

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



Energy Conservation Standards For Residential Water Heaters

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Standards Authority and Background

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Standards Authority and Background

- The Energy Policy and Conservation Act (EPCA) of 1975 (Pub. L. 94-163), as amended:
 - Established the Energy Conservation Program for Consumer Products other than Automobiles, which includes residential water heaters.
- National Appliance Energy Conservation Act of 1987 (NAECA) (Pub. L. 100-12)
 - Established energy conservation standards for residential water heaters
 - Required DOE to conduct 2 rounds of rulemaking to evaluate amended standards
- DOE published first amended energy conservation standard (ECS) for residential water heaters on Jan. 17, 2001. 66 FR 4474.
 - Required compliance beginning on January 20, 2004
- DOE published the most recent amended ECS for residential water heaters on April 16, 2010. 75 FR 20112.
 - Compliance with new standards is required beginning on **April 16, 2015**

Scope of DOE Water Heater Standards

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Scope of DOE Water Heater Standards

Residential Water Heater Product Classes

Residential Water Heater	Rated Storage Volume	Nominal Input
Gas-fired Storage	≥ 20 to ≤ 100 gallons	$\leq 75,000$ Btu/h
Oil-fired Storage	≤ 50 gallons	$\leq 105,000$ Btu/h
Electric Storage	≥ 20 to ≤ 120 gallons	≤ 12 kW (40,956 Btu/h)
Tabletop*	≥ 20 to ≤ 100 gallons	≤ 12 kW (40,956 Btu/h)
Gas-fired Instantaneous	≤ 2 gallons	$> 50,000$ to $\leq 200,000$ Btu/h
Electric Instantaneous*	≤ 2 gallons	≤ 12 kW (40,956 Btu/h)

*Energy Conservation Standards will not change as a result of April 2010 final rule.

- The April 2010 final rule did not change the applicability of the standards.
- DOE published a test procedure final rule on July 11, 2014 (79 FR 40541) that expanded the scope of the test method, but did not change the scope of energy conservation standards.

Amended Standards

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Amended Standards

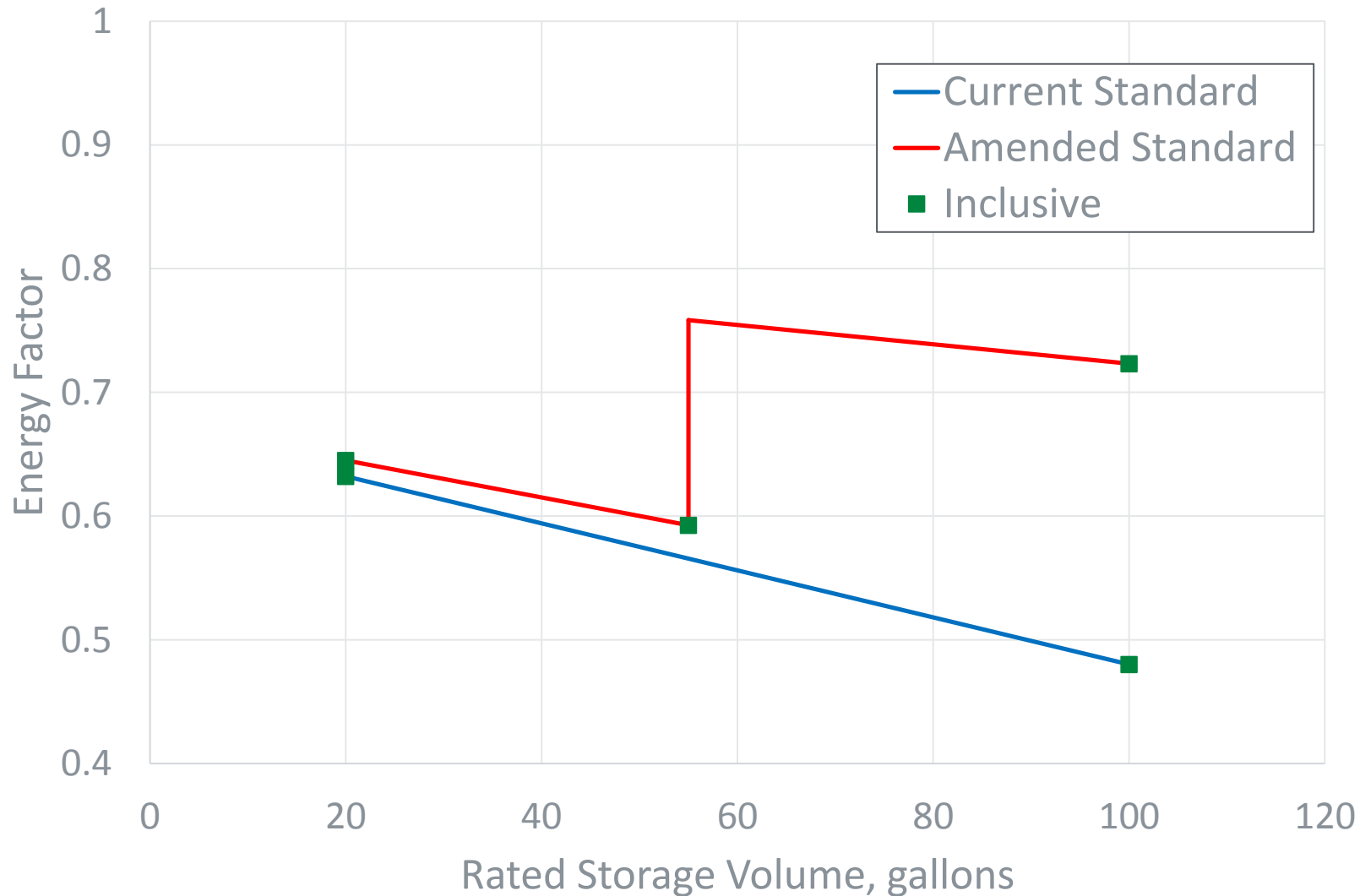
Product Class	Current Energy Conservation Standard	Energy Conservation Standard on April 16, 2015
Gas-fired Water Heater	$0.67 - (0.0019 \times \text{Rated Storage Volume in gal})$	For tanks with a Rated Storage Volume at or below 55 gal: $EF = 0.675 - (0.0015 \times \text{Rated Storage Volume in gal})$. For tanks with a Rated Storage Volume above 55 gal: $EF = 0.8012 - (0.00078 \times \text{Rated Storage Volume in gal})$.
Oil-fired Water Heater	$0.59 - (0.0019 \times \text{Rated Storage Volume in gal})$	$EF = 0.68 - (0.0019 \times \text{Rated Storage Volume in gallons})$.
Electric Water Heater	$0.97 - (0.00132 \times \text{Rated Storage Volume in gal})$	For tanks with a Rated Storage Volume at or below 55 gallons: $EF = 0.960 - (0.0003 \times \text{Rated Storage Volume in gal})$. For tanks with a Rated Storage Volume above 55 gal: $EF = 2.057 - (0.00113 \times \text{Rated Storage Volume in gal})$.
Tabletop Water Heater*	$0.93 - (0.00132 \times \text{Rated Storage Volume in gal})$	$EF = 0.93 - (0.00132 \times \text{Rated Storage Volume in gal})$.
Instantaneous Gas-fired Water Heater	$0.62 - (0.0019 \times \text{Rated Storage Volume in gal})$	$EF = 0.82 - (0.0019 \times \text{Rated Storage Volume in gal})$.
Instantaneous Electric Water Heater*	$0.93 - (0.00132 \times \text{Rated Storage Volume in gal})$	$EF = 0.93 - (0.00132 \times \text{Rated Storage Volume in gal})$.

*Energy Conservation Standards will not change as a result of April 2010 final rule.

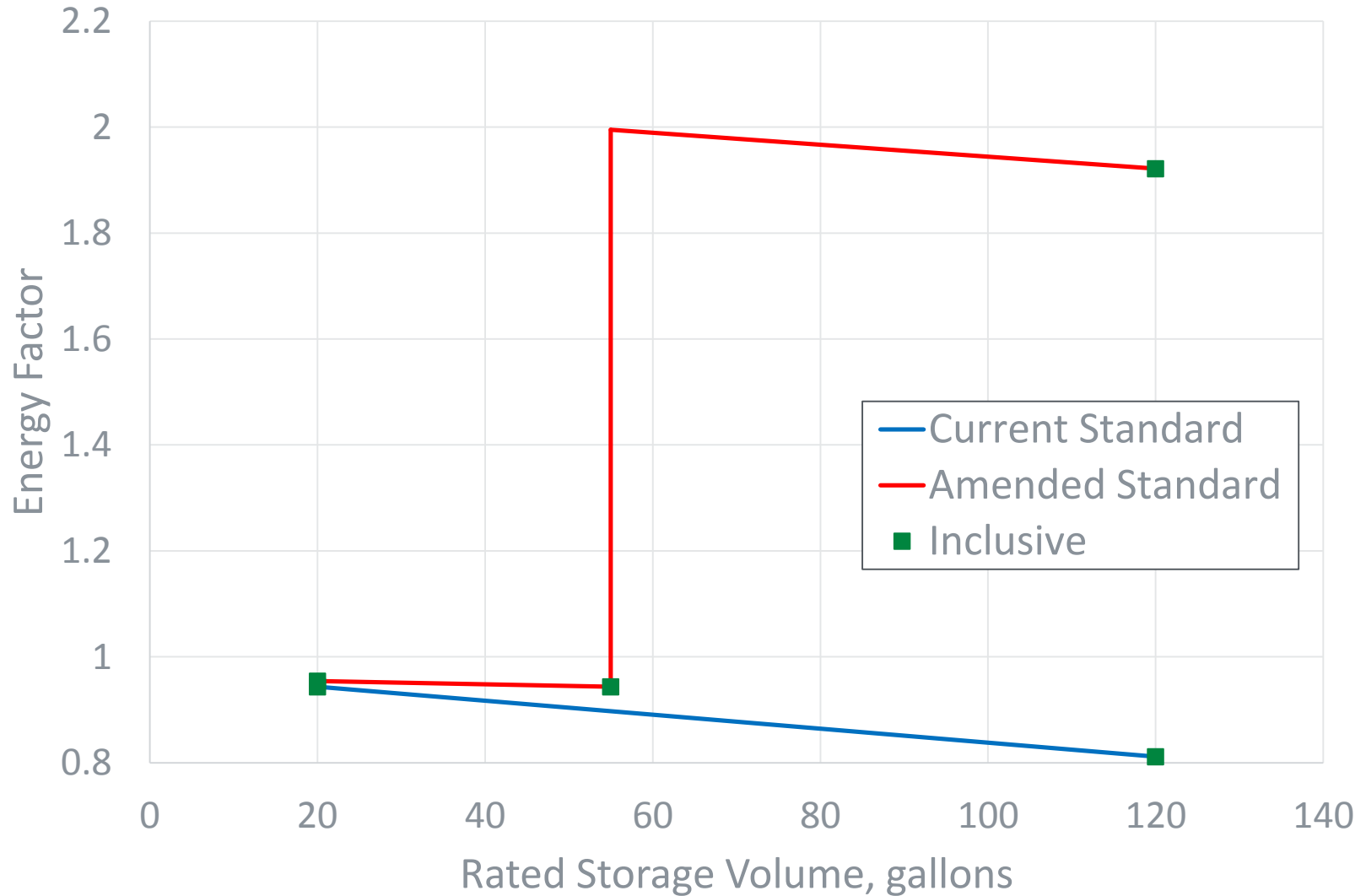
Amended Standards – Key Points

- For gas-fired and electric storage water heaters:
 - Standards equation slope and intercept change
 - More stringent standard for water heaters above 55 gallons rated storage volume
- For gas-fired instantaneous and oil-fired storage water heaters:
 - Standards equation slope does not change
 - Standards equation intercept does change
- For electric instantaneous and tabletop water heaters:
 - Standards equations were not amended
- Amended standards require compliance on **April 16, 2015**.

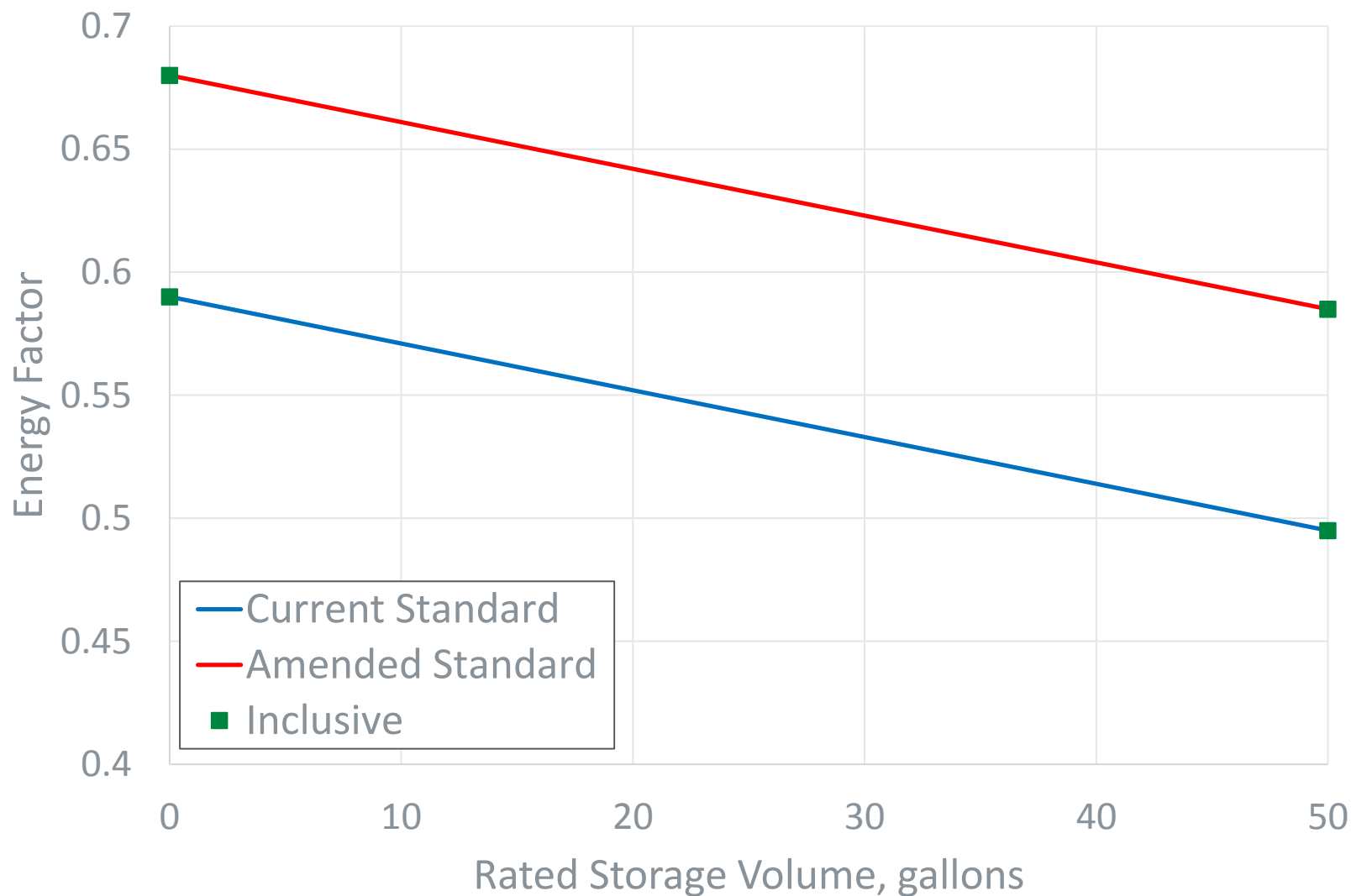
Amended Standards – Gas-fired Storage



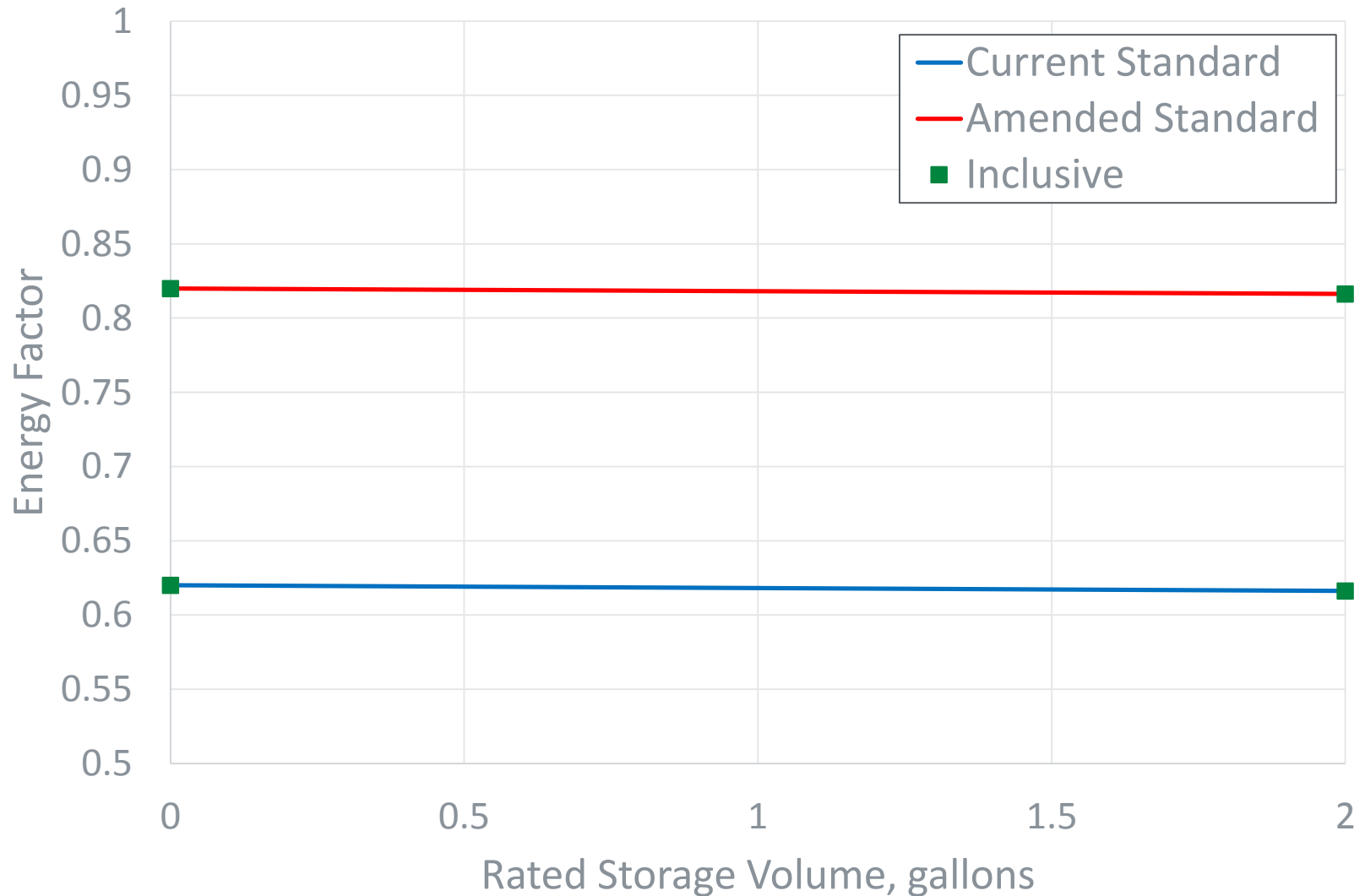
Amended Standards – Electric Storage



Amended Standards – Oil-fired Storage



Amended Standards – Gas-fired Instantaneous



Ongoing Activities

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Ongoing Activities

- Uniform Efficiency Descriptor Mathematical Conversion Rulemaking
 - NOPR under development; expected publication Feb. 2015
 - Final rule expected publication summer 2015

- Solar Water Heater Rulemaking
 - Request for Information published on October 21, 2014 (79 FR 62891)
 - DOE is currently considering comments and deciding next steps