



ENERGY STAR[®]

Water Heaters

**Draft 2 Version 2.0
Stakeholder Meeting
November 10, 2011**

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Webinar Goals



- Highlight key changes from Draft 1.
- Solicit stakeholder feedback on proposal and outstanding issues.
- Address stakeholder questions about process and/or changes.
- Identify next steps and timeline.

Key Areas for Discussion



- Whole-home Electric
 - UL certification concern
 - Additional requirements, warranty, metrics
- POU Electric Units
 - Binary label in a complex market
 - Scope, revised requirements, metric for small tank heaters
- Whole home gas: Warranty
- Solar Water Heaters (reprise)

Revision Drivers



- Technology Neutrality
- Specific small issues with specification
- Opportunity to capture greater energy savings by expanding scope

Technology Neutrality



- Product Categories
 - Distinguished by Fuel Source
 - Electric
 - Gas
 - Solar
 - Further Distinguished by Use
 - Whole-home
 - Point-of-Use (POU)
- Distinctions also affected by test methods

Proposal Summary



Fuel	Product type	Requirements
Electric	Whole home storage	EF \geq 2.0 FHR \geq 50 GPH
	Point of use	EF \geq .97, low flow rate $>$.5 GPM
Gas	Whole home storage	EF \geq .67, FHR \geq 67 GPH
	Whole home tankless	EF \geq .82, GPM \geq 2.5
Solar	Electric or gas backup	SF \geq .5

Whole-home Electric



- UL certification concern
 - Stakeholder commented that UL safety certification of original tank voided when add-on heat pump attached
 - Initially, UL confirmed this
 - At manufacturers requests, certifiers are examining the installation more carefully
 - EPA reaching out to other stakeholders with experience in installations

Whole-home Electric cont'd



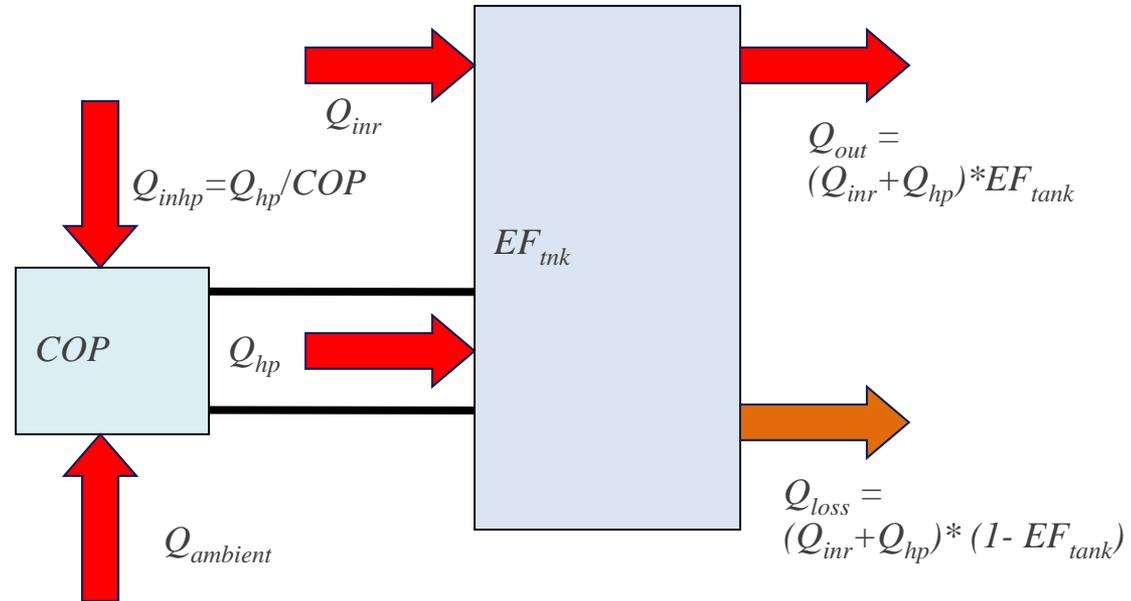
- Added requirements for all heat pumps
 - Audible alert of blocked condensate drain
 - Reporting of lower compressor cutoff temp
- Warranty Requirement for add-on
 - Manufacturers should be responsible only for their own equipment
 - Consumers made aware of the warranty conditions through warning statement

Whole-home Electric cont'd



- Retained 2.0 EF requirement for add-ons in this Draft
- Considering EF improvement metric
 - Recognizes the energy savings of add-ons
 - Additional consumer information
 - But, actual EF improvement will depend on use pattern and climate
 - EF still reported, perhaps requirement is lower

Energy Factor Multiplier (EFM)



$$Q_{inr} = \alpha \cdot Q_{hp}$$

$$EF_{sys} = \frac{Q_{out}}{Q_{inhp} + Q_{inr}} = EF_{tank} \frac{(\alpha + 1)}{\alpha + 1/COP}$$

$$EFM = \frac{(\alpha + 1)}{\alpha + 1/COP}$$

Energy Factor Multiplier (EFM)



Percent saved on water heating as a function of how much of the heating the heat pump supplies, and its COP in situ

		COP			
		4.0	3.0	2.5	2.0
% water heating energy supplied by the heat pump	10%	39%	35%	32%	26%
	50%	50%	44%	40%	33%
	80%	63%	56%	50%	42%
	90%	68%	61%	55%	45%
	95%	71%	63%	57%	48%
	100%	75%	67%	60%	50%

3 POU Electric Use Cases

- Many stakeholders commented on payback
- Since there is no differentiation among POU heaters, consider alternate solutions
 1. New construction
 - ENERGY STAR central heat pump saves more energy than two resistance POU units
 2. Home addition/remodeling
 - Complex set of questions regarding when POU heater is a good solution
 - How often do additions reflect added hot water needs (e.g. extra person) anyway?

3 POU Electric Use Cases



3. Improve HW delivery to existing, distant fixture
 - Takes some of the HW load off central WH
 - May save energy or cost energy, depending on...
 - EF of central heater
 - Length and insulation of pipes
 - Usage pattern at fixture; percent of hot water use
 - For payback, cost of installation (labor and materials) significant and also dependent on many factors
 - Purchase decision is complicated as well by other options for addressing poor HW delivery
 - Does a binary label like ENERGY STAR actually leave consumers better informed in this case?

POU Electric: Scope



- Physical dimension requirement
 - “Table-top water heaters” definition may not be appropriate for POU
 - Capacity requirement: < 20G
- Pending legislation
 - Legislative action required to allow < 25kW to be included under the EF test method
 - This has been accounted for in the specification

POU Electric Requirements



- No booster requirement
 - Most installations do not need it
 - Consumers can see if unit has this function
- Warranty changed to ≥ 6 yrs on heat exchanger, 1 year on parts
- Metric for small tank style POU
 - EF test method in process at DOE
 - Developing TE test method would delay revision

Whole-home Gas



- Includes high efficiency gas storage and gas condensing water heaters
- $EF \geq 0.67$
 - Level to be re-examined during the next revision V3.0
- Warranty changed to 6 years
 - Needed to reconcile varying warranties in previous categories
 - 6 years sufficient assurance of product quality

Labeling Solar Water Heaters



- Some feedback from stakeholder groups, but not much
- Feedback from manufacturers about how labels is used in sales
- Investigating how utilities use the solar water heating program
 - Additional information needed
 - USH2O survey: preliminary results

USH20 survey prelim results



- Of 18 EE program sponsors and implementers...
- Only 18% required ES qualification, and
- Only 35% thought their programs would be effected by label not being available, BUT
- 70% thought ES qualification was a useful requirement, and
- 88% thought ES should continue labeling

USH2O Survey Prelim Results



- Some see indirect effect on programs
- Primary advantages mentioned:
 - Normalizes solar HW as a consumer product
 - Gives general assurance of quality/reliability
- Some felt ES potential to effect market was not fully realized; in particular that standardization could be useful
- Some mentioned climate specific needs

Key SWH Questions



- Do utilities rely on ENERGY STAR for their solar water heating programs?
- Market changed since the ENERGY STAR program took effect?
 - More sales? More confidence in SWH?
- Does ENERGY STAR change consumers' performance or payback expectations?
 - Are expectations met? If not, market impact?

Other SWH Programs



- **Federal Incentives/Policies for Renewables & Efficiency**
 - Residential Energy Conservation Subsidy Exclusion
 - Subsidies provided to customers by public utilities are non-taxable.
 - Residential Renewable Energy Tax Credit
 - Up to 30% tax credit on solar water heaters. Expires 12/31/2016.
 - Energy-Efficient Mortgages (EEM)
 - FHA backed homeowner EEM.
 - Energy Standards for Public Buildings
 - Requires adopting renewable technologies such as solar water heaters for public buildings.

Revision Timeline



- Nov. 10th Stakeholder meeting at ENERGY STAR Partner Meeting
- Dec. 2, 2011 Draft 2 comment period closes
- Jan. 2012 Draft final, comment period
- Jan. 2012 Final specification published
- Nov. 1, 2012 Effective date

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