

# Heat-Pump Water Chilling Packages

Appliance Efficiency Rulemaking  
California Energy Commission

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# Agenda

- ❑ Pre-rulemaking
- ❑ Purpose
- ❑ Scope and Test Procedure
- ❑ Reported Data
- ❑ Next Steps
- ❑ Discussion and Comments



# Pre-rulemaking

## **Order Instituting Rulemaking (3/14/12)**

Commission identified a variety of appliances with the potential to save energy and/or water for appliance efficiency measures.

## **Invitation to Participate (3/25/13)**

Opportunity for interested parties to inform the Commission about the product, market, and industry characteristics of the appliances identified in the OIR.

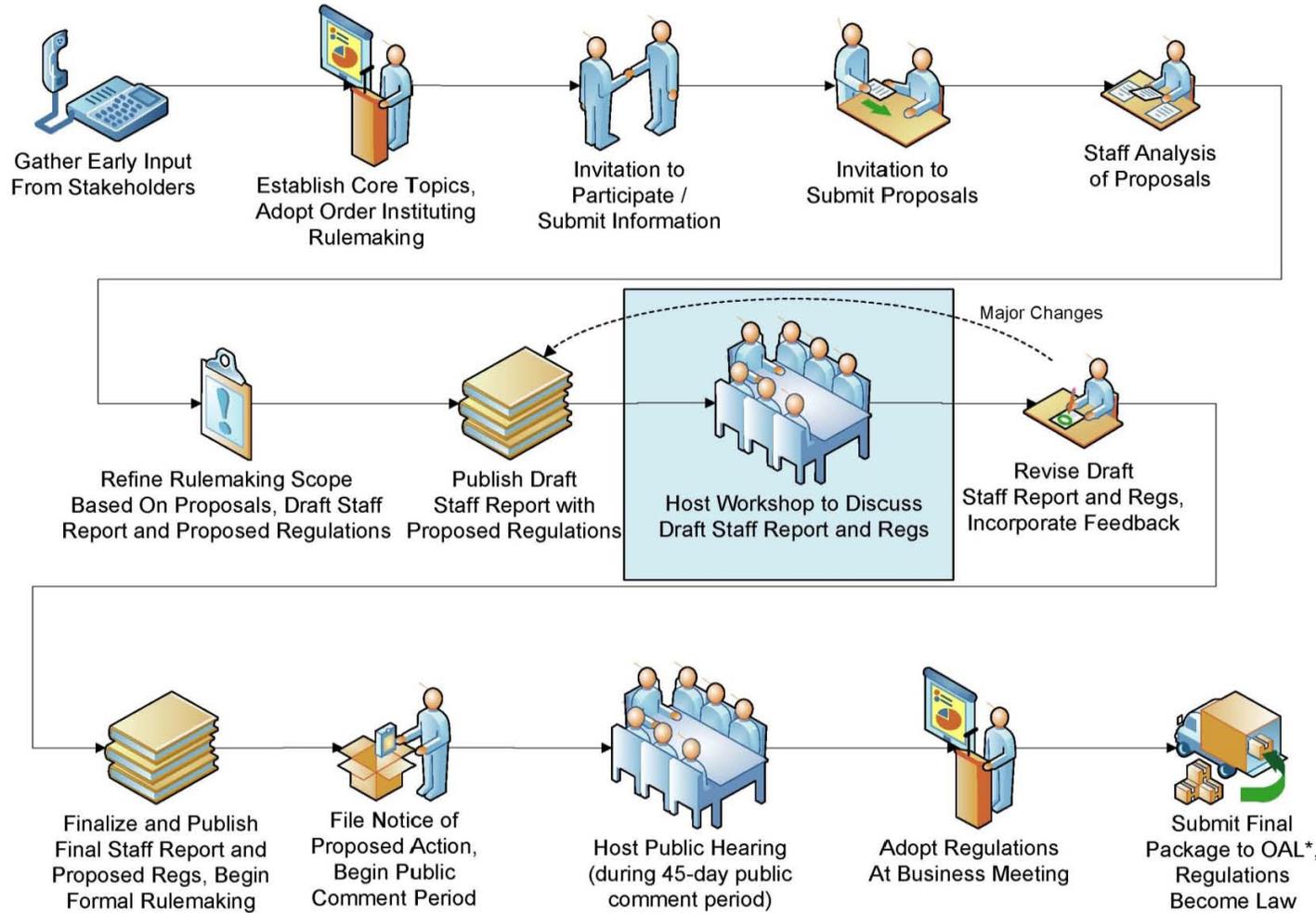
## **Invitation to Submit Proposals (6/13/13)**

Opportunity for interested parties to submit proposals for standards, test procedures, labeling requirements, and other measures to improve efficiency.



Appliance Energy Efficiency Rulemaking Process

5/2/2013



\*Office of Administrative Law



# Purpose

- Builders, designers, inspectors, and standards development professionals in the state require repeatable and reliable information about product performance in order to meet energy design goals.
- Heat-pump water chilling packages did not have readily verifiable performance data. The Energy Commission's building regulations added testing and verification to table 110.2-D and certification through the buildings program.
- Commission staff propose move these requirements into the Title 20 appliance standards, requiring all equipment be certified to the more robust appliance efficiency database before being sold, offered for sale, or installed after January 1, 2016.



# Scope and Test Procedure

Staff proposes using ANSI/AHRI 550-590 (I-P) 2011 for equipment testing.

All equipment currently covered by table 110.2-D would be covered and any other product that meets the following definition:

*“a factory-made package of one or more compressors, condensers, and evaporators designed for the purpose of heating water. Where such equipment is provided in one or more than one assembly, the separate assemblies are designed to be used together. The package is specifically designed to make use of the refrigerant cycle to remove heat from an air or water source and to reject the heat to water for heating use. This unit may include valves to allow for reverse-cycle (cooling) operation”*



# California Energy Commission

**TABLE 110.2-D WATER CHILLING PACKAGES – MINIMUM EFFICIENCY REQUIREMENTS <sup>a,b</sup>**

Equipment Type	Size Category	Path A Efficiency <sup>a,b</sup>	Path B Efficiency <sup>a,b</sup>	Test Procedure <sup>c</sup>
Air Cooled, With Condenser Electrically Operated	< 150 Tons	≥ 9.562 EER ≥ 12.500 IPLV	N.A. <sup>d</sup>	AHRI 550/590
	≥ 150 Tons	≥ 9.562 EER ≥ 12.750 IPLV	N.A. <sup>d</sup>	
Air Cooled, Without Condenser Electrically Operated	All Capacities	Air-cooled chillers without condensers must be rated with matching condensers and comply with the air-cooled chiller efficiency requirements.		
Water Cooled, Electrically Operated, Reciprocating (Reciprocating)	All Capacities	Reciprocating units must comply with the water-cooled positive displacement efficiency requirements.		AHRI 550/590
Water Cooled, Electrically Operated Positive Displacement	< 75 Tons	≤ 0.780 kW/ton ≤ 0.630 IPLV	≤ 0.800 kW/ton ≤ 0.600 IPLV	AHRI 550/590
	≥ 75 tons and < 150 tons	≤ 0.775 kW/ton ≤ 0.615 IPLV	≤ 0.790 kW/ton ≤ 0.586 IPLV	
	≥ 150 tons and < 300 tons	≤ 0.680 kW/ton ≤ 0.580 IPLV	≤ 0.718 kW/ton ≤ 0.540 IPLV	
	≥ 300 Tons	≤ 0.620 kW/ton ≤ 0.540 IPLV	≤ 0.639 kW/ton ≤ 0.490 IPLV	
Water Cooled, Electrically Operated, Centrifugal	< 150 Tons	≤ 0.634 kW/ton ≤ 0.596 IPLV	≤ 0.639 kW/ton ≤ 0.450 IPLV	AHRI 550/590
	≥ 150 tons and < 300 tons	≤ 0.634 kW/ton ≤ 0.596 IPLV	≤ 0.639 kW/ton ≤ 0.450 IPLV	
	≥ 300 tons and < 600 tons	≤ 0.576 kW/ton ≤ 0.549 IPLV	≤ 0.600 kW/ton ≤ 0.400 IPLV	
	≥ 600 Tons	≤ 0.570 kW/ton ≤ 0.539 IPLV	≤ 0.590 kW/ton ≤ 0.400 IPLV	



# Reported Data

The full list of required report data is available in the staff report, pages 42-43 in “Table X” and includes performance data such as:

Heating and Cooling capacity

Energy Efficiency Ratio (EER) for cooling

Integrated Part Load Value (IPLV)

Coefficient of Performance (COP) for heating

COPR of heat reclaiming



# Next Steps

- ❑ Consider input from today's workshop and written comments. Written comments are due by June 6, 2014.
- ❑ Revise staff report analysis and proposed requirements, as necessary
- ❑ Commission staff is available to discuss questions and concerns at any time during the proceeding.



# Discussion & Comments

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