New Equipment Standards from DOE and ENERGY STAR Criteria

Illinois Stakeholder Advisory Group

Kara Rodgers
Senior Program Manager
November 29, 2011

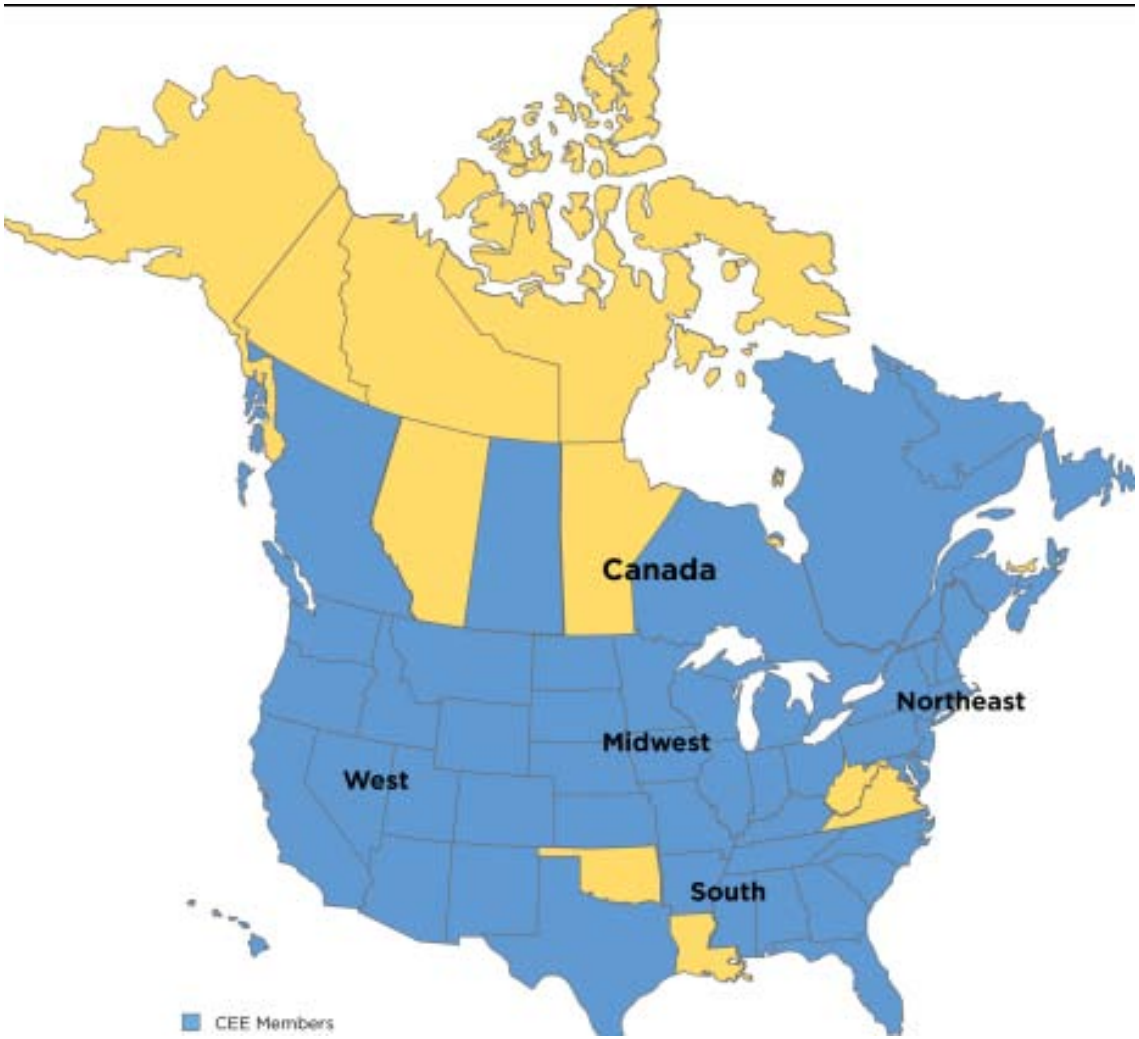
Summary

- Background
- New DOE Furnace Standards
- New DOE Equipment Standards
- New ES Standards

OUR MISSION

CEE increases the effectiveness of energy efficiency programs by enhancing communications and harmonizing approaches across programs to advance energy efficiency for the public benefit.

CEE



- > 130 members serve all or part of 45 states and 8 provinces
- 86% of the $9.1B* total efficiency budget is managed by members
- 2009 EPA Climate Protection Award recognized CEE members approach

- CEE is a member-driven nonprofit, governed by a Board of Directors from member organizations

* Source: Preliminary CEE State of the Efficiency Program Industry 2011

CEE focuses exclusively on member efficiency programs

Members

- Efficiency Program Administrators — CEE members including utilities and non-utilities with ratepayer funded programs
- National Program Sponsors — CEE members such as DOE national labs, state and provincial energy offices, government energy research agencies, national efficiency organizations

Non-Members

- Partners — CEE has established relationships with DOE, EPA, EPRI, GTI, AGA, IEE, and trade associations such as AHRI, HARDI, ACCA
- Organizations with private interests, e.g., manufacturers, consultants, program contractors are not members but are consulted about relevant aspects for programs

High Efficiency Residential Gas Heating Initiative

- Launched in 1998, and seeks to
  - Increase the percentage of sales of high efficiency equipment
  - Reduce the cost of high efficiency equipment
  - Increase the number of contractors who promote high efficiency equipment
  - Increase consumer awareness of the components of a quality installation
  - Increase the number of quality installations
- Sets common efficiency specifications voluntarily adopted by CEE members
- Suggests awareness building activities as also being important

Background on Furnace Standards

- EISA allows for the DOE to issue rules on conservations standards
- Jan 2010 comments submitted to DOE to increase standards for Res furnaces, central AC, heat pumps
- Comment period until Oct 17, 2011
- DOE finalized the rule October 25, 2011, and it will apply **May 2013** for non-weatherized (indoor) furnaces and Jan 2015 for remaining measures
- **Feb 2012*:*** ENERGY STAR moves to 95% AFUE for Northern states and remains at 90% AFUE for Southern States

Comments submitted by Air-conditioning, Heating, and Refrigeration Institute (AHRI), American Council for an Energy-Efficient Economy (ACEEE), Alliance to Save Energy (ASE), Appliance Standards Awareness Project (ASAP), Natural Resources Defense Council (NRDC), and Northeast Energy Efficiency Partnerships (NEEP)

CEE 7

Timeline for Residential Furnace Efficiency Specifications

May 2013:

U.S. DOE min. standards for furnaces take effect, establishing 80% min. AFUE for U.S. South and 90% AFUE for the U.S. North.

Jan 2015:

U.S. DOE min. standards for weatherized (outdoor) furnaces, A/C and heat pumps take effect.

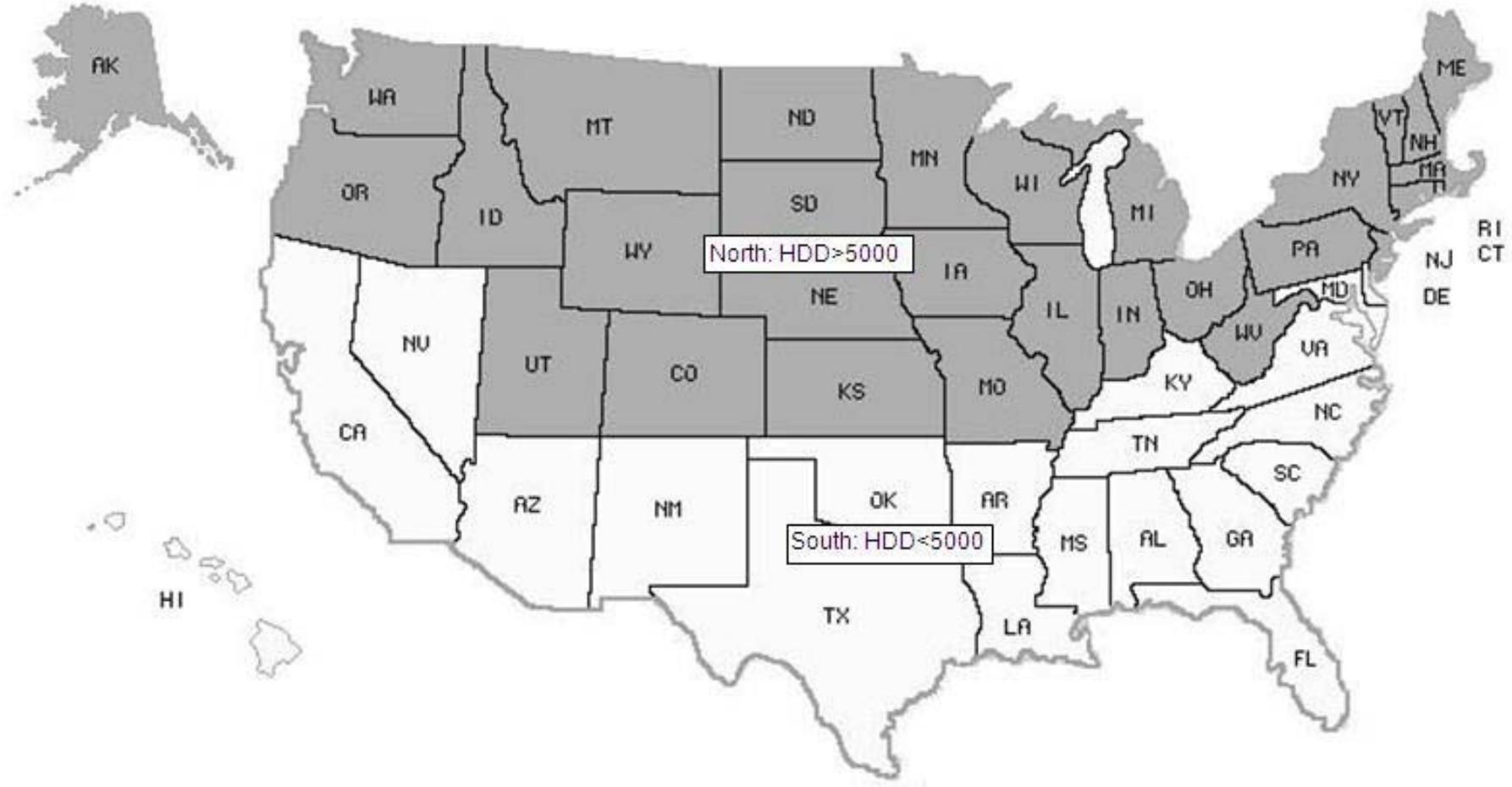
Feb 2012:
ENERGY STAR for Furnaces version 3.0 takes effect, establishing 90% AFUE for the U.S. South and 95% AFUE for the U.S. North

Feb 2013:
ENERGY STAR for Furnaces version 4.0 takes effect, adding cabinet tightness specification

Oct 2014:
California's SCAQMD Rule 1111 takes effect, limiting NOx emissions for **condensing** furnaces to 14 ng/Joule

Oct 2015:
California's SCAQMD Rule 1111 takes effect, limiting NOx emissions for **non-condensing** furnaces to 14 ng/Joule

For the first time, the new DOE standards and ENERGY STAR specs for furnaces are *regional*



New DOE minimum AFUE standards for Non-Weatherized Gas Furnaces* (NWGF), by region

U.S. AND CANADIAN MINIMUM STANDARDS FOR NWGF* (U.S. Effective Date May 1, 2013)		
Region	Most Recent Minimum Standard	New Regulation
U.S. South	≥ 80%	≥ 80%
U.S. North		≥ 90%
Canada††	≥ 90%	

* Non-Weatherized Gas Furnaces (NWGF) is how these regulations refer to **the majority of standard indoor residential gas furnaces**. Outdoor (weatherized) and space-constrained (mobile home) furnaces are subject to different AFUE standards and compliance on Jan. 1, 2015

†† Canadian standards are *already in effect* as of as of Jan. 1 2010. No new furnaces in Canada will be labeled ENERGY STAR until the new standards take effect in 2015

ENERGY STAR for Furnaces Version 3.0 and Version 4.0

- Version 3.0: new **regional** standards; **effective Feb. 1, 2012**

Region	AFUE		Furnace Fan Efficiency (e)
	Current	Final	
U.S. South	≥ 90%	≥ 90%	≤ 2.0%
U.S. North		≥ 95%	
Canada††	None	≥ 95%	

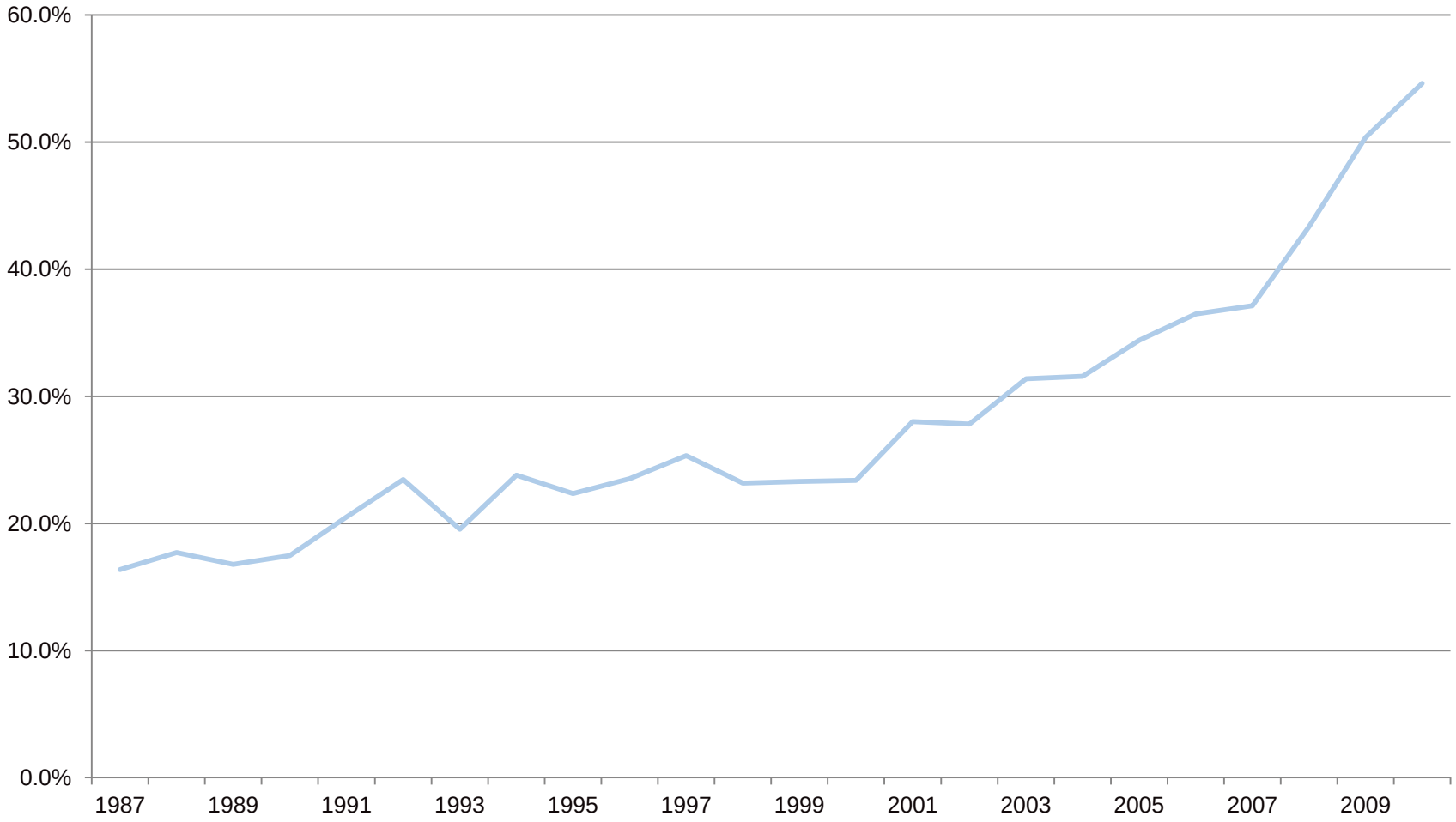
- New regional label for U.S. South:

- Version 4.0: adds new cabinet-leakage specification; **effective Feb. 1, 2013**

Version 4.0 Additional Specification:	
Air Leakage	Qleak ≤ 2.0%

***** ENERGY STAR is a voluntary EPA labeling program that establishes specifications for energy-efficient products, and grants qualified higher-efficiency products an "ENERGY STAR" label

Tremendous Growth in Shipments of 90%+ AFUE Furnaces



Other 2015 Standards: Central Air Conditioners and Heat Pumps

Product Class	National Standards
Split-system air conditioners	SEER = 13
Split-system heat pumps	SEER = 14 HSPF = 8.2
Single-package air conditioners	SEER = 14
Single-package heat pumps	SEER = 14 HSPF = 8.0
Small-duct, high-velocity systems	SEER = 13 HSPF = 7.7
Space-constrained products – air conditioners	SEER = 12
Space-constrained products – heat pumps	SEER = 12 HSPF = 7.4

Residential Furnace Detail

Product class	National Standards	Northern Region Standards
Non-weatherized gas	AFUE = 80%	AFUE = 90%
Mobile home gas	AFUE = 80%	AFUE = 90%
Non-weatherized oil-fired	AFUE = 83%	AFUE = 83%
Weatherized gas	AFUE = 81%	AFUE = 81%
Mobile home oil-fired	AFUE = 75%	AFUE = 75%
Weatherized oil-fired	AFUE = 78%	AFUE = 78%
Electric	AFUE = 78%	AFUE = 78%

Impact on Ameren Illinois Portfolio

- **New Standard: 90% AFUE**
  - 90% becomes new baseline
  - Therefore all incremental costs and savings are based on increasing to 95% from 90%

- **Efficiency standard is 95% AFUE**
  - Currently 80% to 95% AFUE saves 171 therms
  - 90% to 95% AFUE reduces savings to 45 therms
  - ➢ **This means nearly 4 times more units need to be sold**

Impact on Ameren Illinois Portfolio

- **Treatment of Installations costs are the determining factor:**
  - Higher installation costs for high efficiency condensing units (90% and 95%)
  - **Assuming $0 incremental labor costs between 90% and 95% results in TRC > 1**

Measure	Efficient	Baseline	kWh	Therm	Cost	TRC
AFUE 95 w ECM - **No Labor****	AFUE 95 ECM intermittent motor	AFUE 90 standard motor	345	45.0	$597	**1.24**
AFUE 95 - **No Labor****	AFUE 95 no ECM	AFUE 90 standard motor	0	45.0	$72	**5.49**

Measure	Efficient	Baseline	kWh	Therm	Cost	TRC
ER* -AFUE 95 Stage 1	AFUE 95	AFUE 78 standard motor	0	216.0	$824	0.98

*ER: Early Replacement

**There is no incremental labor cost between the 90% and the 95% (both are condensing units).

Impact on Ameren Illinois Portfolio

Issue #1: Excessive number of units need to be sold

- 3 additional units need to be sold that were equivalent savings to one unit previously

Issue #2: Lack of replacement measure

- Furnaces are currenlty 70%+ of therm savings
- Remaining measures can not compensate;
  - Boilers, thermostats, heat pumps, water heaters, insulation, Behavior Modification

Impact on Ameren Illinois Portfolio

Issue #3: Market resistance to install higher efficiency

- Market baseline is 80%
- 90% - 95% AFUE is **costly and invasive installation**
  - 1 stack vs 2 stack; not just a switch and replace
  - Therefore high resistance to install to standard; high preference for repairing old efficiency

Impact on Ameren Illinois Portfolio

Issue #4: Impact of economy

- Incentive does not compensate for total cost to increase from 80% to 95%
- Cost to upgrade: $4,455
- Incentive: $125 - $200
- Cost to repair is lower than upgrade

New furnace standard creates a TRANSFORMED MARKET?