

# **Regional Greenhouse Gas Initiative CO<sub>2</sub> Budget Trading Program**



## **Offset Project Consistency Application Instructions**

### **Building Sector Energy Efficiency**

**Version 1.1**

**Issued by:**  
**Bureau of Energy and Technology Policy**  
**CT Department of Energy & Environmental Protection**  
**<http://www.ct.gov/deep/>**

**April 2016**

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## 1. Overview

To demonstrate that a building sector end-use energy efficiency offset project qualifies for the award of CO<sub>2</sub> offset allowances, a Project Sponsor must submit to the Connecticut Department of Energy & Environmental Protection (“Department”) in accordance with these instructions, a fully completed *Consistency Application – Building Sector Energy Efficiency Version 1.1* (“*Consistency Application*”), including the coversheet and all forms and related attachments. An incomplete *Consistency Application* will not be reviewed to determine consistency. Following these instructions will ensure that the *Consistency Application* contains all necessary information and is submitted properly.

Each Project Sponsor should review the CO<sub>2</sub> Budget Trading Program regulations at [section 22a-174-31a of the Regulations of Connecticut State Agencies](#) (“RCSA”) addressing offset projects and the award of CO<sub>2</sub> offset allowances. All offset application materials and other documents are available at [www.ct.gov/deep/cwp/view.asp?a=2684&Q=440696&depNav\\_GID=1619](http://www.ct.gov/deep/cwp/view.asp?a=2684&Q=440696&depNav_GID=1619).

Before the *Consistency Application* can be completed, the Project Sponsor must establish a general account and obtain an offset project ID code through the RGGI CO<sub>2</sub> Allowance Tracking System (RGGI COATS). The Project Sponsor identified in the *Consistency Application* must be the same as the Authorized Account Representative for the RGGI COATS general account identified in the *Consistency Application*. For information about establishing a RGGI COATS general account and offset project ID code, consult the RGGI COATS User’s Guide, available at <http://www.rggi-coats.org>.

Key eligibility dates and application submittal requirements for offset projects are as follows:

- For offset projects commenced between December 20, 2005, and December 31, 2008, the *Consistency Application* must be submitted by June 30, 2009.
- For offset projects commenced on or after January 1, 2009, the *Consistency Application* must be submitted within six months after the project is commenced.
- For an offset project located in one participating state, the *Consistency Application* must be filed with the appropriate regulatory agency in that state.
- For an offset project located in more than one participating state, the *Consistency Application* must be filed in the participating state where the majority of the CO<sub>2</sub>-equivalent emissions reduction or carbon sequestration due to the offset project is expected to occur.

## 2. Submission Instructions

Please complete this form and supporting documents in accordance with [section 22a-174-31a of the RCSA](#), the RGGI Model Rule ([www.rggi.org/documents](http://www.rggi.org/documents)) and these instructions to ensure the proper handling of your application. These instructions are not a substitute for the requirements of the relevant statutes and any regulations thereunder. You should review all applicable laws prior to completing this application. Remember, it is your responsibility to comply with all applicable laws. There is no fee associated with the submission of this application.

Submit one (1) complete paper hardcopy original *Consistency Application* and one (1) electronic copy in the form of a CD disk to the Department at the location specified below. The Model Rule requires that all offset project documentation, including the *Consistency Application* shall be signed by a Professional Engineer, identified by license number. Submit hardcopies of forms requiring signatures as originally-signed copies and scan such signed forms for electronic submission. Facsimiles of the *Consistency Application* are not acceptable under any circumstances.

ATTN: MICHAEL MALMROSE  
CO<sub>2</sub> BUDGET TRADING PROGRAM  
BUREAU OF ENERGY AND TECHNOLOGY POLICY  
CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION  
10 FRANKLIN SQUARE  
NEW BRITAIN, CT 06051

If you have any questions about this application, please contact Michael Malmrose at [michael.malmrose@ct.gov](mailto:michael.malmrose@ct.gov) or at (860) 827-2933.

The *Consistency Application* has three parts, as described below. Each part comprises specified forms and required documentation. The *Consistency Application* has been created as a Microsoft Word document with editable fields. Enter information directly in the fields provided or submit information or documentation as an attachment, as directed. Include headers on all attachments indicating the form to which each is attached, the offset project name, and offset project ID code.

The Project Sponsor should save an electronic copy for his or her file to serve as a reference for any necessary remediation.

### **3. Instructions for Consistency Application Forms**

The *Consistency Application* includes ten (10) forms divided into three parts, as follows:

#### **Part 1. General Information Forms**

- Form 1.1 – Coversheet
- Form 1.2 – General Information
- Form 1.3 – Attestations
- Form 1.4 – Project Sponsor Agreement
- Form 1.5 – Disclosure of Greenhouse Gas Emissions Data Reporting

#### **Part 2. Category-Specific Information and Documentation Forms**

- Form 2.1 – Project Description
- Form 2.2 – Demonstration of Eligibility
- Form 2.3 – Emissions Baseline
- Form 2.4 – Monitoring and Verification Plan

#### **Part 3. Independent Verification Form**

- Form 3.1 – Independent Verifier Certification Statement and Report

The following instructions address each of the forms in numerical order. Note that the forms themselves include many embedded instructions.

## Part 1. General Information Forms

The five (5) forms in Part 1 of the *Consistency Application* address general requirements applicable to building sector energy efficiency offset projects. Instructions for the Part 1 forms are provided below.

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### Form 1.1      Coversheet

Enter the requested information in the editable text fields in the form.

Check the boxes to indicate that all forms are being submitted. For information about entering the Project Sponsor, offset project name and offset project ID code, and RGGI COATS account name and number, see instructions below for Form 1.2, General Information.

Submit all forms including the Coversheet. If a required form is not submitted, the *Consistency Application* will not be considered complete for commencement of review by the Department.

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### Form 1.2      General Information

Enter the requested information in the editable text fields in the form. If a text field is not applicable or is unanswerable, enter “NA.” Note the following:

**Offset Project Name and ID Code:** Enter the offset project name and ID code. The name of the offset project should be the same name entered by the Project Sponsor when creating a project record in RGGI CO<sub>2</sub> Allowance Tracking System (RGGI COATS). The offset project ID code is the alphanumeric code generated when the Project Sponsor creates a record of the offset project in RGGI COATS. See the RGGI COATS User’s Guide for more information about creating an offset project record in RGGI COATS, available at [www.rggi.org/market/tracking](http://www.rggi.org/market/tracking).

**Project Sponsor:** Identify the Project Sponsor and provide his or her contact information. The Project Sponsor is the natural person who is the Authorized Account Representative for the RGGI COATS general account identified in the *Consistency Application*.

**RGGI COATS General Account Name and Number:** Enter the RGGI COATS general account name and number. The RGGI COATS general account identified in the *Consistency Application* is the RGGI COATS account into which any awarded CO<sub>2</sub> offset allowances related to the offset project will be transferred.

**Project Information:** Enter project information. The name of the offset project should be the same name entered by the Project Sponsor when creating a project record in RGGI COATS. The project location entered should be the primary location of the project if the project consists of actions at multiple locations. The summary narrative of the project should indicate all locations where project actions occur or will occur.

**Project Sponsor Organization:** Provide the full legal name of the organization the Project Sponsor represents, including any alternative names under which the organization also may be doing business (e.g., John Doe Enterprises, Inc., d/b/a JDE). If the Project Sponsor is representing himself or herself as an individual, enter “NA”.

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### **Form 1.3 Attestations**

Check the boxes that apply and sign and date the form. Submit the originally signed form as part of the paper hardcopy *Consistency Application*. Scan the signed and dated form for submission as part of the electronic version of the *Consistency Application*.

If the offset project includes an electric generation component, any and all attribute credits generated by the offset project that may be used for compliance with a renewable portfolio standard (RPS) or other regulatory requirement (other than awarded CO<sub>2</sub> offset allowances), must be transferred to the Department. If applicable, attach a copy of the Attribute Credit Transfer Agreement to Form 1.3. The attached agreement must include a header that indicates it is an attachment to Form 1.3 and includes the offset project name and offset project ID code.

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### **Form 1.4 Project Sponsor Agreement**

Sign and date the form. Submit the originally signed form as part of the paper hardcopy *Consistency Application*. Scan the signed and dated form for submission as part of the electronic version of the *Consistency Application*.

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### **Form 1.5 Disclosure of Greenhouse Gas Emissions Data Reporting**

Check the appropriate box in the form to indicate whether greenhouse gas emissions data related to the offset project have been or will be reported to any voluntary or mandatory programs, other than the CO<sub>2</sub> Budget Trading Program. For each program for which data have been or will be reported, provide the program name, the program type (voluntary or mandatory), program contact information (website or street address), the categories of emissions data reported, the frequency of reporting, when the reporting began or will begin, and reporting status (prior, current, future). The Project Sponsor must disclose future reporting related to current commitments made to voluntary programs as well as future reporting mandated by current statutes, regulations, or judicial or administrative orders.

## Part 2. Category-Specific Information and Documentation Forms

The four (4) forms in Part 2 of the *Consistency Application* address category-specific requirements and documentation for building sector end-use energy efficiency offset projects.

### Form 2.1 Project Description

Enter information describing the offset project directly in Form 2.1 where requested. Attach a detailed narrative of the actions to be taken by the offset project. The attached narrative must include a header that indicates it is an attachment to Form 2.1 and identifies the offset project name and offset project ID code.

The attached narrative must include the following information:

1. **Summary Description of Project.** Provide a narrative summary of the actions to be taken as part of the offset project.
2. **Building Location(s) and Specifications.** Enter the following information in the Project Summary Table in Form 2.1:
  - Unique ID number (e.g., 1,2,3) for each building included in the offset project
  - Address of each building
  - Type of each building (existing building, whole-building retrofit, or new construction)
  - Use of each building (commercial or residential)
  - Square footage of each building
  - Total number of buildings included in the offset project
  - Total square footage for all buildings included in the offset project

An example of the Project Summary Table is provided below. Add additional pages of Form 2.1 as necessary to include information for all buildings included in the offset project. If the table is attached, it must conform with this format. If the table is attached, enter “Table is Attached” directly in the table in Form 2.1.

[Sample] Project Summary Table

<b>Building ID</b>	<b>Building Address/Location</b>	<b>Building Type</b>	<b>Building Use</b>	<b>Building Sq Ft</b>
		<input type="checkbox"/> Existing <input type="checkbox"/> Whole-building retrofit <input type="checkbox"/> New construction	<input type="checkbox"/> Residential <input type="checkbox"/> Commercial	
		<input type="checkbox"/> Existing <input type="checkbox"/> Whole-building retrofit <input type="checkbox"/> New construction	<input type="checkbox"/> Residential <input type="checkbox"/> Commercial	

*If additional space is necessary reproduce this table and attach it to the application. If the table is attached, enter “Table is Attached” directly in the table in Form 2.1.*

<b>Total # of Buildings:</b> _____	<b>Total Sq Ft:</b> _____
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**Note:** Multifamily residential buildings more than three stories above grade should be classified as “commercial,” in accordance with ASHRAE Standard 90.1-2004.

3. **Owners and Operators of Buildings.** For each building included in the offset project, provide the company name, contact name, address, phone number, and website (if available) of the building owner and the building operator (if different from the owner). Provide the name, address, phone number, and e-mail of the facility manager for each building.

Provide organization legal name, contact information, and physical address for the parent company if the building owner or operator is a subsidiary.

4. **Parties Implementing Offset Project.** Provide the company name, contact name, phone number, and e-mail of all general or prime contractors, subcontractors, consultants, and vendors providing significant goods and services to the offset project. Provide the company name, contact name, address, phone number, license number, and e-mail of the professional engineer (PE) that has reviewed all project documentation included in and attached to the *Consistency Application* and signed Form 1.3.
5. **Equipment and Materials Specifications.** Enter information in the Equipment and Materials Specifications Table in Form 2.1 or attach the table to summarize specifications for each planned or installed eligible energy conservation measure (ECM). Include the following information:
  - Identify the category of each applicable ECM, using the corresponding identification letter from the Categories of Eligible Energy Conservation Measures key in the Table (include only eligible ECMs).
  - Assign each ECM a unique ID number (e.g., 1,2,3).
  - Describe the specific measure taken or to be taken, including the manufacturer, model, capacity, and energy efficiency or energy performance of both original and new equipment or materials.
  - Specify the building ID numbers, consistent with those specified in the Project Summary Table in Form 2.1, for all buildings affected by the ECM.
  - For each ECM, enter the quantity of equipment or material installed and the unit of measure for the equipment or material installed (e.g., for a furnace, one unit or one piece of equipment; for ceiling insulation upgrades, ceiling square footage; etc.).
  - Specify the type(s) of fuel impacted using the letter codes provided in the Types of Fuel key in the table. Include both pre-installation and post-installation fuel type(s), even if there will be no fuel change.

An example of the Equipment and Materials Specifications Table is provided below. If the table is attached, it must conform with this format. If the table is attached, enter “Table is Attached” directly in the table in Form 2.1.

### [Sample] Equipment and Materials Specifications Table

ECM <sup>†</sup>	ID	Description of Specific ECM	List the ID Numbers of Buildings Affected by the ECM	Total Equipment/Material Installed		Fuel Type <sup>‡</sup>	
				Quantity Installed	Unit	Original	New
(a)	1.	Upgrade boiler: original Acme XYZ3 250 BTU boiler, AFUE = 75. Replace with ACME ZZZ90 250 BTU boiler, AFUE = 80.	Building 1, Building 5, Building 7	10	Boiler units	NG	NG

If additional space is necessary reproduce this table and attach it to the application. If the table is attached, enter “Table is Attached” directly in the table in Form 2.1.

<sup>†</sup> **Categories of Eligible Energy Conservation Measures**

- (a) improvements in the energy efficiency of combustion equipment that provides space heating and hot water, including a reduction in fossil fuel consumption through the use of solar and geothermal energy
- (b) improvements in the efficiency of heating distribution systems, including proper sizing and commissioning of heating systems
- (c) installation or improvement of energy management systems
- (d) improvement in the efficiency of hot water distribution systems and reduction in demand for hot water
- (e) measures that improve the thermal performance of the building envelope and/or reduce building envelope air leakage
- (f) measures that improve the passive solar performance of buildings and utilization of active heating systems using renewable energy
- (g) fuel switching to a less carbon-intensive fuel for use in combustion systems, including the use of liquid or gaseous eligible biomass, provided that conversions to electricity are not eligible

<sup>‡</sup> **Types of Fuels**

NG = natural gas      P = propane      O = heating oil      K = kerosene

6. **Documentation of Equipment and Materials Specifications.** Provide the following documentation of equipment and materials identified in the Equipment and Materials Specifications Table:

- a. For equipment, building components, and building materials installed or to be installed as part of the offset project, copies of relevant sections of the manufacturer specifications that verify all information provided in the Equipment and Materials Specifications Table. Include ENERGY STAR specifications if applicable. For building envelope components and materials, also provide documentation of R-value or U-value.
- b. For original equipment, building components, and building materials being replaced, photos of original equipment and building components/materials, equipment nameplates, energy performance or ENERGY STAR labels (as applicable, showing manufacturer, model number, and energy efficiency or energy performance), and locations of installations. For building envelope components and materials, provide documentation of R-value or U-value (if available) and photos showing wall condition and wall layers.

If equipment or building component/building material documentation is not available (e.g., due to missing labels or manuals, or discontinued equipment), provide documentation of average or generic specifications for equipment or components/materials of equivalent age and features. Documentation may include, for example, market studies from the time period of original installation or state building codes for the time period of original installation.

**Note:** The Equipment and Materials Specification Table and accompanying documentation will be used by the Department to establish ECM eligibility pursuant to subsection 22a-174-31a(g) of the RCSA. If the offset project described in the *Consistency Application* is in progress, documentation of actual post-installation equipment and materials specifications will be required as part of the first annual *Monitoring and Verification Report* submitted for the project to confirm as-installed ECM eligibility.

7. ***Building Plans and Project Technical Schematics.*** For building systems to be affected by the offset project, attach the following for each building included in the offset project:

- a. ***Pre-Installation Plans and Schematics.*** Pre-installation building plans and technical schematics of the whole building (for new buildings or whole-building retrofits) or of the affected building areas or building systems (for existing buildings with localized retrofits). Plans and schematics provided should include only sections relevant to the offset project and the following information:
  - i. Building footprint
  - ii. Design specifications, technical schematics, and drawings
  - iii. Elevations, plans, and sections
  - iv. Location, configuration, and size of all equipment, building components and building materials, and distribution systems
  - v. Copies of any calculations performed, including methodology and references (e.g., flow rates, solar heating-specific calculations)
- b. ***Post-Installation Plans and Schematics.*** Post-installation building plans and technical schematics of the whole building (for new buildings or whole-building retrofits) or of the affected building areas or building systems (for existing buildings with localized retrofits). Plans and schematics provided should include only sections relevant to the offset project and the following information:
  - i. Building footprint and demolition plan, if applicable (e.g., for changes in building footprint)
  - ii. Design specifications, technical schematics, and drawings
  - iii. Elevations, plans, and sections
  - iv. Location, configuration, and size of all equipment, building components and building materials, and distribution systems
  - v. Copies of any calculations performed, including methodology and references (e.g., flow rates, solar heating-specific calculations)

c. **Additional Measure-Specific Documentation.** Provide the following additional documentation (both pre- and post-installation) for the following ECMs if included in the offset project:

- i. *Heating Distribution Systems (category (b))*<sup>1</sup>: Duct plan, system insulation and air sealing specifications, duct tightness specifications, terminal air and water flow rate measurements, and system leakage measurements
- ii. *Hot Water Distribution Systems/Demand Reduction (category (d))*: Pipe layout, riser diagram (for commercial buildings), fixture schedule, fixture flow rates, system insulation and sealing, terminal flow rate measurements, and system leakage measurements
- iii. *Building Envelope Measures (category (e))*: Window schedule, sectional diagram of wall layers, insulation specifications, and thermal bridging details
- iv. *Passive/Active Solar Heating Systems (category (f))*: For passive solar ECMs only, include design intent narrative highlighting passive solar features

**Note:** The documentation outlined above will be used by the Department to establish ECM eligibility pursuant to subsection 22a-174-31a (g) of the RCSA. If the offset project specified in the *Consistency Application* is in progress, final post-installation building plans and technical schematics representing the as-installed offset project must be submitted with the first annual *Monitoring and Verification Report* submitted for the project to confirm as-installed ECM eligibility.

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<sup>1</sup> Category letter refers to the ECM category identified in the Equipment and Materials Specifications Table, Categories of Eligible Energy Conservation Measures key.

## Form 2.2 Demonstration of Eligibility

Provide documentation of project eligibility as an attachment to Form 2.2. The attachment must include a header that indicates it is an attachment to Form 2.2 and includes the offset project name and offset project ID code.

A summary of eligibility requirements is provided in Table 1. below.

**Table 1. Summary of Eligibility Requirements**

<b>All Commercial and Residential Projects</b>	
<ul style="list-style-type: none"> <li>• Demonstrate eligibility of the ECMs (addressed in Form 2.1)</li> <li>• Demonstrate eligibility of the fuel types affected (addressed in Form 2.1)</li> <li>• Demonstrate adherence to installation best practices</li> <li>• Document that whole building energy performance complies with referenced standards (applicable to whole-building retrofits and new buildings)</li> </ul>	
Projects Commencing Prior to Jan. 1, 2009	Projects Commencing on or After Jan. 1, 2009
<ul style="list-style-type: none"> <li>• Document combustion equipment complies with performance standards</li> <li>• Document other ECMs comply with performance standards</li> </ul>	<ul style="list-style-type: none"> <li>• Document that the market penetration rate for each ECM is less than five (5) percent</li> </ul>

Note that categorical ECM eligibility is addressed in Form 2.1. The Equipment and Materials Specification Table included in Form 2.1 must link each offset project ECM to one or more of the following eligible ECM categories that addresses an eligible fuel type<sup>2</sup>:

- (a) improvements in the energy efficiency of combustion equipment that provides space heating and hot water, including a reduction in fossil fuel consumption through the use of solar and geothermal energy
- (b) improvements in the efficiency of heating distribution systems, including proper sizing and commissioning of heating systems
- (c) installation or improvement of energy management systems (EMS)
- (d) improvement in the efficiency of hot water distribution systems and reduction in demand for hot water
- (e) measures that improve the thermal performance of the building envelope and/or reduce building envelope air leakage
- (f) measures that improve the passive solar performance of buildings and utilization of active heating systems using renewable energy
- (g) fuel switching to a less carbon-intensive fuel for use in combustion systems, including the use of liquid or gaseous eligible biomass, provided that conversions to electricity are not eligible

**Note:** Equipment, materials, or actions required under state building codes or required pursuant to any local, state, or federal law, regulation, or administrative or judicial order are not eligible for the award of CO<sub>2</sub> offset allowances. This includes instances where initiation of the offset project itself triggers certain requirements pursuant to state building codes or other legal requirements.

<sup>2</sup> Eligible fuel types include natural gas, distillate fuel oil, propane, and kerosene.

Pay careful attention to the specific documentation that must be submitted for each type of ECM and for each of the eligibility requirements described in this section applicable to the offset project. When references are required, cite the reference standard's name and publication year, applicable section number and title, and specific page number. Note that in cases where documentation for an offset project that has not yet been completed reflects the intent of the project, further documentation of the as-completed offset project must be submitted with the first annual *Monitoring and Verification Report* submitted for the project to confirm that the design intent specified in the *Consistency Application* was actually implemented.

Documentation of project eligibility must include the following information:

1. **Documentation of ECM Installation.** For all ECMs included in the offset project, attach the following documentation of ECM installation, as applicable:
  - a. For all categories of ECMs, provide invoices or completed work orders for *completed offset projects* that show purchases of materials, equipment, and design and installation services that detail the date of installation, what was installed, and what services were provided. Note, for offset projects *in progress*, this information must be submitted as part of the first annual *Monitoring and Verification Report* submitted for the project.
  - b. For certain categories of ECMs, provide additional documentation, as follows:
    - i. *Building Envelope Measures (category (e))*: Provide a pre-implementation infiltration report, along with the citation of the reference standard that defines the blower door test or other measurement procedure that was used for baseline measurement and will be used to measure post-installation infiltration. For *completed projects*, also include the post-implementation infiltration report. Note that for *in-progress projects*, the post-implementation infiltration report must be submitted as part of the first annual *Monitoring and Verification Report* submitted for the project.
    - ii. *Energy Management Systems (EMS) (category (c))*: Provide either a design intent statement indicating that there was/is no EMS installed prior to the offset project, or a short narrative about the pre-existing control strategy, including documentation of the model and manufacturer of the EMS, the settings, the control mechanisms (e.g., schedule/sensors), and evidence of EMS installation. For *completed projects*, provide a short narrative about the new control strategy, including documentation of the model and manufacturer of the EMS, the settings, the control mechanisms (e.g., schedule/sensors), and evidence of EMS installation. Include computer screenshots to illustrate system settings. For *in-progress projects*, provide a narrative of the proposed EMS control strategy, including the model and manufacturer of the EMS, the settings, and the control mechanisms (e.g., schedule/sensors). Note that for *in-progress projects*, a post-implementation narrative about the new control strategy, including documentation of the model and manufacturer of the EMS, the settings, the control mechanisms (e.g., schedule/sensors), and evidence of EMS installation, including computer screenshots, must be provided with the first annual *Monitoring and Verification Report* submitted for the project.

For all documentation, indicate the ECM ID number specified in the Equipment and Materials Specification Table in Form 2.1 to which the documentation applies.

2. **HVAC Installation Best Practice.** Attach documentation demonstrating that all combustion equipment and related air-handling equipment (HVAC systems) installed or to be installed as part of the offset project have been sized and installed or will be sized and installed according to industry best practices for the applicable type of building. Documentation must demonstrate that the following requirements are or will be met:
  - a. **Commercial Buildings.** Provide documentation of the following (see subsection c. below for specific documentation requirements):
    - i. Sizing calculations were or will be performed according to accepted manufacturer or engineering standards.
    - ii. Installation requirements, which vary by type of equipment and are listed within specific sections of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Standard 90.1-2004 and ASHRAE Standard 62.1-2004, were met or will be met.
    - iii. HVAC systems have been balanced or will be balanced. Cite the reference standard that defines the system balancing procedure.
    - iv. The building has been commissioned or will be commissioned according to appropriate standards. Cite applicable commissioning standards of ASHRAE 90.1-2004 Appendix E.
  - b. **Residential Buildings.** Provide documentation of the following (see subsection c. below for specific documentation requirements):
    - i. Sizing calculations were performed or will be performed according to the Air Conditioning Contractors of America (ACCA) Manual J, Eighth Edition.
    - ii. Installation requirements, equipment-specific tests, and verifications, which vary by type of equipment and are listed within specific sections of the Consortium for Energy Efficiency (CEE) “Specification of Energy-Efficient Installation and Maintenance Practices for Residential HVAC Systems” (2000) were met or will be met.
  - c. **Documentation Requirements.** To demonstrate conformance with the documentation requirements at subsections a. and b. above, provide the following:
    - i. **For both Completed and In-Progress Projects:**
      - (A) Copies of HVAC system sizing calculations. Reference the standard that was used to define calculation methodologies. Include all worksheets in accordance with the following standards, as applicable:
        - Commercial Buildings: ASHRAE 90.1-2004 and ASHRAE 62.1-2004
        - Residential Buildings: ACCA Manual J, Eighth Edition
      - (B) For projects in commercial buildings, location, performance, and general configuration of installed equipment and duct and pipe distribution systems, including sizes, and the terminal air or water design flow rates.
    - ii. **For Completed Projects:**
      - (A) Copies of the installation instructions that accompany all HVAC equipment to be installed.
      - (B) Invoices or completed work orders that show purchases of materials, equipment, and design and installation services that detail what was installed.

(C) A statement that HVAC installation was completed in accordance manufacturer instructions and the applicable reference standards:

- Commercial Buildings: ASHRAE 90.1-2004 and ASHRAE 62.1-2004
- Residential Buildings: Consortium for Energy Efficiency (CEE) “Specification of Energy-Efficient Installation and Maintenance Practices for Residential HVAC Systems,” 2000

Include documentation showing which tests/verifications were performed in accordance with the guidance given by the reference standards listed above, along with evidence of completion.

(D) Memo signed by a representative of the building owner indicating receipt of all equipment operations and maintenance manuals and other O&M information, and identifying the specific documentation received.

(E) Copy of HVAC system balance report.

(F) Copy of HVAC system commissioning report.

iii. ***For In-Progress Projects:***

(A) A design intent statement that HVAC installation will be completed in accordance with manufacturer instructions and the following reference standards:

- Commercial Buildings: ASHRAE 90.1-2004 and ASHRAE 62.1-2004
- Residential Buildings: Consortium for Energy Efficiency (CEE) “Specification of Energy-Efficient Installation and Maintenance Practices for Residential HVAC Systems,” 2000

For each type of equipment installed, cite the applicable standard that will be used to define the installation, testing, and verification requirements for the equipment in accordance with the guidance given by the reference standards listed above.

(B) A design intent statement that all operations and maintenance information for new equipment will be provided to the building owner at completion of the project, including a template of the form acknowledging receipt of the information.

(C) A design intent statement that HVAC systems will be balanced, citing the reference standard that will define the system balancing procedure.

(D) A design intent statement certifying that the building will be commissioned, citing of the reference standard that will define the commissioning procedure in accordance with ASHRAE 90.1-2004 Appendix E.

Note that documentation confirming application of the design intent in the as-completed offset project for the items listed at (A) through (D) above must be submitted with the first annual *Monitoring and Verification Report* submitted for the project.

3. ***Building Eligibility.*** Attach documentation of building eligibility under one of the following provisions for each building included in the offset project (status of all buildings referenced in Form 2.1 must be identified under one of the following):

a. ***Existing Buildings.*** For existing buildings, provide documentation of the date of completion of building construction.

- b. **Whole-Building Retrofit.** For whole-building retrofits, describe the building system(s) and/or building components to be replaced as part of the offset project and reference the applicable provisions in State or local building codes that require a building permit for such actions.
- c. **New Buildings.** For new buildings, provide documentation that the building meets eligibility requirements under one of the two following scenarios for new building eligibility:
  - i. *New buildings replacing existing buildings at the same site:* For each new building included in the offset project, provide a design intent statement and building specifications indicating that the new building is designed to replace an existing building on the same property where the existing building is or was located. Provide plans for each new building indicating that the building footprint is located on the same property as the existing building is or was located.
  - ii. *New buildings designed to be “zero-net-energy” buildings:* For each new building included in the offset project, provide documentation that the new building will be a zero-net-energy building. A zero-net-energy building is defined as a building designed to produce as much energy, using renewable energy sources, as the building is projected to use, as measured on an annual basis.

Provide the following documentation to demonstrate that the building is designed to be a zero-net-energy building:

- Narrative of the design approach taken to achieve zero-net-energy performance
- Building simulation software input file, output file, and assumptions for the design building documenting estimated annual energy use and estimated annual energy production for the as-designed building, on CD-ROM
- Copy of software manufacturer literature showing the modeling program name and version number
- Document demonstrating that software is certified by the BESTEST method (commercial building software) or is RESNET certified (residential building software)

4. **Whole-Building Energy Performance.** For each building included in the offset project that is identified at section 3. above as a new building or whole-building retrofit, attach documentation that the building meets the applicable energy performance standard below. A whole-building retrofit is defined as a building project that involves replacement of more than one building system or set of building components, and also requires a State or local building permit. Note that demonstration of whole-building energy performance may be met through a combination of non-eligible ECMs (e.g., ECMs targeting electricity usage and other common measures) and eligible ECMs, but CO<sub>2</sub> offset allowances will be awarded only for CO<sub>2</sub> emissions reductions achieved through eligible ECMs. Documentation must include the following:

- a. **Commercial Buildings.** Provide documentation that the building exceeds by 30 percent the energy performance of a simulated baseline building with similar configuration, orientation, and location that meets the ASHRAE 90.1-2004 standard (Energy Cost Budget Method compliance path, Section 11)<sup>3</sup>, including the following:

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<sup>3</sup> Currently, building energy simulation is the only way to demonstrate above-standard whole-building energy performance. If, in the future, prescriptive paths are created by ASHRAE or IECC that describe energy performance 20 percent or 30 percent better than the reference standard, following such a prescriptive path may be an additional option to prove eligibility under the whole-building energy performance requirement.

- Building simulation software input file, output file, and assumptions for a reference building that meets the ASHRAE 90.1-2004 standard, on CD-ROM
- Building simulation software input file, output file, and assumptions for the new building or whole-building retrofit, on CD-ROM
- Copy of software manufacturer literature showing the program name and version number
- Document demonstrating that software is certified by the BESTEST method

b. **Commercial-Scale Multi-Family Residential Buildings.** For a multi-family residential buildings defined as commercial under ASHRAE 90.1-2004, provide documentation that the building exceeds by 20 percent the energy performance of a simulated baseline building with similar configuration, orientation, and location that meets the ASHRAE 90.1-2004 standard (Energy Cost Budget Method compliance path, Section 11)<sup>4</sup>, including the following:

- Building simulation software input file, output file, and assumptions for a reference building that meets the ASHRAE 90.1-2004 standard, on CD-ROM
- Building simulation software input file, output file, and assumptions for the new building or whole-building retrofit, on CD-ROM
- Copy of software manufacturer literature showing the program name and version number
- Document demonstrating that software is certified by the BESTEST method

c. **Low-Rise Residential Buildings.** For a building defined as low-rise residential under ASHRAE 90.1-2004, provide documentation that the building exceeds by 30 percent the energy performance of a simulated baseline building with similar configuration, orientation, and location that meets the International Energy Conservation Code (IECC) 2003 with 2004 Supplement standard (documented in accordance with RESNET National Home Energy Rating Technical Guidelines, 2006), including the following:

- Building simulation software input file, output file, and assumptions for a reference building that meets the IECC 2003 with 2004 Supplement standard, on CD-ROM
- Building simulation software input file, output file, and assumptions for the new building or whole-building retrofit, on CD-ROM
- Copy of software manufacturer literature showing the program name and version number
- Document demonstrating that software is RESNET certified

5. **Combustion Equipment Performance Standards.** For offset projects commencing *prior to* January 1, 2009, provide documentation that combustion equipment installed or to be installed as part of the offset project meets or exceeds the following minimum energy efficiency criteria:

a. **Commercial Boilers.** Provide documentation that commercial boilers meet the following minimum energy efficiency criteria in Table 2 (see specific documentation requirements at subsection c. below):

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<sup>4</sup> See footnote 3.

**Table 2. Minimum Commercial Boiler Energy Efficiency**

Technology	Size (Btu/hr)	Rating Method	Minimum Efficiency
Gas-fired <sup>a</sup>	125,000 - 300,000	AFUE	≥ 88.0%
	300,000 - 12,500,000	Thermal Efficiency <sup>b</sup>	≥ 90.0%
Oil-fired	> 300,000	Thermal Efficiency	≥ 88.0%

<sup>a</sup> Gas-fired boilers shall be installed with controls that allow the boiler to operate in condensing mode and installed with vents designed for positive vent static pressure and vent gas temperature that leads to condensate production in the vent.

<sup>b</sup> Thermal Efficiency is defined as useful energy output (Btu) divided by energy input (Btu), and presented as a percentage. This shall be measured under steady-state conditions, at full rated useful thermal output, 140°F supply from, and 120°F return water temperature to, the boiler.

b. **Residential Boilers, Furnaces, and Water Heaters.** Provide documentation that residential combustion equipment meets the minimum energy efficiency criteria in Table 3 (see specific documentation requirements at subsection c. below):

**Table 3. Minimum Residential Combustion Equipment<sup>a</sup> Energy Efficiency**

Technology	Rating Method	Minimum Efficiency
Gas-fired furnace	AFUE	≥ 94%
Oil-fired furnace	AFUE	≥ 92%
Gas/oil-fired boiler	AFUE	≥ 90%
Gas/oil-fired water heater	Energy Factor	≥ 0.62

<sup>a</sup> For furnaces, defined as equipment with a heat input rate of less than 225,000 Btu/hr; for boilers, defined as equipment with a heat input rate of less than 300,000 Btu/hr; for water heaters, defined as equipment subject to 10 CFR 430.

c. **Documentation Requirements.** Provide the following documentation to demonstrate that each piece of combustion equipment installed or to be installed as part of the offset project meets the energy efficiency criteria specified at subsections a. and b. above:

- New equipment nameplate information, including model name of the equipment, manufacturer, model number, capacity, energy efficiency, efficiency rating system used, and fuel type used
- A copy of the product specification sheet and, if applicable, Energy Star label
- Indication of the ECM ID number specified in the Equipment and Materials Specification Table of Form 2.1 to which the documentation for each piece of equipment applies

6. **Other ECM Performance Standards.** For offset projects commencing *prior to* January 1, 2009, provide documentation in table or narrative form indicating that all other ECMs (all non-combustion equipment ECMs) installed or to be installed as part of the offset project meet the more stringent of the minimum energy performance standards specified in the Energy Benchmark for High Performance Buildings (EBHPB) Version 1.1 (New Buildings Institute, 2005) or the State energy code, whichever results in better energy performance. If the ECM is not included in either of these reference standards, then provide documentation in table or

narrative form indicating that the ECM meets the more stringent of the minimum energy performance standards specified by Federal Energy Management Program (FEMP) Product Energy Efficiency Recommendations *or* Energy Star criteria. Documentation must include the following information:

- A copy of the relevant section of the applicable standard that clearly shows the required energy performance criteria for the specific ECM
- Equipment or material information and specifications (e.g. R-value, U-factor) that identify energy performance
- A copy of the product specification sheet and, if applicable, Energy Star label
- The ECM ID number specified in the Equipment and Materials Specification Table of Form 2.1 to which the documentation for each ECM applies

7. **Market Penetration Rate.** For offset projects commencing *on or after* January 1, 2009, attach documentation that the eligible ECMs included in the offset project have a market penetration rate of less than five (5) percent. For new building or whole-building retrofit offset projects, documentation that the energy performance of the project building(s) falls within the top five (5) percent of energy performance for a similar class of buildings may be used to demonstrate conformance with this requirement. Market penetration rate is defined as a measure of the diffusion of a technology, product, or practice in a defined market, as represented by the percentage of annual sales for a product or practice, or as the percentage of the existing installed stock for a product or category of products, or as the percentage of existing installed stock that utilizes a practice. Note that the Department will determine the sufficiency of the market penetration rate documentation provided, including the appropriateness of the market definition and market penetration metric used. Documentation must include the following information:

- Documentation of the defined market
- Market penetration or market saturation studies, market assessments, building stock performance data, sales data, or other data that indicate market penetration of the ECMs included in the offset project

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### Form 2.3      Emissions Baseline

Provide documentation of baseline period energy use and CO<sub>2</sub> emissions in the editable text fields in Form 2.3 or as an attachment, as directed. Enter the baseline year where requested in the form. The baseline year is the most recent calendar year prior to commencement of the offset project for which historic fuel use data is available for 12 consecutive months. If the offset project involves a new building, the baseline year is the calendar year preceding the submission of the *Consistency Application*. Where requested in the form, for each fuel type enter energy baseline usage (in MMBTUs) and associated CO<sub>2</sub> emissions (in lbs CO<sub>2</sub>).

Attach documentation supporting calculations of baseline energy use and baseline CO<sub>2</sub> emissions. Each attachment must include a header that indicates it is an attachment to Form 2.3 and includes the offset project name and offset project ID code. Documentation must include the following:

1. **Documentation of Baseline Energy Monitoring Approach.** Provide narrative documentation of the energy monitoring or modeling procedures used to determine baseline energy use, including demonstration of conformance with the appropriate guidelines and standards applicable to the building types included in the offset project, as follows:

- Commercial Buildings:
  - IPMVP Volume I, Option B or D, as applicable
  - ASHRAE Guideline 14-2002
- Commercial Buildings, where the only change to the building as part of the energy efficiency project will involve eligible ECMs included in the offset project:
  - IPMVP Volume I, Option C
  - ASHRAE Guideline 14-2002
- New Commercial Buildings:
  - IPMVP Volume III, Option D
  - ASHRAE Guideline 14-2002
- New and Existing Residential Buildings:
  - RESNET National Home Energy Rating Technical Guidelines, 2006

Documentation of conformance with the above-listed references must include the following:

- Clear identification of any data gaps and estimated or modeled data
- Documentation of all conditions that affect baseline measurement (e.g., measurement process and equipment, weather, building occupancy, time of day)

Note, for projects **implementing similar measures in multiple residential buildings**, a representative sampling of buildings may be used to determine baseline energy use, rather than measurement of each building. If sampling is employed, attach a copy of the sampling protocol that provides demonstration at the 95 percent confidence interval that the reported value is within 10 percent of the true value. The sampling protocol and statistical method must include uncertainty and confidence interval calculations.

2. **Baseline Energy Use Data.** Provide documentation of baseline energy use for each building included in the offset project, as outlined below:
  - a. **Existing Commercial Buildings.** For each building included in the offset project, provide total building fuel consumption data for the baseline year, by fuel type (MMBtu). For each building, provide records of whole-building metered energy use by fuel type for the baseline year and records of metered energy use, if available, for individual end-uses or building systems to be targeted by eligible ECMs.
  - b. **Eligible New Commercial Buildings.** For each new building included in the offset project, provide energy simulation modeling of baseline energy use for a reference building with similar configuration, orientation, and location using BESTEST certified software. The reference building must meet the ASHRAE 90.1-2004 energy performance standard. Provide the following documentation of energy simulation modeling:
    - Building simulation software input file, output file, and assumptions for a reference building that meets the ASHRAE 90.1-2004 standard, on CD-ROM
    - Copy of software manufacturer literature showing the modeling program name and version number
    - Document demonstrating that software is certified by the BESTEST method
  - c. **Existing Low-Rise Residential Buildings.** For each building included in the offset project, provide total building fuel consumption data for the baseline year, by fuel type (MMBtu). For each building, provide records of whole-building metered energy use by fuel type for the

baseline year and records of metered energy use, if available, for individual end-uses or building systems to be targeted by eligible ECMs.

d. **Eligible New Low-Rise Residential Buildings.** For each new building included in the offset project, provide energy simulation modeling of baseline energy use for a reference building with similar configuration, orientation, and location using RESNET certified software. The reference building must meet the IECC 2003 with 2004 Supplement energy performance standard. Provide the following documentation of energy simulation modeling:

- Building simulation software input file, output file, and assumptions for a reference building that meets the IECC 2003 with 2004 Supplement standard, on CD-ROM
- Copy of software manufacturer literature showing the modeling program name and version number
- Document demonstrating that software is RESNET certified

3. **Isolation of Energy Use.** Provide documentation of the isolation of energy use for each end-use or building system to be targeted by eligible ECMs as part of the offset project. Such isolation must ensure that each eligible ECM, once implemented, will be able to be isolated from all other eligible and non-eligible ECMs, as well as from overall building energy use. There are two options for isolation of energy use for end-uses or building systems to be targeted by eligible ECMs:

- Direct metering of end-use or building system to be affected by eligible ECMs (note that if the only change to the building as part of the energy efficiency project will involve eligible ECMs included in the offset project, metering of whole-building energy use is sufficient under this approach)
- Use of energy simulation modeling to apportion building energy use to each end-use or building system affected by eligible ECMs

For both of these options, ECMs must be isolated from whole-building or whole-system energy use and also adjusted for areas where multiple ECMs interact with one another (required to avoid double-counting of ECM energy use) or where one ECM utilizes more than one eligible fuel type. Provide a narrative identifying the procedures used to isolate energy use for end-uses or building systems to be targeted by eligible ECMs in conformance with the following guidelines and/or standards applicable to the building types included in the offset project:

- Commercial Buildings:
  - ASHRAE Guideline 14-2002
  - ASHRAE 90.1-2004, Section 11 and Appendix G
- Residential Buildings:
  - RESNET National Home Energy Rating Technical Guidelines, 2006

If energy simulation modeling is used to isolate energy use, provide the following documentation:

- Building simulation software input file, output file, and assumptions, on CD-ROM
- Copy of software manufacturer literature showing the modeling program name and version number
- Document demonstrating that software is BESTEST or RESNET certified, as applicable

4. **Adjustments to Baseline Energy Use.** Provide documentation of adjustments that were made to baseline energy use as follows:

- a. **Equipment and Materials Adjustments.** Provide documentation of adjustments to account for minimum equipment energy efficiency standards or minimum building component energy performance standards. If applicable building codes or equipment standards require that equipment or materials installed as part of the offset project meet certain minimum energy efficiency or energy performance requirements, baseline energy use must assume the existence of such equipment or materials during the baseline period. If such requirements apply, the baseline must assume – for all building equipment and building components to be targeted by ECMS as part of the offset project – that equipment and materials were present during the baseline period that meet current minimum energy efficiency or energy performance requirements (e.g., State and local building codes or federal equipment standards). If the ECM involves the replacement of combustion equipment, baseline energy use must assume the existence during the baseline period of new equipment that meets minimum energy efficiency requirements and that burns the same fuel as the ECM replacement equipment.
- b. **Operating and Weather Condition Adjustments.** Provide documentation of measurement conditions during the baseline period that are unusual or measurement conditions that are expected to change between the baseline period and reporting period, and adjustment factors applied to baseline energy use to account for such measurement conditions. Adjustments may address issues such as weather, building occupancy, and changes in building use or function. Provide documentation of adjustments applied to baseline energy usage in accordance with the following equation:

$$\text{Energy Usage (MMBtu)} = BEU_{AECM} \times A_b$$

where:

$BEU_{AECM}$  = Annual baseline energy use by fuel type (MMBtu) attributable to the application(s) to be targeted by the energy conservation measure(s).

$A_b$  = An adjustment factor that corrects for changes to the system of interest between when the baseline data were collected and when the ECM will be implemented. Separate adjustment factors may be used for the baseline and for post-implementation energy usage, or a single factor that includes all adjustments may be applied to post-implementation energy usage.

Provide documentation demonstrating that the application of any adjustments are consistent with the following guidelines and standards applicable to the building types included in the offset project:

- Commercial Buildings:
  - ASHRAE Guideline 14-2002
  - ASHRAE 90.1-2004, Section 11 and Appendix G
- Residential Buildings:
  - RESNET National Home Energy Rating Technical Guidelines, 2006

If any of the adjustments applied under subsections a. and b. above required energy simulation modeling, provide the following documentation:

- Building simulation software input file, output file, and assumptions, on CD-ROM
- Copy of software manufacturer literature showing the modeling program name and version number
- Document demonstrating that software is BESTEST or RESNET certified, as applicable

5. **Total Baseline Energy Use.** Provide a spreadsheet documenting the calculation of total baseline energy usage. Baseline energy usage is the sum of energy use, by fuel type, for all the isolated end uses or building systems that will be affected by eligible ECMs included in the offset project. Baseline energy usage includes the application of any adjustment factors in accordance with section 3. above.

6. **Baseline Emissions.** Provide a spreadsheet documenting the calculation of baseline emissions derived from baseline energy use and associated fuel-specific emissions and oxidation factors. Use the following formula to calculate total (summed over all combustion fuel types) baseline emissions in lbs of CO<sub>2</sub> (calculate each combustion fuel's emissions contribution separately):

$$\text{Emissions (lbs. CO}_2\text{)} = \sum_{i=1}^n (\text{BEU}_i \times \text{EF}_i \times \text{OF}_i)$$

where:

$\text{BEU}_i$  = Annual baseline energy use for fuel type  $i$  (MMBtu)

$\text{EF}_i$  = Emissions factor (lbs. CO<sub>2</sub>/MMBtu) for fuel type  $i$  as shown below in Table 4

$\text{OF}_i$  = Oxidation factor for fuel type  $i$  as shown below in Table 4

**Table 4. Emissions and Oxidation Factors**

Fuel	Emissions Factor (lbs CO <sub>2</sub> /MMBtu)	Oxidation Factor
Natural Gas	116.98	0.995
Propane	139.04	0.995
Distillate Fuel Oil	161.27	0.99
Kerosene	159.41	0.99

#### Form 2.4 Monitoring and Verification Plan

Provide the Monitoring and Verification Plan (M&V Plan) as an attachment to Form 2.4. The attachment must include a header that indicates it is an attachment to Form 2.4 and includes the offset project name and offset project ID code.

The attached M&V Plan must include the following information:

1. **Documentation of Energy Monitoring Approach.** For each building included in the offset project, provide narrative documentation of the energy monitoring procedures to be used during the reporting period to determine energy use. Specify the data sources and calculations to be used to determine annual post-installation energy use by fuel type. Actual energy usage must be

measured, with simulation modeling used only to isolate energy use related to end-uses or building systems targeted by eligible ECMs included in the offset project. Documentation must include demonstration of conformance with the appropriate guidelines and standard applicable to the building types included in the offset project:

- Commercial Buildings:
  - IPMVP Volume 1, Option B *or* D, as applicable
  - ASHRAE Guideline 14-2002
- Commercial Buildings, where the only change to the building as part of the energy efficiency project will involve eligible ECMs included in the offset project:
  - IPMVP Volume 1, Option C
  - ASHRAE Guideline 14-2002
- New Commercial Buildings:
  - IPMVP Volume III, Option D
  - ASHRAE Guideline 14-2002
- New *and* existing residential buildings:
  - RESNET National Home Energy Rating Technical Guidelines, 2006

Documentation of conformance with the above-listed references must include the following:

- Clear identification of any data gaps and estimated or modeled data
- Documentation of all conditions that affect reporting period measurement (e.g., measurement process and equipment, weather, building occupancy, time of day)

Note, for projects ***implementing similar measures in multiple residential buildings***, a representative sampling of buildings may be used to determine reporting period energy use, rather than measurement of each building. If sampling is to be employed, attach a copy of the sampling protocol to be used that provides demonstration at a 95 percent confidence interval that the reported value will be within 10 percent of the true value. The sampling protocol and statistical method must include uncertainty and confidence interval calculations.

2. **Procedures for Collection of Reporting Period Energy Use Data.** Provide documentation of the procedures to be used during the reporting period to collect actual metered energy usage data by fuel type for each building included in the offset project. Specify the metered energy usage data to be collected for each building.
3. **Isolation of Energy Use.** Provide documentation of the procedures to be used for isolation of energy use during the reporting period for each end-use or building system to be targeted by eligible ECMs as part of the offset project. Such isolation must ensure that each eligible ECM will be isolated from all other eligible and non-eligible ECMs, as well as from overall building energy usage. There are two options for isolation of energy use for end-uses or building systems to be targeted by eligible ECMs:
  - Direct metering of end-use or building system affected by eligible ECMs (note that if the only change to the building as part of the energy efficiency project will involve eligible ECMs included in the offset project, metering of whole-building energy use is sufficient under this approach)
  - Use of energy simulation modeling to apportion building energy use to each end-use or building system affected by eligible ECMs

For both of these options, ECMs must be isolated from whole-building or whole-system energy use and also adjusted for areas where multiple ECMs interact with one another (required to avoid double-counting of ECM energy use) or where one ECM utilizes more than one eligible fuel type. Provide a narrative identifying the procedures to be used during the reporting period to isolate energy use in conformance with the following guidelines and/or standards applicable to the building types included in the offset project:

- Commercial Buildings:
  - ASHRAE Guideline 14-2002
  - ASHRAE 90.1-2004, Section 11 and Appendix G
- Residential Buildings:
  - RESNET National Home Energy Rating Technical Guidelines, 2006

If energy simulation modeling is to be used to isolate energy use, provide the following documentation:

- Building simulation software input file, output file, and assumptions, on CD-ROM
- Copy of software manufacturer literature showing the modeling program name and version number
- Document demonstrating that software is BESTEST or RESNET certified, as applicable

4. **Procedures for Adjustments in Energy Use to Account for Differing Conditions.** Provide documentation of measurement conditions during the reporting period that may be unusual or measurement conditions that are expected to change between the baseline period and reporting period, and adjustment factors that may be applied to reporting period energy use to account for such measurement conditions. Specify the data sources and calculations to be used to account for differing conditions, and the procedures for collecting data. Adjustments may address issues such as weather, building occupancy, and changes in building use or function. Provide documentation of adjustments to be applied to reporting period energy usage in accordance with the following equation:

$$\text{Energy Usage (MMBtu)} = \text{PIEU}_{\text{AECM}} \times A_b$$

where:

$\text{PIEU}_{\text{AECM}}$  = Annual energy use by fuel type (MMBtu) attributable to the application(s) targeted by the energy conservation measure(s).

$A_b$  = An adjustment factor that corrects for changes to the system of interest between when the baseline data were collected and the reporting period.

Provide documentation demonstrating that the application of any adjustments is consistent with the following guidelines and standards applicable to the building types included in the offset project:

- Commercial Buildings:
  - ASHRAE Guideline 14-2002
  - ASHRAE 90.1-2004, Section 11 and Appendix G

- Residential Buildings:
  - RESNET National Home Energy Rating Technical Guidelines, 2006

If any of the adjustments to be applied require energy simulation modeling, provide the following documentation:

- Building simulation software input file, output file, and assumptions, on CD-ROM
- Copy of software manufacturer literature showing the modeling program name and version number
- Document demonstrating that software is BESTEST or RESNET certified, as applicable

5. **Procedures to Determine Reduction in Energy Use by Fuel Type.** Provide a spreadsheet that specifies the building-specific data sources, methods, and calculations to be used for each building included in the offset project to determine reporting period energy savings by fuel type relative to baseline energy usage. Energy use for all end-uses and building systems included in the energy usage baseline must be addressed during the reporting period.
6. **Documentation of Project Implementation.** For offset projects that were not completed when the *Consistency Application* was submitted, document the procedures that will be followed to ensure that the offset project will be implemented as specified in the *Consistency Application*. Specify the procedures for conducting a site audit of the buildings included in the offset project, or if a site audit is not required pursuant to subdivision 22a-174-31a (g)(6) of the RCSA, specify procedures for the collection and provision of specifications of equipment and materials installed and copies of equipment invoices and other project-related invoices documenting installation of the offset project.
7. **Quality Assurance/Quality Control (QA/QC) Procedures.** Document the procedures for recording names and contact information for the personnel responsible for project monitoring and documentation and the personnel responsible for QA/QC of project monitoring data and documentation. Document the procedures that will be taken for QA/QC of project monitoring data and documentation, including but not limited to the following:
  - Energy usage metering and collection of energy use data
  - Adjustments to energy usage to account for differing conditions during the reporting period relative to the baseline year
  - Building energy simulation modeling, if used
  - Calculation of energy usage reductions and emissions reductions
  - Compilation of an annual QA/QC report summarizing findings of QA/QC activities conducted and any remedial actions taken
8. **Record Keeping and Records Retention Protocol.** Document the record keeping and records retention protocol that will be used to maintain offset project documentation throughout the duration of the offset project, including maintenance of an electronic index and/or hardcopy of all project documentation.

## Part 3. Independent Verification Form

The form in Part 3 of the *Consistency Application* addresses requirements and documentation related to the independent verifier certification statement and report. Instructions for the form in Part 3 are provided below.

### Form 3.1 Independent Verifier Certification Statement and Report

An accredited verifier and licensed professional engineer must sign and date the form. Submit the originally signed form as part of the paper hardcopy of the *Consistency Application*. Scan the signed and dated form for submission as part of the electronic version of the *Consistency Application*.

Provide the independent verifier report as an attachment to Form 3.1.

The verifier report must include a header that indicates it as an attachment to Form 3.1 and includes the offset project name and offset project ID code.

The verifier report must document the following:

1. The verifier has reviewed the entire *Consistency Application* and evaluated the contents of the application in relation to the applicable requirements of section 22a-174-31a of the RCSA.
2. The verifier has evaluated the adequacy and validity of information supplied by the Project Sponsor to demonstrate that the offset project meets the applicable eligibility requirements of subsections 22a-174-31a(c) and (g) of the RCSA.
3. The verifier has evaluated the adequacy and validity of information supplied by the Project Sponsor to demonstrate baseline emissions pursuant to the applicable requirements of subsection 22a-174-31a(g).
4. The verifier has evaluated the adequacy of the monitoring and verification plan submitted pursuant to subsection 22a-174-31a(g).

The verifier report must include the following contents, in the order listed below:

- Cover page with report title and date
- Table of contents
- List of acronyms and abbreviations
- Executive summary
- Description of objective of report
- Identification of the client, including name, address, and other contact information
- Identification of the offset project
- Description of evaluation criteria (applicable regulatory provisions and documentation required in the *Consistency Application*)
- Description of the review and evaluation process, including any site visits and interviews
- Identification of individuals performing the verification work, including the verification team leader and key personnel, and contact information for the team leader
- Description of the materials provided to the verifier by the Project Sponsor
- Evaluation conclusions and findings, including level of assurance provided