	Incentives offset cost and should be reported and described in the cost approach section of the report. Clearly identify the incentives that offset the gross cost of construction to meet appraisal standards. Incentives are typically not a sales concession in sales comparison approach since they do not transfer with the property and are not paid by the seller. Incentives are typically for a specified period and only those available as of the date of value should be addressed in the appraisal process. Incentives may be available to offset repairs or deferred maintenance items as well. Incentives, rebates, and tax credits for most U.S. properties can be found at www.dsireusa.org

Completed by: W. Casey Murphy	Title: Vice-President of Quality Systems	Date: 08/19/2024

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 appraisal 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. Appraisers typically do not have sufficient information to complete this addendum without builder, contractor, or third party verifier documentation.
- Attach this completed document to the MLS listing to provide sufficient detail on sales and listings to assist buyers, appraisers, and real estate agents in understanding the high performance features of the property.
- Complete the pages that apply to the property appraised and provide to appraiser prior to the completion of an appraisal.
- Provide the Addendum to the lender at the time of loan application to assist them in understanding the property type so an appraiser with sufficient knowledge of this property type will be engaged to provide an appraisal to meet secondary mortgage market guidelines.

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Client:	Sample Customer	Client File #:	
Subject Property:	123 Main St, Chesapeake, VA 23320	Appraisal File #:	

Residential Green and Energy Efficient Addendum
Additional Resources

Appraised Value and Energy Efficiency: Getting it Right. This document provides links to resources in understanding the secondary mortgage market guidelines on appraisals of energy efficient and green features. It addresses the following:

- What can builders do?
- For Buyers: Assuring a competent appraiser for your home
- For Lenders: A sample letter that should be completed and provided to the lender at the time of mortgage application alerts the lender to the special features that requires an appraiser with knowledge of the property type. https://www.appraisalinstitute.org/assets/1/29/AI-BCAP_Flyer.pdf

PV Value®. PV Value® is a discounted cash flow (Income Capitalization Approach) to valuing energy produced. The solar PV system inputs on this form are necessary to use this program. www.pvvalue.com

Residential Green Valuation Tools. A textbook resource for completing the AI Residential Green and Energy Efficient Addendum is available. It can be purchased at the following website: http://www.appraisalinstitute.org/residential-green-valuation-tools/

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Glossary

ASHRAE 700 / ICC National Green Building Standard (NGBS): An ANSI-approved residential green building standard developed by the National Association of Home Builders (NAHB) and the International Code Council (ICC). It is applicable to single and multifamily projects, renovations and additions and residential land development. To comply, all buildings must incorporate sustainable lot development techniques and address energy, water & material resource efficiency and indoor environmental quality. Also, all owners must be educated about building operation and maintenance. https://www.nahb.org/en/research/nahb-priorities/green-building-remodeling-and-development/icc-700-national-green-building-standard.aspx

Building Envelope: The building envelope is everything that separates the building's interior from the exterior. This includes the foundation, exterior walls, roof, doors and windows. The envelope rating should be compared to the local building code requirements for this rating to identify a structure that exceeds the building code.

Energy Recovery Ventilation System (ERV) or Heat Recovery Ventilators (HRV): These systems provide fresh air without wasting all the energy already used to heat the indoor air. By recovering sensible (heat) or latent (moisture) energy from the stale indoor air, they offer fresh air ventilation with reduced energy loss.

ENERGY STAR Certified New Homes: EPA's ENERGY STAR certified homes are independently verified to be at least 15 percent more efficient that code-built homes, and include additional energy efficiency measures that can deliver savings of up to 30 percent compared to standard new homes. More than just a collection of ENERGY STAR products, an ENERGY STAR certified home includes a comprehensive package of energy efficiency systems and features that work together to deliver better performance, including a High-Efficiency Heating & Cooling System, a Complete Thermal Enclosure System; a Water Protection System; and Efficient Lighting & Appliances. www.energystar.gov/newhomes

ENERGY STAR Products: Behind each blue label is a product, building, or home that is independently certified to use less energy and cause fewer of the emissions that contribute to climate change. Today, ENERGY STAR is the most widely recognized symbol for energy efficiency in the world. In order to earn the label, ENERGY STAR products must be third-party certified based on testing in EPA-recognized laboratories. In addition to up-front testing, a percentage of all ENERGY STAR products are subject to "off–the–shelf" verification testing each year. The goal of this testing is to ensure that changes or variations in the manufacturing process do not undermine a product's qualification with ENERGY STAR requirements. https://www.energystar.gov/about/origins_mission

Geothermal: A geothermal heat pump uses the constant below ground temperature of soil or water to heat and cool your home. http://energy.gov/energysaver/articles/geothermal-heat-pumps

HERS Index: The Home Energy Rating System (HERS) Index is an industry standard by which a home's energy efficiency is measured. It's also the nationally recognized system for inspecting and calculating a home's energy performance. A qualified third party certifier assesses the house based on its physical characteristics. The energy estimates from this assessment may vary depending on the lifestyle of the occupants, increasing utility expenses, and changes in the maintenance or characteristics of the energy features. There are three rating types: sampling rating, projected rating, and confirmed rating. A Sampling Rating is an application of the Home Energy Rating process whereby fewer than 100% of a builder's new homes are randomly inspected and tested to evaluate compliance with a set of threshold specifications. A Projected Rating: A Rating Type that encompasses one individual dwelling or dwelling unit and is conducted in accordance with Section 5.1.4.3.1 through 5.1.4.3.5 of the ANSI/RESNET/ICC Standard 301. A Confirmed Rating is a rating type that encompasses one individual dwelling or dwelling unit and is conducted in accordance with Sections 5.1.4.1.1 through 5.1.4.1.3. More information: http://www.resnet.us/hers-index. The ANSI standard utilized in the HERS Index is posted at https://codes.iccsafe.org/public/chapter/content/7324/.

Home Energy Score (HES): The Home Energy Score, developed and managed by the U.S. Department of Energy (DOE), is a national system that allows homes to receive an energy rating, like the MPG rating available for cars. The Home Energy Score uses a 10-point scale to reflect how much energy a home is expected to use under standard operating conditions. The Home Energy Score uses a standard calculation method and considers the home's structure and envelope (walls, windows, foundation) and its heating, cooling, and hot water systems. Only Assessors who pass DOE's Simulation Training can provide the Home Energy Score. www.HomeEnergyScore.gov

Indoor airPLUS: EPA's Indoor airPLUS is a voluntary EPA label for new homes that integrate a set of construction practices and technologies to reduce indoor air pollutants and improve the indoor air quality in a new home beyond minimum code requirements. It is only available to homes that first meet ENERGY STAR® Certified Home requirements. http://www.epa.gov/indoorairplus

LEED: Leadership in Energy and Environmental Design is a green certification program created by the U.S. Green Building Council (USGBC). As an internationally recognized mark of excellence, LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988

Living Building Challenge: Created by the Living Future Institute, the Living Building Challenge is the world's most rigorous proven performance standard for buildings. People can use the regenerative design framework to create spaces that, like a flower, give more than they take. Living Building Challenge certification requires actual rather than modeled performance. Therefore, projects must be operational for at least twelve consecutive months prior to evaluation. https://living-future.org/lbc/basics/

Low E: "Low emissivity" indicates a coating is added to the glass surface. The coating allows visible light to pass through the glass while stopping radiant heat energy from entering the building by passing through the glass. Approximately 40% of the sun's harmful ultra violet rays are blocked and insulation enhanced. https://energy.gov/energysaver/energy-efficient-windows

NGBS Small Project Remodel: Run by the Home Innovation Research Labs, this program certifies whole house and small project remodels as energy efficient. Unlike the Whole–House Remodel, the Small Project certification is prescriptive. Chapter 12 of the National Green Building Standard includes a list of mandatory practices, related to materials use, sustainable products, energy efficiency, and indoor environmental quality. A Home Innovation Accredited NGBS Green Verifier gives a final inspection to verify Small Project certification. During inspection, the Verifier will ensure the applicable practices have been met.
http://www.homeinnovation.com/services/certification/green_homes/remodeling_certification/remodel_home_certification_process

NGBS Whole Home Remodel: Run by the Home Innovation Research Labs, this program certifies whole house and small project remodels as energy efficient. Certification of a whole-building remodel requires demonstrating that there has been a minimum of a 15% reduction in energy consumption and at least a 20% reduction in water consumption over the pre-remodel condition. There are some mandatory practices that must be met. A minimum number of points must be obtained from practices related to Lot Design, Resource Efficiency, Indoor Environmental Quality, and Homeowner Education.
http://www.homeinnovation.com/services/certification/green_homes/remodeling_certification/remodel_home_certification_process

Passivhaus Standard: German standard for low energy homes that began in the 1980s. Passivhaus is a rigorous, voluntary standard for energy efficiency in a building, reducing its ecological footprint. It results in ultra-low energy buildings that require little energy for space heating or cooling. The Passive House Institute (PHI) is an independent research institute that has played an especially crucial role in the development of the Passive House concept - the only internationally recognized, performance-based energy standard in construction. http://passiv.de/en/

Passive House Institute US (PHIUS): Buildings designed and built to the PHIUS+ 2015 Passive Building Standard consume 86% less energy for heating and 46% less energy for cooling (depending on climate zone and building type) when compared to a code- compliant building. PHIUS+ 2015 is the first and only passive building standard based upon climate-specific comfort and performance criteria aimed at presenting a cost-optimized solution to achieving the most durable, resilient, and energy-efficient building possible for a specific location. http://www.phius.org/home-page

Passive Solar: Passive solar is technology for using sunlight to light and heat buildings with no circulating fluid or energy conversion system. http://rredc.nrel.gov/solar/glossary. A complete passive solar building design has the following five elements: (1) aperture (collector) (2) absorber (3) thermal mass (4) distribution (5) control. http://www.nrel.gov/docs/fy01osti/27954.pdf

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Rain Garden: A rain garden is a depressed area in the landscape that collects rain water from a roof, driveway or street and allows it to soak into the ground. Planted with grasses and flowering perennials, rain gardens can be a cost effective and beautiful way to reduce runoff from your property. Rain gardens can also help filter out pollutants in runoff and provide food and shelter for butterflies, songbirds and other wildlife. More complex rain gardens with drainage systems and amended soils are referred to as bio-retention. https://www.epa.gov/soakuptherain/rain-gardens

SEER: Seasonal energy efficiency ratio - The higher the SEER rating, the more energy efficient the equipment is. A higher SEER can result in lower energy costs. https://energystar.zendesk.com/hc/en-us/articles/212111387-What-is-SEER-EER-HSPF-

Smart House: A smart house is a home that has highly advanced, automated systems to control and monitor any function of a house – lighting, temperature control, multi-media, security, window and door operations, air quality, or any other task of necessity or comfort performed by a home's resident. http://architecture.about.com/od/buildyourhous1/g/smarthouse.htm

Water Heaters: Types are described here: http://energy.gov/energysaver/articles/solar-water-heaters.

WaterSense: EPA released its Final Version 1.1 WaterSense New Home Specification. This specification will be effective January 1, 2013 and establishes the criteria for new homes labeled under the WaterSense program and is applicable to newly constructed single-family and multi-family homes. http://www.epa.gov/watersense/new_homes/homes_final.html

Whole Building Ventilation System: A whole building ventilation system assists in a controlled movement of air in tight envelope construction. Whole building ventilation equipment is often a part of the forced air heating or cooling systems. There are various methods of providing whole home ventilation including a heat recovery ventilator (HRV) or an energy recovery ventilator (ERV). Four primary types of systems here: https://energy.gov/energysaver/whole-house-ventilation

Zero Energy Ready Home (ZERH): To qualify as a DOE Zero Energy Ready Home, a home shall meet certain minimum requirements, be verified and field-tested in accordance with HERS Standards by an approved verifier, and meet all applicable codes. Builders may meet the requirements of either the Performance Path or the Prescriptive path to qualify a home. http://energy.gov/eere/buildings/zero-energy-ready-home

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Appendix C: Photovoltaic (PV) Addendum

Your Photovoltaic (PV) System Can Add Value to Your Home

Photovoltaic systems (or solar systems) save you money on electricity costs and they can also increase the value of your home. Studies have consistently found that homes with PV systems can sell for more than comparable homes without them. A large national study conducted by the Lawrence Berkeley National Laboratory in 2015, for example, found that PV panels added an average of $4 per watt to a home's sales price. In other words, a typically-sized 5 kW (5,000 W) PV system can add $20,000 to a home's value.

These numbers are averages, however. When the appraiser looks at a home, he or she isn't thinking about national averages, but about how that *home's specific PV system* will be valued by the *local market*.

Your Pearl Certification report will enable buyers, agents, and appraisers to access critical information and increase the likelihood that your home will be properly valued.

Your Pearl Certification report also includes the results of our equity calculator. The calculator generates a discounted cash flow analysis that provides data for appraisers to use when determining how much value to assign to your PV system.

How to Capture Your Panel's Value When You Sell or Refinance Your Home

When you decide to sell or refinance your home, follow these steps to position yourself to recapture the value of your PV system. Start early, so that all parties in the transaction have access to your Pearl Certification Report when they need it:

1. If you are refinancing, give your Pearl Certification Report to your loan officer.

2. If you are selling, print out your full Pearl Certification Report and give it to your real estate agent. If you haven't selected an agent, consider working with a Pearl Partner agent who will be more knowledgeable in marketing Pearl-certified homes.

3. Make sure your agent includes a copy of your Pearl Certification Report and information about the PV system in your MLS listing.

4. Make sure your agent makes a copy of your Pearl Certification Report available at the home showing so that buyers understand the value of your PV system.

5. During refinance or at time of sale, if your solar system is secured by a UCC-1 filing, the appraiser and lender may consider your PV system "personal property", rather than a feature of your home, and assign no value to it in the appraisal as a result. To ensure that your PV system is properly valued, tell the buyer's lender (or the lender of your refinance) to instruct the appraiser to perform a "subject to" or "hypothetical" appraisal for the home that assumes the UCC-1 will be removed at closing because the solar loan will be paid off as part of the transaction. (For other approaches and more information about this subject, visit https://pearlcertification.com/
    a. Alternatively, you can pay off the solar loan and remove the UCC-1 filing before the home is appraised.

6. Make sure that the appraiser has a copy of your Pearl Certification Report *before* they conduct the appraisal. Providing them with documentation showing how much you paid for the system will also help them. *You do have the right to provide information to your appraiser!*

How the Appraiser Will Use This Report

Your Pearl Certification report shows the discounted cash flow -- the dollar value of the energy your PV is projected to generate -- from today through the end of the power production warranty period. This value is an important data point for the appraiser.

However, you should keep in mind that the appraiser is unlikely to simply add this value to the appraisal. The appraiser is required to take into account "market reaction" to PV in your neighborhood. He or she usually does this by looking at the sales prices of comparable homes in the same market that have sold recently. If the appraiser sees that homes with PV are selling for more than similar homes without PV, they can use your Pearl Certification report as an additional tool to help determine how much value your PV system adds to your home. If PV is relatively new in your market and the appraiser cannot find comparable homes with PV that have sold recently, they can consider the discounted cash flow amount shown in your Pearl Certification report as an alternative basis for assigning value to your PV system.

Owned and Leased Systems

Fannie Mae and the Federal Housing Administration (the FHA) recognize that PV systems can add value to a home. However, there's an important qualification: both recognize the value of a PV system only if it is owned by the homeowner. If the system is leased from a third party, these institutions do not recognize that it will add value. This does NOT mean that a leased system is not a benefit to a buyer: the home's electricity costs will be lower as a result of the PV system than they would otherwise be. However, the PV system will not be assigned a value in the appraisal.

More Information

The data presented in this report are accurate as of 08/19/2024, when you plan to refinance or sell, reach out to Pearl for an updated Certification Report including the value of your PV system. Additional information and resources on appraising solar panels can be found on Pearl's Appraiser page https://pearlcertification.com/appraiser-advantage/ and at the Appraisal Institute's website https://www.appraisalinstitute.org/

Pearl is also here to help. If you are planning to sell or refinance, log in to your Green Door account, call us at 1-844-307-3275, or email us at help@pearlcertification.com to get support from the Pearl team. Please note that Pearl does not perform real estate or valuation services. Licensed agents and appraisers are the experts in their respective industries and geographical areas. Pearl can share best practices and assist these professionals as they perform their services, which may include responding to requests from agents or appraisers for information when the agent or appraiser initiates communication with Pearl. Pearl does not intervene in disputes and does not initiate communication with agents, appraisers, or lenders during real estate transactions.

Pearl Certification Discounted Cash Flow Details

Overview

The values presented here are calculated using the Income-Based Approach where our algorithm looks at the total future benefits that the homeowner will receive from the photovoltaic system over its useful life, and calculates what the value of those future benefits is right now.

The useful life of the photovoltaic system is determined by the length of the power production warranty. A system will likely continue to operate after the warranty has expired and in that sense the value presented here is a conservative estimate of the potential value of the system.

System Information	
Ownership Type	Owned
Total System Size (kW)	8.5
Discounted Cash Flow Range	$27,432 - $33,990
Discounted Cash Flow	$30,711

Rates and Costs	
Utility Provider	
Electricity Rate	0.22 $/kWh
Discount Rate	6.47%
Electricity Escalation Rate	1.76%
Operations & Maintenance Costs	$11.50 per kW per year

Solar Panel Array	
Installed Date	Jan. 1, 2024
Manufacturer	Hanwha Q CELLS
Model Number	Q.PEAK DUO BLK ML-G9+ 390
Array Size (kW)	8.50
Tilt	20
Azimuth	180
Panel efficiency rating	21.43%
Array Type	Roof Mounted - Fixed
Reported Installation Cost	None
Panel warranty (years)	None

Inverter	
Inverter Type	String Inverter
Age Of Inverter	0 years
Warranty (years)	12
Manufacturer	SolarEdge Technologies Ltd.
Model Number	SE10000H-US [240V]

Power Production Warranty	
Warranty (years)	
Power at the end of the warranty	

Total Discounted Cash Flow

Year	Low	Expected	High
2024	$27,431.77	$30,710.96	$33,990.14
2025	$25,501.31	$28,555.81	$31,610.29
2026	$23,664.40	$26,505.21	$29,346.01
2027	$21,916.52	$24,554.12	$27,191.71
2028	$20,253.35	$22,697.71	$25,142.05
2029	$18,670.82	$20,931.40	$23,191.97
2030	$17,165.02	$19,250.83	$21,336.63
2031	$15,732.24	$17,651.85	$19,571.45
2032	$14,368.95	$16,130.50	$17,892.05
2033	$13,071.78	$14,683.03	$16,294.27
2034	$11,837.55	$13,305.86	$14,774.16
2035	$10,663.20	$11,995.57	$13,327.94
2036	$9,545.83	$10,748.94	$11,952.04
2037	$9,367.97	$10,448.14	$11,528.30
2038	$8,356.43	$9,319.70	$10,282.95
2039	$7,394.00	$8,246.09	$9,098.17
2040	$6,478.30	$7,224.66	$7,971.01
2041	$5,607.06	$6,252.88	$6,898.68
2042	$4,778.13	$5,328.33	$5,878.52
2043	$3,989.46	$4,448.73	$4,907.99
2044	$3,239.10	$3,611.90	$3,984.68
2045	$2,525.19	$2,815.75	$3,106.30
2046	$1,845.97	$2,058.33	$2,270.67
2047	$1,199.75	$1,337.74	$1,475.71
2048	$584.94	$652.20	$719.45

Source Details:
1) Electricity Rate: This calculation applies an average dollar per kWh rate for electricity. The average $/kWh rate is sourced on a per utility basis from the Energy Information Administration's (EIA) forms EIA-861- schedules 4A & 4D and EIA-861S.
2) Discount Rate: As a default, this calculation uses the weekly published 30 year mortgage rate from Freddie Mac
3) Electricity Escalation Rate: This calculation pulls in the specific state's average percentage electricity rate increase over the past 30 years, and applies this rate as a constant year-over-year increase to the electricity rate
4) Operation and Maintenance Costs: This calculation assumes an O&M cost of $11.50 per kW per year. The $11.50 rate is sourced from the two system benchmark studies from NREL, one from 2018 and the other from 2020.

For further details on the methodology used in these calculations please visit:
https://resources.pearlcertification.com/solar-equity-calculator/methodology-for-calculator