### ENERGY STAR Air Purifier/Cleaner

###### Description

An air purifier (cleaner) meeting the efficiency specifications of ENERGY STAR is purchased and installed in place of a model meeting the current federal standard.

This measure was developed to be applicable to the following program types:  TOS, NC.

If applied to other program types, the measure savings should be verified.

###### Definition of Efficient Equipment

The efficient equipment is defined as an air purifier meeting the efficiency specifications of ENERGY STAR as provided below.

* Must produce a minimum 50 Clean Air Delivery Rate (CADR) for Dust[[1]](#footnote-1) to be considered under this specification.
* Minimum Performance Requirement: = 2.0 CADR/Watt (Dust)
* Standby Power Requirement: = 2.0 Watts Qualifying models that perform secondary consumer functions (e.g. clock, remote control) must meet the standby power requirement.
* UL Safety Requirement: Models that emit ozone as a byproduct of air cleaning must meet UL Standard 867 (ozone production must not exceed 50ppb)

###### Definition of Baseline Equipment

The baseline equipment is assumed to be a conventional unit[[2]](#footnote-2).

###### Deemed Lifetime of Efficient Equipment

The measure life is assumed to be 9 years[[3]](#footnote-3).

###### Deemed Measure Cost

The incremental cost for this measure is $70.[[4]](#footnote-4)

###### Loadshape

Loadshape C53 - Flat

###### Coincidence Factor

The summer peak coincidence factor for this measure is assumed to be 100 % (the unit is assumed to be always on).

**Algorithm**

###### Calculation of Savings

###### Electric Energy Savings

ΔkWh = kWhBase- kWhESTAR

Where:

kWhBASE *=* Baseline kWh consumption per year[[5]](#footnote-5)

= see table below

kWhESTAR *=* ENERGY STAR kWh consumption per year[[6]](#footnote-6)

= see table below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clean Air Delivery Rate (CADR)** | **CADR used in calculation (midpoint)** | **Baseline Unit Energy Consumption (kWh/year)** | **ENERGY STAR Unit Energy Consumption (kWh/year)** | **ΔkWH** |
| CADR 51-100 | 75 | 441 | 148 | 293 |
| CADR 101-150 | 125 | 733 | 245 | 488 |
| CADR 151-200 | 175 | 1025 | 342 | 683 |
| CADR 201-250 | 225 | 1317 | 440 | 877 |
| CADR Over 250 | 300 | 1755 | 586 | 1169 |

###### Summer Coincident Peak Demand Savings

∆kW*=* ∆kWh/Hours \*CF

Where:

∆kWh = Gross customer annual kWh savings for the measure

Hours = Average hours of use per year

= 5844 hours[[7]](#footnote-7)

CF = Summer Peak Coincidence Factor for measure

= 66.7%[[8]](#footnote-8)

|  |  |
| --- | --- |
| **Clean Air Delivery Rate** | **ΔkW** |
| CADR 51-100 | 0.033 |
| CADR 101-150 | 0.056 |
| CADR 151-200 | 0.078 |
| CADR 201-250 | 0.100 |
| CADR Over 250 | 0.133 |

###### Natural Gas Savings

N/A

###### Water Impact Descriptions and Calculation

N/A

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

There are no operation and maintenance cost adjustments for this measure.[[9]](#footnote-9)

###### Measure Code: RS-APL-ESAP-V02-160601

1. Measured according to the latest ANSI/AHAM AC-1 (AC-1) Standard [↑](#footnote-ref-1)
2. As defined as the average of non-ENERGY STAR products found in EPA research, 2011, ENERGY STAR Qualified Room Air Cleaner Calculator. [↑](#footnote-ref-2)
3. ENERGY STAR Qualified Room Air Cleaner Calculator. [↑](#footnote-ref-3)
4. Ibid [↑](#footnote-ref-4)
5. ENERGY STAR Qualified Room Air Cleaner Calculator. [↑](#footnote-ref-5)
6. Ibid. [↑](#footnote-ref-6)
7. Consistent with ENERGY STAR Qualified Room Air Cleaner Calculator. [↑](#footnote-ref-7)
8. Assumes that the purifier usage is evenly spread throughout the year, therefore coincident peak is calculated as 5844/8766 = 66.7%. [↑](#footnote-ref-8)
9. Some types of room air cleaners require filter replacement or periodic cleaning, but this is likely to be true for both efficient and baseline units and so no difference in cost is assumed. [↑](#footnote-ref-9)