

# 2019 Chiller New Equipment & Construction

## *Instructions for completing the NE&C CHILLER Incentive Worksheet*

### Requirements:

1. This Incentive is available only for comfort cooling applications operating for min. 800 equivalent full load hours (EFLH) or 1500 run hours. Process chillers or chillers equipped w/ variable speed drives may be evaluated as a Custom Incentive.
2. Proposed comfort cooling chiller shall meet or exceed the FL or IPLV efficiencies as listed in on Incentive form.
3. Chiller equipment efficiency criteria are based on ARI Standard 550/590-98 at ARI standard conditions (see note 6) using a non-CFC refrigerant. Attach copy of manufacturer's performance sheet showing both Full Load (FL) and Integrated Part Load Value (IPLV) efficiencies (kW/ton). Air cooled chiller efficiencies shall include condenser fan energy consumption. Tons should be ARI net capacity, not gross capacity. Incentives for chillers shall be calculated using FL (Full Load) and IPLV (Integrated Part Load Value) efficiency ratings.
4. The total Incentive (I) for air cooled chiller projects with efficiencies based on EER is calculated as follows:  
Total Incentive = Base Incentive (F) = (C x E) plus Performance Incentive (H) (using either FL or IPLV) = (D-B) x 10 x C x G (performance Incentive is for each 0.1 EER point above minimum criteria and may not exceed twice the base Incentive)
5. The total Incentive (I) for water cooled chiller projects with efficiencies based on kW / ton is calculated as follows:  
Total Incentive = Base Incentive F = (C x E) plus Performance Incentive H (using FL or IPLV kW/ ton) = (B-D) x 100 x C x G (performance Incentive is for each 0.01 KW/ton below maximum criteria and may not exceed twice the base Incentive)
6. All water-cooled chillers shall incorporate condenser water reset strategy.
7. ARI Chiller standard 550/590-98 conditions are as follows:
  - 44° F leaving chiller water,
  - 2.4 GPM / ton,
  - 95° F entering condenser air temperature (air cooled only),
  - 85° F entering condenser water temperature (water cooled only),
  - 3.0 GPM / ton condenser water flow rate (water cooled only)
8. Chillers with VFD's shall have a minimum 3% impedance reactor in its AC power input connection.
9. Chiller equipment using chlorofluorocarbons (CFC's) as a refrigerant is not eligible for an Incentive. This includes the following refrigerant: CFC-11, CFC-12, and CFC-115 (R502).
10. The Incentive offer is not valid unless signed and dated by the Utility Representative. The Customer accepts the Utilities Incentive offer and agrees to the Terms and Conditions of the Utility by signing in the pre-approval offer block.
11. The Chiller Application must be completed and the Incentive approved prior to purchasing or installing the equipment.
12. Invoices will be required for payment of Incentive.
13. The Incentive, in conjunction with all other sources of funding, cannot exceed the total project cost.

### Pre-Installation:

1. Review the Incentive eligibility requirements.
2. Review the proposed equipment specifications to confirm it meets the minimum efficiency requirements. Chillers must have both Full Load (FL) and Integrated Part Load Value (IPLV) efficiencies.
3. Provide to the utility representative the manufacturer's equipment specifications and record the following information on the worksheet: manufacturer/model number, unit size, unit efficiency, chiller tons and Full Load (FL) and Integrated Part Load Value (IPLV) efficiencies (kW/ton or EER).
4. Calculate the appropriate Incentive in the following examples:

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## Examples of how to calculate chiller Incentives:

Eligibility Requirements		Proposed Equipment		Incentives				
Unit Size ARI Net Tons	Minimum Performance Requirements, FL or IPLV	Net Tons	Proposed Efficiency	Base Incentive (per ton)	Base Incentive Total	Performance Incentive per ton (Max of 2 times base Incentive)	Performance Incentive Total	Total Incentive (F+H)
(A)	(B)	(C)	(D)	(E)	(F) = (C * E)	(G)	(H) (see examples)	(I) = (F + H)
<b>Air Cooled Chillers</b>								
< 150 tons	EER: FL: 10.52 IPLV: 13.75	<u>125</u>	FL: 9.8 IPLV: 14.2	\$20	<u>\$2,500</u>	\$3.25	<u>\$1,829</u>	<u>\$4,329</u>
<b>Water Cooled Chillers - Centrifugal</b>								
≥ 150 and < 300 tons	kW/ton: FL: 0.518 IPLV: 0.360	<u>275</u>	kW/ton: FL: 0.580 IPLV: 0.335	\$17	<u>\$4,675</u>	\$1.25	<u>\$861</u>	<u>\$5,536</u>

### Ex 1: Incentive calculation for a 125 ton air cooled chiller unit with EER= 9.8 (FL) and EER = 14.2 (IPLV)

Unit does not meet Full Load minimum requirement (however, it does meet the IEEC 2009 Code) and meets IPLV minimum requirement so the unit qualifies for a Incentive.

Total Incentive = Base Incentive: (C \* E) + Performance Incentive: (D - B) \* 10 \* C \* G

Base Incentive = 125 tons \* \$20/ton = \$2,500

Performance Incentive (using IPLV kW/ton values) = (14.2 - 13.75) \* 10 \* \$3.25 = \$14.63/ton, Incentive is 125 tons \* \$14.63/ton = \$1,829 which is less than the maximum of 2 times the base Incentive

Total Incentive (I) = \$2,500 + \$1,829 = **\$4,329**

### Ex 2: Incentive calculation for a 275 ton water cooled chiller unit with a FL kW/ton of 0.580 and IPLV kW/ton of 0.335

Unit does not meet Full Load minimum requirement (however, it does meet the IEEC 2009 Code) and meets IPLV minimum requirement so the unit qualifies for a Incentive.

Total Incentive = Base Incentive: F = C \* E + Performance Incentive: H = (B - D) \* 100 \* C \* G

Base Incentive = 275 tons \* \$17/ton = \$4,675

Performance Incentive (using IPLV kW/ton values) = (0.360 - 0.335) \* 100 \* \$1.25 = \$3.13/ton, Incentive is 275 tons \* \$3.13/ton = \$861 which is less the maximum Incentive of than 2 times the base Incentive.

Total Incentive (using IPLV kW/ton values), (I) = \$4,675 + \$861 = **\$5,536**

## Post-Installation:

### **Utility Representative must verify that:**

1. The Chiller has been installed and operable.
2. The installed chiller matches the Chiller Incentive Application information. If the equipment has changed from what was approved for the initial Incentive offer, the actual equipment specifications must be submitted and reviewed by the utility to verify compliance with technical requirements and approved before a Incentive is considered.
3. The invoice or proof of payment has been submitted.
4. The Utility Representative & Customer have signed & dated the post installation inspection block on the Incentive form.