Existing Facilities Program

TECHNICAL GUIDANCE DOCUMENT FOR CHILLERS

This document provides greater detail regarding the participation options, requirements and bonuses available for chillers through NYSERDA's **Existing Facilities Program**. Incentives are offered on a Pre-Qualified or Performance basis.

Pre-Qualified Incentives: Efficiency Requirements

For electric chillers under 300 tons of cooling capacity that meet or exceed specified minimum efficiency levels, NYSERDA offers a fixed dollars-per-unit tonnage incentive. Please see the table below. The measure worksheet for chiller incentives via Pre-Qualified participation is available at **nyserda.ny.gov/existingfacilities**

Electric Chiller Efficiency Levels and Incentive Amounts

Measure Description	Measure Code	Size (Nominal Tons)	Minimum Efficiency	Unit Incentives	
				Base Incentive ($/Ton)	Additional Incentive ($/Ton)
Air-cooled Chiller with Condenser	ACC-1	≥ 30 & ≤ 100	Full load: 9.8 EER Part Load: 13.3 EER	$25	$5/ton for each 0.1 EER IPLV above criteria
Water-cooled Chiller (Rotary Screw/ Scroll)	WCC-1	≥ 30 & < 150	Full load: 0.72 kW/ton IPLV: 0.59 kW/ton	$15	$8/ton for each 0.01 kW/ton IPLV below criteria
	WCC-2	≥ 150 & < 300	Full load: 0.64 kW/ton IPLV: 0.49 kW/ton	$15	$2/ton for each 0.01 kW/ton IPLV below criteria
Water-cooled Chiller (Centrifugal)	WCC-3	≥ 30 & < 150	Full load: 0.64 kW/ton IPLV: 0.53 kW/ton	$15	$8/ton for each 0.01 kW/ton IPLV below criteria
	WCC-4	≥ 150 & < 300	Full load: 0.59 kW/ton IPLV: 0.52 kW/ton	$15	$2/ton for each 0.01 kW/ton IPLV below criteria

Notes:

1. *Only units that meet both minimum requirements are eligible for incentives.*
2. *Equipment efficiency criteria based on ARI standards using non-CFC refrigerant.*
3. *Tons should be ARI net capacity, not gross capacity.*
4. *Equipment using CFC as refrigerant is not eligible.*
5. *Efficiency ratings for full load (EER or kW/ton) and IPLV (kW/ton) must be calculated at ARI Standard 550/590-98 rating conditions:*
   a. *44ºF; leaving chilled water; 2.5 gpm/ton (air-cooled and water-cooled chillers)*
   b. *95ºF; entering condenser air (air-cooled chillers only)*
   c. *85ºF; entering condenser water (water-cooled chillers only); 3.0 gpm/ton*

Performance-Based Incentives (Electric & Gas): Efficiency Requirements & Incentives

Performance-Based participation offers an incentive based on the annual energy savings. All electric chillers must surpass ASHRAE 90.1 2007 [Addendum bt] Full Load and Non-Standard Part Load Value (NPLV) requirements by at least 2%. Projects incorporating chillers less than 300 tons must surpass whichever standard is more stringent: Performance-Based (as noted above), or Pre-Qualified (as listed in the specific categories on the Measure Worksheets).

The efficiency ratings used for comparison to ASHRAE requirements are the nameplate efficiencies rated for actual operating conditions. Chillers that do not exceed both Full Load and NPLV requirements in ASHRAE 90.1 2007 [Addendum bt] by at least 2% are ineligible for incentives. In order to determine the applicable required efficiency, as well as estimate potential bonus incentive, a Super Efficient Chiller Estimator is available at **nyserda.ny.gov/existingfacilities**

Super Efficient Electric Chiller Bonus:

Water-cooled electrically operated chillers greater than or equal to 300 tons of cooling capacity may be eligible for a bonus to be added to the Performance-Based incentive. There is a Full Load Based Bonus (Path A), and alternatively, a Non-Standard Part Load Value (NPLV) Based Bonus (Path B), available for qualifying chillers. A Super Efficient Electric Chiller Bonus Estimator is provided on the Existing Facilities Program homepage to facilitate estimating this bonus. Please see **nyserda.ny.gov/existingfacilities**

EFP #: _____

Applicant: _____
Facility: _____

Standard 90.1-2007 Addendum bt
Path Selected:

Standard 90.1-2007 Addendum bt
◉ Path A - Full Load
○ Path B - Part Load

Proposed Chiller Inputs

Tons	800.0	Tons
Full-Load Leaving Evaporator Water Temperature (LvgEvap)	43.00	deg. F
Full-Load Leaving Condenser Water Temperature (LvgCond)	101.00	deg. F

Boundaries		
Minimum	*300*	*Tons*
Minimum LvgEvap	*36*	*degF*
Maximum LvgCond	*115*	*degF*

Proposed Chiller Efficiencies

	Full Load	NPLV
Nameplate Efficiency (kW/Ton)	0.5980	0.4870
ASHRAE Path A Efficiency for a 800 ton chiller	*0.5700*	*0.5390*
Adjusted Maximum Efficiencies (kW/Ton)	***0.6693***	***0.6329***
EFP Requirement: (Need to be this *% Better than ASHRAE*)	3.0%	2.0%
Efficiencies Need To Be: (kW/Ton)	**0.6492**	**0.6202**
Nameplate Values Are this *% Better than ASHRAE:*	***10.65%***	***23.05%***

Legend - Eligible for Incentives?		
x.xx%	Not eligible for PB incentives	
x.xx%	Meets Performance-Based criteria (>= 2.0%)	
x.xx%	Meets SECB criteria* (>=3% or >=12.5%)	
*Path chosen must be:	***x.xx%***	for SECB Incentive

EFP Super Efficient Chiller Bonus Incentives

Full Load $/kW Incentive	$1,400	per kW
NPLV $/kW Incentive	$1,000	per kW

Full Load Based Bonus [(ASHRAE Full Load kW/Ton) - (Actual kW/Ton)] * Tons * $1,400/kW
Full Load Based Bonus =[(0.669 kW/Ton) - (0.598 kW/Ton)] * 800 Tons * $1,400/kW
Full Load Based Bonus = 56.80 kW * $1,400/kW
Full Load Based Bonus **$79,520.00**

Eligible for Full Load Based Bonus Above

Full Load Based Bonus: Chillers surpassing the centrifugal standard of ASHRAE 90.1 2007 [Addendum bt] 'Path A' Full Load kW/ton by at least 3% (in addition to the NPLV kW/ton by at least 2%) are eligible for a Full Load Based Bonus. The Full Load Based Bonus is calculated by multiplying the difference between the chiller's Full Load rating and the ASHRAE 'Path A' Full Load requirement by the tonnage of the chiller, then multiplying that number by a bonus incentive rate of $1,400 per kW.

(ASHRAE 90.1 2007 'Path A' Full Load kW/ton - Full Load kW/ton of chiller) × tonnage of chiller × $1,400/kW

NPLV Based Bonus: Chillers surpassing the centrifugal standard of ASHRAE 90.1 2007 [Addendum bt] 'Path B' NPLV kW/ton by at least 12.5% (in addition to the Full Load kW/ton by at least 2%) are eligible for a NPLV Based Bonus. The NPLV Based Bonus is calculated by multiplying the difference between the chiller's NPLV rating versus ASHRAE's 'Path B' NPLV requirement by the tonnage of the chiller, then multiplying that number by a bonus incentive rate of $1,000 per kW.

(ASHRAE 90.1 2007 'Path B' NPLV kW/ton - NPLV kW/ton of chiller) × tonnage of chiller × $1,000/kW

Performance-Based Incentives: Non-Electric Chillers

Steam-to-Electric or Natural Gas-to-Electric: Applicants who replace non-electric (i.e., steam or natural gas) cooling with a qualifying electric chiller are eligible for the Super Efficient Electric Chiller Bonus, provided that the proposed electric chiller meets or exceeds all of the necessary requirements. (No kWh-based incentives are offered for non-electric-to-electric chiller projects.)

Ineligible Chillers or Projects: Electric chillers that do not surpass both the ASHRAE 90.1 2007 [Addendum bt] Full Load (Path A) and Non-Standard Part Load Value (Path B) requirements by at least 2% are ineligible for incentives.

The following fuel conversion projects are also ineligible for funding:

- Electric-to-Natural Gas or Steam
- Steam-to-Natural Gas
- Natural Gas-to-Steam
- Steam-to-Steam (Steam Retention)

If you have additional questions, please contact us toll free at (866) NYSERDA (866-697-3732) (choose ext. "0," and ask to speak with an Existing Facilities Project Coordinator), or email us at **EFPOutreach@nyserda.ny.gov.**