

## C&amp;I Energy Efficiency Program Guidelines

**Fuel Switch Measure**

The following is the minimum information required for fuel switching Energy Conservation Measures (ECM's). Fuel switching is defined as any measure that converts existing natural gas or oil HVAC equipment to electricity. Example Fuel Switch Measures include but are not limited to the following:

Eligible Existing Equipment	Proposed Replacement Technology
Gas-engine-drive chiller	Electric Chiller
Gas absorption chiller	
Gas-fired boiler	Electric Boiler
Steam-driven boiler	

Ineligible Measures	Examples
Fuel Conversion from	- Electric → Gas - Oil → Gas - Steam → Electric
District Steam Equipment	- Steam chillers on Con Edison district steam
Fuel Switching (HVAC)	- Heat pumps - Heat pump chillers - Heat recovery chillers (for space heating/cooling or hot water) - Steam Absorption Chiller - Steam Turbine Chiller - Steam chillers with on-site natural gas boiler (or cogen system)
Fuel Switching (Non-HVAC)	- Electrification of non-HVAC equipment (stoves, washers, dryers)
Heating Systems	- Conversion to electric resistance heating
Cogeneration/CHP	- Removal of Cogeneration or Combined Heat and Power (CHP) plants

**Required Project Documentation**

All projects must provide documentation as outlined in the C&I Energy Efficiency Program [Custom Measures Guidance](#), along with the following documentation:

1. A detailed description of the fuel switching measure being proposed including energy savings and calculation methodology that accurately quantifies the proposed savings.
  - A. Savings shall be calculated as the difference in energy consumption between baseline equipment and new energy efficient technology.
  - B. Savings shall be expressed in MMBTU.
  - C. Savings baselines are dependent on measure application type as follows:

Measure Application Type	Baseline Utilized for Calculation	Proposed
Normal Replacement	Code or Industry Standard Efficiencies (Gas / Steam Fuel Equipment)	Electric Fuel Equipment
Special Circumstance – Extended Life or Early Replacement	Existing Equipment Efficiency (Gas / Steam Fuel Equipment) <sup>1</sup>	Electric Fuel Equipment

Existing equipment efficiency must be backed up with supporting documentation submitted by the customer or PC as per the Extended Life or Early Replacement technical guidance.

- D. Savings approach may include but are not limited to:
  - Computer Energy Modeling Software
  - Bin Analysis
  - Modified TRM measures

E. Con Edison Master Case ID (Provided by Con Edison Energy Services)

**Savings Methodology**

Fuel switch savings are calculated as the difference in energy consumption between baseline equipment and the new energy efficient technology.

***Fuel Switch Savings (Total MMBTU) = Baseline Consumption – EE Consumption***

Energy savings are expressed in total MMBTU, which is the conversion of the sum mlbs or therms savings of the displaced original fuel baseline technology and the increased kWh consumption from the substituted new fuel measure.

Example: if a natural gas fired chiller is replaced by an electric chiller, the energy savings is represented as an increase in electric usage, in kWh, and as the decrease in natural gas usage, in Therms. These savings are rolled up into total MMBTU savings.

The following unit conversions to MMBTU are noted:

<b>Fuel</b>	<b>Native Units</b>	<b>Conversion Factors</b>
District Steam	Mlbs	1.2
Oil No. 2	Gallons (US)	0.138
Oil No. 4	Gallons (US)	0.146
Electric	kWh	0.003412
Gas	Therms	0.1

**Example Conversions:**

**kWh to MMBTU:**

$kWh \times 0.003412 \text{ mmbtu} / kWh = mmbtu$

**Therms to MMBTU:**

$Therms \times 0.1 \text{ mmbtu} / Therms = mmbtu$

**Mlbs to MMBTU<sup>1</sup>:**

$mlbs \times 1.2 \text{ mmbtu} / mlbs = mmbtu$