

# 2010 Chiller Rebate

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

### **Requirements:**

1. This rebate 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 rebate.
2. 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. Rebates for chillers shall be calculated using FL and IPLV efficiency ratings.
3. The total rebate (H) for air cooled chiller projects with efficiencies based on EER is calculated as follows:  
 $H = \text{base rebate (B x D) plus performance rebate (using FL or IPLV EER): (C - A) x 10 x E}$   
(performance rebate may not exceed \$52 per ton).
4. The total rebate (H) for water cooled chiller projects with efficiencies based on kW / ton is calculated as follows:  
 $H = \text{base rebate (B x D) plus performance rebate (using FL or IPLV kW/ton): (A-C) x 100 x B}$   
(performance rebate may not exceed \$52 per ton).
5. All water-cooled chillers shall incorporate condenser water reset strategy.
6. 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)
7. Chillers with VFD's shall have a minimum 3% impedance reactor in its AC power input connection.
8. Chiller equipment using chlorofluorocarbons (CFC's) as a refrigerant is not eligible for a rebate. This includes the following refrigerant: CFC-11, CFC-12, and CFC-115 (R502).
9. The rebate offer is not valid unless signed and dated by the Utility Representative. The Customer accepts the Utilities rebate offer and agrees to the Terms and Conditions of the Utility by signing in the pre-approval offer block.
10. The Chiller Application must be completed and the rebate approved prior to purchasing or installing the equipment.
11. Invoices will be required for payment of rebates.
12. The rebate, in conjunction with all other sources of funding, cannot exceed the total project cost.

### **Pre-Installation:**

1. Review the rebate 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 rebate in the following examples

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## Examples of how to fill out rebate table:

Measure	Minimum Efficiency FL and IPLV (A) Req. 1-4	Unit Size - Net (B)	Unit Efficiency (C) Req. 2,6	Base Unit Rebate (D)	Performance Rebate (\$) (E) Req. 2,6	Calculated Base Rebate per chiller, \$ (F) Req. 3, 4	Calculated Performance Rebate per chiller, \$ (G) Req. 3, 4	Total Rebate (\$) (H)
<b>Air Cooled Chillers</b>								
≤ 300 tons	EER: FL: <u>10.5</u> IPLV: <u>12.8</u>	<u>175</u>	EER: FL: <u>10.7</u> IPLV: <u>13.6</u>	\$30 / ton	\$5 / ton for each 0.1 EER above minimum criteria	<b>\$5,250</b>	<del>\$1,750</del> <b>\$7,000</b>	<b>\$12,250</b>
<b>Water Cooled Chillers – Rotary Screw and Scroll</b>								
≥ 300 tons	kW/ton: FL: <u>0.575</u> IPLV: <u>0.515</u>	<u>450</u>	kW/ton: FL: <u>0.530</u> IPLV: <u>0.410</u>	\$25 / ton	\$8 / ton for each 0.01 kW /ton below minimum criteria	<b>\$11,250</b>	<del>\$16,200</del> <b>\$23,400</b>	<b>\$34,650</b>

### Ex 1: rebate calculation for a 175 ton air cooled chiller unit with FL EER = 10.7 and IPLV EER = 13.6

Base rebate: (B x D) + Performance rebate: (C – A) x 10 x E x B

Base rebate = 175 x \$30 = \$5,250

Performance rebate (using FL kW/ton values) = (10.7-10.5) x 10 x \$5 = \$10/ton (less than max of \$52/ton) use \$10\*175 = \$1,750

Performance rebate (using IPLV kW/ton values) = (13.6-12.8) x 10 x \$5 = \$40/ton (less than max of \$52/ton) use \$40 \* 175 = \$7,000

Total rebate (using FL kW/ton values), (H) = \$5,250 + \$1,750 = \$7,000

Total rebate (using IPLV kW/ton values), (H) = \$5,250 + \$7,000 = **\$12,250**

The final rebate is the larger of the two rebate calculations: **\$12,250**

### Ex 2: rebate calculation for a 450 ton water cooled chiller unit with a FL kW/ton of 0.530 and IPLV kW/ton of 0.410

Base rebate: (B x D) + Performance rebate: (A-C) x 100 x E x B

Base rebate = 450 x \$25 = \$11,250

Performance rebate (using FL kW/ton values) = (0.575-0.530) x 100 x \$8 = \$36/ton (less than max of \$52/ton) use \$36 \* 450 = \$16,200

Performance rebate (using IPLV kW/ton values) = (0.515-0.410) x 100 x \$8 = \$84/ton (more than max of \$52/ton) use \$52 \* 450 = \$23,400

Total rebate (using FL kW/ton values), (H) = \$11,250 + \$16,200 = \$27,450

Total rebate (using IPLV kW/ton values), (H) = \$11,250 + \$23,400 = **\$34,650**

The final rebate is the larger of the two rebate calculations: **\$34,650**

## Post-Installation:

### Utility Representative must verify that:

1. The Chiller has been installed and operable.
2. The installed chiller matches the Chiller Rebate Application information. If the equipment has changed from what was approved for the initial rebate offer, the actual equipment specifications must be submitted and reviewed by the utility to verify compliance with technical requirements and approved before a rebate 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 rebate form.