



# STATE STRATEGIES

TO INCREASE ENERGY AND WATER EFFICIENCY IN  
LOW INCOME HOUSING TAX CREDIT PROPERTIES



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The strategies reflected in this report represent a moment in time. State Housing Finance Agencies update their Qualified Allocation Plans on an annual basis, and, as part of that, may update their water and energy efficiency policies or procedures. The National Housing Trust will continue to track strategies HFAs are using, and make that information available on PrezCat, our online database of state and local affordable housing preservation policies. Please visit <http://www.prezcat.org> to view the most current state strategies to increase energy and water efficiency in Low Income Housing Tax Credit properties.

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ELEVATE ENERGY



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# INTRODUCTION



This report examines how state housing finance agencies (HFAs) are using the 9 percent Low Income Housing Tax Credit Program (LIHTC) to develop and preserve affordable rental housing that is energy and water efficient. Through a review of Qualified Allocation Plans and additional documents outlining HFA policies and priorities, this report identifies strategies HFAs are using to maximize the energy and water efficiency of low-income housing, including:

- Green Capital or Physical Needs Assessments
- Energy and Water Audits or Modeling
- Performance-based Requirements or Incentives
- Third-party Building Standards
- Required Energy Professional
- Energy and Water Benchmarking
- Water Conservation Requirements or Incentives
- Coordination with Utility Energy Efficiency Programs
- Project-specific Utility Allowances
- Renewable Energy Incentives

Some of these strategies are more widely used than others. For example, 33 HFAs require or incentivize properties to meet the criteria of a third-party building standard, whereas only six require or incentivize owners to benchmark the energy and water use of the property. Nonetheless, this report confirms that most HFAs are taking seriously the importance of ensuring that LIHTC properties are energy and water efficient. And, although there are some concerns about the impact of high efficiency construction on development costs, we can expect the strategies identified in this report to become more common.

This report was written with an appreciation of the time, research, public participation and foresight that goes into the development of a Qualified Allocation Plan (QAP). HFAs must use the 9 percent tax credit program to meet a diverse set of housing needs, and each QAP represents a delicate balance. Therefore, this report does not rank QAPs, nor assign value to any of the strategies outlined. Each is an important step toward more energy and water efficient affordable housing. We hope this report will be a resource to HFAs as they continue to explore options for maximizing the efficiency of the properties they finance. Advocates for sustainable affordable housing should also find the information here useful as they contemplate which policies to pursue to achieve their goals.

## **The Role of Energy and Water Efficiency in LIHTC Properties**

Maximizing the energy and water efficiency of LIHTC properties is important for several reasons. The LIHTC program is the largest affordable housing rental production and preservation program in the nation, creating or preserving more than 2.2 million affordable homes since 1986. With an affordability period often longer than 30 years, these properties must be built to high-quality standards that stand the test of time.

Reducing energy and water consumption is critical to maintaining affordable housing. According to multiple studies, the cost of energy is the largest controllable, variable operating expense in affordable multifamily housing.<sup>1</sup> In addition, water and wastewater charges have been increasing at well above the Consumer Price Index (CPI) for many years.<sup>2</sup> Improving the energy and water efficiency of LIHTC properties lowers operating costs, which can free up capital for maintenance, repairs and other improvements. Reducing energy costs may also stabilize or increase property cash flow and reduce loan default risk, thereby preserving affordable housing.

Increasing the energy and water efficiency of LIHTC properties makes a significant difference for residents, as well. Low-income households typically spend 7.2 percent of their income on energy bills; more than two times that of the median household, which spends only 3.5 percent on energy bills.<sup>3</sup> Where energy and water are individually metered, high energy burdens can have real consequences on a family's budget. Regardless of the metering configuration, energy inefficient housing increases residents' risk for developing serious negative health conditions, such as respiratory symptoms, asthma, cancer, and cardiovascular disease.<sup>4</sup> Improving energy and water efficiency in LIHTC properties can significantly improve indoor air quality<sup>5</sup> and produce positive impacts on residents' financial security, health and well-being.

Energy efficiency investments in low-income multifamily housing can also help states and utilities reach their energy savings or carbon reduction targets. A recent study by Optimal Energy found significant energy savings potential in the affordable multifamily housing sector. By 2035, the report estimates that energy efficiency programs in multifamily affordable housing could cut electricity usage by as much as 32 percent and natural gas by as much as 24 percent.<sup>6</sup>

In short, making LIHTC properties more energy and water efficient is a cost-effective way to reduce energy consumption, maintain housing affordability, reduce pollution, and create healthier, more comfortable living environments for residents.

## **About the Low Income Housing Tax Credit Program**

The LIHTC program is administered jointly by the U.S. Department of Treasury and state housing finance agencies (HFAs). There are two types of tax credit rates in the LIHTC program—the “4 percent” rate and the “9 percent” rate. 4 percent tax credits are awarded along with private activity bonds, and subject to a private activity bond cap per state. 4 percent tax credits are more widely available and not subject to a competitive allocation process. The amount of 9 percent tax credits a state can allocate in a given year is limited based on a per capita formula authorized by Congress. To allocate the 9 percent credits HFAs use a competitive process, with selection criteria outlined in the HFA's Qualified Allocation Plan (QAP) or similar document.

Developers who receive an allocation of 9 percent credits sell these tax credits to corporations to offset the corporations' tax liability. In return,

## HOW THE LOW INCOME HOUSING TAX CREDIT WORKS<sup>7</sup>



1

The U.S. Department of the Treasury **issues tax credits to the states.**



2

**States control the type of housing, the location** and other characteristics to best serve their residents. **State agencies write regulations (called a qualified allocation plan (QAP))** describing the selection criteria that governs the competition.



3

Housing developers compete for the tax credits. Developments **that best meet the selection criteria outlined in the QAP** are awarded the tax credits.



4

Investors buy the tax credits. The sale **results in equity** to the developer to help finance the development.



5

The equity **lowers the amount of money that must be borrowed** to fund construction. The lower debt payments **allow the developers to charge affordable rent.**

developers receive equity to help cover the costs of preserving or constructing affordable rental housing. Apartments created or preserved using tax credits must be rented to households with incomes of no more than 60 percent of the area median income. Rent restrictions must remain in place for at least 30 years from the time the property is placed in service (i.e. when the housing is ready to be occupied).

Federal statute provides HFAs wide discretion in determining how to allocate tax credits to address state and local housing needs. Section 42 of the Internal Revenue Code requires each HFA to set forth selection criteria in a Qualified Allocation Plan (QAP). Section 42 does require QAPs to include three preferences and ten other selection criteria, including energy efficiency, but does not define how HFAs should evaluate these criteria.

Affordable housing developers pay close attention to the QAP when evaluating whether to pursue a development for a couple of reasons. First, the 9 percent LIHTC program is very competitive. In many states, applications for credits far exceed supply year after year. Thus, developers seek to maximize their chances of securing funding by ensuring that the developments they pursue adhere closely to the priorities of the housing agency as laid out in the QAP.

Second, submitting a competitive application for 9 percent tax credits requires significant investment

of capital and staff resources. Developers pursuing 9 percent credits must demonstrate that they have control of the property to be eligible for an award. The acquisition and pre-development costs associated with pursuing a development can be significant, and developers must be confident that their application will be competitive if they are going to invest scarce resources.<sup>8</sup>

### Analytical Approach

QAPs are the main document through which HFAs require or incentivize energy or water efficiency in LIHTC properties. The focus of this report is on two main mechanisms in the QAP that guide allocation decisions per state and local housing needs: threshold requirements and incentives (points or preferences). Threshold requirements set forth the minimum standards a proposal must meet to qualify for an allocation of tax credits. Additionally, HFAs use points or preferences to rank applicants against each other, with the higher scoring application receiving an allocation of tax credits above a lower scoring application. Although points or preferences are optional, HFAs can virtually ensure that applicants meet certain criteria by assigning enough weight to the criteria that the application has little chance of receiving an allocation without complying.<sup>9</sup>

In addition to reviewing threshold requirements and incentives in QAPs, accompanying documents were also reviewed. These documents include green

building or energy conservation policies, design and construction manuals, funding applications, and underwriting guidelines.

We identified 10 common strategies that HFAs use to ensure that LIHTC properties take concrete steps toward reducing energy and water use:

- 1 Green Capital or Physical Needs Assessments (GCNA or GPNA).** A GCNA or GPNA combines a conventional Capital or Physical Needs Assessment with an energy audit to evaluate the energy and water efficiency needs of a property.
- 2 Energy and Water Audits or Modeling.** An energy or water audit is an assessment of the energy and/or water consumption of a building or buildings, or a modeled simulation to evaluate of cost-effective energy and water efficiency investments.
- 3 Performance-based Requirements or Incentives.** A performance-based approach involves reducing energy and water consumption at a property by a certain percentage as compared to a pre-retrofit baseline.
- 4 Third-party Building Standards.** Green building standards include certification systems established by independent third parties to evaluate the sustainability of a building. Common standards include Leadership in Energy and Environmental Design (LEED), EarthCraft, Enterprise Green Communities, and the National Green Building Standard.
- 5 Required Energy Professional.** Development teams that include energy consultants or green professionals to integrate green building, energy and water efficiency throughout the planning, design and construction process.
- 6 Energy and Water Benchmarking.** Benchmarking is the process of tracking the energy and water consumption of a property

and comparing the building performance to other properties within a portfolio, or to similar buildings elsewhere.

- 7 Water Conservation Requirements or Incentives.** Requirements or incentives for the installation of low-flow plumbing fixtures to avoid excessive water consumption and associated utility costs.
- 8 Coordination with Utility Energy Efficiency Programs.** Direct coordination between HFAs and utilities on energy efficiency program design and implementation. Or, requirements or incentives to pursue utility-sponsored or other energy efficiency related funding to incorporate into an application.
- 9 Project-specific Utility Allowances.** A utility allowance that more accurately reflects the reasonable energy and water use of residents at a specific property. Either a high-quality energy consumption model or the use of actual consumption data if made available from the utility.
- 10 Renewable Energy Incentives.** The incorporation of renewable sources (solar, wind, or geothermal heat) to generate energy on-site to offset energy use for common areas or tenant spaces.

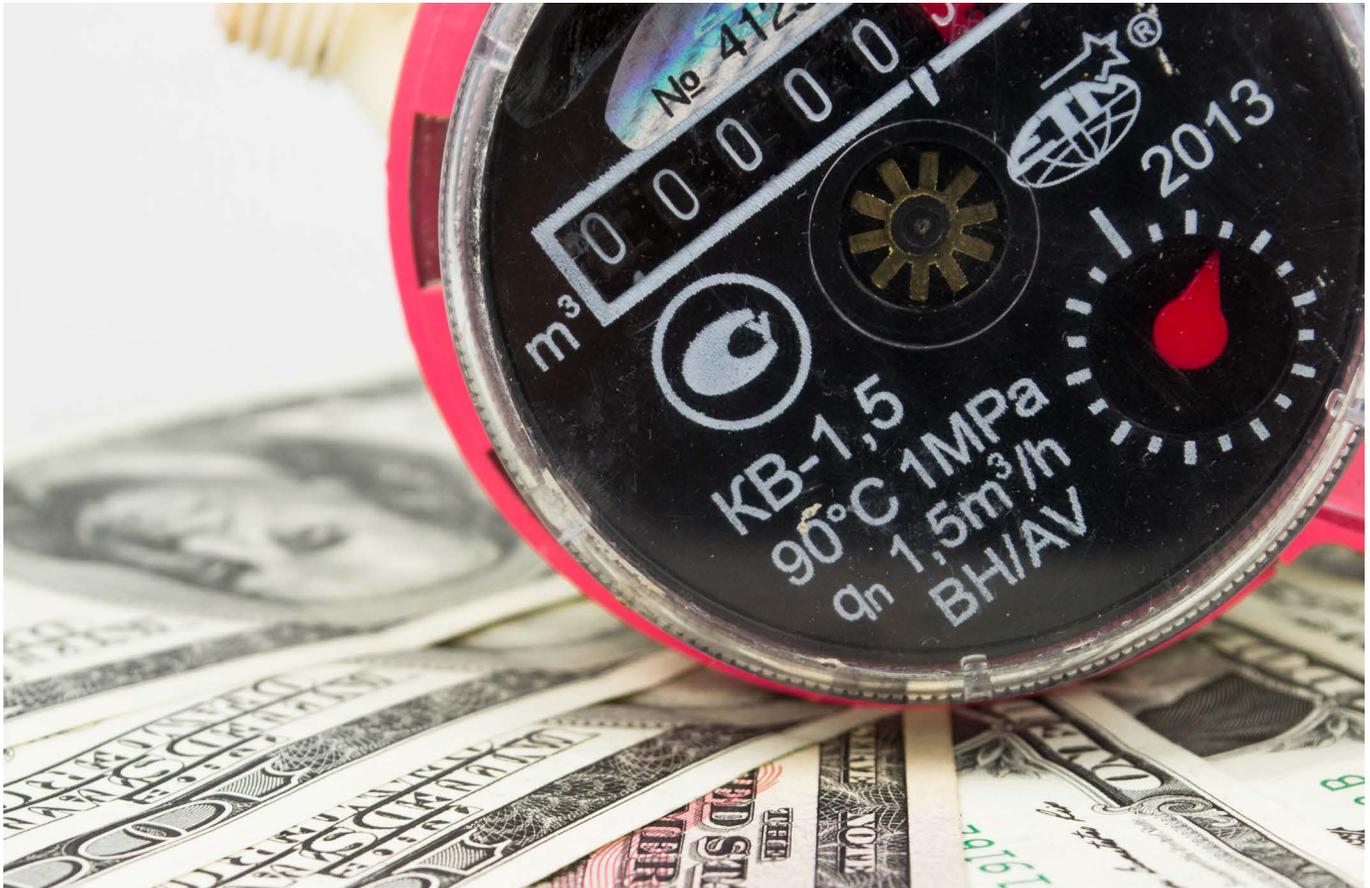
This report reflects approved QAPs and accompanying documents as of June 1, 2016. The following sections provide information on the number of HFAs using each strategy listed and how they are being applied differently to new construction and rehabilitation properties. Examples from specific QAPs are highlighted to illustrate the mechanics of each strategy and are presented as innovative policies or procedures for HFAs to consider as they explore options for improving the energy and water efficiency of the affordable housing in their state.

#### NEW CONSTRUCTION V. REHABILITATION

HFAs recognize the inherent differences between new construction and rehabilitation projects. Energy efficiency opportunities may be limited in an existing property. Accordingly, HFAs develop policies and incentives that seek to strike a balance between promoting the highest levels of efficiency and supporting the preservation of existing affordable housing. This may mean developing separate criteria for new construction and rehabilitation projects applying for Housing Credits. Throughout this report, requirements and incentives for energy and water efficiency are separated between New Construction and Rehabilitation when a given HFA has chosen to differentiate between these development types in their QAP.

## 1

# GREEN CAPITAL OR PHYSICAL NEEDS ASSESSMENT



**T**he Capital Needs Assessment (CNA) or Physical Needs Assessment (PNA) is an assessment to determine the cost to maintain a property over a specific period that includes an evaluation of all major building components and systems to identify and plan upgrades and estimate the associated costs. Almost all HFAs require rehabilitation properties and/or acquisition rehab, adaptive re-use, or preservation applications to conduct a CNA or PNA (Appendix B). Integrating energy and water efficiency audits or an evaluation of future energy and water efficiency upgrades into a CNA or PNA can help owners plan for upgrades and provide expected costs of improvements, with the addition of cost savings for energy and water improvements.

Typically, CNAs/PNAs do not require an evaluation of potential energy and water efficiency upgrades. However, 12 HFAs require applicants to consider energy and water efficiency and the impact on long-

term operating expenses when conducting a CNA/PNA, or couple the CNA/PNA with an energy audit. For example, the **Delaware State Housing Authority** requires a Capital Needs Assessment that must be

**The Vermont Housing Finance Agency (VHFA) highlights the importance of energy efficiency in its Capital Needs Assessment Guidance:<sup>1</sup>**

## **OPTIMUM ENERGY EFFICIENCY IS CRITICAL**

In today's escalating and volatile utility markets, properties must be as energy efficient as possible and meet the highest standards possible to assure long-term operating sustainability. Recommendations on energy and utility efficiency improvements must be included as an essential part of the CNA. VHFA, the Vermont Housing & Conservation Board, and the Vermont Department of Housing and Community Development (DHCD) Energy Standards should be used as a frame of reference in achieving optimum energy efficiency.



completed by a licensed architect and include an energy audit completed by a certified energy rater.

Other HFAs state that Capital or Physical Needs Assessments should include energy efficiency as a consideration, but do not expressly require an energy audit or outline criteria for assessing energy efficiency or water efficiency upgrades. For

example, the **Georgia Department of Community Affairs** requires, “Whereas the PNA documents the existing conditions and immediate physical needs, the DCA Rehabilitation Work Scope must include these considerations as well as future property marketability, durability, and energy efficiency which will add to the residential quality of life.”

## 2

# ENERGY AND WATER AUDITS OR MODELING

**A**n energy audit for rehabilitation or energy model for new construction is the first step to comprehensive energy management. Currently, HFAs in 13 states require or encourage LIHTC applicants to conduct energy audits for rehabilitation projects and 8 HFAs require or encourage energy modeling analysis for new construction (Appendix C). To meet these requirements, the project development team must consult a certified energy efficiency professional for an energy audit to identify and consider all cost-effective energy savings opportunities to incorporate into the scope of work.

The **Missouri Housing Development Commission** requires multifamily rehabilitation projects with more than 12 apartments to conduct an energy audit. An assessor or rater who is certified through the Building Performance Institute (BPI), Residential Energy Services Network Home Energy Ratings

System (RESNET), or ENERGY STAR must prepare the audit. The minimum standard for energy audits is ASHRAE Level 1. ASHRAE Level 1 audits are simple walk-through audits that identify energy conservation opportunities, but do not provide a cost analysis.<sup>11</sup>



Interestingly, water and wastewater charges have been increasing at well above the Consumer Price Index (CPI) for many years,<sup>12</sup> but only three HFAs—**State of Nevada Housing Division**, the **Maryland Department of Housing and Community Development**, and the **Pennsylvania Housing Finance Agency**—incorporate water into their audit requirements. In addition, the **California Tax Credit Allocation Committee** includes water as an optional assessment protocol under its Existing Multifamily Assessment Protocols. A water audit will examine all areas in which the property uses water (maintenance, mechanical systems, irrigation and other building processes) to help identify operations and maintenance issues and consider water savings opportunities that can lower operating costs in the long run.

## THE MARYLAND DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT (DHCD)

requires an energy and water audit for rehabilitation projects to identify all cost-effective energy conservation and water conservation measures that can be incorporated into the project's scope of work. DHCD has developed a Multifamily Energy Audit Guide that sets forth audit standards. In addition, all energy conservation and water conservation measures identified in the audit with a Savings to Investment Ratio of 2.0 or greater (meaning that for \$1.00 invested the property achieves \$2.00 in savings) must be incorporated into the project's scope of work.

## 3

# PERFORMANCE-BASED REQUIREMENTS & INCENTIVES

Energy and water audits for rehabilitation or energy modeling for new construction properties coincide nicely with performance-based incentives that encourage owners to pursue comprehensive retrofits. Performance-based incentives require owners to establish the energy consumption of a property pre-retrofit or pre-construction, and install energy and water conservation features to achieve a percent reduction in energy and water consumption.



Eleven HFAs require or encourage new construction properties to demonstrate increased energy performance. Twelve HFAs incentivize developers and owners to increase the energy efficiency of a rehabilitation property over pre-retrofit conditions. HFAs that include performance-based requirements or incentives typically rely on a percent improvement over pre-retrofit conditions or a reduced Home Energy Rating System (HERS) Index Score, a nationally recognized system for calculating a home's energy performance created by the Residential Energy Services Network (RESNET).

The **Maryland Department of Housing and Community Development** provides an instructive example for rehabilitation projects. As mentioned,

DHCD requires an energy and water audit to identify energy conservation measures. To incentivize owners to use the results of the audit to inform the scope of work and improve the performance of the building, DHCD awards additional points to rehabilitation projects that will result in overall energy savings of 20-30% above pre-retrofit levels as determined by the energy and water audit. DHCD does not require or award points for new construction properties that demonstrate improved energy performance.

Similarly, the **California Tax Credit Allocation Committee (CTCAC)** requires rehabilitation projects to demonstrate a 10% improvement above modeled energy consumption of the building based on CTCAC Existing Multifamily Assessment Protocols. CTCAC awards three points to rehabilitation projects that result in a 15% improvement over pre-retrofit conditions or 5 points for a 20% improvement over pre-retrofit conditions as demonstrated using California Energy Commission approved software. CTCAC awards points to new construction projects that demonstrate a percentage improvement beyond the requirements of 2013 Title 24, Part 6 of the California Building Code; 3 points for a 9% improvement and 5 points for a 15% improvement.

Other HFAs award points for improved energy performance based on the HERS Index Score. For example, the **Kansas Housing Finance Resources Corporation** awards points for a reduced HERS Index Score on a tiered scale for both new construction and rehabilitation. A project achieving a HERS Index Score of 85-78 is awarded 10 points; of 77-71 is awarded 15 points; and of 70 and below can receive 20 points. A house with a HERS Index Score of 70 is 30% more energy efficient than a standard new home.<sup>13</sup> For more information on performance-based incentives and requirements see Appendix D.

## 4 THIRD-PARTY BUILDING STANDARDS



**T**hirty-three HFAs require or incentivize properties to meet the criteria of, or achieve certification through, a third-party standard like LEED, Enterprise Green Communities, or EarthCraft (Appendix E). Some states have developed their own standards like the Evergreen Sustainable Development Standards in Washington or the Alaska Building Energy Efficiency Standard (BEES). Of the 33, 14 HFAs require new construction projects to meet the mandatory criteria, or the minimum level of certification of a third-party standard. Of those, 11 states require both new construction and rehabilitation projects to meet minimum criteria.

The **Colorado Housing Finance Agency** provides an instructive example. CHFA requires all applicants to meet Enterprise Green Communities requirements:

All applicants must agree to meet the 2011 or 2015 Enterprise Green Communities requirements in order to apply for credits. Applicants must complete a Green Communities Self Certification Workbook and score a minimum of 30 points for acquisition/rehab projects and 35 for new construction projects,

certifying that the project will meet or exceed the Enterprise Green Communities requirements or the equivalent of those requirements for new construction or rehabilitation as applicable.

Enterprise Green Communities provides a compliance pathway for New Construction, Substantial Rehabilitation, and Moderate Rehabilitation in both single-family and multifamily to account for the differences between property types.

HFAs also encourage higher levels of performance by awarding more points for higher levels of achievement. For example, the **Indiana Housing and Community Development Authority (IHCD)** requires new construction buildings to meet the minimum standards established by LEED, Enterprise Green Communities or achieve a Bronze rating under the National Green Building Standard. IHCD

awards points to new construction and rehabilitation properties that meet higher standards, as seen below.

States are also beginning to award points for more rigorous building standards. Connecticut, Idaho, Illinois, Montana, New Jersey, and Pennsylvania award points for Passive House. Illinois and New Jersey also award points for projects that achieve certification through the Living Building Challenge.

### THE INDIANA HOUSING AND COMMUNITY DEVELOPMENT AUTHORITY (IHCD) 2016 QAP AWARDS POINTS FOR MEETING THIRD-PARTY STANDARDS

CERTIFICATION	POINTS
<b>LEED</b>	
LEED Silver Rating	1 point
LEED Gold Rating	2 points
LEED Platinum Rating	3 points
<b>National Green Building Standard</b>	
Silver Rating National Green Building Standard	1 point
Gold Rating National Green Building Standard	2 points
Emerald Rating National Green Building Standard	3 points
<b>Enterprise Green Communities</b>	
Enterprise Green Communities Certification	2 points
Enterprise Green Communities (+10 over minimum)	3 points
Equivalent under rating system accredited by the American National Standards Institute	Up to 3 points

### HFAS HAVE STARTED TO INCENTIVIZE MORE RIGOROUS BUILDING STANDARDS

**PASSIVE HOUSE** is a rigorous international building standard developed by the Passive House Institute to optimize a building's energy performance through passive measures and components such as insulation, airtightness, heat recovery, solar gains, solar shading and incidental internal heat gains.<sup>14</sup>

**THE LIVING BUILDING CHALLENGE** is a certification program that consists of seven performance categories: place, water, energy, health & happiness, materials, equity, and beauty. Certification is based on actual, rather than modeled or anticipated performance.<sup>15</sup>

## 5

# REQUIRED ENERGY PROFESSIONAL

**A**ffordable housing owners and developers can engage energy consultants or accredited green professionals throughout the planning, design and construction process to identify and incorporate all cost-effective energy and water savings opportunities into the project's scope. There are varying degrees to which HFAs require or incentivize development teams to consult with an energy or green building professional. Generally, HFAs that require energy audits, energy consultations, or certification through a third-party green building standard will ensure that owners and developers consult with a certified energy professional or green-building professional at certain points of the planning, design and construction process, but few require an energy professional to be involved throughout.

Four HFAs require energy consultants or green professionals to be members of the development team or require project development staff to take specific trainings to build capacity and consider energy and water efficiency opportunities throughout the process.

- The **Iowa Finance Authority** requires an energy consultant to be a part of the Qualified Development Team, and applicants are encouraged to engage the energy consultant prior to submitting the application.
- The **West Virginia Housing Development Fund** awards points if one of the principals has attended green building training.
- As a requirement for achieving Sustainable Development points, the **Indiana Housing and Community Development Authority** requires a green professional be part of the design team (separate from the project architect or engineer) and the person must sign off on all building certifications that are committed to in the application.

**The Connecticut Housing Finance Agency provides detailed information regarding the role of the energy consultant throughout the planning, design and construction phases, 2015 Energy Conservation Guidelines.**

- 1 **Initial Assessment:** Energy Consultants discuss goals (such as ENERGY STAR Certification) and potential EE/RE opportunities with Owners and Property Managers.
- 2 **Energy Audit:** Energy Consultants perform a building study and present recommendations, including possible utility incentives and rebates.
- 3 **Solution Design:** Energy Consultants develop a scope of work for competitive bid.
- 4 **Project Finance:** Energy Consultants and Owners compare available options and secure funding, including utility incentives and rebates.
- 5 **Competitive Procurement:** Energy Consultants solicit and analyze bids; Owners sign construction and incentive contracts.
- 6 **Installation:** Energy Consultants provide field observation and construction contract administration.
- 7 **Incentives Acquisition:** Energy Consultants provide required test results, reports and certificates to the utilities for release of incentives and rebates.
- 8 **Post-project:** Energy Consultants and Owners may pursue ENERGY STAR Certification

## 6

# ENERGY AND WATER BENCHMARKING



**B**enchmarking is the process of tracking the energy and water consumption of a property on an on-going basis and comparing performance over time to similar properties, either within a complex or portfolio, or compared to similar properties elsewhere. Benchmarking the energy and water performance of a building helps building owners make data-driven decisions to improve operations and maintenance, identify opportunities for upgrades, and track investments to see if measures have realized their expected savings. For HFAs, benchmarking can help ensure that the properties they invest in stand the test of time and inform future energy and water efficiency policies and priorities.

The U.S. Department of Housing and Urban Development (HUD) has committed to benchmarking as a key tool to further its commitment to creating energy-efficient, water-efficient and healthy housing as part of a broader effort to foster the development of inclusive, sustainable, and resilient communities. Utility costs account for roughly 21% of public housing operating budgets and a similar share in the assisted housing sector. HUD spends an estimated \$6.4 billion annually to cover the costs of utilities in its public

and assisted housing programs. Benchmarking not only helps building owners make decisions, but is critical for HUD to account for utility expenditures, plan future budget needs, offer targeted incentive programs and technical assistance, and verify the return on these investments.<sup>16</sup> In October 2016, HUD issued a notice stating that it was seeking approval from the Office of Management and Budget (OMB) to require owners of certain property types to provide HUD's Office of Multifamily Housing Programs with utility consumption metrics.<sup>17</sup>

Several HFAs have taken a leadership role in promoting benchmarking for LIHTC properties. The **Illinois Housing Development Authority, New York City Housing Preservation & Development,** and the **Pennsylvania Housing Finance Agency** require properties to benchmark energy and water use (Appendix F). The **New Jersey Housing and Mortgage Finance Agency** (NJHMFA) and **Rhode**

**Island Housing** award points for projects that commit to benchmarking and the **Alaska Housing Finance Corporation** awards points for projects that commit real-time energy monitoring. For example, NJHMFA awards points to applicants that commit to collecting data from 75% of residents and uploading common area energy usage data to EPA Portfolio Manager.

**The Illinois Housing Development Authority’s (IHDA) 2016 Standards for Architectural Planning and Construction require owners to benchmark properties for a minimum of five years and provide IHDA access to the data:**

Collect and monitor project performance data on energy, water, and, if possible, healthy living environments for a minimum of five years. Allow IHDA access to that data. For sub-metered projects, property owner /developer must agree to collect utility release forms from a percentage of residents to track actual utility data of a sample of homes. The following table identifies the percentage of residents for which the property owner /developer must collect and track utility data, as based on the project size in total number of units.

Number of units / Percentage of units	0 - 25 units / 50%	25 - 100 units / 25%	100+ units / 15%
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Provide IHDA with access to the performance data annually for a five-year period through the IHDA Utility Release Form submitted prior to final closing and /or the EPA’s Portfolio Manager account information to help populate its database intended to collect national information on green affordable housing.

Multifamily building data can be tracked and analyzed using EPA’s Portfolio Manager tool: [www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager)

The Portfolio Manager Overview is an interactive energy management tool that allows the project team to track and assess energy and water consumption across its entire portfolio of buildings in a secure online environment.

## 7

# WATER CONSERVATION INCENTIVES OR REQUIREMENTS

The opportunities for water efficiency improvements, and associated savings in water and wastewater charges, are substantial. Fannie Mae’s recent analysis of energy consumption in multifamily housing found that the least efficient properties use over six times as much water per square foot as the most efficient properties (twice the spread of energy consumption across the same data set).<sup>18</sup> Where water is individually metered, water efficiency investments can have a positive impact on residents’ financial security. Where water costs are paid for by the building owner, as is more common, improving water efficiency is another opportunity to reduce operating costs.

The most common strategy HFAs use to promote water efficiency is requiring or encouraging the use of low-flow plumbing fixtures. 26 HFAs require or incentivize low-flow showerheads, lavatory faucets, and toilets for new construction properties and 24 HFAs require or incentivize these fixtures for rehabilitation to avoid unnecessary water consumption and its associated utility costs. Of those, 9 specifically reference EPA WaterSense-labeled products for new construction and rehabilitation.<sup>19</sup> Fixtures that meet the performance criteria for water efficiency set by the U.S. Environmental Protection Agency’s WaterSense program achieve water savings while being no more expensive to purchase and install than less efficient

products.<sup>20</sup> Recognizing that WaterSense products cost no more than standard water fixtures, the **North Carolina Housing Finance Agency** requires all plumbing fixtures in both new construction and rehabilitation projects to be EPA WaterSense labeled. For a full set of the specifications required by HFAs that encourage water conservation, please refer to Appendix G.

In addition to the HFAs that specifically require low-flow fixtures, 10 HFAs require new construction projects and 9 require rehabilitation projects to meet a third-party standard that incorporates water conservation criteria to varying degrees, as outlined below.

## WATER CONSERVATION CRITERIA IN THIRD-PARTY BUILDING STANDARDS<sup>21</sup>

Enterprise Green Communities 2015	WaterSense-labeled fixtures, if available, are mandatory for New Construction, Substantial Rehab, and Moderate Rehab.
EarthCraft Multifamily	EarthCraft Certified, Gold and Platinum levels require fixtures to meet National Energy Policy Act low-flow standards. WaterSense labeled fixtures are required for Platinum and optional for Certified and Gold.
LEED v. 4 BD+C, BD+ C Homes and MF Lowrise, and BD+C Multifamily Midrise	All newly installed fixtures that are eligible for labeling must be WaterSense-labeled.
ICC 700 National Green Building Standard (NGBS)	Points are available for water efficiency measures, including low-flow water fixtures for both New Construction and Rehabilitation projects. WaterSense-labeled products are not specified.

## 8

# COORDINATION WITH UTILITY ENERGY EFFICIENCY PROGRAMS

Utility spending on energy efficiency has increased significantly in the past decade. Funding for such programs was roughly \$7.7 billion in 2015.<sup>22</sup> Many utilities have efficiency programs designed to help owners of affordable housing invest in efficiency repairs and improvements. Increasingly, in a time of constrained housing resources, HFAs are beginning to look for ways to help owners and developers access these utility energy and water efficiency programs and incentives.

One such method is by encouraging or requiring applicants to identify utility-sponsored, local, regional, or federal energy efficiency rebate or incentive programs for which the property is eligible. Minnesota Housing, the Connecticut Housing Finance Authority, the **Maryland Department of Housing and Community Development**, the **Utah Housing Corporation**, the **Iowa Finance Authority**, the **Pennsylvania Housing Finance Agency** and the **Wisconsin Housing and Economic Development Authority** all require or incentivize coordination with utility-sponsored energy efficiency programs. In 2015, **Minnesota Housing** adopted an energy rebate analysis requiring developments receiving tax credits or deferred funding from Minnesota Housing to pursue utility, local, state or federal energy incentives to be incorporated into the financing plan of the development.

HFAs in other states have worked directly with utilities to develop and implement utility-funded programs aimed at increasing the energy efficiency of affordable housing. In New Jersey, PSE&G developed its multifamily retrofit program in collaboration with the **New Jersey Housing and Mortgage Finance Agency** to ensure the program met the unique needs of the multifamily affordable housing sector and to market the program to owners. The Residential Multifamily Housing Program provides owners with a free investment grade audit and upfront interest-free financing or grant incentives to cover the cost of energy efficiency improvements. PSE&G has already made more than 10,000 apartments more energy efficient and expects to complete upgrades at an additional 10,000 apartments during the next several years.<sup>23</sup>



## HIGHLIGHTS OF PSE&G RESIDENTIAL MULTIFAMILY HOUSING PROGRAM<sup>24</sup>

- Free on-site energy audit with audit report
- Resources are provided for whole-building retrofits
- Three-step payment process to eliminate the building owner's need to fund the capital investment before the project begins:
  1. Execution of contract
  2. Job 50% complete
  3. After final inspection
- PSE&G offers guidance and technical assistance for soliciting contractor bids
- Owners have the option of repaying the zero interest loans through energy savings on their utility bill with a 10-year repayment period for NJHMFA financed properties.

## MINNESOTA HOUSING'S 2015 RENTAL HOUSING DESIGN AND CONSTRUCTION STANDARDS OUTLINE THE REQUIREMENTS OF THE ENERGY REBATE ANALYSIS

### ENERGY REBATE ANALYSIS

All projects receiving tax credit allocation or deferred funding from Minnesota Housing shall provide an Energy Rebate Analysis (ERA).

- A** At the application phase, submit a preliminary/draft explanation of energy rebates being considered with estimated rebate amounts.
- B** Prior to closing/loan commitment submit a final ERA as follows:

- 1** Prepared by a third-party entity with no identity of interest to the developer, borrower, or owner of the development property. The third-party entity may be a Licensed Architect, Licensed Engineer, Needs Assessor, HERS Rater, or other entity deemed qualified by Minnesota Housing to provide this service.
- 2** The ERA should be on the letter head of the entity it was prepared by and shall include contact information and date it was prepared.
- 3** The ERA shall include a list of eligible utility company, local, regional, state, or federal rebate programs.
- 4** The ERA shall include recommendations of applicable rebates to be included with estimated rebate amounts or estimated tax credit amounts.
- 5** Include calculations, energy models, or other technical data to support recommendations.
- 6** Include letters, program data information, or other documentation from utility providers to support noted programs
- 7** If renewable energy strategies are proposed, a cost-benefit analysis shall be included.

The **Maryland Department of Housing and Community Development** (DHCD) administers the Multifamily Energy Efficiency and Housing Affordability-EmPOWER (MEEHA-EmPOWER) program, which is funded by the state's investor-owned utilities and regulated by the Maryland Public Service Commission. DHCD, and HFAs generally, are uniquely positioned to deliver utility funded programs targeted to the affordable housing sector because of their ability to streamline project execution. Through the MEEHA-EmPOWER program, DHCD provides loans and grants with flexible terms for the purchase and installation of energy conservation measures. Funding is available to two types of projects. "Pipeline Projects", those seeking DHCD rental housing financing and MEEHA-EmPOWER funding can submit one application to DHCD for all of their

financing requests. "Non-Pipeline" projects seeking funding only for energy efficiency improvements are also eligible to participate.<sup>25</sup>

While an HFA administering a utility-sponsored energy efficiency program is exceedingly rare, HFAs can still bridge the gap between affordable housing owners and utilities. HFAs have existing relationships with owners and can help provide utilities with a reliable pipeline of energy efficiency retrofit projects. In addition, HFAs can work with utilities to ensure resources continue to be available to multifamily affordable housing and that incentives and rebates are structured to meet the unique needs of the sector.

## 9

# PROJECT-SPECIFIC UTILITY ALLOWANCES



**W**here tenants pay for some or all utilities in LIHTC properties that do not receive HUD or USDA Rural Development subsidies,<sup>26</sup> the maximum net rent that an owner receives is equal to gross rent minus a utility allowance. Most owners base utility allowances on a local Public Housing Authority (PHA) schedule, which is in turn based on the typical costs of utilities paid by energy-conservative households in the locality, using community consumption data for housing of similar size and type. This method is often chosen because it is authorized by the IRS, but also easy and inexpensive. Such PHA schedules are often an inaccurate measure of actual consumption at LIHTC units, which tend to be newer and more energy-efficient than the rest of the rental housing stock available to voucher holders.

Project-specific utility allowances more accurately reflect the reasonable energy and water use of residents at a specific property, in contrast to those derived from a schedule or other means that do not reflect the particular property. Project-specific utility allowances can be calculated through either a high-quality energy consumption model or an analysis of the project's actual tenant consumption data.

**Energy Consumption Model (ECM):** An engineering-based method that provides an estimate of reasonable consumption, taking into account specific building and unit characteristics affecting consumption including unit size, building orientation, design and materials, mechanical systems, appliances and location.<sup>27</sup>

**Actual Tenant Consumption Data:** An analysis of actual consumption based on a representative sample of tenant consumption data or utility bills. The owner or regulatory agency must still select the appropriate data point for determining “reasonable” consumption, whether average or another data point. The use of actuals can only be used after a project has been in operation for 12 months or more.

Project-specific utility allowance policies and practices that account for cost-savings from energy upgrades can encourage building owners to make investments that optimize building performance. This is because investments can be recouped through increases in the net rent an owner receives without increasing the tenant’s overall housing costs (i.e., tenants are held harmless as the reduction in a tenant’s allowance are offset by the tenant’s energy cost savings). The increase in rent revenue can be re-invested to improve property conditions or resident services.

However, there are barriers to implementing project-specific utility allowances, including:

- **Access to data.** Rules vary by state and utility with regard to accessing and analyzing consumption data for tenant-metered units. In addition, obtaining individual utility release forms from tenants can be time-consuming and administratively burdensome.
- **Upfront costs.** Under IRS rules, the energy consumption model requires owners to hire qualified professionals to perform the required analysis. Assembling a representative sample of reliable consumption and cost data and calculating the resulting allowances can also take time and expense.
- **Model quality and application.** An energy consumption model must include the proper inputs and be applied correctly to account for building and unit characteristics, design and materials, mechanical systems, appliances, location and utility rates which affect the resulting allowance.
- **Market conditions.** In markets where projects are not charging maximum allowable rents due to soft market conditions, reducing the utility allowance may not result in higher net rents, possibly eliminating this mechanism for owners to recoup investments in energy efficiency or renewables.

- **Verification.** In some cases, HFAs may lack the capacity or expertise to verify the accuracy of project-specific utility allowances, whether calculated using an energy consumption model or by a sampling of actual consumption data. Verifying the accuracy of utility allowances is critical to shield residents from improper rent increases.

Despite these challenges, most HFAs allow developers to use the energy consumption model or to calculate utility allowances based on actual consumption data. Two HFAs go further, either by requiring developers to use one of these methods or by providing incentives for developers to adopt a particular method. There is no solid estimate of how many projects are using project-specific utility allowances in states where they are options. Further research is necessary to understand owners’ decisions regarding utility allowance methodologies.

In 2014, the Arizona Department of Housing began requiring properties with new LIHTC awards to calculate their utility allowances using a project-specific utility allowance. Projects that receive a new allocation of tax credits must work with a certified Residential Energy Services (RESNET) rater calculates the utility allowances. The RESNET rater uses on-site data to establish a baseline Home Energy Rating System (HERS) Index Score on the existing property conditions, then works with the developer to identify cost-effective energy improvements that will help the property earn points in the QAP. After construction, the energy model is updated and a final HERS rating and utility allowances are calculated for the property. In subsequent years, owners must calculate utility allowances using actual consumption data.

The Washington State Housing Finance Commission (WSHFC) awards two points for properties that use an Energy Consumption Model to calculate utility allowances, “In an effort to encourage building owners to make all energy saving investments that optimize a building’s energy efficiency and for tenants to conserve energy usage...”. An independent licensed engineer or other qualified third party approved by the WSHFC is required to calculate the utility allowance.

# 10 RENEWABLE ENERGY INCENTIVES



**E**ight HFAs award points to new construction or rehabilitation projects that incorporate renewable energy to offset residential or common area energy load. The requirements HFAs set forth for renewables vary by renewable energy systems allowed (solar photovoltaic, solar thermal, wind power, or geothermal, etc.) and whether renewable energy systems are required to offset a minimum level of energy load, either common area load or tenant load, and the percentage required. Please refer to Appendix I for a description of these eight HFAs’ criteria for incorporating renewable energy into LIHTC properties.

The California Tax Credit Allocation Committee (CTCAC) is the only HFA that requires a rehabilitation project to achieve energy efficiency points before it is eligible to pursue points for renewable energy. Improving the energy efficiency of a building before installing a renewable energy system will save project costs by reducing the size of the system needed to offset energy load.

For new construction, CTCAC awards points for energy efficiency with renewable energy systems that provide the following percentage of project tenants’ energy loads.

**2015 California Tax Credit Allocation Committee regulations require the following offsets to earn points:**

OFFSET OF TENANTS’ LOAD	LOW-RISE MULTIFAMILY	HIGH-RISE MULTIFAMILY
20 percent	3 points	4 points
30 percent	4 points	5 points
40 percent	5 points	

For rehabilitation, projects that receive points for energy efficiency<sup>28</sup> may be awarded points for committing to developing, and/or managing, their project with one or more of the following:

**Projects shall include either:**

- a** Photovoltaic (PV) generation that offsets tenant loads; or
- b** PV that offsets either 50 percent (50%) of common area load (if the combined available roof area of the project structures, including carports, is insufficient for provision of 50% annual common area electricity use, then the project shall have onsite renewable generation based on at least 90% of the available solar accessible roof area); or
- c** Solar hot water for all tenants who have individual water meters.

# CONCLUSION AND AREAS FOR FUTURE RESEARCH

Increasing the energy and water efficiency of LIHTC properties can help maintain affordable housing, reduce pollution, and create healthier, more comfortable living environments for residents. After a review of QAPs and accompanying documents outlining requirements, policies and priorities, it is clear HFAs are looking to improve the energy and water efficiency of the properties in which they invest. However, more research is needed to evaluate which of these strategies are most successful and to identify ways to broaden the application of these strategies to other HFA-supported housing. Specific areas of further research include:



- **Evaluate the effectiveness of the strategies employed by HFAs to improve the energy and water efficiency of the properties they finance.**

Some research has been done to evaluate specific strategies. For example, “The Impact of Energy Efficient Design and Construction on LIHTC Housing in Virginia” evaluates the effect of the **Virginia Housing Development Authority’s** QAP energy efficiency scoring criteria.<sup>29</sup> More research should be done to understand the impact these strategies have on building performance, affordability, and resident health and comfort. An evaluation of how these strategies apply to different building types (new construction, substantial rehab, moderate rehab, and adaptive reuse) could also lead to further refinement of these strategies.

- **Data driven approaches.** Access to energy consumption and cost data, either through benchmarking the energy and water use of a property or through utility allowance

calculations, not only helps owners improve operations and maintenance and prioritize investments, but can inform HFA policies and priorities. More work should be done to understand how HFAs that require or incentivize benchmarking are using the data that is collected, and whether this data is being used to help owners of poor performing buildings access resources or technical assistance that will help them make energy and water upgrades.

- **Energy and water efficiency in 4 percent tax credit properties.** This report focuses on the competitive 9 percent LIHTC program. However, more and more HFAs are seeking to use 4 percent tax credits to preserve affordable housing. More research should be done to understand the extent to which projects seeking 4 percent credits are subject to the same energy and water efficiency requirements as projects receiving an allocation of 9 percent credits. Strategies should be explored to incorporate energy and water efficiency into these properties.

HFAs, housing, and energy efficiency advocates should continue to explore options to maximize the energy and water efficiency of LIHTC properties. To that end, The National Housing Trust will continue to track strategies HFAs are using, and make the information available on PrezCat ([www.prezcat.org](http://www.prezcat.org)), our online catalog of state and local affordable housing preservation policies and tools.

Hopefully, this report and future tracking will serve as the basis for more research and conversation about the enormous benefits of energy and water efficiency in affordable housing and how best to deliver results.



## ENDNOTES

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- 6 Optimal Energy, Affordable Multifamily Energy Efficiency Potential Study, commissioned by Natural Resources Defense Council, January, 2015, located at <http://www.energyefficiencyforall.org/efficiency-potential>.
- 7 Abt Associates and National Housing Trust. "How Can the Low Income Housing Tax Credit Program Most Effectively be Used to Provide Affordable Rental Housing Near Transit?", July 2014.
- 8 Ibid.
- 9 While most states use competitive scoring criteria to rank QAPs and allocate credits, HFAs have discretion to fund priority projects that are viewed by the agency to meet a pressing state or local housing need regardless of application rank.
- 10 Vermont Housing Finance Agency, Vermont Housing & Conservation Board, and Vermont Department of Housing and Community Development. Capital Needs Assessment (CAN) Guidance, 2015. Retrieved from <http://www.vhfa.org/documents/developers/CNA%20-%>
- 11 Baechler MC. 2011. A Guide to Energy Audits. PNNL-20956, Pacific Northwest National Laboratory, Richland, WA. Retrieved from: [http://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-20956.pdf](http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20956.pdf)
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- 13 RESNET (n.d.) *Home Energy Rating*. Retrieved from: <http://www.resnet.us/energy-rating>. For multifamily, the Energy Rating Index is calculated using a conditioned floor area weighted average of the Energy Rating Index Values from all dwelling units; or the weighted average of the Energy Rating Index from all values dwelling units based on the unit distribution; or the largest Energy Rating Index of all dwelling units in the building, as approved the authority having jurisdiction. Please see Interpretation Request: Application of ANSI/RESNET 301-2014 to Multifamily Buildings. Retrieved from: [http://www.resnet.us/standards/MINHERS\\_301\\_Multifamily\\_Buildings\\_Rating\\_Interpretation\\_v\\_final\\_pub.pdf](http://www.resnet.us/standards/MINHERS_301_Multifamily_Buildings_Rating_Interpretation_v_final_pub.pdf)
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- 15 International Living Future Institute (n.d.) *Living Building Basics*. Retrieved from: <https://living-future.org/lbc/basics/>
- 16 60-Day Notice of Proposed Information Collection: Energy Benchmarking, 81 Fed. Reg. 192 (October 4, 2016). *Federal Register: The Daily Journal of the United States*. Web. 4 Oct. 2016.
- 17 Ibid
- 18 Fannie Mae, "Transforming Multifamily Housing: Fannie Mae's Green Initiative and ENERGY STAR® for Multifamily". Sept. 2014. p.5.
- 19 EPA WaterSense specifications: toilets: 1.28 gallons per flush, lavatory faucets 1.5 gallons per minute; showerheads 2.0 gallons per minute.
- 20 See, for example, California Energy Commission, "Staff Analysis of Lavatory Faucet Appliance Standards," Docket Number 15-AAER-05, p. 5, July 24, 2015, [http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-05/TN205513\\_20150724T152718\\_Staff\\_Analysis\\_of\\_Lavatory\\_Faucet\\_Appliance\\_Standards.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-05/TN205513_20150724T152718_Staff_Analysis_of_Lavatory_Faucet_Appliance_Standards.pdf). The commission "concluded that there was no incremental cost between a 1.5 GPM faucet and a 2.2 GPM faucet, based on studies conducted by the investor-owned utilities and verification through a retail price search showing no premium for the more efficient products" (p. 6). The commission reached a similar conclusion regarding showerheads during a separate rulemaking later in 2015. Different models of plumbing products may vary widely in price, but these differences are attributable to style, finish, material, and features unrelated to flush volume or flow rate.
- 21 Please see the section on third-party standards for further discussion of how HFAs are incorporating third-party green building standards into QAPs
- 22 Berg, W.; Nowak, S., et al. *The 2016 State Energy Efficiency Scorecard*. 2016. Retrieved from: <http://aceee.org/state-policy/scorecard>
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- 24 Bryant, Elaine and Ringhof, Susan., *The Collaborative Program Design and Delivery Strategies Behind the Development, Regulatory Approval, and Successful Implementation of PSE&G's Residential Multifamily Housing Program*. Retrieved from [http://www.puc.state.pa.us/Electric/pdf/Act129/OBF-PSEG\\_Paper.pdf](http://www.puc.state.pa.us/Electric/pdf/Act129/OBF-PSEG_Paper.pdf).
- 25 Maryland Department of Housing and Community Development. *Multifamily Energy Efficiency Improvement Programs*, 2016. Retrieved from: <http://dhcd.maryland.gov/HousingDevelopment/Pages/EnergyEfficiencyWeatherization.aspx>
- 26 In LIHTC properties that do receive HUD or RD subsidies, the utility allowance for all rent-restricted units is determined under the applicable HUD or RD program rules, which generally require project-specific allowances based upon average actual consumption and cost. 26 C.F.R. §1.42-10 (2016).
- 27 California Housing Partnership Corporation and National Housing Law Project. *An Affordable Housing Owner's Guide to Utility Allowances*, 2016. Retrieved from: [http://chpc.net/wp-content/uploads/2016/04/UA-Guide\\_April-2016Web.pdf](http://chpc.net/wp-content/uploads/2016/04/UA-Guide_April-2016Web.pdf).
- 28 CTCAC section 10325(c)(6)(D) Rehabilitation Projects: The project will be rehabilitated to improve energy efficiency above the modeled energy consumption of the building(s) based on existing conditions. In the case of projects in which energy efficiency improvements have been completed within five years prior to the application date pursuant to a public or regulated utility program or other governmental program that established existing conditions of the systems being replaced using a HERS Rater, the applicant may include the existing conditions of those systems prior to the improvements. The project must undergo an energy assessment that meets the CTCAC Existing Multifamily Assessment Protocols. The report documenting the results of the Assessment must be submitted using the Sustainable Building Method Workbook's CTCAC Existing Multifamily Assessment Report Template. Points are awarded based on the building(s) percentage decrease in estimated Time Dependent Valuation (TDV) energy use (or improvement in energy efficiency) post rehabilitation as demonstrated using the appropriate performance module of California Energy Commission (CEC) approved software: Improvement Over Current 15 percent 3 points 20 percent 5 points
- 29 Virginia Center for Housing Research at Virginia Tech. *The Impact of Energy Efficient Design and Construction on LIHTC Housing in Virginia*, 2015. Retrieved from: <http://www.housingvirginia.org/energy-efficiency-affordable-housing/>

# APPENDIX A:

## STRATEGIES STATES USE TO IMPROVE THE ENERGY AND WATER EFFICIENCY OF LIHTC PROPERTIES

	Green Capital Needs Assessment/ Physical Needs Assessment	Energy Audits or Modeling	Performance-based Requirements or Incentives	Third-party Green Building Standards	Required Energy Professional	Energy and Water Benchmarking	Water Conservation	Utility Coordination	Project-specific Utility Allowances	Re-newable energy
Alabama							X			
Alaska				X		X				X
Arizona	X	X	X	X			X		X	X
Arkansas							X			
California		X	X	X						X
Colorado				X						
Connecticut		X	X		X			X		X
Delaware		X	X							
Florida	X			X			X	X		
Georgia	X	X		X			X			
Hawaii				X						
Idaho			X	X						
Illinois	X		X	X		X				
Illinois-Chicago	X			X						
Indiana				X	X		X			
Iowa		X	X		X		X	X		
Kansas		X	X				X			
Kentucky										
Louisiana				X						
Maine							X			
Maryland		X	X	X			X	X		X
Massachusetts							X			X
Michigan				X			X			
Minnesota	X			X				X		
Mississippi				X			X			
Missouri	X	X		X						
Montana				X						
Nebraska	X									
Nevada	X	X	X				X			X
New Hampshire							X			
New Jersey				X		X		X		
New Mexico			X	X						
New York										
NYS HCR							X			
NYC HPD		X		X		X				
North Carolina							X			
North Dakota				X			X			
Ohio				X						
Oklahoma							X			
Oregon				X				X		
Pennsylvania	X	X	X	X		X		X		

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### STRATEGIES STATES USE TO IMPROVE THE ENERGY AND WATER EFFICIENCY OF LIHTC PROPERTIES

	Green Capital Needs Assessment/ Physical Needs Assessment	Energy Audits or Modeling	Performance-based Requirements or Incentives	Third-party Green Building Standards	Required Energy Professional	Energy and Water Benchmarking	Water Conservation	Utility Coordination	Project-specific Utility Allowances	Re-newable energy
Rhode Island						X		X		
South Carolina							X			
South Dakota			X				X			
Tennessee	X			X			X			
Texas				X			X			
Utah				X				X		
Vermont	X			X				X		
Virginia				X			X			X
Washington				X					X	
Washington, D.C.				X						
West Virginia					X		X			
Wisconsin		X		X				X		
Wyoming							X			

All appendices reflect approved QAPs and accompanying documents as of June 1, 2016

## APPENDIX B: GREEN CAPITAL NEEDS OR PHYSICAL NEEDS ASSESSMENTS

	Green C/PNA	Property Type	Stage Submitted
Arizona	X	Rehabilitation and Adaptive Re-use	Application
Florida	X	Rehabilitation, Acquisition and Rehab	Credit Underwriting Review
Georgia	X	Rehabilitation, Adaptive Reuse, and Historic Preservation	Application
Illinois	X	Rehabilitation	Application
Illinois-Chicago	X	All	Preliminary at Stage 1 Application Final at Stage 2
Minnesota	Optional	Rehabilitation	Application
Missouri	X	Rehabilitation	Application
Nebraska	X	Rehabilitation	Application
Nevada	X	Acquisition/Rehabilitation	Application
Pennsylvania	X	Any currently occupied residential housing development	Application
Tennessee	X	Adaptive Reuse, Preservation or Rehabilitation	Application
Vermont	X	All projects	New Construction/Adaptive Reuse/Gut Rehab: Prior to 8609 Issuance All others: Prior to Reservation

All appendices reflect approved QAPs and accompanying documents as of June 1, 2016

## APPENDIX C: ENERGY MODELING, ANALYSIS OR AUDIT REQUIREMENTS

	New Construction	Rehabilitation/ Preservation	Includes water (Y/N)	Standard Referenced	Auditor Certification Referenced
Arizona	X	X			RESNET Home Energy Rater (HERS)
California	X	X	Optional		For energy modeling and utility data analysis: California Association of Building Energy Consultants (CABEC) Certified Energy Plans Examiner (CEPE)-Res CEPE ID for 3 stories or less and Non Res CEPE ID for 4 stories or more and Whole House Rater. For Whole building energy assessment: HERS Whole House Rater, BPI Multifamily Building Analyst, GreenPoint Rater for Existing Multifamily
Connecticut	X	X		ASHRAE Level II (recommended)	Professional Engineer's license in the State of Connecticut, CEM, BPI, RESNET HERS, or Energy Star
Delaware	X	X			BPI
Georgia		X			BPI, RESNET Home Energy Rater (HERS), or equivalent
Iowa	X	X			HERS rater, certified energy rater (existing buildings)
Kansas	X	X			
Maryland		X	X		RESNET/BPI and performed by a DHCD listed Qualified Energy Auditor
Missouri		X		Minimum ASHRAE Level 1	BPI, RESNET or ENERGY STAR
Montana	Encouraged	Encouraged			
Nevada	X	X	X		Nevada Housing Division contracts with a qualified energy company
New York City HPD		X			BPI or analyst provided by Con Edison's energy efficiency incentive program
Pennsylvania		X	X		BPI Certified Multifamily Building Analyst
Wisconsin	X	X			Focus on Energy no-cost energy audit

All appendices reflect approved QAPs and accompanying documents as of June 1, 2016

## APPENDIX D:

### BUILDING ENERGY PERFORMANCE REQUIREMENTS AND INCENTIVES

	New Construction			Rehabilitation/Preservation		
	Required	Points	Standard	Required	Points	Standard
Arizona		X	Points for each HERS Index point reduction below the baseline HERS Index Score of 67	X	X	<b>Threshold:</b> 15% improvement over pre-renovation as verified by a RESNET certified HERS rater <b>Points:</b> One points for each HERS Index point reduction below baseline
California		X	Percentage improvement beyond the requirements of 2013 Title 24, Part 6 of the California Building Code: 9% improvement=3 points; 15% improvement=5 points	X	X	<b>Threshold:</b> 10% improvement above the modeled energy consumption of the building based on CTCAC Existing Multifamily Assessment Protocols <b>Points:</b> Improvement over current conditions based on the building's percentage in estimated Time Dependent Valuation (TDV) energy use, or the performance module of California Energy Commission (CEC) approved software: 15% improvement=3 points 20% improvement =5 points
Connecticut		X	Gut/Rehab and New Construction: Modeled Energy Star Home v. 3.0 HERS Index below 52, or Energy Star Multifamily High Rise energy cost savings greater than or equal to 23% over ASHRAE 90.1-2007 Standards		X	Minor, Moderate or Substantial Rehabilitation: Projected reduction in energy consumption greater than or equal to 33%
Delaware		X	For 100% electric units/buildings HERS Index Score of 55 or less (without solar PV) For units/buildings using gas: HERS Index Score of 45 or less (without solar PV)		X	For 100% electric dwellings/buildings: HERS Index Score of 65 or less (without solar PV) For dwellings/buildings using gas: HERS Index Score of 55 or less (without solar PV)
Idaho		X	HERS Index Score below 70		X	HERS Index Score below 100
Illinois		X	10% improvement over ASHRAE 90.1-2010 or HERS Index Score below 75		X	5% improvement over ASHRAE 90.1-2010 or HERS Index Score below 75
Iowa		X	HERS Index Score below 62		X	Exceed IECC 2012 by 8% or more
Kansas	X	X	<b>Threshold:</b> HERS Index Score of 100 <b>Points:</b> Tiered scale HERS Index Score of 85-78= 10 points; 77-71=15 points; 70 and below=20 points		X	Tiered scale HERS Index Score of 85-78= 10 points; 77-71=15 points; 70 and below=20 points or Rehab or Historic Conversion exceeds the requirements of the IECC
Maryland					X	20-30% improvement over baseline as determined by DHCD's required energy audit
Nevada				X		10% above the 2006 IECC Code as determined by REM-Rate Analysis or equivalent energy use analysis.
New Mexico	X		HERS Index Score below 85			
Pennsylvania		X	Achieve Energy Star v. 3.0 and reduced HERS Index Score of 60 or less without solar PV for 100% electric dwellings/buildings or 50 or less without solar PV for dwellings/buildings utilizing gas		X	Achieve Energy Star v. 3.0 and reduced HERS Index Score. Substantial Rehab: HERS Index Score of 70 or less without solar PV for 100% electric buildings or 60 or less without solar PV for dwellings with gas. Moderate Rehab: HERS Index Score of 80 or less without solar PV for 100% electric dwellings buildings or 75 or less for dwellings utilizing gas
South Dakota		X	HERS Index Score below 60		X	HERS Index Score below 60

## APPENDIX E: THIRD-PARTY BUILDING STANDARDS

	New Construction			Rehabilitation/Preservation			Referenced Standards	Different Requirements New Construction v. Rehab
	Required	Points	Preference/Goal	Required	Points	Preference/Goal		
Alaska		X					Alaska Building Energy Efficiency Standard (BEES)	X
Arizona		X			X		LEED	X
California		X			X		LEED, EGC, GreenPoint Rated Program	X
Colorado	X			X			EGC	X
Florida	X					X	LEED, NGBS, Florida Green Building Certification	X
Georgia		X					EarthCraft, LEED	
Hawaii		X			X		LEED, NGBS	
Idaho		X			X		LEED, NGBS, EGC, Passive House	
Illinois	X	X		X	X		LEED, EGC, NGBS, Passive House, Living Building Challenge	
Illinois-Chicago	X			X			City of Chicago Sustainable Development Policy	X
Indiana	X	X			X		LEED, NGBS, EGC	X
Louisiana		X			X		LEED	X
Maryland		X			X		LEED, NGBS, Green Globes, EarthCraft	
Michigan	X	X		X	X		MSHDA Affordable Green Standard, EGC, LEED	X
Minnesota	X			X			Minnesota Green Communities	
Mississippi		X			X		NGBS	
Missouri	X					X	EGC, LEED, NGBS	X
Montana			X			X	Passive House	
New Jersey		X			X		EGC, NGBS, Climate Choice Homes Program/Energy Star Tier 3 Participation, Living Building Challenge, Passive House	
New Mexico		X			X		LEED, EGC, NGBS, Build Green NM, MFA Green Building Criteria	
New York City HPD	X			X			EGC	
North Dakota		X			X		LEED, EGC, NGBS	X
Ohio	X			X			EGC, LEED, NGBS	
Oregon	X			X			EGC, Earth Advantage Homes, LEED	
Pennsylvania	X			X			EGC, Passive House	X
Tennessee		X			X		EGC	
Texas		X			X		EGC, LEED, NGBS	X
Utah		X			X		EGC, LEED	

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## APPENDIX E: THIRD-PARTY BUILDING STANDARDS

	New Construction			Rehabilitation/Preservation			Referenced Standards	Different Requirements New Construction v. Rehab
	Required	Points	Preference/Goal	Required	Points	Preference/Goal		
Vermont	X		X	X		X	VHFA green building design standards, LEED, EGC	
Virginia		X			X		EarthCraft, LEED	
Washington	X			X			Evergreen Sustainable Development Standard	X
Washington, D.C.	X			X			EGC	
Wisconsin		X			X		Wisconsin Green Built Home Standard	

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EGC-Enterprise Green Communities

LEED- Leadership in Energy and Environmental Design

NGBS- ICC 700 National Green Building Standard

## APPENDIX F: ENERGY AND WATER BENCHMARKING REQUIREMENTS AND INCENTIVES

	Required	Points	Language
Alaska		X	Points are awarded to projects that commit to a Real-time Monitoring device with the capacity to export data for retrieval and analysis by the Alaska Housing Finance Corporation.
Illinois	X		Projects must collect and monitor project performance data on energy, water and, if possible, healthy living environments for a minimum of five years, and allow the Illinois Housing Development Authority access to that data. For sub-metered projects, property owner /developer must agree to collect utility release forms from a percentage of residents to track actual utility data of a sample of homes.
New Jersey		X	Points are awarded to participants in the New Jersey Housing and Mortgage Finance Agency's (NJHMFA) Energy Benchmarking Initiative. In order to qualify for these points, the application shall include a copy of the completed and signed letter of intent from the developer to NJHMFA. For the next three years, the applicant shall ensure that at least 75 percent of the tenants have active utility release forms (or provide documentation of the efforts to obtain such forms) and common area utility data shall be reported. Common area utility data shall be uploaded into EPA Portfolio Manager.
New York City HPD	X		Applicants receiving allocations from the New York City Department of Housing Preservation and Development (HPD) must agree to New York City's Local Law 84 (LL84) and HPD's Benchmarking Protocol, including using a firm that has an EPA ENERGY STAR Portfolio Manager Automated Benchmarking System partner designation.
Pennsylvania	X		The Pennsylvania Housing Finance Agency contracts with a third-party entity to monitor the utility consumption of projects.
Rhode Island		X	Points are awarded to projects that commit to sign up with a Utility Benchmarking Service (UBS) for all utilities including tenant-paid utilities. The costs for the UBS should be reflected in the applicant's operating expenses.

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## APPENDIX G: WATER CONSERVATION REQUIREMENTS AND INCENTIVES

	New Construction				Rehabilitation/Preservation			
	Required	Points	Preferences/ Goal	Language	Required	Points	Preferences/ Goal	Language
Alabama		X		WaterSense labeled water closet, faucets (bathroom and kitchen) and showerheads.				
Arizona	X	X		<b>Required:</b> toilets 1.28 gpf, showerheads 1.75 gpm, kitchen faucets 2.0 gpm, bathroom faucets 0.5 gpm . <b>Points:</b> toilets dual flush or 1.1 gpf or less toilets throughout the project.	X	X		Same as New Construction
Arkansas	X			Showerheads 2.5 gpm	X			Same as New Construction
Florida	X			WaterSense labeled products or required maximum flow rates: showerheads 2.0 gpm or faucets 1.5 gpm	X			Same as New Construction
Georgia	X			Toilets 1.28 gpf, shower heads 2.0 gpm, kitchen faucets 2.0 gpm, bathroom faucets 1.5 gpm	X			Same as New Construction
Indiana		X		Ultra-low flush (<=1 gal per flush) or Dual Flush toilets		X		Same as New Construction
Iowa		X		WaterSense toilets 1.28 gpf (dual flush toilets do not qualify); showerheads 1.5 gpm, kitchen faucets 1.5 gallons bathroom faucets 1.0 gpm; showerheads use 1.5 gpm or less		X		Same as New Construction
Kansas	X			Showerheads 2.5 gpm	X			Same as New Construction
Maine	X			Toilets 1.6 gpf or dual flush, showerheads 2.0 gpm, faucets 1.0 gpm, urinals 1.0 gpf or waterless	X			Same as New Construction
Maryland		X		WaterSense labeled products in all units and any common facilities.		X		Same as New Construction
Massachusetts	X			Code-mandated water conservation regulations: toilets 1.6 gpf, low-flow devices, etc. and advanced water conservation measures that go beyond state/local regulations;	X			Same as New Construction
Michigan	X			WaterSense labeled fixtures, or the following specifications: toilets 1.28 gpf, Showerheads 2.0 gpm, kitchen faucet 2.0 gpm, or lavatory faucet 1.5 gpm	X			Same as New Construction
Mississippi	X			Must use at least of one (1) high efficiency toilet or dual flush per unit.	X			Same as New Construction
Montana			X	Design and product selection exceeds applicable energy codes in performance. Examples include low flow fixtures, or dual flush or composting toilets.			X	Same as New Construction

## APPENDIX G: WATER CONSERVATION REQUIREMENTS AND INCENTIVES

	New Construction				Rehabilitation/Preservation			
	Required	Points	Preferences/ Goal	Language	Required	Points	Preferences/ Goal	Language
Nevada	X	X		<b>Required:</b> showerheads 2.0 gpm, bathroom faucets 1.5 gpm. <b>Points:</b> WaterSense toilets or comparable devices.		X		WaterSense toilets or comparable devices.
New Hampshire	X			Shower heads 1.5 gpm, kitchen faucets 1.5 gpm, bathroom faucets 0.5 gpm, toilets 1.3 gpf, with a 250 gram solid waste removal capability minimum.	X			Same as New Construction
New York State HCR	X			Toilets 1.6 gpf; showerheads 2.0 gpm; kitchen faucets 2.2 gpm; bathroom faucets 1.5 gpm. Projects are encouraged to include WaterSense labeled products.	X			Same as New Construction
North Carolina	X			WaterSense labeled bathroom faucets, showerheads and toilets.	X			Same as New Construction
North Dakota		X		Points within green building criteria for water-conserving fixtures: toilets 1.28 gpf, showerheads 2.0 gpm, kitchen faucets 2.0 gpm and bathroom faucets 1.5 gpm		X		Same as New Construction
Oklahoma		X		Showerheads 2.5 gpm		X		Same as New Construction
South Carolina	X			Low-flow showerheads, kitchen and bathroom faucets, and toilets				
South Dakota	X			WaterSense qualified faucets, toilets/urinals, and showerheads	X			Same as New Construction
Tennessee	X			WaterSense labeled faucets, shower heads, and toilets and use of at least of one (1) high efficiency or dual flush toilet per unit	X			Same as New Construction
Texas		X		WaterSense labeled toilets, bathroom faucets, showerheads, and kitchen faucets.		X		Same as New Construction
Virginia		X		WaterSense faucets, showerheads, and toilets. Points for Sub-metered Water Expense		X		Same as New Construction
West Virginia		X		Showerheads 2.5 gpm, and each showerhead and faucet has an aerator installed.		X		Same as New Construction
Wyoming	X			Required <b>average</b> flow rates: lavatory faucet < 2.00 gpm, showers < 2.00 gpm per stall, toilets < 1.30 gpf, toilets are dual flush or meet WaterSense specifications	X			Same as New Construction

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gpm- gallons per minute

gpf- gallons per flush

## APPENDIX H: COORDINATION WITH UTILITIES

Connecticut	The Connecticut Housing Finance Agency (CHFA) requires applicants to submit an Energy Conservation Plan that includes information on the applicant's efforts to secure other energy efficiency-related funding, including utility-sponsored incentive commitments and local, state and federal incentives. CHFA also provides a coordinated outline of the CHFA planning, design and construction process, with the Connecticut Energy Efficiency Fund (CEEF) process for awarding energy incentives through the state's electric utilities.
Florida	Florida Housing administers the Multifamily Energy Retrofit Program (MERP) revolving loan fund to finance energy efficiency improvements identified in an energy audit for each eligible property.
Iowa	The Iowa Finance Authority includes utility company rebates for energy efficiency measures in the calculation of Total Project Costs.
Maryland	The Maryland Department of Housing and Community Development administers the Multifamily Energy Efficiency and Housing Affordability-EmPower (MEEHA-EmPower) program, which is funded by the state's investor-owned utilities. Through the MEEHA-EmPower program, DHCD provides loans and grants with flexible terms for the purchase and installation of energy conservation measures.
Minnesota	Minnesota Housing requires all projects receiving tax credits or deferred funding from Minnesota Housing to provide an Energy Rebate Analysis. The estimated rebate will be considered a source used to size tax credit and deferred loan awards.
New Jersey	PSE&G and the New Jersey Housing and Mortgage Finance Agency partnered to develop a multifamily retrofit program that provides owners with a free investment grade audit, and upfront interest-free financing or grant incentives to cover the cost of energy efficiency improvements.
Oregon	Oregon Housing and Community Services allows 9% LIHTCs to be combined with various other public and private resources including the Low Income Weatherization Program (LIWP).
Pennsylvania	The Pennsylvania Housing Finance Agency requires applicants to submit an Energy Rebate Analysis including a preliminary/draft explanation of all energy rebates that may be available for the project with estimated rebate amounts must be submitted with the application. The estimated rebate amounts are considered a source and used to size tax credit awards.
Rhode Island	Rhode Island Housing awards points for projects undertaking substantial rehabilitation that demonstrate an ability to surpass Tier II standards under National Grid's program guidelines. National Grid's Tier II Standards require a 25-44% improvement in energy performance.
Utah	For projects within the Rocky Mountain Power or Questar service area, the HERS rater will help prepare energy rebate documentation for submittal, and assist the applicant in working with utility representatives.
Vermont	The Vermont Housing Finance Agency incorporates Efficiency Vermont Energy Standards as part of its Green Building and Design Standards. Efficiency Vermont is Vermont's energy efficiency utility.
Wisconsin	The Wisconsin Housing and Economic Development Authority awards points for submission of a letter from Focus on Energy stating that the applicant has met with Focus on Energy staff to review the proposed development for possible energy savings ideas OR provide evidence that Focus on Energy has conducted a no-cost energy audit for an existing multifamily building listed on the application. Focus on Energy is Wisconsin utilities' statewide energy efficiency and renewable energy resource program.

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## APPENDIX I: RENEWABLE ENERGY INCENTIVES

	New Construction	Rehabilitation	Language
Alaska	X	X	Points are awarded for incorporating solar thermal energy, geothermal energy, or solar photovoltaic energy into the project design and operations.
Arizona	X	X	8 Points awarded to new construction or rehabilitation projects for one or multiple renewable energy systems large enough to off-set 10% of estimated residential annual energy load. 4 points for a 5% off-set, or 1.5 points if the site is designed, engineered and wired to accommodate the installation of solar PV in the future. 4 points for one or multiple renewable energy systems large enough to off-set 50% of common area energy load.
California	X	X	New Construction and Adaptive Reuse projects: Points are awarded for energy efficiency with renewable energy that provides the following percentages of project tenants' energy loads: 20% low-rise 3 points, high-rise 4 points; 30% low-rise 4 points, high-rise 5 points; 40% low-rise 5 points. Rehabilitation projects are eligible for points for renewable energy if they receive points for energy efficiency and include either: photovoltaic (PV) generation that offsets tenant loads; or PV that offsets either 50% of common area load (if the combined available roof area of the project structures, including carports, is insufficient for provision of 50% of annual common area electricity use, then the project shall have onsite renewable generation based on at least 90% of the available solar accessible roof area); or solar hot water for all tenants who have individual water meters.
Connecticut	X	X	Points awarded based on the number of Sustainable Design Measures (SDM) provided and indicated in the plans, specifications, Energy Conservation Plan, and/or other support documents. 3 sustainable design measures= 3 points, 2 sustainable design measures = 2 points, 1 sustainable design measure = 1 point. Of the four possible Sustainable Design Measures, one is a renewable energy system. The project must include a roof-top, building, or landscape integrated Photovoltaic (PV) system providing ≥ 33% of site lighting energy requirements, or an ENERGY STAR-qualified central geothermal HVAC system.
Maryland	X	X	Points awarded to any project utilizing alternative energy (solar, geothermal, etc.) for any of the following: water heating and cooling, lighting, or electric generation for common area or tenant units.
Massachusetts	X	X	Points awarded to projects that include any of the following types of renewable energy in the plans and specifications: wind energy, stationary fuel cells, hydro-electric power, solar photovoltaics, solar thermal collectors (hot water), landfill gas.
Nevada	X	X	Points awarded for the installation of renewable energy sources (e.g., photovoltaics, wind power). Projects that offset the total estimated electricity demand by 5% (4 points), 5-10% (6 points), 10-15% (8 points).
Virginia	X	X	Points awarded for any solar thermal system that meets at least 60% of the development's domestic hot water load.

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