



Home Efficiency Rebates (IRA Sections 50121): Multifamily Requirements Guidance for Modeled Savings

January 2025

VERSION 2

Published on January 17, 2025

Modification Note: This version replaces Version 1.0 published on July 5, 2024. Changes are highlighted in the text in **yellow**.

Modifications to this document are as follows.

Item No.	Description of Modification	Location(s)
1	Text added to clarify how states may choose to treat small multifamily building energy modeling.	Introduction, p. 3
2	Table 1 and sentence (and associated footnotes) describing rebate levels for 50121 modeled energy savings removed because it is duplicative of information in the Program Requirements & Application Instructions.	Section A, pp. 3-4
3	Text added to describe template for reporting within Audit Template.	Section A, p. 7
4	Option 1 updated to clarify that the software list linked in this document is a non-exhaustive list of ASHRAE 140-2007 tested modeling options.	Section A, pp. 8-9
5	Option 2 updated to clarify that the Quick Building Assessment Tool is the simplified energy modeling tool permitted for use within this option.	Section A, pp. 8-9
6	Option 3 updated to clarify that alternative energy modeling approaches may also require evaluation and to clarify when this option may be a good fit for states.	Section A, pp. 8-9
7	Text removed from body and footnote added to clarify that TREAT modeling software can support fuel switching.	Section A, p. 9
8	Updates to clarify reporting requirements related to Audit Template or standardized spreadsheet.	Section A, p. 10

9	Section "Diagnostic Testing for Modeled Path for 50121" labeled as Section B	Section B, p. 10
10	Appendix B added to describe small multifamily data requirements.	Appendix B, p. 11
11	Footnote numbering for all	Throughout

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Introduction

States¹ are required to allocate at least 10% of their rebate funding to serve low-income multifamily buildings for their residential energy rebate programs (hereafter “rebate programs”) under the Inflation Reduction Act, including the Home Efficiency Rebates program (Section 50121) and the Home Electrification and Appliance Rebates program (Section 50122).² This document is intended to assist states in developing approaches for home assessments and modeling requirements for the Home Efficiency Rebates modeled energy savings pathway for multifamily housing. For the Home Energy Rebate programs, a multifamily building is defined as a single building containing at least two dwelling units used for residential purposes. Since modeling approaches are dependent upon certain building size characteristics, the guidance below **generally** applies to buildings that are four stories or greater. **Small multifamily buildings may utilize single family home assessment and energy modeling approaches and** follow the requirements for single family buildings listed in the [Data & Tools Requirements Guide](#).³

Section A: 50121 Modeled Savings Multifamily Projects

The modeled savings pathway under the Home Efficiency Rebates program (Section 50121) requires calibrated home energy models consistent with the BPI-2400 standard to estimate energy savings prior to the upgrades.^{4,5} The BPI-2400⁶ standard applies to existing detached single-family dwellings and townhouses that have independent mechanical systems for each dwelling unit (heating, cooling, water heating, and ventilation); direct access to outdoors for each dwelling unit; and were designed to have continuous party walls with no penetrations to adjacent units, with such party walls extending from ground to roof where the dwelling unit is attached to one or more adjacent single-family dwelling units. The BPI-2400 standard does not apply to multifamily buildings. This guide is intended to provide states equivalent guidance where BPI-2400 does not apply and support states in planning their modeled program for multifamily projects.

¹ For the purposes of this document, “states” means, collectively or individually, the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands.

² See Section 3.1.3 Program Requirements: Low-Income Homes of the Program Requirements & Application Instructions: <https://www.energy.gov/scep/articles/home-energy-rebate-programs-requirements-and-application-instructions>.

³ See Section 5.1 Single Family Buildings of the Data & Tools Requirements Guide: <https://www.energy.gov/scep/articles/ira-home-energy-rebates-data-and-tools-requirements-guide>.

⁴ See 42 U.S.C. 18795(b)(1): <https://www.congress.gov/bill/117th-congress/house-bill/5376/text#H741D247E41374BD6987932592E439F1B>.

⁵ See Section 3.2.4.1.1 Addressing Missing Data for 50121 Modeled Energy Savings of the Program Requirements & Application Instructions: <https://www.energy.gov/scep/articles/home-energy-rebate-programs-requirements-and-application-instructions>.

⁶ See the BPI-2400 standard: https://www.bpi.org/_cms/docs/20240523_BPI-2400-S-2015_Delta_Standard_v2.pdf.

Multifamily Modeled Program Pathway Overview

Energy modeling for a typical multifamily project involves gathering building energy data by performing an energy audit, assessing the potential for energy efficiency measures (EEMs), and performing energy models using approved modeling software or other analytic tools to estimate the energy savings that could be achieved implementing the EEMs. The process can be seen in Figure 1 below.

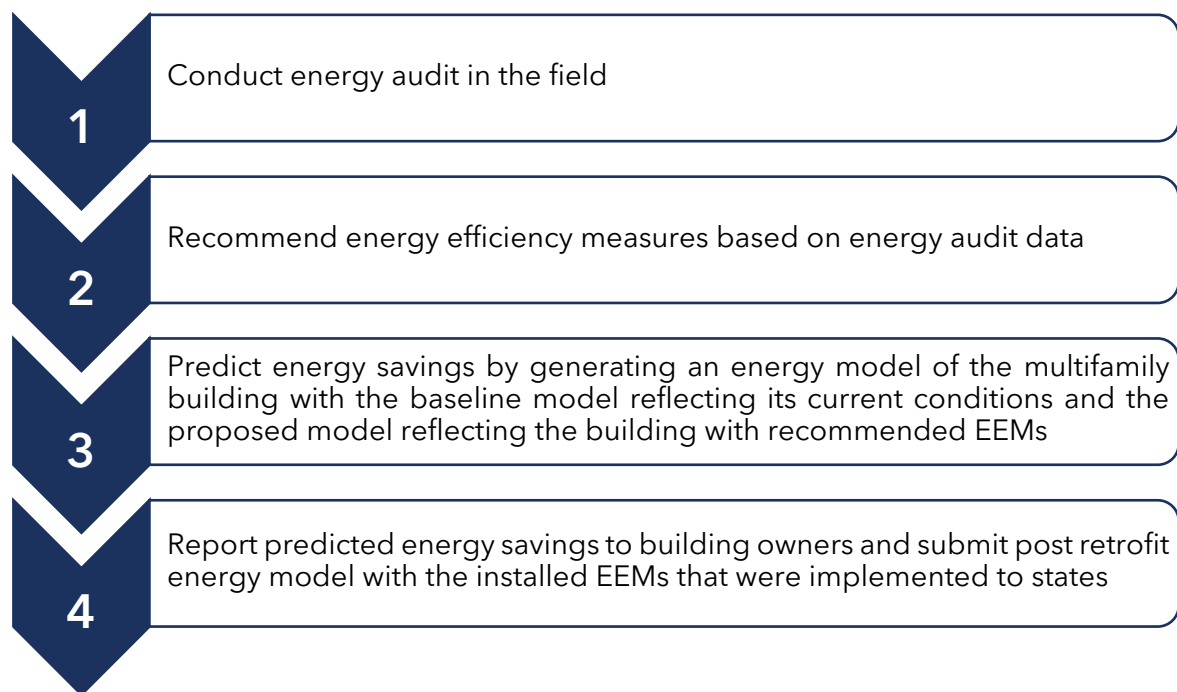


Figure 1. Multifamily Energy Modeling Process (Source: SCEP, created for this material)

Since BPI-2400 standard requirement is not applicable to multifamily energy modeling, DOE has developed this guidance for states to understand the applicable requirements for multifamily projects as they relate to:

1. Home assessments
2. Energy modeling
3. Reporting

The overview of the process for implementing the modeled path for Section 50121 projects is shown below in Figure 2.

Assessment	Energy Modeling	Reporting Data
- Energy Auditors conduct ASHRAE Level II or equivalent energy audit using Audit Template or a standardized spreadsheet - Energy Auditor identifies EEMs based on the energy audit	- Energy consultants perform energy modeling using ASHRAE standard 140-2007 tested software; OR - Energy consultants use standardized spreadsheet analysis to estimate savings; OR - Energy consultants use simplified energy modeling tools such as Quick Building Assessment Tool (QBAT).	- Energy consultants / energy modelers / building owners or eligible entity representatives / contractors report assessment and energy modeling data - Energy modeling data must be reported in BuildingSync or spreadsheet format via Audit Template or spreadsheet reporting respectively

Figure 2. Implementing the Modeled Pathway (Source: SCEP, created for this material)

Home Assessments

All buildings receiving Home Efficiency Rebates require a home assessment.⁷ State programs are required to establish basic requirements that ensure each home assessment:

- Complies with and collects information consistent with Section 5.2 of the [Data & Tools Requirements Guide](#).
- Collects and/or produces the following data points, in addition to the required data fields in the [Data & Tools Requirements Guide](#):
 - Estimated total project cost as defined in Section 2.1 of the [Program Requirements & Application Instructions](#).
 - Identification of the tool/software used to produce the energy cost estimate.⁸
 - Written acknowledgement from the consumer of the proposed project's estimated impact on household energy costs and consumption including estimate of the energy savings in dollars in year one based on current utility rates at the home.⁹

⁷ See Section 3.2.2 Program Requirements: Home Assessments of the Program Requirements & Application Instructions: <https://www.energy.gov/scep/articles/home-energy-rebate-programs-requirements-and-application-instructions>.

⁸ See Section 3.2.2 Program Requirements: Home Assessments of the Program Requirements & Application Instructions: <https://www.energy.gov/scep/articles/home-energy-rebate-programs-requirements-and-application-instructions>.

⁹ See Section 3.2.2 Program Requirements: Home Assessments of the Program Requirements & Application Instructions: <https://www.energy.gov/scep/articles/home-energy-rebate-programs-requirements-and-application-instructions>.

- Written acknowledgement from the consumer of the amount they will owe not covered by the rebates.¹⁰
- Estimated Post-Retrofit Energy Consumption of the proposed project, in a manner consistent with Section 3.2.4.1 of the [Program Requirements & Application Instructions](#).
- Estimated energy savings attributable to the proposed project, calculated in a manner consistent with Section 3.2.4.1 of the [Program Requirements & Application Instructions](#).
- Datapoints as required per the State's requirements to retain data in Section 3.2.5 of the [Program Requirements & Application Instructions](#).

A multifamily building assessment or energy audit determines how much energy a project uses and helps identify the energy saving measures that leads a project towards meeting the energy savings goal. An energy audit can vary in magnitude depending on the auditor and the needs of the project. Differences in data definitions exist, making it difficult to compare projects as well as report required data. When the energy auditing process is not defined, the quality of proposed scopes of work are more likely to vary significantly across projects, with many overlooking upgrades with significant savings potential. For instance, when an audit process is not defined and the auditor has limited time or limited access to collect building data, the auditor can choose to not review measures that could take longer to assess or not consider improvements to systems that are not accessible, such as heating units in plenum spaces.

To improve recommendations for EEMs and savings estimates, as well as facilitate reporting and data analysis, collect information consistent with Section 5.2 of the [Data & Tools Requirements Guide](#). It mirrors conducting an ASHRAE level II audit¹¹ which is the type of assessment commonly used for multifamily buildings and considered an industry standard.

In addition to these data requirements for multifamily building assessments, DOE, under this program, requires that the data collected from home assessments be reported to DOE in a standard data format (BuildingSync or standardized spreadsheet format).¹² BuildingSync is a common schema for energy audit data that can be utilized by different software and databases involved in the energy audit process. This streamlines the energy audit process, improving the value of the data and minimizing the duplication of effort for subsequent audits. It often leads to recommending better energy efficiency measures, which can achieve greater energy savings. Standardized spreadsheet reporting can be used when the assessment is done as a part of other programs that could have similar assessment requirements of conducting an ASHRAE Level II audit.

¹⁰ See Section 3.2.2 Program Requirements: Home Assessments of the Program Requirements & Application Instructions: <https://www.energy.gov/scep/articles/home-energy-rebate-programs-requirements-and-application-instructions>.

¹¹ See Section 5.2 Multifamily Buildings of the [Data and Tools Requirements Guide](#)

¹² See Section 3.1.6.1 Data Protection and Data Standards of the Program Requirements & Application Instructions: <https://www.energy.gov/scep/articles/home-energy-rebate-programs-requirements-and-application-instructions>.

To streamline the effort of reporting and standardizing the process of identifying the energy savings measures for multifamily buildings, DOE recommends the use of [Audit Template](#). The Audit Template tool follows ASHRAE Standard 211 "Standard for Commercial Building Energy Audits" and supports customization. DOE has developed a template within Audit Template for use by states that mirrors the multifamily building data inputs in Table 4 of the [Data and Tools Requirements Guide](#). In addition, Audit Template can add customized templates upon request. This customization will allow states to add standardized templates that include DOE required inputs as well as any additional inputs that are specific to the home assessment for their program. Across the country, multifamily building owners and their auditors are using this tool to assess the energy saving opportunities in their buildings. A growing number of cities also require this tool as part of alternative compliance pathways that require an energy audit or other building-level information reporting. In New York City and other major cities, there are a few local laws that mandate the reporting of energy use in multifamily buildings. To assist building owners in standardizing the reporting of energy use in multifamily buildings, the local ordinances relied on Audit Template as a tool to standardize the data collection and reporting. Audit Template is essentially a web-based app that a building auditor/assessor uses to enter building audit information such as the heating type in the building and other measures that are part of a standard energy audit. Audit Template will assist energy auditors and building authorities plan the data that needs to be collected for a successful audit.

Using Audit Template will ensure that the energy audit data is reported in BuildingSync data format which is consistent with the program requirements. However, the states can choose to use a standardized spreadsheet format to enter the data collected in an audit.

Figure 3 shows a sample workflow for performing home assessments.

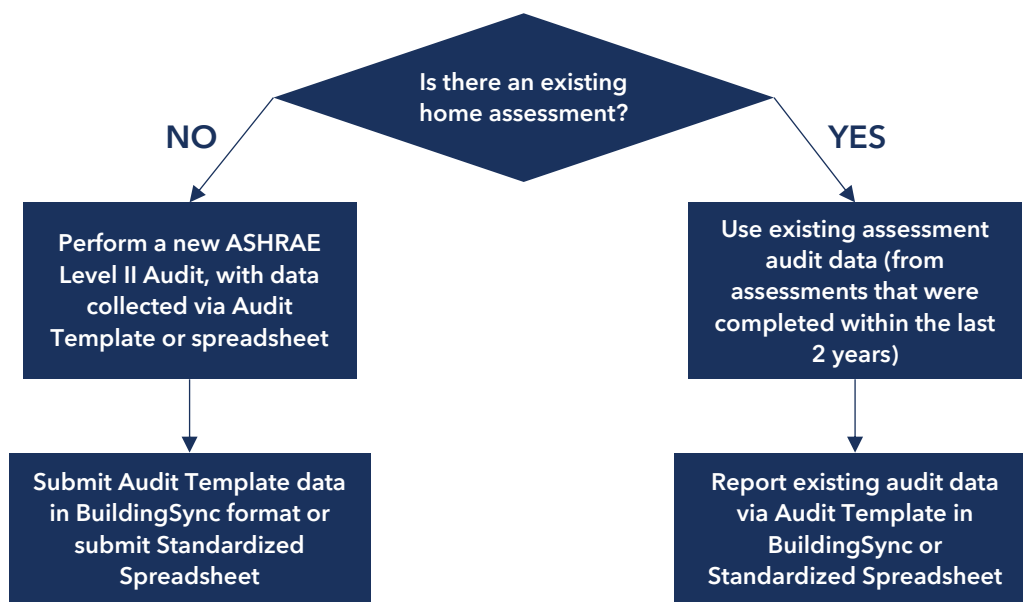


Figure 3. Sample Home Assessment Workflow (Source: SCEP, created for this material)

Energy Modeling

Energy modeling for multifamily projects can be accomplished using various methodologies. To allow states the flexibility in choosing the methodology that suits the needs of the industry within the state, the guidance lays out the multiple options. Options 1 and 2, presented below, do not require evaluation per Section 3.2.4.1.1 in the [Program Requirements & Application Instructions](#).

- Option 1: Energy modeling software that are tested to ASHRAE Standard 140-2007. Software tested to this standard includes but is not limited to the software listed on the Federal Tax Deduction (179D) Qualified Software list available [here](#)
- Option 2: The Quick Building Assessment Tool (QBAT) simplified energy modeling tool
- Option 3: Alternative energy modeling methodology (requires DOE approval and may also require evaluation)

A diagrammatic description of how energy modeling could be performed is shown in the below figure:

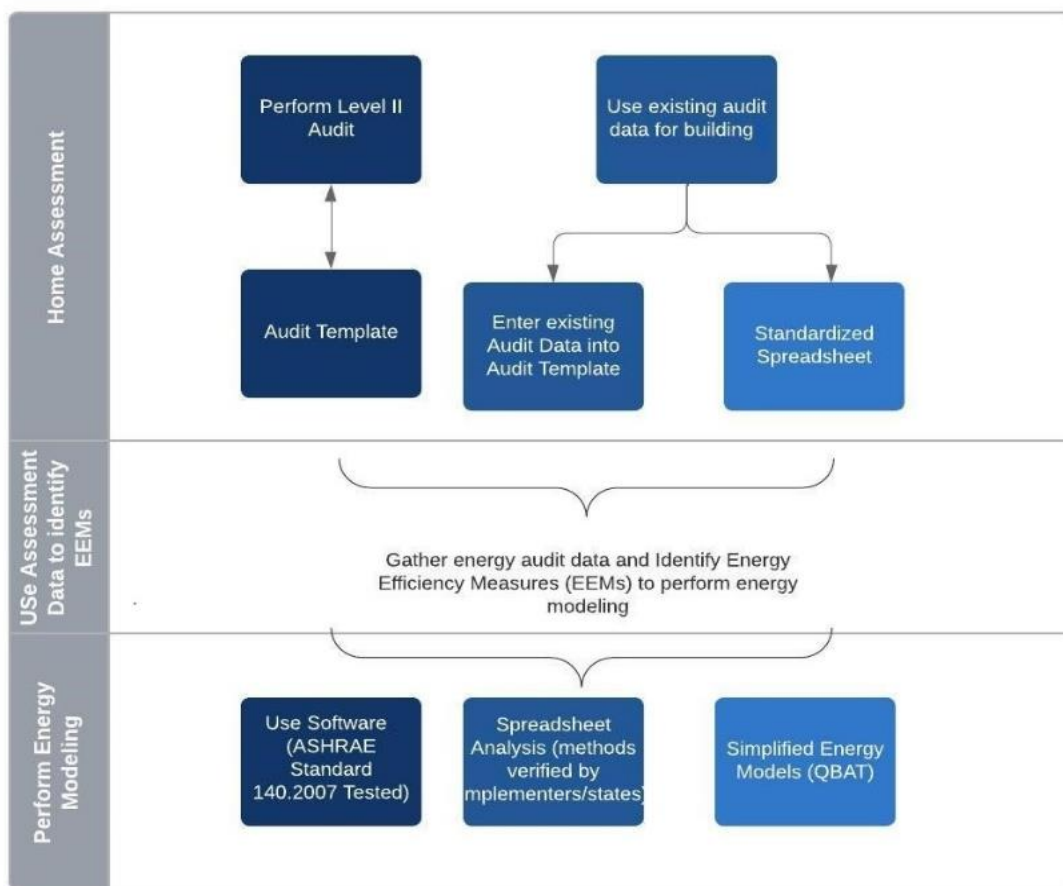


Figure 4. Energy Modeling Diagram (Source: SCEP, created for this material)

Option 1: Energy modeling using software consistent with ASHRAE Standard 140-2007

DOE recommends that state programs use energy modeling software tested to ASHRAE Standard 140-2007.¹³ ASHRAE Standard 140 is a critical part of ensuring that building energy modeling (BEM) engines provide accurate and consistent results to building designers, energy consultants, efficiency program administrators, and product developers. Detailed energy modeling is recommended for a better prediction of energy savings for the multifamily buildings. Energy modeling software results must be reported in the BuildingSync or standardized spreadsheet format.¹⁴ To submit the energy modeling data in BuildingSync format, the results must be plugged into Audit Template to submit 'post-retrofit' data.¹⁵

Commonly used energy modeling software for multifamily energy modeling such as Energy Plus, eQUEST, and any DOE-2 compliant software are tested using the ASHRAE Standard 140-2007.

Commonly used software TREAT for weatherization is also an ASHRAE 140-2007 tested option for energy modeling¹⁶. A non-exhaustive list of software tested to the ASHRAE Standard 140-2007 can be found on the Federal Tax Deduction (179D) Qualified Software list available [here](#). States may propose additional energy modeling software tested to ASHRAE 140-2007 by providing documentation demonstrating that the software has been tested to the standard.

Option 2: The Quick Building Assessment Tool (QBAT) simplified energy model

Energy modeling can be executed in the [QBAT](#), a simplified energy model, which is tested to ASHRAE Standard 140-2007. QBAT was developed to estimate energy savings for energy measures quickly without the need for complex energy modeling that is not always feasible. The simplified energy models gather assessment data and have a simple calculation engine that can estimate the energy savings with proposed energy measures. The results from using simplified energy models must be reported in BuildingSync format or a standardized spreadsheet. To submit the energy modeling data in BuildingSync format, the results must be plugged into Audit Template to submit 'post-retrofit' data.

Option 3: Alternative energy modeling methodology

States may choose to use an alternative savings estimation methodology. This is a good option for states that may already have a methodology that they follow for multifamily energy savings estimation, particularly if the state has conducted evaluations to confirm its accuracy. If a state chooses to use a savings estimation methodology not included above (Options 1 and 2), then the methodology must be reviewed and approved by DOE. If DOE determines that the proposed

¹³ See Section 5.2 Multifamily Buildings of the Data & Tools Requirements Guide:

<https://www.energy.gov/scep/articles/ira-home-energy-rebates-data-and-tools-requirements-guide>.

¹⁴ See Section 3.1.6.1 Data Protections and Data Standards of the [Program Requirements and Application Instructions](#).

¹⁵ Reference this resource for information on reporting building data in Audit Template:

<https://help.buildingenergyscore.com/support/solutions/articles/8000053355-getting-started-reporting-building-data>. Please note that the Audit Template tool can be customized for states' needs.

¹⁶A prior version of this document stated that fuel switching is not permitted in TREAT. This statement is not accurate and has been removed. TREAT modeling software is able to support fuel switching in multifamily buildings.

methodology is sufficiently supported through independent evaluation to prove its reliability, no additional evaluation is required.

If DOE determines the proposed methodology is not sufficiently reliable, states must agree to conduct a program evaluation consistent with Section 3.2.4.1.1 in the [Program Requirements & Application Instructions](#).

To request approval of an alternative methodology, a state must submit the following to DOE:

- Documentation of methodology (e.g., overview of savings estimation methodology, consistency with industry standards for savings estimation, key inputs, and results),
- An unlocked copy of the tool or spreadsheet used that applies the methodology, and
- Evaluation reports or findings related to methodology.

Reporting Modeling Data to DOE

As stated in the energy modeling sections, the **building characteristics**, energy savings measures, and the energy savings data must be reported **in Audit Template or in a standardized spreadsheet. Audit Template supports the data submission in BuildingSync.**¹⁷

The energy assessor/auditor reporting the data, can utilize the Audit Template assessment file that was used for assessment and plug in the energy savings measures that were modeled and report energy savings that were recorded in the modeling and generate a 'post-retrofit' file in Audit Template which supports the data submission in BuildingSync format. If Audit Template is not used, the energy saving measures and the energy savings data can be submitted in a standardized spreadsheet format **that DOE will provide states upon request.**

Section B: Diagnostic Testing for Modeled Path for 50121

Diagnostic testing requirements for multifamily buildings are like single family buildings listed in the [Data and Tools Guide](#). All insulation, air sealing and HVAC projects must be installed by a qualified contractor. Contractors must document the install by capturing geo-tagged photos (use of PNNL's Quality Install Tool¹⁸ is recommended).

¹⁷ See Section 5.2 Multifamily Buildings of the Data & Tools Requirements Guide:

<https://www.energy.gov/scep/articles/ira-home-energy-rebates-data-and-tools-requirements-guide>.

¹⁸ See <https://quality-install-tool.pnnl.gov/>. Specifically, the workflow should be for ductless heat pump and central ducted split heat pump depending on which system is being installed.

Appendix A: Data requirements for home assessment and energy modeling data reporting

Table 10 in Section 5.2 Multifamily Buildings of the [Data & Tools Requirements Guide](#) shows the data elements that must be collected and reported for a multifamily building assessment. All data elements are required for modeled projects unless they are not applicable to the building type.

Appendix B: Small Multifamily Data requirements for home assessment and energy modeling data reporting

For small multifamily buildings where an ASHRAE Level II audit and a detailed energy model is not a good fit, the states can choose to follow the home assessment and modeling guidelines for single family buildings listed in the [Data & Tools Requirements Guide](#).

When a state chooses to follow single family building modeling guidelines for small multifamily buildings, they may use energy modeling software on DOE's approved single family modeling tools list without additional approval. The audit/assessment data then must be consistent with the single family buildings' HPXML requirements listed in the [Data & Tools Requirements Guide](#). Small multifamily buildings following a single family modeling approach should still be reported as multifamily household eligibility (see line 19) in the Required Transaction Data Components in Table 1 of the [Data & Tools Requirements Guide](#).