### Multi-Family Space Heating Steam Boiler Averaging Controls

###### Description

###### This measure covers multi-family space heating boiler averaging controls. Temperature sensors are placed in interior spaces to monitor the average temperature of the building. At minimum a sensor must be placed at each corner and at one central location. Additionally, a temperature sensor must monitor the outside air temperature. These sensors shall provide data to the averaging controls. The averaging controls will adjust the boiler operation based upon an average of the indoor sensors and the outside air temperature. These controls shall also incorporate a night-time setback capability. Buildings utilizing thermostatic radiator valves, or other modulating control valves or sequences to control the temperature in individual spaces are not eligible.

###### This measure was developed to be applicable to the following program types: RF.

###### Definition of Efficient Equipment

To qualify the boiler(s) must incorporate an averaging control system utilizing at least 5 indoor sensors and 1 outdoor sensor. The controls shall have the capability to incorporate a nighttime setback throughout the building.

###### Definition of Baseline Equipment

The baseline is a boiler system without averaging controls or other steam supply modulating controls. Current boiler control system can utilize a single thermostat or aquastat and timer.

###### Deemed Lifetime of Efficient Equipment

The measure life for the domestic hot water boilers is 20 years.[[1]](#footnote-1)

###### Deemed Measure Cost

###### As a retrofit measure, the actual installed cost should be used for screening purposes.

###### Loadshape

N/A

###### Coincidence Factor

N/A

**Algorithm**

###### Calculation of Savings

###### Electric Energy Savings

N/A

###### Summer Coincident Peak Demand Savings

N/A

###### Natural Gas Energy Savings

ΔTherms = Capacity x EFLH x SF / 100,000

Where:

Capacity = Boiler gas input size (Btu/h)

= Actual

EFLH = Effective Full Load Hours for heating are provided in section 4.4. HVAC End Use

SF = Savings Factor

= 5%[[2]](#footnote-2) or custom if savings can be substantiated

100,000 = converts Btu/h to therm

For Example:

A 1,000,000 btu/h steam boiler in a Mid-Rise Multi-Family building in Chicago has averaging controls installed.

ΔTherms = 1,000,000 x 1,685 x 0.05 / 100,000

= 843 therms

###### Water Impact Descriptions and Calculation

N/A

###### Deemed O&M Cost Adjustment Calculation

N/A

###### Measure Code: CI-HVC-SBAC-V01-160601

1. The Brooklyn Union Gas Company, High Efficiency Heating and Water and Controls, Gas Energy Efficiency Program Implementation Plan. [↑](#footnote-ref-1)
2. A conservative estimate considering only setback savings, with DOE estimates as much as 1% per degree per 8 hours of setback. http://energy.gov/energysaver/thermostats [↑](#footnote-ref-2)