

Program Guidebook

# 2017 Multifamily Market Transformation Program

including the

## Multifamily High Efficiency New Construction Multifamily Water and Space Heating Multifamily Direct Install

program elements

prepared for



CenterPoint Energy

by



Frontier Associates

version 20170331

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# 1. Program Overview

## 1.a. Program Description

CenterPoint Energy's Multifamily Market Transformation Program (hereafter, "Program") encompasses three program elements that address energy efficiency opportunities within the Multifamily market segment.

- The Multifamily High Efficiency New Construction program element offers developers of qualifying new Multifamily construction projects incentives for achievement of above-code energy savings and/or for the installation of certain defined prescriptive measures.
- The Multifamily Water and Space Heating element promotes the installation of energy efficient non-electric water and space heating in Multifamily housing developments. The program includes boiler systems, individual gas water and space heating units, and combination gas water heating and space heating systems.
- The Multifamily Direct Install program element offers property owners and managers a free visual audit of existing properties to determine eligibility for energy efficient direct install measures, which include LEDs, water savings measures (faucet aerator, low-flow showerheads), and water heater pipe insulation. If eligible, these measures are installed at no cost to the property and residents, and tenant education handouts are provided to residents to describe the benefits of energy efficiency and provide energy saving tips.

Projects in each program element are selected for funding based on qualifying measures, estimated completion date and available funds.

Frontier Associates ("Frontier," the Program Manager) implements the program for CenterPoint Energy ("CenterPoint"), and partners with Tempo, Inc. ("Tempo") in implementing the Multifamily High Efficiency New Construction program element.

This Guidebook presents Program participation guidelines applicable to Project Sponsors and Projects submitted in the 2017 program year. All documentation required for incentive payment must be received by November 1, 2017, in order to incentive checks to be issued during the program year. Within the Direct Install program element, all installation work must be completed by December 31, 2017. Projects that fail to meet these deadlines may need to reapply in a subsequent program year, subject to Program and incentive availability, and incentive levels in place at the time of reapplication.

The Program is one of many offered by the CenterPoint Energy offering financial incentives, educational resources, and information on energy efficiency measures and technologies. These programs are available to CenterPoint Energy Customers, including residential Customers, businesses, and schools. Information about these programs can be found at the CenterPoint Energy's website, <http://www.centerpointenergy.com>.

## 1.b. Participation Process

The Program participation process, in summary, is as follows:

1. Project Sponsors (which are typically Multifamily property developers or owners, property management or consulting companies, or contractors) begin by contacting the Program Manager and describing their proposed project in order to determine eligibility.
2. Once eligibility has been established, the Project Sponsor registers the project using the program database, and submits an application and all required documentation.

3. The Program Manager and CenterPoint present an estimate of applicable and available incentives to the Project Sponsor, along with any additional requirements for completing the project and processing the incentive payment prior to the funding expiration date.
4. Project Sponsors accept the estimate provided, and the Program Manager and CenterPoint co-signs the estimate and earmarks program funding for the project. Program funds at this point are reserved for the project.
5. The Project Sponsor completes all work, coordinating with the Program Manager and CenterPoint as directed, supplies all documentation required for payment, and notifies program staff of completion prior to the funding expiration date.
6. The Program Manager and CenterPoint reviews and approves final project documentation, arranges and conducts on-site inspections and testing as required.
7. Once approved, CenterPoint sends an incentive check directly to the Project Sponsor.

**1.c. Program Management and Contacts**

The Program Coordinator is:

**Steve Wiese**, Frontier Associates  
[swiese@frontierassoc.com](mailto:swiese@frontierassoc.com), (512) 372-8778 x118

Technical contacts within each program element are as follows:

<u>Program Element</u>	<u>Primary Contact</u>
Multifamily High Efficiency New Construction element	<b>Aaron Gary</b> , Tempo, Inc. (972) 579-2064, <a href="mailto:aaron.gary@tempopartners.com">aaron.gary@tempopartners.com</a>
Multifamily Water and Space Heating element	<b>Angel Moreno</b> , Frontier Associates (512) 372-8778 x102, <a href="mailto:amoreno@frontierassoc.com">amoreno@frontierassoc.com</a>
Multifamily Direct Install element	<b>Steve Wiese</b> , Frontier Associates (512) 372-8778 x118, <a href="mailto:swiese@frontierassoc.com">swiese@frontierassoc.com</a>

Frontier works on behalf of the CenterPoint Energy to implement the Program, and is referred to as the Program Manager. For questions regarding Frontier Associates’ relationship to the CenterPoint Energy and the Program, please contact:

**Sarah Andrews**, CenterPoint Energy  
[sarah.andrews@centerpointenergy.com](mailto:sarah.andrews@centerpointenergy.com), (713) 207-6454

**1.d. Program Changes/Updates**

This document is intended to provide a detailed and consistent reference on Program design and implementation processes to participants, but does not address every possible situation or complication which may arise during implementation. When instances requiring clarification are identified, the Program Manager will, in conjunction with CenterPoint, attempt to provide guidance consistent with Program intent as well as with other goals and priorities.

CenterPoint Energy and the Program Manager reserve the right to change Program guidelines, processes, requirements, budgets, budget allocations and other Program details at any time without prior notice to market participants. However, CenterPoint Energy and the Program Manager will strive to provide timely notice of such changes.

### **1.e. Indemnification of CenterPoint Energy and Program Manager**

CenterPoint Energy, Frontier Associates and Tempo, Inc. are not a manufacturer, supplier or guarantor of eligible energy efficiency measure components, nor are guarantors of Project Sponsors, and none make any representations or warranties of any nature, directly or indirectly, express or implied, as to performance of the Project Sponsor or of the reliability, performance, durability, condition or quality of the energy efficiency measure components selected, purchased, and installed at customer premises.

## **2. Eligibility**

### **2.a. Project Sponsors**

Project Sponsors act as a single point of contact with the Program, and have ultimate responsibility for fulfilling all obligations associated with proposed and accepted projects. Any entity with a material interest in the project or projects proposed, and who meets all program participation requirements, is eligible to participate in the program as a Project Sponsor.

Eligible Project Sponsors typically include:

- Multifamily property developers, owners, management, and consulting companies
- Architectural/engineering/construction and design/build firms
- National or local energy service companies (ESCOs)
- National or local companies that provide energy-related services (e.g., contracting) or products (e.g., lighting, HVAC equipment)

In the Multifamily High Efficiency New Construction program element, Project Sponsors must be partnered with a qualified energy rater.<sup>1</sup>

To ensure that the program incentive budget is allocated to projects that are likely to meet with success, all Project Sponsors are required to demonstrate a commitment to fulfilling program objectives and competency in completing the proposed project. Participation requirements applicable to Project Sponsors include the following:

- Demonstrated successful experience by the Project Sponsor, key staff and any partners/subcontractors with work similar to that proposed, including relevant experience, areas of expertise and references
- Submission of IRS Form W-9
- Proof of applicable insurance: all statutorily required coverages, including Workers' Compensation; Commercial General Liability at \$1 million each occurrence, general aggregate; Excess Umbrella (including Bodily Injury and Property Damage combined) at \$1 million. Insurance policies should name as additional insured: Frontier Associates, 1515 S Capital of Texas Hwy, Suite 110, Austin TX 78756, 512-372-8778.

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<sup>1</sup> Qualified energy raters are typically certified HERS raters, though the Program Managers may consider additional certifications or qualification systems at their discretion.

## **2.b. Projects**

A project is defined by a set of eligible dwelling units at an eligible Multifamily property included in a single application along with a description of the proposed or installed energy efficiency features or measures, and/or estimate of energy/demand savings relative to baseline, for each unit.

Projects must be fully documented by the Project Sponsor and the Project Sponsor's qualified energy rater in order to receive initial approval and final payment. Documentation requirements generally follow those outlined in the [Texas Technical Reference Manual \(TRM\), version 4.0](#), but additional documentation may be requested by the Program Manager. Appendix C outlines documentation requirements relevant to each Program element.

## **2.c. Multifamily Units**

Units participating in all program elements must meet the following eligibility requirements to qualify for incentives:

- All units must be separately metered, and part of a Multifamily residential building. Multifamily residential buildings are defined as buildings with three or more units and with twelve or fewer above-grade residential stories<sup>2</sup>;
- All units must be serviced by CenterPoint Energy (as evidenced by approved town and ZIP code, and ultimately a CenterPoint Energy meter/ESI ID number);
- New/existing construction:
  - Units participating in the Multifamily High Efficiency New Construction or Multifamily Water and Space Heating program elements must be new construction, as indicated on the building permit.<sup>3</sup>
  - Multifamily Units participating in the Direct Install program element must be existing construction.
- Additional requirements for units participating in the Multifamily High Efficiency New Construction program element include:
  - Units must be built to standards above current energy codes to qualify as “high performance” and tested by a qualified energy rater;
  - Optional: To earn the Above-Code Certification incentive bonus, the unit and/or residential building must be awarded a certificate in one of the following programs:
    - Enterprise Green Communities Criteria
    - USGBC LEED
    - ENERGY STAR Certified Homes
    - ENERGY STAR Multifamily High Rise (New Construction)

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<sup>2</sup> In limited cases, townhomes that are constructed as part of a larger multifamily property may qualify, at the discretion of the Program Manager and CenterPoint Energy.

<sup>3</sup> In limited cases, major reconstruction projects permitted as remodels (“gut rehab” projects) may qualify as new construction, at the discretion of the Program Manager and CenterPoint Energy.

- National Green Building Standard
- Passive Building Certification
- Living Building Challenge Certification
- Others as approved by CenterPoint Energy

All participating units in any program element must be completed with construction, testing, and results submitted by November 1, 2017 for processing.

CenterPoint will pay incentives once all requirements and conditions are met, the required data is submitted, and proper documentation is delivered to the Program.

Upon request, CenterPoint may consider innovative Multifamily projects not meeting all of the above requirements for inclusion under a Pilot program.

### **Identifying and Qualifying Hard-to-Reach Units**

Some program funds are dedicated to projects/units that serve hard-to-reach customers.

- Units participating in the Multifamily High Efficiency New Construction and Multifamily Water and Space Heating program elements may qualify for market or hard-to-reach funds.
- Units participating in the Direct Install program element must meet hard-to-reach income qualification standards.

Hard-to-reach projects are defined as those serving customers earning less than 200% of federal poverty level. Income eligibility of occupants is typically accomplished for Multifamily homes via the Public Utility Commission of Texas' (PUCT) [Property Owner Certification Form of Tenant Income Eligibility For Full Incentive Energy Efficiency Services](#).

- If the property participates in one of the programs as listed in Category 1 on the form, the Project Owner fills out the form, and attaches the required documentation. Each apartment that is used as a residence is eligible for hard to reach funding. Apartments that are used as storage units, office space, or anything other than a residence do not qualify for hard to reach funding.
- Property management can qualify a complex using Category 2 on the form. Property management can use the application for apartment rental information to fill out a worksheet for each residential apartment that is occupied if the income information was obtained during the last 18 months. Model apartments, storage units, are not counted and are not eligible. If 75% of the residential units are income qualified, then all of the residential apartments are eligible for hard to reach funding. Vacant apartments are counted as an income ineligible resident but if the complex is eligible, the vacant apartments that are intended to be rented as a residence are eligible for hard to reach funding.
- An individual building of 5 units or more in an apartment complex can qualify for hard to reach funding if 66% of the households in residential units in the building are income qualified according to the income guidelines on the form. Duplex or fourplex buildings can be eligible for hard to reach funding if 50% of the households in the building are income eligible. If the building-by-building method of income qualification is used for a Multifamily project, a tracking spreadsheet should be uploaded into the database along with the income verification forms.



Other documentation, such as certain Land Use Restrictive Agreements (LURAs), may also be acceptable.

**2.d. Energy Efficiency Measures/Equipment**

Measures eligible for incentives within each Program element are summarized in the table below.

<u>Program element</u>	<u>Eligible Measures/Equipment</u>
Multifamily High Efficiency New Construction element	<p>Building design/construction modeled to achieve above-code energy performance.</p> <p>Prescriptive measures as detailed in section 3.b.</p>
Multifamily Water and Space Heating element	<p>Efficient non-electric (natural gas) water and space heating equipment, including:</p> <ul style="list-style-type: none"> <li>• Individual water heaters,</li> <li>• Boilers, and</li> <li>• Combo unit gas heating systems.</li> </ul> <p>All water heating equipment must meet or exceed applicable federal efficiency standards and local building code requirements.</p> <ul style="list-style-type: none"> <li>• 40 gallon capacity natural gas storage tank water heaters must have an efficiency factor (EF) of at least 0.62.</li> <li>• 50 gallon capacity natural gas storage tank water heaters must have an efficiency factor of at least 0.60.</li> </ul>
Multifamily Direct Install element	<p>LED lamps must be ENERGY STAR® qualified.</p> <p>Water saving measures eligible only in units with electric water heating:</p> <ul style="list-style-type: none"> <li>• Kitchen and bathroom faucet aerators must not exceed a 1.5 GPM flow rate maximum.</li> <li>• Low-flow showerheads must not exceed a 2.0 GPM flow rate maximum.</li> <li>• Water heater pipe insulation (only in units with electric water heaters) must have a minimum insulating value of R3.</li> </ul>

All construction and installations must obtain appropriate local building permits and pass all required local inspections, and must be in full compliance with the National Electric Code and all other applicable federal, state, and local codes and standards. All equipment must be installed in accordance with manufacturer’s instructions.

## 2.e. Energy Savings

Energy and demand savings for each measure are derived from deemed savings or algorithm-based savings as documented in the currently applicable version of the [Texas Technical Reference Manual \(TRM 4.0\)](#). Where TRM deemed savings or algorithms are not directly applicable to eligible measures in this program, savings will be derived from approved methods consistent with those in the TRM.

## 3. Incentive Design and Delivery

### 3.a. Overall Budget

The 2017 budget for all three program elements is **\$1,145,000**.

Half of this total is budgeted for hard to reach projects in all three program elements, and half is budgeted for market rate projects in the Multifamily High Efficiency New Construction and Multifamily Water and Space Heating program elements.

**Table 1. Budget by Program Element and Market Segment**

Program Element	Market Segment	
	Market Rate	Hard to Reach
Multifamily High Efficiency New Construction	\$572,500	\$572,500
Multifamily Water & Space Heating		
Direct Install	not applicable	

These are budgeted amounts: the Program Manager and CenterPoint reserve the right to alter these allocations as needed throughout the program year.

### 3.b. Incentives Offered

#### Multifamily High Efficiency New Construction program element

CenterPoint offers incentives to reward Developers and qualified energy raters for each Multifamily unit that meets program guidelines. The Program currently offers financial incentives using a per unit performance metric, with prescriptive measure incentives built in to the structure. The performance of a unit is determined by the kWh saved over a predetermined baseline. Applicable units are eligible to receive an Above Code Certification bonus if they are certified with a qualifying program.

Prescriptive measures and bonus incentives are in addition to the pay-for-performance incentive. HVAC and Lighting incentives are not cumulative, i.e. 100% High Efficacy Lighting is awarded \$15/unit, not \$37/unit. A minimum of two prescriptive measures is required to participate in the program. The maximum performance-based incentive is \$40 per unit.

Prescriptive measure definitions:

- 14.5, 15, and 16+ SEER Central AC/Heat Pump – must be ENERGY STAR certified HVAC systems that meet the eligible SEER rating as demonstrated by a system AHRI certificate
- ENERGY STAR Appliances Package – must include clothes washer, refrigerator, and dishwasher, as applicable if supplied in-unit by the development
- 90 – 100% High Efficacy Lighting – can be screw in or pin based fluorescent lamps, or Light Emitting Diodes (LEDs)

- ENERGY STAR Windows – must be ENERGY STAR certified for Southern Climate Zone; U-factor of 0.40 or less AND SHGC of 0.25 or less
- R-38 Attic Insulation – incentive only applies to top-level units

The participating rater will receive a separate \$20 incentive for every eligible unit that successfully meets the Program requirements and for which all required documentation is provided in a timely manner per defined milestones. The rater incentive is not expected to fully cover the cost of the work the Rater needs to perform in order to deliver documentation required for the program.

**Table 2. Multifamily High Efficiency New Construction Program Element Incentives**

Pay-for-Performance Incentive	
Measure	Incentive
Base kWh Performance	\$0.02/kWh
Prescriptive Measures	
Measure	Incentive (per Unit)
14.5 SEER Central AC/Heat Pump	\$50
15 SEER Central AC/Heat Pump	\$75
16+ SEER Central AC/Heat Pump	\$125
ENERGY STAR Appliances Package	\$80
90% High Efficacy Lighting	\$10
95% High Efficacy Lighting	\$12
100% High Efficacy Lighting	\$15
ENERGY STAR Windows	\$80
R-38 Attic Insulation	\$25
Bonus Incentive	
Measure	Incentive
Above Code Certification Bonus	\$5/unit
Rater Incentive	
\$20/eligible unit	

**Multifamily Water and Space Heating program element**

Incentives offered for the Multifamily Water and Space Heating program element are provided below.

**Table 3. Multifamily Water and Space Heating Program Element Incentives**

Measure	Market Rate Incentive	Hard to Reach Incentive
Individual Water Heaters	\$250	\$450
Boilers	\$150	\$250
Combo Unit/Gas Heating System*	\$350-\$500	\$550-\$750

\*Range depends on an energy savings analysis performed to determine actual energy savings.

**Multifamily Direct Install program element**

This program element offers Project Sponsors a free visual audit of income eligible properties to determine eligibility for direct install measures. If eligible, these measures are procured and installed at no cost to the property and residents.

### ***3.c. Multiple Projects by Same Sponsor***

This program is designed as a Market Transformation Program, with the intent to incentivize changes to building design and construction that would not have happened without the incentive, and to encourage similar activity to occur without incentives in future projects.

To that end, CenterPoint Energy will accept two projects from the same Project Sponsor (or developer) for the same measure in a single program year in the Multifamily Water & Space Heating program element. A third project for that same measure submitted in the same program year may be accepted at a reduced incentive rate. Additional projects for the same measure submitted in consecutive program years will be subject to reduced incentive rates.

### ***3.d. Incentive Assignments***

Program incentives are paid to the building developer or owner, except for Rater incentives, which are are paid directly to the rater.

### ***3.e. Participation in Multiple Program Elements and Other CenterPoint Energy Programs***

Project Sponsors may submit a single project for consideration by one or more program elements; however, if the project is qualified for more than one program element savings and incentives will be adjusted to avoid double counting of savings and double payment of incentives. Participation in this Program does not affect a Customer's eligibility to participate in other CenterPoint Energy-sponsored energy efficiency/conservation programs.

### ***3.f. Projects that Roll Over into Subsequent Program Years***

CenterPoint and the Program Manager maintain lists of prospective projects for potential inclusion in the Program. Because projects may take more than a year to complete, Project Sponsors are advised to contact the Program Manager and CenterPoint in advance for placement on the prospects lists, but not to submit projects for approval until the program year in which they would be eligible for payment.

On occasion, approved projects may be delayed and unable to complete documentation required for incentive payment incentive prior to the program year deadline for reasons outside of the control of the Project Sponsor. In these cases, the Program Manager and CenterPoint will consider allowing the project to reapply to the subsequent year's program. Projects that reapply will be approved, and funding commitments made, at the incentive levels in place in the subsequent year's program.

Neither CenterPoint nor Frontier make any representations or guarnatees about the availability of the Program, funding, or incentive levels in subsequent years.

## **4. Participation Process**

Participating in the 2017 Multifamily Market Transformation Program is comprised of distinct stages. Below are the stages to create a project and move it through the workflow process:

1. Project Sponsor Enrollment
2. Project Initiation and Submittal
3. Approval and Funding Commitment
4. Installation, Completion and Final Submittal
5. Final Inspections and Approval
6. Payment

#### **4.a. Project Sponsor Enrollment**

In order to participate in the Program, the Project Sponsor must:

- Register for the Program on the eTrack sponsor database.
- Agree to meet all applicable Federal, State, and local building codes;
- Provide required information and certifications, including IRS form W9 and a current certificate of insurance meeting program requirements.
- For the Multifamily High Efficiency New Construction program element, identify a qualified rater who will provide documentation necessary for the project.
- Provide additional documentation as listed in Appendix C, the project application materials, and/or as requested by the Program Manager.

#### **4.b. Project Initiation and Submittal**

Once enrolled, the Project Sponsor completes an application for the proposed project using CenterPoint's online project portal (<https://centerpoint.anbetrack.com/>). To complete the application, the Project Sponsor must:

- Identify all material parties to the project, including the entities with legal title to the property during and after construction, as well as other key contacts, such as the architectural/engineering/design firm, energy modeler, etc.
- Identify a project name, addresses and ESID numbers<sup>4</sup> of all units proposed for inclusion in the project, and estimated start and completion dates,
- Agree to, sign, and submit the application form and all required project plans/data, as applicable to each proposed project/program element:
  - For the Multifamily High Efficiency New Construction program element:
    - Provide complete project plans, including a site plan, building plans, unit floor plans, unit schedule, elevations, window and door schedules, and mechanical, plumbing, lighting and appliances schedules.
    - Identify and secure the services of a qualified energy rater and certified verifier appropriate to the Above-Code Certification Bonus, being pursued for energy modeling, inspection, and testing services. The selected firms or individuals cannot be directly employed by the developer, contractor or any other entity directly affiliated to the development.
    - The participating rater will be provided with limited access to the online portal to submit projected ratings for each unique unit type or building, as appropriate, along with a spreadsheet indicating the correlation between the projected ratings and the units as referenced to the unit schedule.
  - For the Multifamily Water and Space Heating element:

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<sup>4</sup> CenterPoint Energy's Electric Customer Support office can provide support to obtain ESID numbers for multifamily properties. Project Sponsors should contact Program staff directly for these inquiries, and Program staff will act as a liaison.

- Provide specifications (make and model) of the efficient non-electric water and space heating equipment to be installed and, if applicable, specifications (make, model, year installed, and serial numbers) of existing equipment to be replaced.
- Provide evidence documenting eligibility of proposed measures as fuel switch measures, such as diagrams of electric and natural gas distribution systems at the site.
- For the Multifamily Direct Install element:
  - Provide the property address, number of units, and likely eligible measures in each unit.

#### ***4.c. Approval and Funding Commitment***

Once an administrator has reviewed the project details, the project will be approved, denied, or sent back for more information. This is also where any required pre-inspection generally takes place. The Program Manager may schedule a pre-inspection to verify eligibility of the project, savings and incentive estimates, before approving the project. Access to the site must be provided.

The Program Manager and CenterPoint Energy will review complete applications based on the following criteria:

- Project leasing date within the current calendar year;
- Project construction completion date within the current calendar year;
- Projects for which all measures will be installed by November 1 of the current calendar year.

Within the Multifamily Water and Space Heating program element, priority will be given to the following measures in this order: Combination Space & Water Heating Systems; Individual Water Heaters; Central Boiler Systems;

Once approval is granted, the Project Sponsor may begin project-related work. Incentive approvals always have an expiration date, and typically require quarterly or monthly progress reports and milestone completions in order to maintain the incentive reservation.

#### ***4.d. Installation, Completion and Final Submittal***

The Project Sponsor begins installation of the agreed energy efficiency measures. During the work completion pending stage, all project-related work is completed and, if necessary, new data is uploaded to correctly represent the measures that were implemented. After confirmation that Project measures for each premise are completed, and all required documentation has been uploaded, the Project Sponsor submits the work for final approval. The Program Manager may schedule inspections during the construction phase. Access to the site must be provided.

#### ***4.e. Final Inspections and Approval***

The Program Manager may schedule a final inspection to verify project details prior to final approval. Access to the site must be provided. The Project is then reviewed by the Program Administrator and either approved, sent back for corrections or denied. The Project Sponsor will receive an email indicating the status and any additional notes if deemed necessary.

#### **4.f. Payment**

Once a project has been approved it will be invoiced by the Program Administrator and payment made. The Project Sponsor will receive email notification once the Payment has been made.

### **5. Quality Assurance**

The program design employs pre- and post-inspections as well as non-conformance procedures for investigating the root causes of any failed inspections. Handled on a one-by-one basis, consequences may include a reduction/refusal of incentive payment. In instances where incorrect information was deliberately provided by a contractor or distributor, those businesses may be suspended or expelled from the program.

Applicants with projects that are found to be unlikely to produce estimated savings through the pre-inspection process will be notified of the issues regarding their project design or documentation and will be allowed to re-submit or amend their application.

Applicants with projects that fail the post-installation inspections will be required to correct the problems identified and either submit evidence of correction or schedule a second inspection, at the Program Manager's discretion. Project Sponsors that fail to correct deficiencies in a timely manner may be removed from the Program and/or be denied an incentive.

### **6. Project Sponsor Performance Standards**

#### **6.a. Project Sponsor Standing**

All Project Sponsors must maintain good standing with the Program. Project Sponsors in good standing are defined as those:

- Who have attended all required Project Sponsor meetings, technical training sessions and other mandatory events;
- Whose three most recent installations subject to a Program inspection have passed those inspections on the first attempt;
- Who have maintained and documented to the Program Manager proper and current licensure, certificates, insurance, and other eligibility requirements;
- Who have provided all required progress reports in a timely fashion;
- Who have completed more than 80% of approved projects within the applicable incentive reservation period; and,
- Who work in good faith with the Program Manager to resolve any Customer disputes or complaints and to change business practices as appropriate to reduce the likelihood of future disputes or complaints.

Project Sponsors who are not in good standing may be removed from the Program. They will be notified by the Program Manager of their status and will be required to work with the Program Manager to develop a plan to correct the problem(s). A lack of progress on this plan may lead to disqualification.

#### **6.b. Project Sponsor Disqualification**

All Project Sponsors are required to maintain proper licensure, certificates, insurance, and other eligibility requirements as stated in the online registration system. The Program Manager may also determine and maintain metrics of Project Sponsor performance which may be used to

disqualify Project Sponsors from participation in the Program. Project Sponsor performance metrics which indicate potential grounds for disqualification may include, but are not limited to:

- High rates of Customer complaints handled by Program Management staff;
- High rates of submitting incomplete or ineligible project applications;
- Low rates of passing Program inspections;
- Low rates of completing pre-approved projects within the incentive reservation period;

### **6.c. Dispute Resolution**

Unresolved disputes hurt the success of the Program. In this respect, the overriding objective of all the participants in the Program is to achieve 100% Customer satisfaction and to satisfactorily resolve any and all disputes at the lowest level possible.

Disputes, concerns or complaints arising from Customers should, in general, be addressed at the lowest level possible. Most of the time, this means the problem should be resolved between the Project Sponsor and Customer.

Issues that cannot be addressed by the Project Sponsor and Customer and are brought to the attention of the Program Manager may be addressed by the Program Manager. The Program Manager's first level response shall be to document the date and nature of the complaint and the specific details. This shall include contact information, name, address, phone number and/or email of all parties involved. The Program Manager will maintain all contact and status records. This will open the issue; next an appropriate action step must be completed for it to be resolved and closed. The Program Manager shall be responsible to delegate or take action to resolve the issue within 2 weeks.

Disputes, concerns or complaints arising between Project Sponsors and the Program Manager shall follow a similar path. The Program Manager's first level response shall be to document the date and nature of the complaint and the specific details. Again, this will include contact information, name, address, phone number, and/or email of all parties involved. The Program Manager will maintain all contact and status records. This will open the issue; next an appropriate action step must be completed for it to be resolved and closed. The Program Manager shall be responsible to delegate or take action to resolve the issue within 2 weeks.

Disputes that cannot be resolved or have future action agreed to by all parties during initial contact may be brought to the second level or to the Energy Efficiency Program Manager.





CenterPoint Energy currently serves 2,348,517 metered electricity delivery customers in its greater Houston, Texas service area, including providing electric service to the cities and zip codes listed below.

City		Zip	City		Zip
Alief	TX	77411	Houston	TX	77005
* Angleton	TX	77515	Houston	TX	77006
Bacliff	TX	77518	Houston	TX	77007
Barker	TX	77413	Houston	TX	77008
Baytown	TX	77520	Houston	TX	77009
Baytown	TX	77521	Houston	TX	77010
Baytown	TX	77522	Houston	TX	77011
Beasley	TX	77417	Houston	TX	77012
Bellaire	TX	77401	Houston	TX	77013
Bellaire	TX	77402	Houston	TX	77014
Boling	TX	77420	Houston	TX	77015
* Brazoria	TX	77422	Houston	TX	77016
* Brookshire	TX	77423	Houston	TX	77017
Channelview	TX	77530	Houston	TX	77018
Clute	TX	77531	Houston	TX	77019
Crosby	TX	77532	Houston	TX	77020
Cypress	TX	77410	Houston	TX	77021
Cypress	TX	77429	Houston	TX	77022
Cypress	TX	77433	Houston	TX	77023
Damon	TX	77430	Houston	TX	77024
Danbury	TX	77534	Houston	TX	77025
* Dayton	TX	77535	Houston	TX	77026
Deer Park	TX	77536	Houston	TX	77027
* Dobbin	TX	77333	Houston	TX	77028
* Eagle Lake	TX	77434	Houston	TX	77029
East Bernard	TX	77435	Houston	TX	77030
Egypt	TX	77436	Houston	TX	77031
Freeport	TX	77541	Houston	TX	77032
Freeport	TX	77542	Houston	TX	77033
Fresno	TX	77545	Houston	TX	77034
* Friendswood	TX	77546	Houston	TX	77035
Fulshear	TX	77441	Houston	TX	77036
Galena Park	TX	77547	Houston	TX	77037
Galveston	TX	77550	Houston	TX	77038
Galveston	TX	77551	Houston	TX	77039
Galveston	TX	77552	Houston	TX	77040
Galveston	TX	77553	Houston	TX	77041
Galveston	TX	77554	Houston	TX	77042
Galveston	TX	77555	Houston	TX	77043
Glen Flora	TX	77443	Houston	TX	77044
Guy	TX	77444	Houston	TX	77045
Highlands	TX	77562	Houston	TX	77046
Hitchcock	TX	77563	Houston	TX	77047
* Hockley	TX	77447	Houston	TX	77048
Houston	TX	77001	Houston	TX	77049
Houston	TX	77002	Houston	TX	77050
Houston	TX	77003	Houston	TX	77051
Houston	TX	77004	Houston	TX	77052

City		Zip	City		Zip
Houston	TX	77041	Houston	TX	77089
Houston	TX	77042	Houston	TX	77090
Houston	TX	77043	Houston	TX	77091
Houston	TX	77044	Houston	TX	77092
Houston	TX	77045	Houston	TX	77093
Houston	TX	77046	Houston	TX	77094
Houston	TX	77047	Houston	TX	77095
Houston	TX	77048	Houston	TX	77096
Houston	TX	77049	Houston	TX	77097
Houston	TX	77050	Houston	TX	77098
Houston	TX	77051	Houston	TX	77099
Houston	TX	77052	* Huffman	TX	77336
Houston	TX	77053	Hufsmith	TX	77337
Houston	TX	77054	Humble	TX	77325
Houston	TX	77055	Humble	TX	77338
Houston	TX	77056	* Humble	TX	77339
Houston	TX	77057	* Humble	TX	77345
Houston	TX	77058	Humble	TX	77346
Houston	TX	77059	Humble	TX	77347
Houston	TX	77060	Humble	TX	77396
Houston	TX	77061	Hungerford	TX	77448
Houston	TX	77062	Katy	TX	77449
Houston	TX	77063	Katy	TX	77450
Houston	TX	77064	Katy	TX	77491
Houston	TX	77065	Katy	TX	77492
Houston	TX	77066	Katy	TX	77493
Houston	TX	77067	Katy	TX	77494
Houston	TX	77068	* Kemah	TX	77565
Houston	TX	77069	Kendleton	TX	77451
Houston	TX	77070	Kenney	TX	77452
Houston	TX	77071	La Marque	TX	77568
Houston	TX	77072	La Porte	TX	77571
Houston	TX	77073	La Porte	TX	77572
Houston	TX	77074	Lake Jackson	TX	77566
Houston	TX	77075	Lane City	TX	77453
Houston	TX	77076	* League City	TX	77573
Houston	TX	77077	* League City	TX	77574
Houston	TX	77078	Lissie	TX	77454
Houston	TX	77079	* Liverpool	TX	77511
Houston	TX	77080	Liverpool	TX	77577
Houston	TX	77081	Magnolia	TX	77353
Houston	TX	77082	Magnolia	TX	77354
Houston	TX	77083	* Magnolia	TX	77355
Houston	TX	77084	* Manvel	TX	77578
Houston	TX	77085	Missouri City	TX	77459
Houston	TX	77086	Missouri City	TX	77489
Houston	TX	77087	Mont Belvieu	TX	77580
Houston	TX	77088	* Montgomery	TX	77356

City		Zip	City		Zip
Needville	TX	77461	* Spring	TX	77380
Newgulf	TX	77462	* Spring	TX	77382
Orchard	TX	77464	* Spring	TX	77383
Pasadena	TX	77501	Spring	TX	77386
Pasadena	TX	77502	Spring	TX	77388
Pasadena	TX	77503	Spring	TX	77389
Pasadena	TX	77504	Spring	TX	77390
Pasadena	TX	77505	Spring	TX	77391
Pasadena	TX	77506	Stafford	TX	77477
Pasadena	TX	77507	Stafford	TX	77497
Pasadena	TX	77508	Sugar Land	TX	77478
* Pattison	TX	77466	Sugar Land	TX	77479
Pearland	TX	77581	Sugar Land	TX	77487
Pearland	TX	77584	Sugar Land	TX	77496
Pinehurst	TX	77362	Thompsons	TX	77481
* Pledger	TX	77468	Tomball	TX	77375
* Prairie View	TX	77446	Tomball	TX	77377
Richmond	TX	77406	* Waller	TX	77484
Richmond	TX	77469	Wallis	TX	77485
Rosenberg	TX	77471	Webster	TX	77598
Rosharon	TX	77583	* West Columbia	TX	77486
San Felipe	TX	77473	* Wharton	TX	77434
* Santa Fe	TX	77510	* Wharton	TX	77488
Santa Fe	TX	77517			
Seabrook	TX	77586			
* Sealy	TX	77474			
Simonton	TX	77476			
South Houston	TX	77587			
Spring	TX	77373			
Spring	TX	77379			
<p><i>Indicates cities/zip codes that overlap into other utilities' service territories.</i></p> <p>* <i>Therefore, there may be customers that are not serviced by CenterPoint and would not be eligible for claiming incentives.</i></p>					

## **Appendix B. Additional Information about the Multifamily High Efficiency New Construction program element**

### ***B.1. Reporting Requirements***

CenterPoint Energy is required to collect certain data from units that are delivered to the Program. This data is usually collected by the qualified energy rater during final performance testing. Developers should work closely with their qualified energy rater to ensure this information is submitted to CenterPoint Energy. Financial incentives will only be paid after CenterPoint Energy receives the required information and verifies its accuracy.

To receive incentives from the Program:

- All required data for each unit must be submitted in the format specified by the Program;
- The participating Rater must submit a certificate the applicable Above-Code program for each participating unit (if applicable).
- Projected ratings for each unique unit type or building, as appropriate, and a spreadsheet correlating projected energy simulation files with unit types and the unit schedule.
- Confirmed ratings with an energy simulation file must be submitted for every unit or building, as appropriate, that is participating in the program.
- Testing and Inspection information must be submitted for every unit that is participating in the program, including sampling and failure data.
- AHRI certificates and/or certificate numbers are required for each unique HVAC system installed within eligible units and a spreadsheet correlating certificates and units needs to be supplied.
- Construction photos of buildings, dwelling units and applicable measure seeking incentives.
- All applicable submittals, invoices and/or bills of lading pertaining to applicable measures seeking incentives.

### ***B.2. Energy Modeling***

Energy Modeling shall be done in accordance with the Adopted RESNET Guidelines for Multi-Family Ratings or ASHRAE 90.1 with Appendix G, as appropriate.

During the initial analysis, values for performance testing (envelope leakage, duct leakage, and ventilation flow) should be estimates based on the Rater's experience.

Confirmed and/or Sampled Ratings must be submitted for high performance units to be eligible for the program. An accredited rater must model the unit's energy performance and reflect the confirmed results from inspections and testing in the energy simulation program.

These are minimum guidelines and are intended to outline the minimum requirements for participating in the Multi-Family High Efficiency New Construction program. Content in the Energy Modeling Requirements section may not meet the requirements of a selected Above-Code program. Always adhere to the most rigorous standard in the event there are overlapping requirements between project goals.

### **B.3. Sampling**

Sampling at test-out is allowed by the program, this does not waive or supersede the development's responsibilities to any jurisdiction with authority or program such as ENERGY STAR, LEED, or National Green Building Standard. At minimum, sampling shall be done in accordance with the Adopted RESNET Guidelines for Multi-Family Ratings or equivalent as approved by the Program Manager.

Failures must be corrected and retested with additional testing as required by State or local code requirement, whichever is more stringent.

### **B.4. Minimum Inspections and Testing**

For high performance units to be eligible for the program, a qualified energy rater must complete on-site inspection and diagnostic tests, including structural phase inspections and final inspections, as required by code or program participation:

- An unguarded Blower Door Envelope leakage test, and
- Duct Leakage to Outside testing

The Program will recognize the Adopted RESNET Guidelines for Multi-Family Ratings with respect to the application of performance test results to modeling, specifically:

- If the results of a dwelling unit unguarded blower door test are to be used for conducting a home energy rating, then the test results shall be multiplied by a multifamily infiltration coefficient of YYY.
- For dwelling units that indirectly use corridor air as the ventilation supply air, or that are built on a slab, or that have no conditioned space below (i.e. they serve as the lowest conditioned leak points in the building), YYY=1.0. For all other dwelling units, YYY=0.85.

Note: If the results of a dwelling unit unguarded blower door test are to be used for assessing compliance with a dwelling unit enclosure leakage limit (e.g., defined by code), application of a multifamily infiltration coefficient may not be appropriate unless approved by the local code official.

The tested air infiltration rate as demonstrated by an unguarded Blower Door Envelope leakage test, must be < 7 ACH 50, verified by a qualified energy rater.

The tested duct leakage to outside the dwelling unit must be < 8.0 cfm 25 Pascals per 100 square feet of conditioned floor area served by each system, verified by a qualified energy rater. These are minimum guidelines and are intended to outline the minimum requirements for participating in the Multifamily High Efficiency New Construction program. Content in the Minimum Inspections and Testing Requirements section may not meet the requirements of a selected Above-Code program. Always adhere to the most rigorous standard in the event there are overlapping requirements between project goals.

### **B.5. Performance Updates**

The Program will work closely with developers' production staff and/or general contractors to evaluate progress toward award commitment. The Program requires developers to submit performance updates at (up to) five production milestone dates, which will be determined upon the developers' enrollment into the Program. These performance milestones are designed to:

- Inform the Program of potential delays and shortfalls that may cause a complex to not meet its award commitment allocation;

- Give the Program insight as to whether reallocating incentive commitments is necessary; and
- Allow the Program to coordinate its sales, training, and marketing activities with each complex's timeline.

Units must be completed and tested by November 1, 2017 to qualify for the 2017 program year incentives. This date is designed to provide enough time for the program implementation team to coordinate on all documentation required to ensure proper review and submission for payment before the end of 2017.

The Program may reallocate incentive commitments, as necessary, at each production milestone to satisfy the Program's goals.

#### ***B.6. Required Data from Developers***

Developers are required to submit the following information at each production milestone:

- Number of units under construction to be submitted into the Program;
- Production delays, if any;
- Personnel changes, if any;
- Completion date;
- Commitment unit's status;

#### ***B.7. Additional Online Resources***

The following online resources are provided as program element references:

- CenterPoint Energy - Energy Efficiency Programs: [www.centerpointefficiency.com](http://www.centerpointefficiency.com)
- Enterprise Green Communities Criteria: <http://www.enterprisecommunity.org/solutions-and-innovation/green-communities/criteria>
- LEED: <http://www.usgbc.org>
- Living Building Challenge Certification: <https://living-future.org/lbc/>
- National ENERGY STAR Program: <http://www.energystar.gov/>
- National Green Building Standard: <http://www.homeinnovation.com/green>
- Passive Building Certification: <http://www.phius.org>
- Residential Energy Services Network: <http://resnet.us/> Adopted RESNET Guidelines for Multifamily Ratings: [http://www.resnet.us/professional/standards/Adopted RESNET Guidelines for Multifamily Ratings 8-29-14.pdf](http://www.resnet.us/professional/standards/Adopted_RESNET_Guidelines_for_Multifamily_Ratings_8-29-14.pdf)
- CenterPoint Energy eTrack Sponsor Database: <https://centerpoint.anbetrack.com/cnpportal/>

## Appendix C. Documentation and Milestone Dates Applicable to Applications and Final Approval/Payment

<b>Multifamily High Efficiency New Construction program element</b>	
<b>Documentation Required for Application Approval</b>	
<ul style="list-style-type: none"> <li>• Project Sponsor Information               <ul style="list-style-type: none"> <li>○ Current Certificate of Insurance</li> <li>○ IRS form W9</li> <li>○ CenterPoint Energy Vendor Master for developer/owner and Rater</li> </ul> </li> <li>• Project Information               <ul style="list-style-type: none"> <li>○ Name</li> <li>○ Addresses</li> <li>○ # of buildings</li> <li>○ # of units</li> <li>○ # of stories (total &amp; residential)</li> <li>○ Conditioned Area Breakdown                   <ul style="list-style-type: none"> <li>▪ In-unit</li> <li>▪ Residential-associated</li> <li>▪ Non-residential</li> </ul> </li> </ul> </li> <li>• Property income eligibility for Hard-to-Reach funds, established via Public Utility Commission of Texas' (PUCT) <a href="#">Property Owner Certification Form of Tenant Income Eligibility For Full Incentive Energy Efficiency Services</a> or equivalent, such as TDHCA Underwriting Report (if applicable)</li> <li>• Project Milestones               <ul style="list-style-type: none"> <li>○ Estimated Construction start and completion dates</li> <li>○ Current status of construction</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• List of Additional Key Contacts and their Roles in the Project (include as attachment)               <ul style="list-style-type: none"> <li>○ Material parties to the project, including the entities with legal title to the property during and after construction</li> <li>○ Archtectural/engineering/design firm</li> <li>○ Qualified energy rater                   <ul style="list-style-type: none"> <li>▪ Current Certificate of Insurance</li> <li>▪ IRS form W9</li> </ul> </li> <li>○ Energy modeler (if separate than rater)</li> <li>○ General Contractor</li> </ul> </li> <li>• Access to complete project plans including:               <ul style="list-style-type: none"> <li>○ Site plan</li> <li>○ Building plans</li> <li>○ Unit floor plans</li> <li>○ Unit schedule</li> <li>○ Elevations</li> <li>○ Window and door schedules</li> <li>○ Mechanical schedules</li> <li>○ Plumbing schedules</li> <li>○ Lighting schedules</li> <li>○ Appliance schedules</li> </ul> </li> <li>• Projected Energy Modeling Data               <ul style="list-style-type: none"> <li>○ Spreadsheet correlating projected energy simulation files with unit types and the unit schedule</li> <li>○ Energy simulation files</li> <li>○ Output reports (may vary depending on software used)</li> </ul> </li> </ul>
<b>Documentation Required for Final Approval and Payment</b>	
<ul style="list-style-type: none"> <li>• ESID numbers of all units proposed for inclusion in the project (gathered with assistance by CenterPoint Energy)</li> <li>• Confirmed Energy Modeling Data</li> <li>• Energy simulation files for every unit or building, as applicable, that is participating in the program</li> <li>• Output reports (may vary depending on software used)</li> <li>• Testing and Inspection information for every unit that is participating in the program</li> <li>• Date of Inspections / Tests</li> <li>• Inspection / Test Results               <ul style="list-style-type: none"> <li>○ Duct Blaster result</li> <li>○ Initial Failures</li> <li>○ Pass/Fail</li> <li>○ Blower Door result</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Sampling protocol information (if applicable)</li> <li>• Construction photos of buildings, dwelling units and applicable measure seeking incentives. (See Photo documentaion guidance.)</li> <li>• AHRI certificates and/or certificate numbers for each unique HVAC system installed within eligible units and a spreadsheet correlating certificates and units needs to be supplied.</li> <li>• All applicable submittals, invoices and/or bills of lading pertaining to applicable measures seeking incentives (electrical and gas use measures that can't be inspected visually).</li> <li>• Certificate for the applicable Above-Code program for each participating unit (if applicable).</li> </ul>



<b>Multifamily Water and Space Heating program element</b>
<b>Documentation Required for Application Approval</b>
<ul style="list-style-type: none"> <li>• Completed and Signed Application Form</li> <li>• Identification of Project Sponsor, Building Developer, Building Owner, Site Manager/Contact</li> <li>• Identification of Subject Property, Number of Units, Project Type (Individual Water Heaters, Central Boiler, or Combo System),</li> <li>• Project Sponsor W9 and Certificate of Insurance,</li> <li>• CenterPoint Energy Vendor Master for developer/owner (incentive payee)</li> </ul>
<b>Documentation Required for Final Approval and Payment</b>
<p><i>Due within 30 days of Application Approval</i></p> <ul style="list-style-type: none"> <li>• Property income eligibility for Hard-to-Reach funds, established via Public Utility Commission of Texas' (PUCT) <a href="#">Property Owner Certification Form of Tenant Income Eligibility For Full Incentive Energy Efficiency Services</a> or equivalent, such as current TDHCA Carryover Allocation Agreement or Underwriting Report (if applicable)</li> </ul> <p><i>Due by earliest of: 30 days after project completion; 30 days after Certificate of Occupancy issued; November 1, 2017:</i></p> <ul style="list-style-type: none"> <li>• Mechanical, Plumbing, and/or other construction drawings as applicable based on the project type.</li> <li>• Individual Unit Information: <ul style="list-style-type: none"> <li>○ Number of Bedrooms</li> <li>○ Number of Bathrooms</li> <li>○ Square Footage</li> <li>○ Cooling Type</li> <li>○ Heating Fuel</li> <li>○ Unit Address</li> <li>○ Eligible equipment details including Manufacturer, Model #, Capacity, Efficiency, Serial #, and specification sheets.</li> </ul> </li> <li>• Project Invoice (or other proof of equipment purchase)</li> </ul>

<b>Direct Install program element</b>
<b>Documentation Required for Application Approval</b>
<ul style="list-style-type: none"> <li>• Completed and Signed Application Form</li> <li>• Identification of Project Sponsor, Building Developer, Building Owner, Site Manager/Contact</li> <li>• Identification of Subject Property, Number of Units, Eligible Measures</li> <li>• Property income eligibility for Hard-to-Reach funds, established via Public Utility Commission of Texas' (PUCT) Property Owner Certification Form of Tenant Income Eligibility For Full Incentive Energy Efficiency Services or equivalent, such as current TDHCA Carryover Allocation Agreement or Underwriting Report (if applicable)</li> </ul>
<b>Documentation Required for Final Approval and Payment</b>
<p><i>Due by earliest of: 30 days after project completion; November 1, 2017:</i></p> <ul style="list-style-type: none"> <li>• Unit-by-unit quantities of installed measures</li> <li>• Inspection/verification completed</li> </ul>

## **Appendix D. Overview of the CenterPoint Energy Multifamily High Efficiency New Construction program element M&V Approach**

This protocol describes how to estimate savings for new multifamily buildings through a M&V approach. The development of the new multifamily buildings M&V methodology is driven by the desire to create and implement a framework to provide high quality verified savings while not restricting the ability of new multifamily buildings program implementers to utilize the tools and systems they have developed. The protocol allows for flexibility in implementation while developing verified energy savings and balancing the risk associated with the uncertainty in the expected savings. The M&V methodology supports the following M&V goals for the new multifamily buildings programs:

- Improve reliability of savings estimates;
- Determine whether energy and peak demand savings goals have been met; and
- Inform future program planning processes

Streamlined measurement and verification of new multifamily buildings shall leverage a model-based approach to energy savings for each home and adhere to typical IPMVP protocols.

Current models approved include:

- BeOpt
- RESNET accredited hourly analysis software (i.e. Ekotrope, etc.)
- Hourly analysis programs tested in accordance with ASHRAE 140 and meeting the requirements of ASHRAE 90.1 Appendix G (i.e. DOE-2, EnergyPlus, HAP, IESVS, etc.)

Additionally, energy modelers are permitted to use spreadsheets and algorithms that enhance the underlying modeling software as part of a larger modeling package. Such enhancements to modeling packages must also be approved by the Program Manager.

This measure is to be applied to multifamily buildings, and portions thereof, based on the Implementation Guidance in Section 4.3 Multifamily of the TRM 4.0.

### **Baseline Condition**

For a list of baseline parameters and key model input values, see Table D1 for multifamily dwelling units in residential multifamily buildings that are three stories or less in height above grade.

See Table D2 for all other multifamily buildings and portions thereof.

Multifamily buildings with 4 or 5 stories above-grade that have their own heating, cooling, and hot water systems, separate from other units, and where dwelling units occupy 80% or more of the occupiable square footage of the building may select the most appropriate baseline. When evaluating mixed-use buildings for eligibility, exclude commercial / retail space when assessing whether the 80% threshold has been met.

**Table D1: New Multifamily Dwelling Unit – Baseline Characteristics**

Baseline Home Parameters and Characteristics	Baseline Specification / Value
<b>House Envelope</b>	
Unit Type	Multifamily Dwelling Units
Number of Stories Above Grade 1	Same as As-Built
Foundation Type	Same as As-Built
Number of Bedrooms	Same as As-Built
Total Conditioned Floor Area	Same as As-Built
Total Conditioned Volume	Same as As-Built
Wall Height Per Floor	Same as As-Built
Window Distribution (N,S,E,W)	Same as As-Built
Percentage Window to Floor Area	Same as As-Built
Front Door Orientation	Same as As-Built
Aspect Ratio (Length / Width)	Use the same estimated average aspect ratio for both baseline and as-built. However, it is recommended to use actual aspect ratio when actual house footprint dimensions are available.
Roof Solar Absorptivity	Same as As-Built. When as-built data is not available, use 0.75.
Attic Insulation R-Value	See IECC 2009, Table 402.1.1
Cathedral Ceiling Insulation R-Value	R-19
Percentage Cathedral Ceilings	Same as As-Built
Wall Construction	2x4-16 inch on center spacing
Wall Framing Fraction	23%
Wall Insulation	See IECC 2009, Table 402.1.1
Wall Sheathing	Plywood
Wall Insulation Grade	3
Door R-Value	Same as As-Built.
Floor Insulation	See IECC 2009, Table 402.1.1
Rim Joist	Same as wall insulation
Window U Factor	Maximum 0.4
Window SHGC	Maximum 0.3
Air Infiltration	7 ACH50
Mechanical Ventilation	None
Slab Edge Insulation	See IECC 2009, Table 402.1.1
<b>HVAC Equipment</b>	
HVAC Equipment Type	Same as As-Built
Cooling Capacity	Same as As-Built or Simulated to Reflect Reference Home Load, not to exceed 20% difference
Heating Capacity	Same as As-Built or Simulated to Reflect Reference Home Load, not to exceed 20% difference
Cooling Efficiency (SEER)	14
Heating Efficiency (AFUE)	80

Baseline Home Parameters and Characteristics	Baseline Specification / Value
Heating Efficiency (HSPF) – Heat Pump	8.2
Duct Location	100% Attic
Duct R-Value	R-6
Duct Leakage to Outside	8 CFM per 100 ft <sup>2</sup> of Conditioned Floor Area
Total Duct Leakage	12 CFM per 100 ft <sup>2</sup> of Conditioned Floor Area or Equivalent Leakage Based on Standard Assumption
Thermostat Type	Same as As-Built
Heating Setpoint	68°F
Cooling Setpoint	78°F
<b>Water Heating System</b>	
DHW Fuel Type	Same as As-Built
DHW Capacity (Gallons)	Same as As-Built for Storage. Assume a 50-gallon storage water heater when as-built water heater is instantaneous.
Energy Factor (EF)	Water heater efficiency based on updates to federal standards (10 CFR Part 430.32 <sup>14</sup> ) as of April 16, 2015
DHW Temperature	120°F
DHW Pipe Insulation	None
Low Flow Shower Heads	None
<b>Lighting</b>	
High efficacy lamps	20% of permanently installed fixtures
<b>Appliances</b>	
Ceiling fans	70.4 CFM per Watt

**Table D2: New Multifamily Building – Baseline Characteristics**

Baseline Home Parameter	Baseline Specification / Value
<b>House Envelope</b>	
Unit Type	Multifamily Building
Number of Stories Above	Same as As-Built
Foundation Type	Same as As-Built
Number of Bedrooms	Same as As-Built
Total Conditioned Floor	Same as As-Built
Total Conditioned Volume	Same as As-Built
Wall Height Per Floor	Same as As-Built
Window Distribution	Same as As-Built
Percentage Window to Floor	Same as As-Built
Front Door Orientation	Same as As-Built
Aspect Ratio (Length / Width)	Use the same estimated average aspect ratio for both baseline and as-built. However, it is recommended to use actual aspect ratio when actual house footprint dimensions are available.
Roof Solar Absorptivity	Same as As-Built. When as-built data is not available, use 0.75.
Attic Insulation U-Value	See ASHRAE 90.1-2007, Table 5.5.2
Cathedral Ceiling Insulation	See ASHRAE 90.1-2007, Table 5.5.2
Percentage Cathedral	Same as As-Built
Wall Construction	2x4 light gauge metal framing -16 inch on center spacing
Wall Framing Fraction	23%
Wall Insulation	See ASHRAE 90.1-2007, Table 5.5.2
Door R-Value	Same as As-Built.
Floor Insulation	See ASHRAE 90.1-2007, Table 5.5.2
Rim Joist	Same as wall insulation
Window U Factor	See ASHRAE 90.1-2007, Table 5.5.2
Window SHGC	See ASHRAE 90.1-2007, Table 5.5.2
Air Infiltration	Same as Proposed
Mechanical Ventilation	See ASHRAE 90.1-2007 Appendix G
Slab Edge Insulation	See ASHRAE 90.1-2007, Table 5.5.2
<b>HVAC Equipment</b>	
HVAC Equipment Type	See ASHRAE 90.1-2007, Table G3.1.1A/G3.1.1B
Cooling Capacity	Same as As-Built or Simulated to Reflect Reference Home Load, not to exceed 20% difference
Heating Capacity	Same as As-Built or Simulated to Reflect Reference Home Load, not to exceed 20% difference
Cooling Efficiency (EER)	See ASHRAE 90.1-2007, Section 6.8
Heating Efficiency	See ASHRAE 90.1-2007, Section 6.8

Baseline Home Parameters and Characteristics	Baseline Specification / Value
Heating Efficiency	See ASHRAE 90.1-2007, Section 6.8
Thermostat Type*	Same as As-Built
Heating Setpoint (Occ/Unoc)*	72°F/70°F
Cooling Setpoint (Occ/Unoc)*	78°F/80°F
<b>Water Heating System</b>	
DHW Fuel Type	Same as As-Built
DHW Capacity (Gallons)	Same as As-Built for Storage. Assume a 50-gallon storage water heater when as-built water heater is instantaneous.
Energy Factor (EF)	See ASHRAE 90.1-2007, Table 7.8
DHW Temperature	120°F
DHW Pipe Insulation	None
Low Flow Shower Heads	None
<b>Lighting*</b>	
High efficacy lamps	1.10 Watts/square foot

\*Additional guidance for schedules, lighting, and appliances can be found in the ENERGY STAR Multifamily High Rise Program Simulation Guidelines, Version 1.0, Revision 3.

## Savings Algorithms and Input Variables

### ***Building Simulation Modeling***

Two simulation models should be developed for each multifamily dwelling unit of building, as appropriate, utilizing an appropriate modeling package software. The first model simulates the baseline home's annual energy use and demand, while the second simulates the as-built home. The energy and demand savings are the difference in annual energy use between the as-built dwelling unit or building and the baseline dwelling unit or building.

### ***Energy Savings Methodology***

Energy savings are estimated utilizing whole-building simulation modeling based on on-site specific data collection, such as those data collected by qualified energy raters.

### ***Summer Demand Savings Methodology***

Summer peak demand savings are estimated utilizing whole-building simulation modeling based on on-site data collection and load shape profiles for the specific climate zone.

### ***Winter Demand Savings Methodology***

Winter peak demand savings are estimated utilizing whole-building simulation modeling based on on-site data collection and load shape profiles for the specific climate zone.

### ***Post-Processing for Calculating Demand and Energy Savings***

Annual energy savings should be calculated as the difference between the simulated annual energy use of baseline and as-built multifamily building for all energy end uses for each dwelling unit or building. Electricity consumption and savings shall be expressed in kilowatt hours (kWh) to the nearest whole kWh.

Peak demand savings should be extracted from the hourly data file in a manner consistent with the definition of peak demand incorporated in TRM 3.0 and the associated methods for extracting peak demand savings from models producing 8,760 hourly savings using Typical Meteorological Year (TMY) data. Peak demand savings shall be expressed in kilowatts (kW) to the nearest tenths of kW.

### **Program Tracking Data and Evaluation Requirements**

The following primary inputs and contextual data should be specified and tracked to inform the evaluation and apply the savings properly. While they do not need to be tracked in the program database, they must be in a format easily made available to evaluators.

- Relevant Energy Code under which the Building was Built—especially in cases where the local jurisdiction has adopted an energy code more stringent than the statewide code.
- Building Envelope
  - Dwelling Unit Type
  - House Footprint Dimensions
  - Number of Stories Above Grade 1
  - Foundation Type
  - Number of Bedrooms
  - Total Conditioned Floor Area
  - Total Conditioned Volume
  - Wall Height Per Floor
  - Window Distribution (N,S,E,W)
  - Front Door Orientation
  - Aspect Ratio (Length / Width) – when available
  - Roof Solar Absorptivity – when available
  - Attic Insulation R-Value
  - Cathedral Ceiling Insulation R-Value
  - Percentage Cathedral Ceilings
  - Ceiling Insulation Grade
  - Wall Construction
  - Wall Framing Fraction
  - Wall Insulation (R-Value)

- Wall Insulation Grade
- Door Material (Wood, Metal, Vinyl, and whether Solid Core or Hollow) – when available
- Rim Joist
- Window U Factor
- Window SHGC
- Air Infiltration
- Mechanical Ventilation
- Slab Edge Insulation – only for houses located in IECC climate zone 4
- HVAC Equipment
  - HVAC Equipment Type
  - AHRI Number of Installed HVAC Equipment – in the absence of an AHRI number, manufacturers' cut sheets and/or make and model numbers should be provided instead.
  - Cooling Capacity
  - Heating Capacity
  - Cooling Efficiency (SEER)
  - Heating Efficiency (AFUE), and HSPF for Heat Pumps
  - Duct Location
  - Duct Insulation R-Value
  - Duct Leakage to Outside (CFA)
  - Heating Set-Point Temperature(s) (°F)
  - Cooling Set-Point Temperature(s) (°F)
  - Thermostat Type (Setback or No Setback)
  - Supply Fan Power (W/CFM)
- Water Heating System
  - Water Heating Systems
  - AHRI Number of Installed Water Heating Equipment – Raters should verify the Energy Factor (EF) on-site during the final inspection; as part of the implementer QA/QC protocol, verify the AHRI information
  - DHW Fuel Type
  - DHW Capacity (Gallons)
  - Energy Factor
  - DHW Set-Point Temperature
  - DHW Pipe Insulation
  - Number of Low Flow Shower Heads and flow rate



- Number of Low Flow Faucets and flow rate
- Lighting
  - Number of sockets with high efficacy lamps or lighting power density, as appropriate.
- Appliances
  - Number of ceiling fans
  - Refrigerator Model Number
  - Dishwasher Model Number
  - Clothes Washer Presence

## References and Efficiency Standards

- RESNET accredited software:  
[http://www.resnet.us/professional/programs/energy\\_rating\\_software](http://www.resnet.us/professional/programs/energy_rating_software)
- ASHRAE 90.1, *Energy Standard for Buildings Except Low-rise Residential Buildings*
- ASHRAE 140, *Standard Method of Test for the Evaluation of Building Energy Analysis Programs*