



Department of Energy
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Best Practice Guidelines for Residential PACE Financing Programs

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Overview

This document provides updated best practice guidelines to help implement the Policy Framework for PACE Financing Programs, initially announced on October 18, 2009.¹ Property Assessed Clean Energy (PACE) financing programs allow state and local governments, where permitted by state law, to extend the use of land-secured financing to fund energy efficiency, renewable energy, and water conservation improvements on private property.² DOE has developed these revisions to the original “Guidelines for Pilot PACE Financing Programs,” initially issued on May 7, 2010, to reflect the evolving structure of the PACE market and incorporate lessons learned from various PACE programs that have been successfully implemented. The revised and updated guidelines focus specifically on best practices and guidelines for residential PACE financing programs.

Since the issuance of the “Guidelines for Pilot PACE Financing Programs” in 2010, 31 states have passed PACE-enabling legislation, and the number of states with active PACE programs (including commercial and/or residential PACE) has grown from two to 16.³ In that time, multiple jurisdictions in those states have set up both commercial and residential PACE programs that demonstrate a wide range of programmatic choices made to reflect the unique characteristics of their individual jurisdictions. These revised guidelines incorporate lessons learned from the experiences of those state and local governments. Future editions will reflect additional lessons learned as the PACE market continues to evolve.

These guidelines focus on best practices for program design, compatibility of PACE with energy efficiency programs and services, and evaluation of program outcomes. As an assessment, PACE is subject to many of the same risks associated with other forms of debt that use a residential dwelling as collateral. As such, the updated guidelines outline a more rigorous approach to determining property owner eligibility and the importance of consumer protections.

¹ The Policy Framework for PACE Financing Programs is available at: http://www.whitehouse.gov/assets/documents/PACE_Principles.pdf.

² For more information on PACE programs, visit:

<http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/PACE.html>. A PACE obligation is collected and secured by the creditor in the same manner as a special assessment against the property, which may require a lien on the property. Lien priority is a matter of state law, and these guidelines do not (and cannot) pre-empt state law.

³ Source: <http://www.pacenation.us/pace-data/>.

The updated guidelines also incorporate advancements in DOE residential energy efficiency analytical tools and resources, such as the DOE Home Energy Score, Home Performance with ENERGY STAR, the Standard Work Specifications, and systematic program guidance available through the Better Buildings Residential Program Solution Center. DOE encourages PACE programs to leverage these and other available DOE resources.

The DOE guidelines provide potential PACE program sponsors with a framework of issues and options that are important to consider when implementing a residential PACE program.

As the PACE market has evolved, state and local governments have found residential PACE to be an effective tool to meet their public policy goals. These guidelines reflect the variety of program design choices made by those jurisdictions, and incorporate emerging guidelines, policies, and procedures developed by the PACE industry.

DOE created these guidelines for state and local jurisdictions developing and implementing residential PACE programs. The broad and growing number of PACE market participants—including private sector providers of PACE administrative, financing, and other services; home improvement contractors; property owners who voluntarily opt into PACE programs; and lenders who hold mortgages on properties with PACE assessments—should also take these guidelines into consideration.

DOE encourages existing and prospective PACE financing programs to use these guidelines to design PACE programs that meet the specific needs of their states and communities.

Program Design Guidelines

States establish PACE programs by enacting legislation that authorizes the adoption of PACE assessment districts at the local government level. Local governments authorize PACE in their jurisdictions by enacting an ordinance, resolution, or other policy that authorizes the local government to establish voluntary special assessments for energy, water, and related improvements financed through local government (or special

What is Residential PACE?

Residential Property Assessed Clean Energy (R-PACE) allows homeowners to finance energy efficiency, renewable energy, water conservation, and other home improvements that have a public purpose (as defined in state law) through an assessment collected with their property taxes. Depending on state law and the PACE program structure, the PACE obligation may be secured by a lien placed on the home, with principal and interest repaid through the local government property tax assessment. If the property is sold, the assessment may be able to stay with the property if the buyer agrees and the new mortgage lender allows.

assessment district) property assessment and collection procedures. PACE assessments are collected and secured in the same manner as any other special assessment against the property.

To enhance consistency and soundness of PACE programs, states, local governments, and third-party PACE program administrators should incorporate the following program design guidelines, recommendations, and best practices when developing and implementing PACE financing programs. These guidelines and best practices should be applied in conjunction with the most current version of industry consensus guidelines developed for PACE financing, in order to help PACE programs achieve their energy and environmental goals, as well as better economic outcomes for participating homeowners and communities.⁴

State and local governments should also consider incorporating a requirement into PACE statutes and local policies that all PACE providers who offer financing within their jurisdictions adhere to the consumer protection and contractor management provisions in these guidelines. DOE will continue supporting state and local governments in incorporating the guidelines into PACE statutes and regulations as they are developed and modified.

1. Define the PACE Program Scope and Eligible Improvements

The primary rationale for PACE programs is to pursue a legally defined “public purpose,” which generally includes environmental, health, energy independence, and economic development benefits. PACE financing for energy improvements addresses some of the market barriers that have prevented the widespread adoption of home energy upgrades: access to capital and efficient, transferable financing mechanisms for upgrades to existing homes.

PACE programs should establish criteria for eligible improvements that are consistent with the public purpose of the programs, as defined by each state or locality. In addition to financing energy efficiency and renewable energy improvements, PACE programs can also establish eligibility criteria for financing health and safety measures necessary to install and ensure performance of energy efficiency measures and protect occupants, such as removal of asbestos prior to installing efficiency measures, electrical system upgrades, roof repairs, radon mitigation, and similar measures. PACE programs can also establish eligibility criteria for measures that achieve a related public purpose (e.g., water conservation or resiliency measures, such as wind hardening or seismic retrofits). State legislatures and/or local

⁴ For information on PACE industry consensus guidelines, visit <http://www.pacenation.us>.

governments define the scope of PACE program activities and categories of improvements eligible for PACE financing. The specific measures eligible for financing may vary depending on state and local needs and objectives.

PACE programs should consider the types of markets served, including coordination of PACE financing with existing programs, services, and incentives that may be offered, such as utility rebates, low-income direct assistance for energy efficiency improvements, tax credits, tax exemptions, and other incentives (e.g., net metering, renewable energy credits) for renewable energy systems. PACE programs should also engage local governments, community stakeholders, contractor trades, and other stakeholders when establishing program goals, defining target markets and improvements, and developing communications and outreach strategies.

1.1 Eligible Improvements

PACE programs should have a clear process in place for defining the types of equipment and installations that are eligible to meet the goals of the PACE program, such as an eligible products list (EPL). Programs should also have a process for reviewing contractors' scopes of work to assure that all measures installed are not only PACE-eligible, but also meet or exceed the specifications detailed in the PACE program's EPL. The EPL should incorporate national efficiency standards (e.g., ENERGY STAR, WaterSense) or state-specific approved product lists and strictly limit qualified products to those on the referenced eligibility lists.

Establishing product eligibility criteria ensures that property owners are financing improvements that are industry recognized and independently verified for achieving higher levels of home energy or water efficiency. Depending on the process taken, programs should also consider establishing a schedule and approach for updating eligible products as new measures meet eligibility criteria, and for approving custom efficiency measures.

In all cases, measures eligible for PACE financing should be limited to those permanently affixed to the property. For additional information on energy efficiency, water efficiency, and renewable energy measures, see the Appendix: Resources.

1.2 Cost-Effectiveness of Measures and Improvements

PACE programs are enacted by state law and authorized by participating local governments with the expressed goal of helping homeowners lower their energy consumption and costs, conserve water, and make other public purpose improvements. PACE programs, whether administered by the local government or a third party, should offer programs and services that meet the objectives of the PACE statute or local ordinance. PACE programs should help

homeowners finance energy upgrades and other improvements in a manner that reduces their energy costs while adding value to their home.

PACE programs should provide information to help homeowners choose among eligible projects, including tools and resources to help homeowners evaluate the cost and savings of energy efficiency, renewable energy, water conservation, and other improvements.

PACE programs should consider the following program design features to facilitate greater uptake of energy-efficient, water-efficient, and other home improvements that meet the statutorily defined public purpose:

- The term of the assessment should not exceed the useful life of the improvements;
- Identify and prioritize energy and water improvements, or portfolios of improvements, that are cost-effective over the term of the assessment (as defined by the state or local government authorizing the PACE program), excluding health and safety costs;
- Include and recommend weatherization measures, such as air sealing and insulation, as eligible measures for PACE assessments. Weatherization measures are typically cost-effective improvements that result in significant energy savings and can provide important non-energy benefits when installed properly, including improved comfort, durability, and indoor air quality;
- Incorporate energy efficiency measures to enhance the economics of renewable energy investments by reducing the energy consumption of the home, thereby enabling appropriate sizing of renewable energy systems. Programs should inform homeowners about the benefits of installing energy efficiency measures along with renewable energy investments to enhance energy savings.

1.3 Energy Assessments and Advising

Energy assessments are an optional service that PACE programs should make available to provide homeowners with recommended energy efficiency and related improvements. While PACE programs are not required to offer energy assessments in order to utilize PACE financing, DOE encourages energy assessments to identify comprehensive, cost-effective energy efficiency improvements relevant to an individual home.

Only a qualified energy assessor or rater should perform assessments. The cost of the assessment should be allowed as an eligible cost that can be incorporated into the PACE financing. Many utilities offer free assessments (i.e., energy audits) or incentives that reduce the cost of the assessment to the homeowner.

Multiple tools are available to identify energy efficiency measures for a specific home, including

the DOE Home Energy Score,⁵ the RESNET Home Energy Rating System (HERS),⁶ and other tools offered by utilities or third-party energy efficiency program administrators (e.g. utility demand-side management planning tools).

Comprehensive energy assessments may not always be practical, for example, in cases where an equipment failure occurs and immediate replacement is necessary. For planned improvements, however, an energy assessment or energy advising services (see box) can help homeowners design a project that fits their budget and achieves their expected outcomes. Qualified energy raters can also identify important health and safety risks, along with corrective steps that should be taken immediately (e.g., fix gas leaks) or prior to completing improvements. Furthermore, a third-party energy professional can verify that the contractor completed and installed work in accordance with the approved scope of work and industry standards.

Navigating Home Upgrades: The Role of Energy Advising Services

Energy advising entails offering a homeowner access to a knowledgeable expert who is independent from the contractor. The energy advisor's role is to help homeowners plan and implement home upgrades, including selecting and working with a contractor; identifying programs and services that are available, including benefits for low-income households; choosing upgrades and reviewing work scopes; and following-up after the work is complete. An energy advisor can also assist the homeowner with documentation of the completed improvements for future use.⁷

For additional information, see Appendix: Resources and additional information provided on energy efficiency measures, evaluation, and program design.

2. Establish Eligibility Criteria

State and local laws treat PACE assessments differently; however, PACE program administrators should design consistent eligibility criteria and standardized procedures to determine the financial eligibility of a property and its owner. These should include the following considerations.

2.1 Verifying Property Ownership

- Check that applicant has clear title to property and that the property is located in the financing district, county, or other applicable municipality that has approved the program in its jurisdiction;

⁵ For more information, visit: www.homeenergyscore.gov.

⁶ For more information, visit: www.resnet.us.

⁷ For more information, visit: <https://rpsec.energy.gov/search/energy%20advisors>.

- Check the property title for restrictions and encumbrances, such as details about power of attorney, easements, subordination agreements, liens and Deeds of Trust (mortgages), home equity lines of credit, and any trust or corporation entity ownership of the property.

2.2 Confirming Property-Based Debt, Tax Assessments, and Property Valuation

- Confirm outstanding amounts of property owners' public and private debt secured by the property, including mortgages or Deeds of Trust, home equity lines of credit (HELOCs), pre-existing tax assessments, and other property tax charges. Estimated property value should be in excess of property owner's public and private debt on the property, including the addition of the new PACE assessment. Moreover, to ensure sufficient equity to support the PACE assessment, property owners should have a minimum of 10% equity in the property, at the time of the PACE transaction;
- PACE programs should determine market value of the property using valuation methods and tools appropriate for their market and individual properties, including automated valuation methods or desktop appraisals performed by a licensed appraiser with training and certification in the valuation of green and sustainable buildings;⁸
- Confirm the total property tax charges with the new PACE assessment are below the maximum property tax level authorized for the jurisdiction, including existing property tax charges, assessments, other property tax charges, and the PACE assessment;
- Property owner is current on property taxes and has not been late in the past three years or since the purchase of the house, if less than three years;
- Property owner is current on all mortgage debt and has not been late on such payments more than once during the preceding 12-months;
- To avoid placing a PACE obligation on properties that are in distress, have recently been in distress, or are at risk for distress, the following should be verified:
 - There are no involuntary liens greater than one thousand dollars (\$1,000) on the property (i.e. liens placed on property for failure of the owner to comply with a payment obligation);
 - The property has no delinquent federal or state tax obligations greater than \$1,000;

⁸ The Appraisal Institute maintains a registry of appraisers with certifications or specializations in valuation of green buildings. For more information visit: http://www.myappraisalinstitute.org/findappraiser/green_sustainability_residential.aspx. Similarly, Lawrence Berkeley National Laboratory has collaborated with members of the appraisal and real estate industry to define parameters for valuing homes with solar PV. See the following reports as examples: https://emp.lbl.gov/sites/all/files/lbnl-1002778_0.pdf and <https://emp.lbl.gov/sites/all/files/selling-into-the-sun-jan12.pdf>.

- The property is not in foreclosure, and there has been no mortgage or other property-related debt default in the past three years (except for any defaults that were cured by the homeowner in a timely manner);
 - The applicant has not had any active bankruptcies within the last seven years; however, this criterion can be met if a homeowner’s bankruptcy was discharged between two and seven years before the application date, and the homeowner has had no past due payments (mortgage and non-mortgage) for more than 60 days in the most recent 24 months;
 - There is no pending Notice of Default (or equivalent notice, depending on state law) on the property and no more than one recorded Notice of Default for the shorter of (i) the previous two years, or (ii) the time elapsed since the present homeowner acquired the property.
- Before any assessment contract is executed, the PACE program should confirm if any existing PACE assessments have been placed on the property and, if so, the program should include that prior PACE obligation in its underwriting and approval process.

2.3 Reviewing Property Owner Income and Debt Obligations

- PACE assessments can help property owners reduce their energy costs and finance repairs and improvements, while adding value to their home. The PACE assessment, however, is an additional financial obligation for the property owner. In addition to property valuation, programs should confirm property owners can support the cost of the PACE assessment by collecting and reviewing information from property owners on their household income and debt obligations. State and localities should work with program administrators to establish underwriting guidelines and criteria for PACE programs that will meet program goals, including how administrators will evaluate income, existing debt obligations, and credit score. These guidelines could include “alternative underwriting” criteria or other approaches to ensure appropriate access to PACE for homeowners that would benefit from making improvements through a PACE assessment.

3. Establish Consumer and Lender Protections

The following attributes for PACE assessments are important consumer and mortgage-holder protections for PACE programs to consider:

3.1 Property Owner Education and Disclosures

PACE uses an established financing mechanism – assessments placed on the property and collected by the local tax assessor – which state and local governments have successfully used for decades to finance improvements that further policy objectives. PACE financing, however, may be unfamiliar to homeowners. As with any debt obligation, it is essential that programs educate homeowners about how PACE financing works and explain the opportunities as well as the potential risks homeowners should consider when utilizing PACE to finance energy and water improvements to their home. In addition, PACE programs can provide homeowners with information on home improvement projects and working with a contractor, including: reviewing contractor credentials and certifications; the importance of obtaining multiple bids for improvements; and obtaining written estimates that include a detailed scope of work with itemized cost estimates for all work performed (e.g., material, labor, permits, taxes, and fees).

PACE disclosures should be in a written document that clearly identifies the terms of the PACE assessment contract to the property owner, using forms that are familiar to property owners.

PACE programs and participating contractors should provide homeowners with PACE assessment consumer disclosures in a form that clearly explains and provides information in writing to homeowners. If disclosures are provided electronically, homeowners should be provided with instructions on how to access and retain the electronic records or documents, or with printed copies of disclosures upon request. Disclosures should include the following:

- How PACE financing works, including the nature of the obligation created upon recordation and homeowner obligations;
- All program fees and how they will be paid;
- The interest rate and all fees, costs, or other charges included in the financing;
- Total cost of the PACE assessment over the entire term, including principal, interest, and fees;
- The total estimated annual PACE assessment payment amount;
- The date the first PACE assessment payment will be due;
- The amount of the PACE assessment and how it will be billed and repaid (e.g., that the payments will be made in the same manner as the property owner’s property taxes);
- Tax deductibility matters, including recommendations to consult a qualified tax advisor on

- tax matters related to PACE assessments (e.g., interest payments on the assessment);
- Information on the interaction between the PACE assessment and the homeowner's mortgage payments, including notification to the homeowner about the potential impact of their assessment on their escrow payment amounts.
- Information on transferring the assessment at time of sale, along with potential market challenges and options, including disclosure that the PACE obligation constitutes an obligation on their home, including (if applicable under the state's PACE statute) a property tax lien on their home, which may be required to be paid-off by a future lender (upon refinancing or by the purchaser's lender) or by a future buyer as a term of purchase;
- Information on any statutory penalties that will be incurred due to late payments and a statement that the property may be subject to foreclosure if the homeowner fails to pay;
- Information on estimated energy savings / energy production from energy efficiency and renewable energy measures;
- Disclosures that any savings the homeowner might experience as a result of the installed product(s) will depend on their usage patterns, seasonal variation and weather, utility rates and trends, and product specifications;
- Options for, and implications of, including tax credits in the PACE assessment.

In addition to written disclosures, programs should confirm key financing terms with the homeowner who is applying for financing. PACE programs should confirm terms directly with the homeowner prior to finalizing the assessment via a live phone call that is recorded, in accordance with state law. The live phone call should occur prior to giving authorization for the contractor to proceed and should include notification of the right to cancel period. These recordings should be available to homeowners upon request. The state or local authorizing entity's PACE program administration contract should specify the items discussed during these phone calls and related compliance documentation.

For examples of PACE disclosure forms see the Appendix: Resources.

3.2 Right to Cancel the Purchase

Property owners entering into PACE financing should be afforded a multi-day right to cancel the purchase following the contract's execution.

3.3 Appropriate Minimum Equity Requirements and Appropriate Maximum Assessments

PACE programs should establish a minimum equity threshold of 10% to qualify for a PACE assessment. In addition, PACE programs should establish a maximum amount for a PACE assessment on a property, either as a percentage of the estimated property value, a maximum dollar amount, or a combination thereof. States have set maximum assessments ranging from 10% to 20% of the estimated property value. The Fannie Mae HomeStyle® program establishes

a maximum amount of 15% of completed appraised value for incorporating existing PACE assessments into a first mortgage purchase or refinance.⁹

PACE programs should also establish a requirement that the sum of the PACE assessment and current debt secured by the property cannot exceed the market value of the property at the time that PACE financing is approved. This will help protect homeowners' properties from becoming "underwater" due to "over-improvement" of properties relative to market price.

Because of the administrative requirements of PACE programs, assessments will generally not be issued for projects below a minimum cost threshold, as determined by the PACE program.

3.4 Home Improvement Information

As a best practice, PACE programs should provide current homeowners, prospective purchasers, and future buyers with information on energy efficiency, water efficiency, renewable energy, and other improvements conducted through PACE financing.

Approaches may include:

- Providing detailed information on completed improvements, equipment specifications (e.g., ENERGY STAR rating), capacity (e.g., solar photovoltaic systems), and energy savings data, if available, in a standard format. Examples include the Home Performance with ENERGY STAR completion certificate or a program certificate that complies with BPI Standard 2101.¹⁰ These documents are increasingly used to populate multiple listing services or can be provided to the homeowner, a real estate agent, or a homebuyer;
- Completing an optional energy assessment that provides a numerical rating for the home post-improvement, such as the DOE Home Energy Score, the RESNET HERS Index, or other energy assessment offered by utility programs.

3.5 Information about the Relationship between PACE Assessments and Mortgage Financing

Programs should clearly explain and provide disclosures on the following:

⁹ The Fannie Mae HomeStyle program allows payoff of an existing PACE loans originated on or after July 6, 2010 of up to 15% of the appraised value of the property. For more information, visit:

<https://www.fanniemae.com/content/guide/selling/b5/3.3/01.html>.

¹⁰ For more information on BPI Standard 2101, visit:

<http://www.bpi.org/Web%20Download/BPI%20Standards/BPI-2101-S-2013%20Standard%20Requirements%20for%20a%20Certificate%20of%20Completion%20for%20Residential%20Energy%20Upgrades%202013-09-03.pdf>.

- Subject to the structure of a state’s PACE statute, that the PACE obligation may result in a property tax lien on the property. If applicable, clearly state if the failure to pay property taxes, including PACE assessments, could trigger foreclosure and property loss even if the property owner is current on other mortgage lien(s);
- Procedures for transferring the PACE assessment at purchase or refinance, including contractual subordination options, if applicable;
- How PACE assessments and the PACE lien position may affect options to sell or refinance the property;
- If some mortgage lenders may be unwilling or unable to modify or refinance a property subject to a PACE assessment due to the type and priority of the assessment.

3.6 PACE Assessment Non-Acceleration upon Property Owner Default

In the event of a sale of a property with an outstanding PACE assessment, including a foreclosure sale, the obligation will remain with the property and the new homeowner will be responsible for paying the remaining PACE balance over time. Non-acceleration should be standard for all PACE assessments. A PACE assessment should survive the foreclosure process (i.e., the full PACE obligation amount does not become due and payable in the event of foreclosure on the property). After a foreclosure, the subsequent owners are responsible for future assessment payments, and could be responsible for any delinquent amounts that remain if foreclosure proceeds were insufficient to pay-off the delinquent amount. Non-acceleration limits liability for the assessment in foreclosure to any amount in arrears at the time; the total outstanding assessed amount is not due in full. In cases of foreclosure, priority collection of delinquent payments for the PACE assessment may be waived or relinquished.

Moreover, the July 19, 2016 guidance from the Federal Housing Administration (FHA) and Department of Veterans Affairs (VA) requires that a PACE obligation be collected and secured by the creditor in the same manner as a special assessment against the property, and that the property shall not be subject to an enforceable claim (i.e., lien) superior to the FHA- or VA-insured mortgage for the full outstanding PACE obligation at any time.¹¹ Because of this, both the FHA and VA guidance require that the unpaid PACE assessment balance must not be accelerated, and that the non-accelerated balance shall transfer and shall not extinguish at sale or refinance.¹²

¹¹ VA Circular 26-16-18, published July 19, 2016:
http://www.benefits.va.gov/HOMELOANS/documents/circulars/26_16_18.pdf.

¹² See FHA Mortgage Letter 2016-11, published July 19, 2016:
<http://portal.hud.gov/hudportal/documents/huddoc?id=16-11ml.pdf>.

3.7 Notification of Mortgage Holders of Record

Existing mortgage servicers should be notified when residential property owners have placed a PACE obligation on the property to fund improvements. In addition, PACE assessments should be recorded in standardized public records, including local government property assessor databases (see Section 4: Public Recording and Disclosure of PACE Assessments).

If PACE assessments are withheld through an impound or escrow account, the monthly payment schedule of the PACE obligation should be provided to the mortgage servicer immediately after the PACE assessment contract has been executed between the PACE program and the property owner.

3.8 Forbearance, Permanent Hardship, and Military Service Relief

PACE programs should consider developing forbearance, modification, and forgiveness mechanisms for homeowners facing economic hardship. Further, to protect servicemembers and military families, PACE programs should be compliant with the requirements of the Servicemembers Civil Relief Act (SCRA).¹³

3.9 Additional Consumer Protection Considerations for Low-Income Households

Low-income households¹⁴ pay a disproportionately higher share of monthly income toward household energy costs. Making cost-effective energy upgrades can potentially reduce the energy cost burden for low-income households while improving the health, safety, durability, and comfort of their homes. For eligible low-income households, PACE financing can provide an option to make home upgrades that address critical needs (e.g., replacing failed or inefficient equipment) and make improvements that reduce energy consumption and costs; however, a PACE assessment creates an additional financial obligation that is secured by the property.

State and local governments should consider their state and local economic and demographic conditions, existing energy efficiency programs and services, income-qualified and housing assistance programs, and related efforts when developing PACE program policies and procedures, particularly related to serving low-income homeowners. State and local governments should work with PACE administrators, low-income housing stakeholders, and

¹³ For more information on SCRA, visit: <https://scra.dmdc.osd.mil/>.

¹⁴ Income qualification levels for low-income weatherization assistance and other energy efficiency programs vary by state and program. The DOE Weatherization Assistance Program provides guidelines for program eligibility, and then each state sets its income requirements within DOE guidelines. For more information visit: <http://energy.gov/eere/wipo/downloads/wpn-16-3-2016-poverty-income-guidelines-and-definition-income>. Other federal assistance programs and utility energy efficiency programs may use different criteria for eligibility.

other relevant organizations to develop a coordinated approach to offering PACE that ensures consumer protections are established and enforced for participating homeowners, including low-income and the elderly.

In addition to consumer protections and procedures designed for all PACE program participants, PACE programs should develop policies and procedures that ensure PACE is used appropriately and at the least-cost for low-income households that otherwise meet program eligibility criteria. The policies and procedures should address, at a minimum, the following:

- A screening process should be implemented to ensure that low-income and elderly homeowners, prior to receiving a PACE assessment, receive verbal and written disclosures, including printed disclosures if provided electronically, that clearly explain that a PACE assessment requires repayment annually, along with their property taxes, and that a lien will be placed on their property (where applicable under state law). The disclosures should clearly explain that default on the PACE assessment could result in foreclosure and loss of their home. PACE programs should provide a point of contact and information referrals (e.g., services for low-income or elderly residents provided by local governments) with the initial PACE disclosures;
- PACE programs should work in coordination with state and local governments, community partners, and utilities that offer low-income assistance to provide low-income households with information on, and assistance in accessing, available resources, including free or reduced cost programs and assistance. This could include providing information (e.g., brochures, links to websites), recommendations, or referrals for energy efficiency programs and services available to low-income households. Examples include direct assistance such as the Weatherization Assistance Program (WAP), the Low Income Home Energy Assistance Program (LIHEAP), income-qualified utility rebates, and other available low cost financing options;
- Where available and feasible to obtain, PACE programs should obtain household energy consumption and expenditures pre- and post-retrofit to understand potential savings and impacts on household income from PACE-related improvements;
- PACE programs and participating contractors should identify and recommend energy efficiency, water, and other improvements, or portfolios of improvements, that are cost-effective for low-income homeowners;
- Low-income service providers (such as Community Action Agencies) can work with PACE programs to register their contractors and service providers as authorized PACE program contractors;
- PACE programs should develop mechanisms to adjust PACE assessments (prepayment or re-amortization) for incentives and other assistance payments, including rebates, tax credits and direct grants (e.g., providing information to households and allowing PACE assessments

to be adjusted after grants or rebates are applied to PACE assessments without prepayment penalty);

- PACE programs should actively monitor contractor performance and program activity in low-income communities, and establish and enforce policies and procedures for non-compliance to deter and address fraud, misrepresentations, or noncompliance with PACE program policies and procedures (see Section 8: Quality Assurance and Anti-Fraud Measures).

State and local governments can consider additional consumer protections and program design elements for PACE programs that are designed to more effectively serve low-income households and leverage other energy efficiency programs and services. The types of approaches and program design elements could include the following:

- Develop and incorporate underwriting methods that consider energy savings, as determined by an energy assessment, when determining eligibility for PACE assessments. Reductions in household energy costs resulting from PACE improvements may help offset the cost of the PACE assessment. For example, PACE programs can consider reductions in energy expenditures when evaluating the ability of the homeowner to afford the PACE assessment;
- PACE programs can provide additional information and assistance, independent from the contractor, to low-income homeowners on choosing eligible home upgrades and reviewing contractor proposals and costs to ensure that estimated savings are proportional to the costs;
- Limit PACE financing for low-income households to products and improvements that pay for themselves over the life of the measures, either individually or in combination if multiple measures are installed, with exceptions for emergency replacement of heating, cooling, and water heating systems, and health and safety measures;
- Limit the PACE assessment to a percentage of the estimated property value (e.g., 10%), or implement independent review and additional qualification requirements for large projects (e.g., over 10% of property value);
- Offer an income-qualified application and participation pathway for low-income households, with additional incentives (e.g., income-qualified utility rebates, reduced interest rates on PACE assessments) and technical assistance (e.g., energy assessment or analysis of energy usage with recommendations for energy upgrades).

4. Public Recording and Disclosure of PACE Assessments

Standardizing record keeping and public disclosure within the state or locality is critical for market transparency and improved integration of PACE into mortgage markets and real estate transactions. A reliable public information source is important for potential buyers, lenders,

appraisers, title agents, and real estate professionals to confirm whether a property is encumbered by a PACE assessment. Standardized records may also help facilitate aggregation and securitization of PACE assessments in municipal or private bond markets. PACE programs should record the Notice of Assessment and Payment of Contractual Assessment Required documentation in a manner consistent with state and local laws.

5. Incentives and Direct Assistance

PACE sponsors should consider how PACE financing is offered in coordination with incentives (e.g. utility rebates, tax credits, or other tax incentives for energy efficiency and renewable energy measures) and direct assistance (e.g., low-income weatherization assistance, direct install programs, or other financial assistance) when developing and implementing their programs. Coordination enables homeowners to access and receive the full benefit of financial incentives and other assistance for upgrades that may be available to them. In addition to utility programs, non-ratepayer-funded federal, state, and local programs may offer financial and technical assistance that PACE programs may leverage. Table 1 shows the types of incentives and assistance available and potential sources.

Table 1. Potential sources of tax incentives, rebates, incentive payments, and direct assistance for energy efficiency, renewable energy, and water efficiency measures

Source	Tax Incentives	Rebates	Renewable Energy Production Incentives (e.g., net metering, renewable energy credits, other)	Grants and Other Direct assistance ¹⁵
Federal ¹⁶	✓			
State	✓	✓	✓	✓
Local	✓	✓		✓
Utility		✓	✓	✓
Non-Profit Organizations				✓
Manufacturer		✓		

Homeowners may be eligible for rebates or incentives for measures installed through a PACE

¹⁵ Federal weatherization assistance is provided through a network of state, local, and non-profit agencies. For more information visit: <http://energy.gov/eere/wipo/weatherization-assistance-program>.

¹⁶ Includes tax credits for renewable energy systems and energy efficiency improvements.

assessment. Homeowners may also be eligible for other incentives or tax credits, which can be more challenging to manage. For example, calculating an expected income tax credit can be complicated, since not all participants will have access to the tax credit and there will be time lags between project completion and tax credit monetization.

PACE programs should provide mechanisms to allow for pre-payment without penalty, and re-amortization of PACE assessments to account for direct cash rebates, tax incentives, and other financial assistance for the energy efficiency, renewable energy, or water conservation improvements chosen. PACE programs should encourage participants to seek qualified tax advice on the implications and options available for monetizing tax credits.

Where feasible and available, PACE programs should consider offering PACE financing in coordination with existing utility programs to leverage other available incentives and support (e.g., energy assessments) to households. PACE programs should actively engage utility and other energy efficiency programs (including low-income assistance) available to households to maximize the benefits of PACE financing. PACE programs should also seek ways to engage low-income households by coordinating with available programs and services that may offer additional support to eligible homeowners (e.g., homebuyer assistance or offering reduced interest rates on PACE assessments to income-qualified households).

6. Property Appraisals and Real Estate Transactions

PACE assessments are designed to achieve improvements in the comfort, health, and energy performance of homes through energy efficiency, renewable energy, and water conservation improvements. Energy efficiency and renewable energy improvements may also contribute to higher property values at resale.^{17,18,19} Therefore, it is important to document upgrades and provide relevant information to those involved at point of sale (e.g., realtor or broker and appraiser), so that parties to the transaction are informed and knowledgeable about upgrades financed through PACE.

¹⁷ An Early Look at Energy Efficiency and Contributory Value. 2015. Colorado Energy Office. <https://www.colorado.gov/pacific/energyoffice/atom/32661>.

¹⁸ Goodman, L. and Zhu, J. 2016. PACE Loans: Does Sales Value Reflect Improvements? *Journal of Structured Finance*, Winter 2016, Vol. 21, No. 4: pp. 6-14. <http://www.ijournals.com/doi/abs/10.3905/jsf.2016.21.4.006?journalCode=jsf>.

¹⁹ Lawrence Berkeley National Lab. 2015. Selling into the Sun: Price Premium Analysis of a Multi-State Dataset of PV Homes. <https://emp.lbl.gov/publications/selling-sun-price-premium-analysis>.

Because PACE programs involve an additional obligation on the property that may be transferable to a future buyer at time of sale, PACE programs should consider the following steps to provide support in real estate transactions:

- Ensure that information on improvements is documented and made available to realtors, appraisers, and lenders through resources including, but not limited to, the property title report, permit records, multiple listing service (MLS) ‘green fields,’ and other resources such as *The Appraisal Institute’s Residential Green and Energy Efficient Addendum*.²⁰ Programs may also employ other approaches, including proactive outreach to sellers and listing agents to support real estate transactions. Additional information on data to collect is provided in Section 10: Data Collection and Evaluation and in the Appendix: Resources;
- Establish a real estate advisor that can assist appraisers, realtors, and home sellers and purchasers with questions regarding PACE assessments and improvements financed through a PACE assessment;
- Offer the DOE Home Energy Score or other energy assessment before and after PACE efficiency upgrades are completed. If a PACE program is not equipped to offer the Score, then homeowners who undertake a PACE assessment should be encouraged to get one through a qualified assessor in the area. Some utilities score homes for free or at a reduced cost. Home inspectors and energy auditors also offer this relatively low cost, quick, and standardized service;
- Engage MLSs, realtors, appraisers, and lenders to provide information on the benefits of energy efficiency, renewable energy, and water efficiency improvements as well as guidance on completing real estate transactions that involve PACE assessments. PACE programs can provide information to real estate agents, lenders, and appraisers on the PACE financing process, and can provide assistance with purchase or refinance transactions involving PACE assessments.

7. Program Execution and Compliance with Applicable Laws

The structure of PACE programs makes the authorizing state and/or local government accountable for ensuring PACE programs comply with applicable federal and state laws, as well as the programs’ public purposes. State and local governments should designate agencies or departments with regulatory authority over PACE programs, including financial compliance, contractor licensing, and business procedures. Participating homeowners should receive information about whom to contact if they have problems or concerns with their PACE project, contractor, or assessment.

²⁰ For more information, see the DOE white paper “*Capturing Residential Energy Efficiency in Real Estate Transactions*” at: http://eetd.lbl.gov/sites/all/files/c-1176_better_buildings_real_estate_white_paper6.pdf.

A well-designed program will help homeowners select the optimal combination of eligible energy upgrades and other improvements, and confirm that the homeowner can support the cost of the additional PACE assessment. Section 8: Quality Assurance and Anti-Fraud Measures outlines steps PACE programs can take to provide oversight and ensure that qualified contractors are performing quality work. PACE programs should also incorporate the most recent versions of industry consensus policies and guidelines.²¹

8. Quality Assurance and Anti-Fraud Measures

Quality assurance and anti-fraud measures are essential protections for property owners, mortgage holders, investors, and local governments. These measures should include:

8.1 Contractor Qualifications

PACE programs should establish minimum contractor requirements, including training and a registry of approved contractors. In addition:

- Contractors should have certifications appropriate to the installed measures (e.g., Building Performance Institute (BPI) certifications for weatherization and North American Board of Certified Energy Practitioners (NABCEP) for solar PV);
- Only licensed auditors and contractors (where licensing boards exist) that adhere to PACE program terms and conditions should be permitted to conduct energy assessments and upgrades financed through PACE programs.

8.2 Work Standards

Program administrators should have clearly defined work standards outlined for all projects eligible for program financing.

- The DOE Standard Work Specifications for Home Energy Upgrades (SWS) define minimum requirements to ensure that work performed during home energy upgrades is effective, durable, and safe. Workers, training instructors, homeowners, and program administrators involved in conducting energy efficiency improvements under PACE programs can use the SWS as an industry guide;²²
- Permits should be obtained where required by state or local law, with permits made available for review upon request of the PACE Program.

8.3 Contractor Management

²¹ Examples include PACE Nation's Consumer Protection Policies, the California State Communities Development Authority Consumer Protection Policies. See Appendix: Resources for links and additional information.

²² See Standard Work Specifications for Home Energy Upgrades. For more information visit: <https://sws.nrel.gov/>.

Program administrators should adopt contractor management systems and procedures that are designed to monitor contractor performance and manage, track, and resolve consumer complaints, including:

- Program administrators should require contractors who install, or subcontract the installation of, products financed by a PACE assessment to register in the program;
- Program administrators should establish and strictly enforce ‘anti-kickback’ policies and procedures that provide direct financial or other monetary incentives for contractors to offer PACE financing over other forms of financing or credit;
- Program administrators should adopt a set of business practices and standards for contractors that registered contractors must adhere to;
- Program administrators should not disclose to contractors the maximum PACE assessment amount that homeowners applying for PACE assessments are eligible to receive;
- Program administrators should conduct pricing reviews for each project to confirm estimated costs are consistent with standard industry pricing ranges for the type of project and equipment installed;
- Programs should have policies and procedures to warn, suspend, or terminate contractors that violate PACE program policies. Programs should not accept applications processed by suspended or terminated contractors;
- PACE programs should establish marketing policies and guidelines, and monitor the marketing and communications of PACE to homeowners by participating contractors;
- PACE programs and participating contractors should strictly prohibit marketing, communications or representations that PACE is a free program, or otherwise imply that PACE does not involve a financial obligation paid by the homeowner. Further, third-party PACE programs should develop and enforce contractor guidelines that prohibit representation of the PACE Program as a government program, or otherwise imply PACE is a form of public assistance to the homeowner.

8.4 Quality Assurance

Standard, industry-accepted quality assurance procedures should be in place, including:

- On-site inspections of projects should be completed on a set proportion of participating properties (e.g., 5% of all projects) upon project completion to ensure that contractors participating in the PACE program are correctly installing the measures and improvements that were approved for financing;²³

²³ Additional guidance on quality assurance and on-site inspection methods and sampling protocols is available in the Home Performance with ENERGY STAR Sponsor Guide and Reference Manual (v1.5). For more information, visit: https://www.energystar.gov/index.cfm?c=home_improvement.hpwes_sponsor_guide.

- If work is not satisfactorily completed, the program administrator should take necessary actions, including withholding or recouping contractor payment until remedied;
- After verifying all work financed through the PACE assessment is complete, homeowners should sign-off on project completion before program administrators issue final payment to the contractor. PACE programs can provide guidance to homeowners and contractors on the sign-off process and verification procedures;
- A process for timely dispute resolution among homeowners, contractors, and program administrators should be developed, published, and implemented to resolve issues with workmanship, product defects, and customer service. Alternately, other mechanisms, such as home improvement warranties or a guarantee fund, could be established that provide an equivalent remedy for aggrieved homeowners from contractor misrepresentation and fraud. Dispute resolution processes should not preclude homeowner access to the court system.

9. Debt Service Reserve and Loan Loss Reserve Funds

PACE programs should establish a debt service reserve fund to protect bondholders from late payment or non-payment of PACE assessments. A debt service reserve fund also enhances the financial stability of PACE programs and reduces foreclosure risks for the issuer. To protect mortgage lenders, states should consider establishing a loan loss reserve fund to protect mortgage lenders financing first mortgages. A loan loss reserve fund minimizes the risk resulting from the need to make payments for PACE assessments due from sales proceeds in the event of a default or foreclosure. PACE programs and states should regularly evaluate PACE assessment activity and portfolio performance over time to determine the size and scope of debt service reserve and loan loss reserve funds for PACE programs.²⁴

10. Data Collection and Evaluation

PACE programs should collect, analyze and report to state and local governments and program stakeholders on the financial performance, energy savings, and cost savings realized from PACE projects. Helpful data to collect include:

- installed measures;
- PACE assessment amount;
- PACE assessment default and delinquency;

²⁴ In September 2013, the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) established a \$10 million loan loss reserve fund for PACE bonds designed to protect first-lien mortgage lenders where a senior lien PACE assessment could place a first-lien mortgage holder at risk of loss in the event of foreclosure or a forced sale. There have been no claims made against the CAEATFA loss reserve to date. Source: CAEATFA: <http://www.treasurer.ca.gov/caeatfa/pace/index.asp>.

- mortgage default and foreclosure for homes with PACE assessments;
- expected energy and cost savings;
- borrower data (e.g., credit score, income and debt obligations);
- where utility information is available, actual energy consumption, water consumption (if applicable), and costs for at least twelve months before and after installation of measures;
- number of projects funded;
- annual and cumulative energy and water savings;
- number of jobs created.

For example, customers of utilities participating in the Green Button Initiative can readily share data with third-party providers.²⁵ With this information, administrators or third-party evaluators can analyze the effectiveness of PACE programs. For additional information on collecting and evaluating program data, see Appendix: Resources.

PACE programs should establish policies and procedures to ensure the privacy and security of customer data, and confirm that participating contractors adhere to those policies and procedures. All data should be collected and shared in accordance with applicable laws, including data security and privacy.²⁶

Conclusion

Current and prospective residential PACE financing programs are strongly encouraged to use these guidelines and best practices to develop PACE programs that meet the needs and goals of their communities. DOE will continue to support the implementation of PACE financing programs by capturing and disseminating best practices, promoting effective program design, and sharing lessons learned with stakeholders.

²⁵ For more information on Green Button, visit: <http://www.greenbuttondata.org/>.

²⁶ For additional guidelines and best practices for data security and privacy, see the PACE Nation Consumer Protection Policies, Section 6: Data Security, and Section 7: Data Privacy.

Appendix: Resources

The following resources are available to assist PACE program administrators and their stakeholders in planning, implementing, and evaluating their residential energy efficiency financing programs.

A) Energy and Water Efficiency Measures: Eligible Product Resources

The following resources provide information for establishing eligible measure lists for residential energy efficiency and water efficiency measures, including examples of eligible product lists from PACE programs.

- The DOE **Energy Saver** website is a consumer resource on saving energy and using renewable energy technologies at home. The Energy Saver website provides information on energy efficiency and renewable energy measures, products, and design strategies for saving energy in residential properties.
www.energy.gov/energysaver/
- The **ENERGY STAR** program certifies products that meet ENERGY STAR criteria, and provides information and resources for contractors, consumers, and programs on energy efficiency measures and improvements for existing homes.
<http://www.energystar.gov>
- The **EPA WaterSense** program makes it easy to find and select water efficient products and ensures consumer confidence in those products with a label backed by independent certification. WaterSense-labeled products are 20 percent more water efficient than average products in their category.
<http://www3.epa.gov/watersense>
- The **Consortium for Energy Efficiency (CEE)** establishes advanced performance tiers for highly efficient products that go beyond ENERGY STAR ratings. CEE develops specifications and publishes qualifying product lists that are available to utilities and residential energy efficiency programs, including PACE.
<http://www.cee1.org>
- **PACE Nation's Consumer Protection Handbook** provides policies and procedures for PACE programs to determine eligible and ineligible measures for PACE financing, including procedures for establishing an eligible products list.
<http://pacenation.us/wp-content/uploads/2016/08/PACENation-CPP-V1-2016.05.10.pdf>
- **California First Eligible Products List (EPL)** provides an example of eligible products for the California First PACE financing program.
<https://renewfinancial.com/product/californiafirst>

B) Energy Efficiency Measures: Cost and Savings Resources

The following resources provide technical information on the cost effectiveness and savings potential of energy efficiency measures.

- The **National Residential Efficiency Measures Database**, maintained by the National Renewable Energy Laboratory (NREL) is a publicly available, centralized resource of residential building retrofit measures and costs for the U.S. building industry.
<http://www.nrel.gov/ap/retrofits/>
- The **Demand-Side Management (DSM) Program Database and Reports**, maintained by Lawrence Berkeley National Laboratory (LBNL), (a) characterizes and inventories efficiency programs and (b) calculates and reports on the cost of saving energy through utility and other energy efficiency programs.
<https://emp.lbl.gov/what-it-costs-save-energy>
- The **California Public Utilities Commission Database for Energy Efficient Resources (DEER)** contains information on selected energy-efficient technologies and measures. The DEER provides estimates of the energy-savings potential for these technologies in residential and nonresidential applications.
<http://www.deeresources.com/>
- **Technical Reference Manuals (TRMs)** provide standards and protocols for verifying, measuring and evaluating energy savings. TRMs are developed and utilized by states and utilities for planning and implementing energy efficiency regulations and programs.
<http://database.aceee.org/state/evaluation-measurement-verification>

C) Renewable Energy Measures: Eligible Products, Costs, and Savings

- The **National Renewable Energy Laboratory (NREL)** provides PV WATTS and other tools and resources to develop estimates of renewable energy potential, including the performance of potential photovoltaic (PV) installations for residential buildings.
http://www.nrel.gov/analysis/models_tools.html; <http://pvwatts.nrel.gov>
- The **Solar Energy Industries Association** provides consumer protection standards, including a Solar Business Code, a Complaint Resolution Process, Disclosure Forms, and Model Contracts for Lease and Power Purchase Agreements (PPAs).
<http://www.seia.org/policy/consumer-protection>
- The **Database of State Incentives for Renewables and Efficiency (DSIRE)** is a comprehensive source of information on incentives and policies that support renewables and energy efficiency in the United States.
<http://www.dsireusa.org>

D) Program Design

The following resources are available to assist PACE program administrators in developing, implementing, and evaluating their residential energy efficiency programs.

- The DOE **Better Buildings Residential Program Solution Center** provides step-by-step guidance to help program administrators and their partners plan, operate, and evaluate residential energy efficiency programs.
<http://www.energy.gov/rpsc/>
- The State and Local Energy Efficiency Action Network **Energy Efficiency Financing Program Implementation Primer** provides key considerations for policymakers, energy efficiency program administrators, and program partners on implementing successful energy efficiency financing programs for existing buildings.
<https://www4.eere.energy.gov/seeaction/publication/energy-efficiency-financing-program-implementation-primer>
- The **Home Energy Score** is an easy-to-produce rating designed to help homeowners and homebuyers gain useful information about a home's energy performance. The Home Energy Score lets a homeowner understand how efficient the home is, how it compares to others, and provides recommendations on how to cost-effectively improve the home's energy efficiency.
<http://www.homeenergyscore.gov>
- The **Home Performance with ENERGY STAR** program provides homeowners with resources to identify trusted contractors that can help explain a home's energy use and identify home improvements that increase energy performance and improve comfort.
https://www.energystar.gov/index.cfm?fuseaction=hpwes_profiles.showSplash
- **PACE Nation** provides resources on residential PACE program design, including consumer protection policies, model legislation and ordinances, and information and on existing PACE programs.
www.pacenation.us
- The **California Statewide Communities Development Authority (CSCDA)** provides an open-market platform model for PACE programs. The CSCDA provides consumer protection policies, including model disclosure forms, for residential PACE programs in California.
www.cscda.org

E) Low-Income Households

The following resources provide additional information for delivering home upgrades to low-income households:

- The **Weatherization Assistance Program Technical Assistance Center (WAPTAC)** provides online resources for weatherization service providers, including technical tools, resources and training resources, an online library of resources, and access to technical experts.
<http://www.waptac.org>
- The **Lawrence Berkeley National Laboratory (LBNL)** provides online resources, including reports, case studies, and presentations on delivering energy efficiency to middle- and low-income households.
<http://middleincome.lbl.gov/>
- The **American Council for an Energy Efficient Economy (ACEEE)** provides reports, case studies, and information on state and local programs, policies, and funding for low-income energy efficiency, including research on best practices and strategies for effectively providing energy efficiency programs and services to low-income households.
<http://aceee.org/topics/low-income-programs>
- The **Low Income Solar Policy Guide** provides a road map to successful policies and programs that are creating access to solar technologies and jobs nationwide.
http://www.lowincomesolar.org/wp-content/uploads/2016/03/Low-Income-Solar-Policy-Guide_3.11.16.pdf

F) Contractor Training and Certification

The following resources provide additional information on contractor training and certification programs for energy efficiency and renewable energy measures:

- The **Building Performance Institute (BPI)** develops standards for energy efficiency retrofit work and issues professional certifications for contractors, home energy rating systems, and quality assurance services.
http://www.bpi.org/home_prof.asp
- The **Residential Energy Services Network (RESNET)** is a national standards-making body for building energy efficiency rating systems, including the Mortgage Industry National Home Energy Rating Standards.
<http://www.resnet.org>
- The **North American Board of Certified Energy Practitioners (NABCEP)** offers entry-level knowledge assessment, professional certification, and company accreditation programs to renewable energy professionals throughout North America.
<http://www.nabcep.org/>

G) Real Estate Transactions and Appraisals

The following resources provide additional information on the valuation of energy-related improvements in real estate transactions and appraisals:

- The DOE report, ***Capturing Energy Efficiency in Residential Real Estate Transactions: Steps That Energy Efficiency Programs Can Take***, describes specific strategies for capturing the value of energy efficiency in real estate transactions, along with case studies and resources for energy efficiency programs, realtors, and appraisers.
https://rpsec.energy.gov/sites/default/files/publication/c-1176_Better_Buildings_Real_Estate_White_Paper.pdf
- The DOE **Better Buildings Residential Program Solution Center** provides a portfolio of resources on valuation and appraisal of energy efficiency improvements and integration of energy efficiency in real estate transactions, including reports, webinars, program case studies, and links to publications and webcasts.
<http://rpsec.energy.gov>
- The **Appraisal Institute** provides training, guidance, and publications for realtors and appraisers on methods and procedures for the valuation of energy efficiency, renewable energy, and other green features and improvements, including the following resources:
 - Residential Green and Energy-Efficient Addendum;
 - Residential Green Valuation Tools;
 - An Introduction to Green Homes.<http://www.appraisalinstitute.org/appraisal-institute-aids-us-department-of-energy-on-home-energy-efficiency/>
- The **PV Value**® online tool helps determine the value of a new or existing PV system installed on residential and commercial properties. It is designed for use by real estate appraisers, mortgage underwriters, credit analysts, PV industry sales staff, and other professionals involved in valuation of PV systems. For appraisers, the inputs specific to PV in the Residential Green and Energy Efficient Addendum can be used as inputs to PV Value®.
<https://www.pvvalue.com/>

H) Program Evaluation and Data

The following resources provide information on energy efficiency program evaluation and data collection:

- The DOE **Uniform Methods Project** provides a voluntary set of standard protocols for determining savings resulting from particular energy efficiency measures implemented through state and utility efficiency programs, including residential energy efficiency.
<http://energy.gov/eere/about-us/ump-protocols>
- The **SEE Action Network Energy Efficiency Program Impact Evaluation Guide** provides an overview of, and guidance on, energy efficiency program evaluation, including definitions, concepts, and steps for calculating savings, avoided emissions, and other impacts.
https://www4.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf
- The DOE Better Buildings Residential Program Solution Center **Evaluation and Data Collection Handbook** provides step-by-step guidance on evaluating residential energy efficiency programs, including planning and conducting evaluations, collecting data, and communicating impacts.
<https://bbnp.pnnl.gov/handbooks/evaluation-data-collection-%E2%80%93-overview>
- The DOE **Program Benchmarking Guide** (a) provides an inventory of recommended Residential Program Progress Metrics, (b) describes approaches for using them effectively, and (c) gives examples of peer benchmarks from residential energy efficiency programs.
<http://energy.gov/eere/better-buildings-residential-network/resources#guide>

I) U.S. Department of Housing and Urban Development (HUD) Resources

Fair Housing and Equal Opportunity

The following resources provide more information on program structure, operation, and evaluation to ensure equal access to housing, mortgage loans, and credit under the Fair Housing laws:

- **HUD Fair Housing** recommends collection of data to ensure that a population is not being disproportionately served.
<http://hudatwork.hud.gov/HUD/fheo/po/e/guidance/fheo-guidance>

Mortgage Market Information

The following sources provide information on the FHA single family PACE policy:

- **FHA Single Family** provides information and resources for lenders and consumers on FHA's single family housing programs and services.
http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh
- **FHA Mortgagee Letters** provides information on HUD guidance to lenders, including PACE.
http://portal.hud.gov/hudportal/HUD?src=/program_offices/administration/hudclips/letters/mortgagee
- The **FHA Resource Center** provides mechanisms for consumers and lenders to contact HUD to learn more about FHA's programs and services.
http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/fhresourcectr