Electric Standard Offer Program

Procedure No. 360-15

Fuel Switch Energy Savings Measures & Existing Electric Equipment

1. Purpose:

To document Public Service Electric & Gas's (PSE&G) procedure for verifying Standard Offer Fuel Switch energy savings when existing electric equipment is used by Host Facilities for purposes other than emergency backup use.

2. Description:

Fuel Switch energy savings are derived from the replacement of existing electric equipment with equipment that uses other fuels. The title of the measurement protocol for these Energy Savings Measures (ESMs) confirms that savings are the result of "replacement of existing equipment". The retention and operation of existing electric equipment effectively reduces the overall energy savings for the fuel switch measures. The extents to which savings are reduced depend on the kWh consumption of the existing electric equipment. An exception to this is the use of existing electric equipment for emergency backup uses. (see "Standard Offer Program Policy 006" approved 7/8/96).

Facilities that operate existing electric equipment (other than for emergency backup use) must account for its operation when calculating the kWh savings for the fuel switch ESM. Savings for fuel switch measures are based on the metered input and/or output of the fuel switch equipment and the equivalent kWh that would be required by the electric equipment to produce the same amount of work. The use of existing electric equipment results in increased supplementary electrical loads associated with the output or work that is being performed. The metered kWh consumption of electric equipment must be subtracted from the fuel switch equipment's calculated kW reduction in order to determine the measures kWh savings.

In instances where the gas equipment's output equals or exceeds the pre retrofit equipments maximum output; no deductions for the use of the existing equipment will be made. Use of the existing equipment under these conditions serves additional capacity needs of the facility and is outside of the scope of the Standard Offer energy savings measures. Monitoring system data and backup documentation must be submitted that substantiate the above conditions in order for the kWh consumption associated with the use of the existing electric equipment to be omitted from the interval kWh savings calculations.

Examples of how the use of existing electric equipment is accounted for when calculating fuel switch measures energy savings can be found at the end of this document.

3. Seller Responsibilities:

The Seller is responsible for notifying PSE&G if existing electric equipment is used for purposes other than for emergency backup use. If the existing equipment is not already being metered, at PSE&G's request, the Seller may be required to install the necessary metering devices that will allow for the use of the equipment to be recorded on an interval basis.

The Seller will coordinate with PSE&G to schedule Post Implementation Audits once all the necessary modifications have been made to the monitoring system.

The Seller will be responsible for incorporating the recorded data for the existing electric equipment into the energy savings calculations. The fuel switch kWh savings are to be derived from the calculated kWh reduction from the metered input and/or output of the fuel switch equipment minus the kWh consumption of the exiting electric equipment. Deductions for the use of existing electric equipment are not required for intervals that the gas equipment's output equals or exceeds the pre retrofit equipments maximum output.

The Seller's monthly billing statements for energy savings for the fuel switch ESMs must fully account for the operation of the existing equipment. This includes electronic billing data and hard copy back up documentation that accounts for the operation of existing equipments.

4. PSE&G Responsibilities:

PSE&G will require that the existing equipment be metered if it determines that a Standard Offer Host Facility operates (or intends to operate) existing electric equipment for purposes other than emergency backup use.

PSE&G will coordinate with Seller to schedule Post Implementation Audits once all the necessary modifications have been made to the monitoring system. PSE&G will verify that the monitoring and verifications system records the necessary data required to fully account for the operation of the existing electric equipment.

As part of its review of the Seller's Monthly Billing Statements, PSE&G will verify that no deductions are made for intervals where the gas equipment's output equals or exceeds the pre retrofit equipments maximum output (provided that the monitoring system data and backup documentation are submitted that can substantiate this).

5. References:

Measurement Protocol for Commercial and Industrial Facilities

Method 5: Replacement of Electric Equipment By Equipment Using Other Fuels (Fuel Switching)

Types of Measures

The measures addressed under Method 5 reduce electric end use by switching to fuels other than electric. These measures have no impact on the operation hours and levels of service of the end use systems, and include, but are not limited to:

- Replacement of existing electric cooling equipment with gas-fired absorption cooling equipment…
- Replacement of electric heating equipment for process heating with equipment using other fuels

This methodology will only address the above two fuel switching alternatives. Other fuel switching cases are possible, however, they must be submitted on a case-by-case basis to the utility. After agreement by the utility they shall be submitted to the NJBRC and Rate Counsel for approval.

Standard Offer Energy Savings Agreement

Article V Monitoring

Billing and Payment

"Seller shall determine, and PSE&G shall verify, the amount (in kWh) of Energy Savings delivered by Seller to PSE&G for all Periods of each billing cycle during the Term of this Agreement. Such determination shall be made in accordance with the Board approved Measurement and Verification Protocol set forth in Appendix A (Project Proposal) hereto which may be through the use of meters and monitoring devices including, in PSE&G's reasonable judgment, elapsed time indicators, paid for and owned by Seller, or by such other methods of calculating Energy Savings consented to in writing by PSE&G either as part of the Measurement and Verification Protocol or as supplement thereto."

Article V Monitoring

(C) Post-Implementation Audit.

"At its discretion PSE&G may, upon reasonable notice to Seller, perform Post-Implementation Audits (so called herein) consisting of a series of on-site, detailed inspections of the Host Facility(ies). The number of such Post-Implementation Audits shall be limited to fifteen (15) times the number of Host Facilities included in the Form 1B of Appendix A (Project Proposal). These audits shall be performed at a time mutually agreeable to PSE&G, Seller and Host Facilities. Each audit shall include, without limitation, a visual inspection of all areas and systems associated with the Project, and other measurements as specified in the Pre-Implementation Audit. PSE&G shall maintain records of meter readings and inspection results for the purpose of evaluating the effectiveness of the Project, and for computation of billing amounts."

Approved By: _____ **Date:** _____

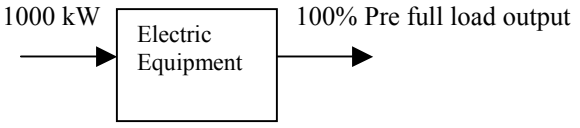
Thirza Jacobus
Manager – Demand Side Management

Examples:

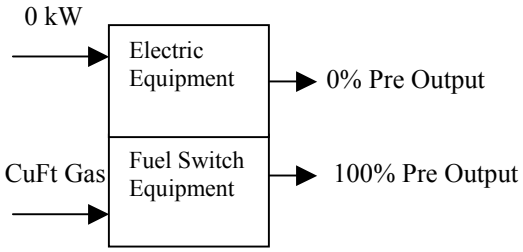
Below are some examples of how the use of existing electric equipment is accounted for when calculating a fuel switch measures energy savings. The examples are based on a hypothetical fuel switch energy savings measure where new gas equipment has been installed to serve the load that existing electric equipment previously served. The input (CuFt of gas) of new fuel switch equipment and the kW input of the existing electric equipment are metered on an interval basis. The existing equipment is not being used for emergency backup use.

Scenario #1

Pre Retrofit Conditions



Post Retrofit Conditions

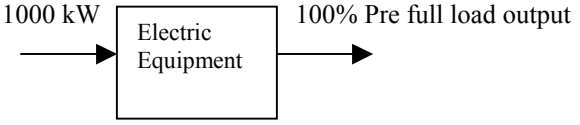


In this case, the gas equipment is the only equipment being operated. The M&V system records zero kW consumption for the electric equipment. The kW reduction for this interval is derived from equivalent kW associated with the metered Cuft gas consumed by the fuel switch equipment minus the metered kW consumption of the electric equipment.

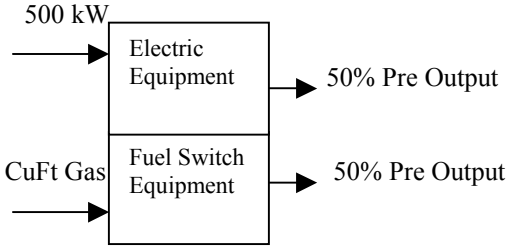
$$1000 \text{ kW}_{\text{Gas}} - 0 \text{ kW}_{\text{Electric}} = 1000 \text{ kW reduction}$$

Scenario #2

Pre Retrofit Conditions



Post Retrofit Conditions

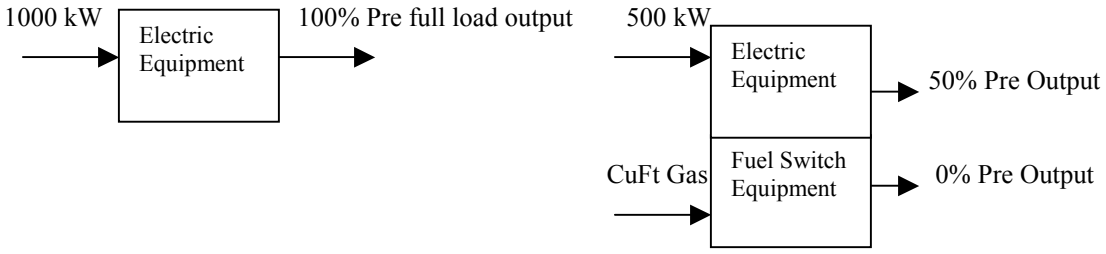


In this case, the gas equipment is providing 50% of the Pre full load output and the electric equipment is providing 50% of the Pre full load output. The kW reduction for this interval is derived from equivalent kW associated with the metered Cuft gas consumed by the fuel switch equipment minus the metered kW consumption of the electric equipment.

$$500 \text{ kW}_{\text{gas}} - 500 \text{ kW}_{\text{Electric}} = 0 \text{ kW reduction}$$

Scenario #3

Pre Retrofit Conditions **Post Retrofit Conditions**

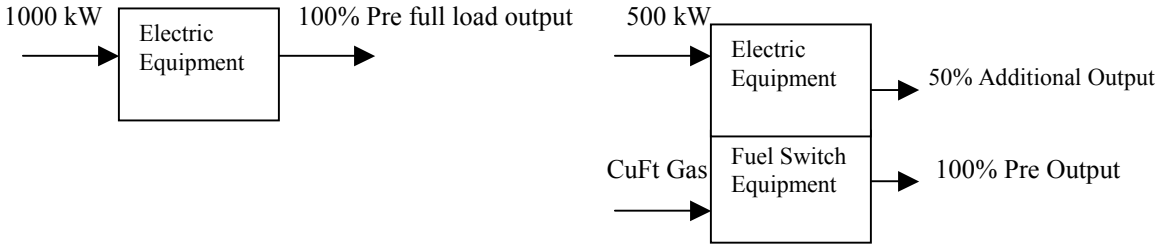


In this case, the existing electric equipment is the only equipment being operated. The M&V system records zero CuFt of gas consumed by the gas equipment. The kW reduction for this interval is derived from equivalent kW associated with the metered Cuft gas consumed by the fuel switch equipment (in this case 0 kW) minus the metered kW consumption of the electric equipment (500 kW).

$$0\ kW_{Gas} - 500\ kW_{Electric} = -500\ kW\ reduction$$

Scenario #4

Pre Retrofit Conditions **Post Retrofit Conditions**



In this case, the gas equipment is providing 100% of the pre retrofit full load output. The output associated with the 500 kW consumed by the existing electric equipment is serving additional capacity requirements of the host facility. The kW reduction for this interval is derived from equivalent kW associated with the metered Cuft gas consumed of the fuel switch equipment. No deductions are required to for the metered kW consumption of the electric equipment.

1000 kW Gas – 0 kW Electric = 1000 kW reduction *

* 0 kW used for the metered electric equipment upon verification via monitoring system data that the gas equipment is providing 100% of the Pre retrofit equipment's full load output.