North American Heat Pump Market Overview- 2011

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North American Heat Pump Market Overview-2011

PRESENTATION TO COVER

- Typical North American Products
- Recent Market Developments
  - Impact of Economic Environment
  - Shifts in Heating Equipment Sales
- Minimum Efficiency Standards
  - Move to Regional Standards

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Applications & Products

- Systems in NA different from those in Europe and Asia
  - Residential systems primarily split air-to-air
  - Commercial systems split or packaged systems
    - In south and southwest U.S. packaged - outdoor installation
    - Ductless systems have relatively small sales
    - Water loop hps and packaged terminal hps used in many commercial buildings
    - Ground-coupled heat pump and HPWH sales growing

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Split System Products

Furnace & Coil

Fan Coil

Outdoor Units

Indoor Units

Ductless Terminal

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Packaged Products

Room Air Conditioner

Rooftop Heat Pump

Packaged Terminal

Water Source HP

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MARKET DRIVERS

- Decline in New Building Starts
- Tight Money Environment
- Large Inventory of Existing Homes for Sale
- Increased Oil and Natural Gas Prices
- Growth in Add-on and Replacement Market
- Incentives for Higher Efficiency Products

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IMPACT OF ECONOMIC CRISIS

- Abrupt Drop in New Building Starts in U.S. in 2006
  - Parallel Decline in Sale of Existing Homes
  - Banks Stopped Loaning Money for Mortgages
- Widespread Foreclosures - Many Homes are “Under water” with market value less than money owed to bank
- Decline in starts halted in 2011 – Situation Still Difficult
- Full Recovery Not Likely in Near Future

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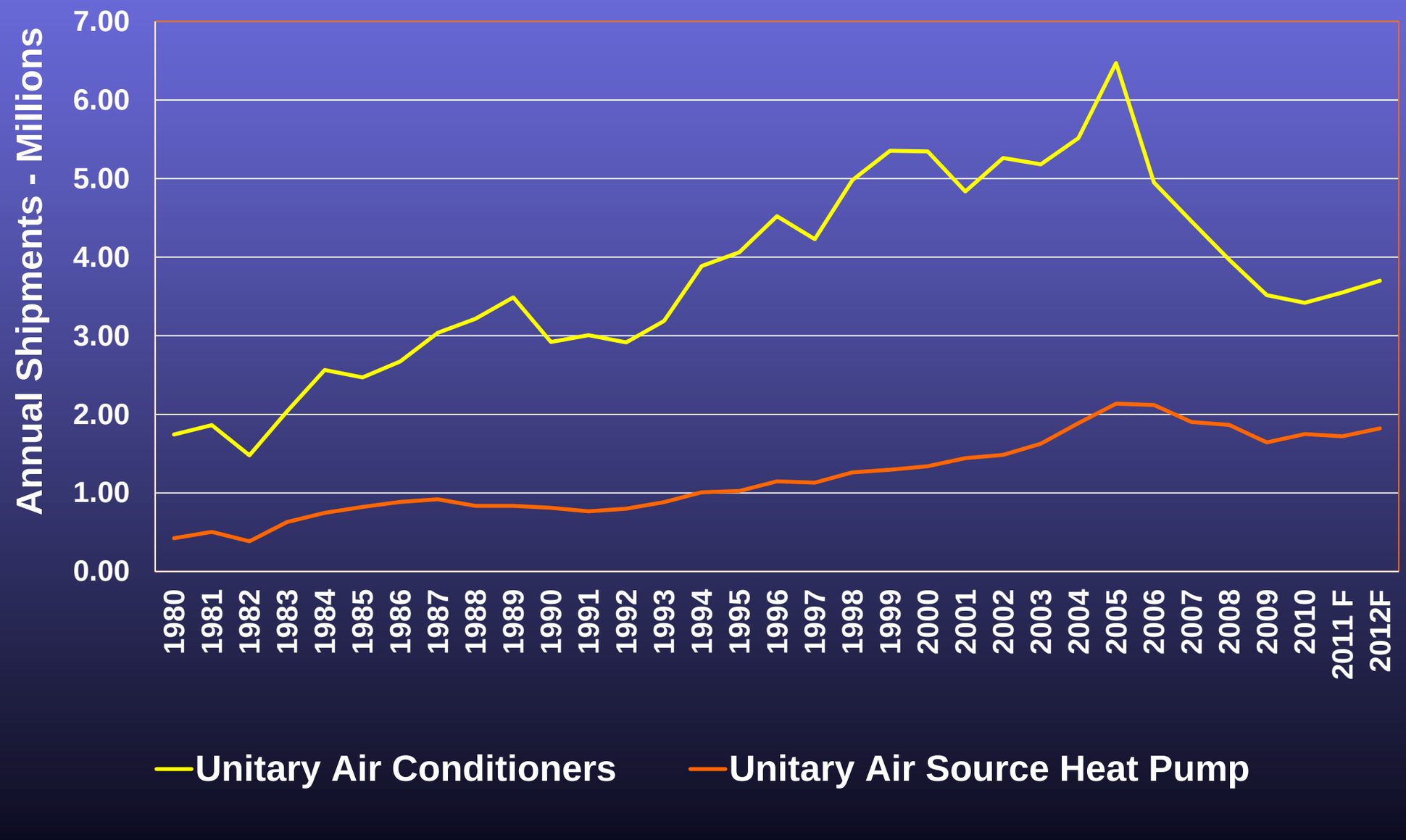
Heat Pump & A.C. Shipment History

U.S. Unitary Air Conditioner and Heat Pump Shipments



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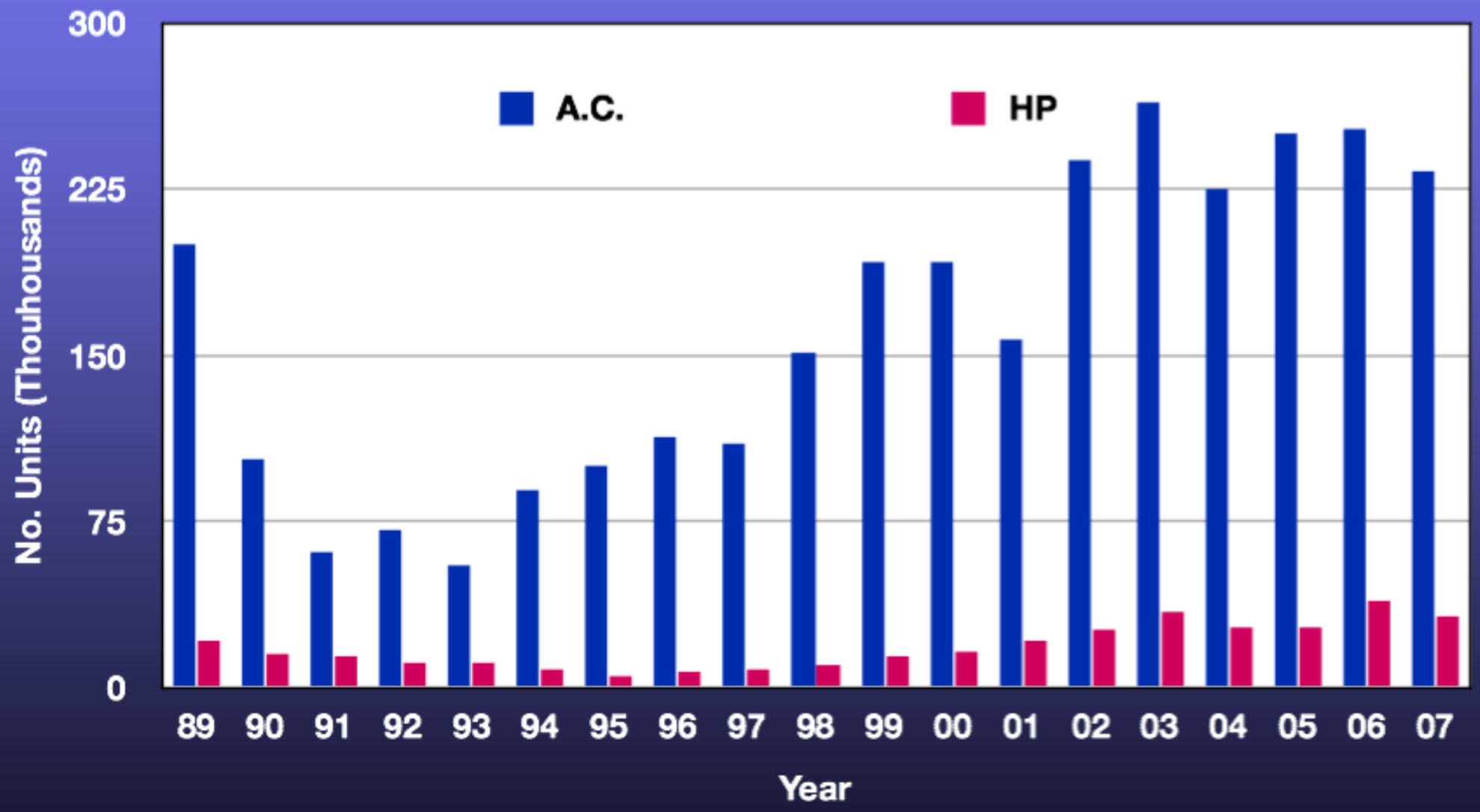
Heat Pump & A.C. Shipment History

Canadian Unitary Air Conditioner and Heat Pump Shipments



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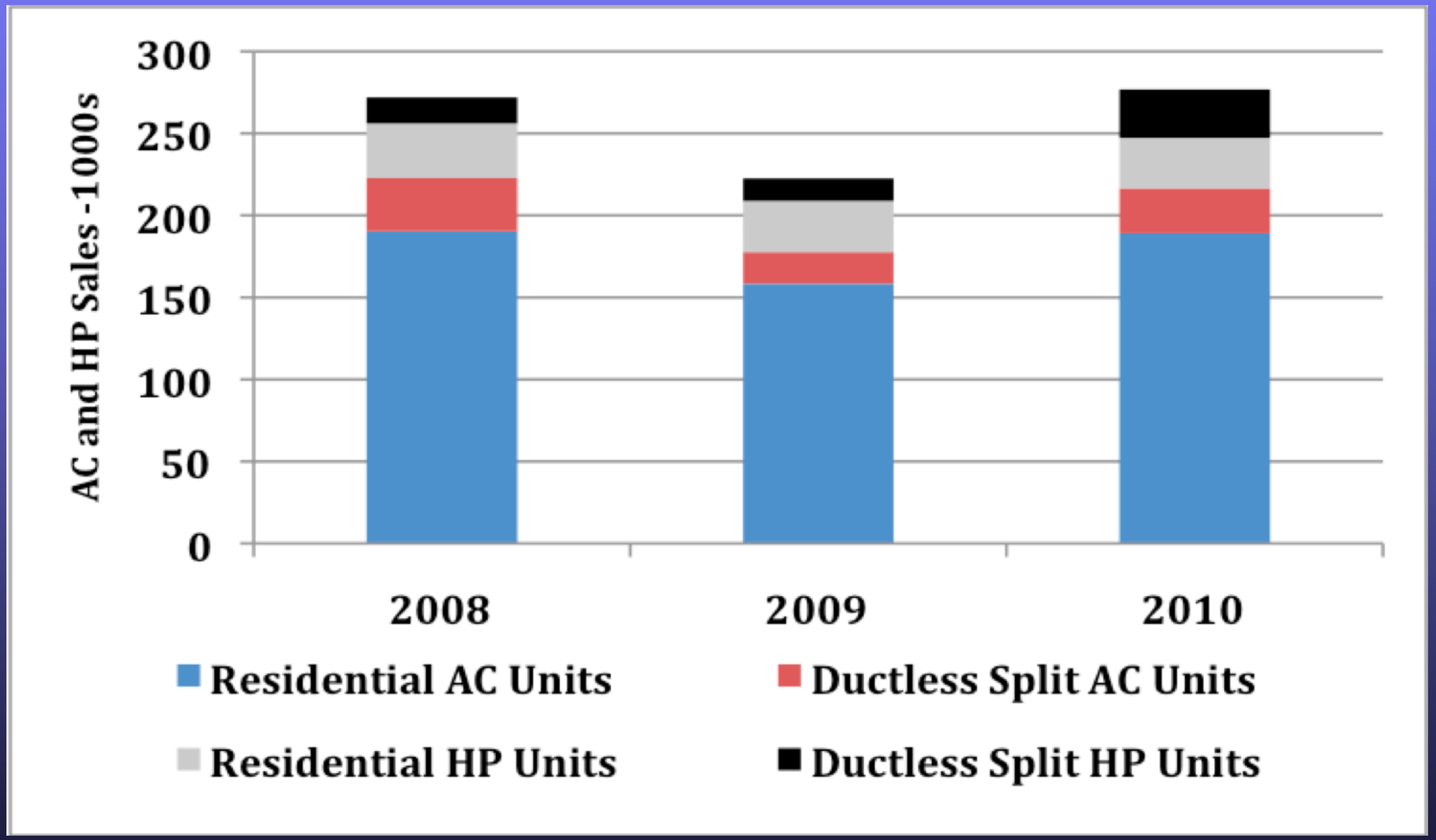
Canadian Heat Pump Sales



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U.S. Heating Equipment Market Changes

- Heat Pumps market share growing
- Declines in gas and oil boilers and furnaces
- Changes driven by:
  - Increased fossil fuel prices
  - Concern over availability of imported gas and oil
  - Demographic changes as population growing in Southern U.S.

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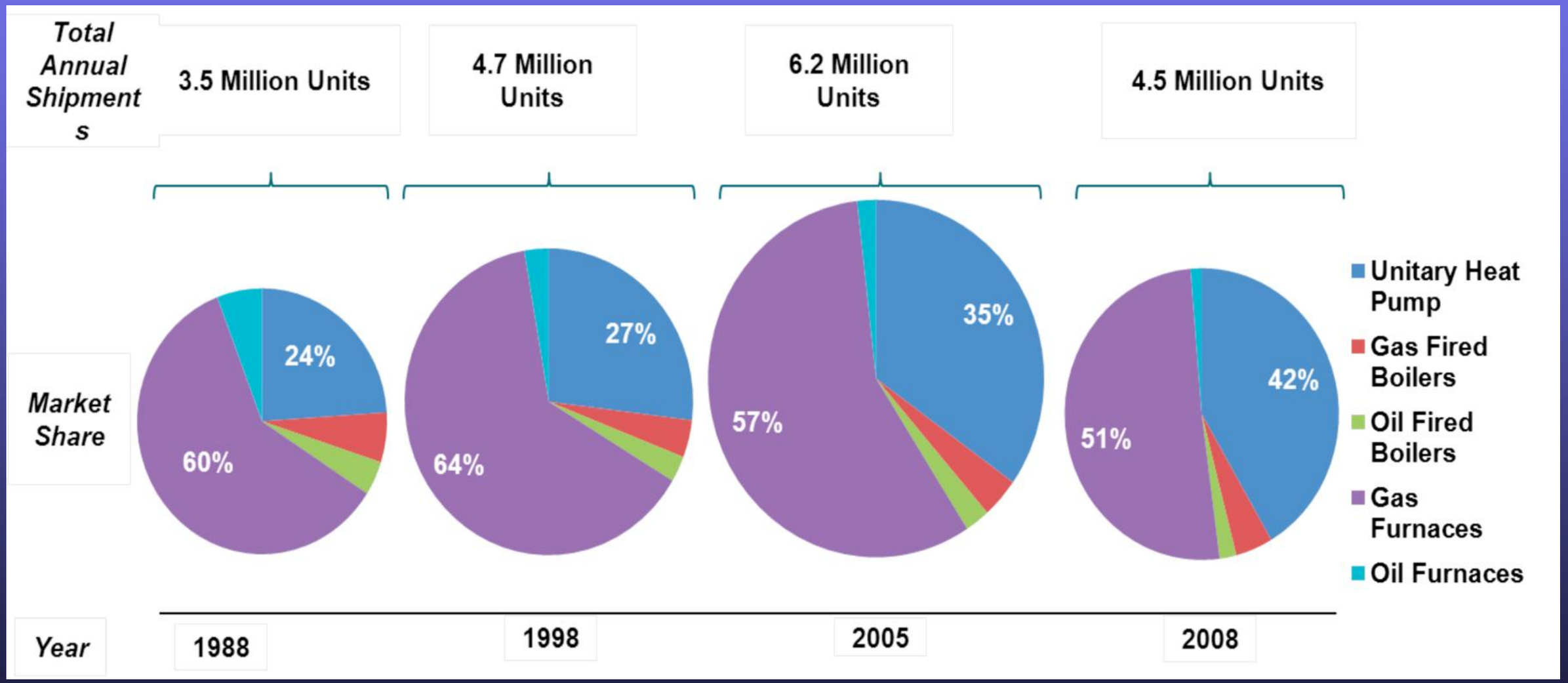
Changing U.S. Heating Market
Heat Pump Share of Shipments



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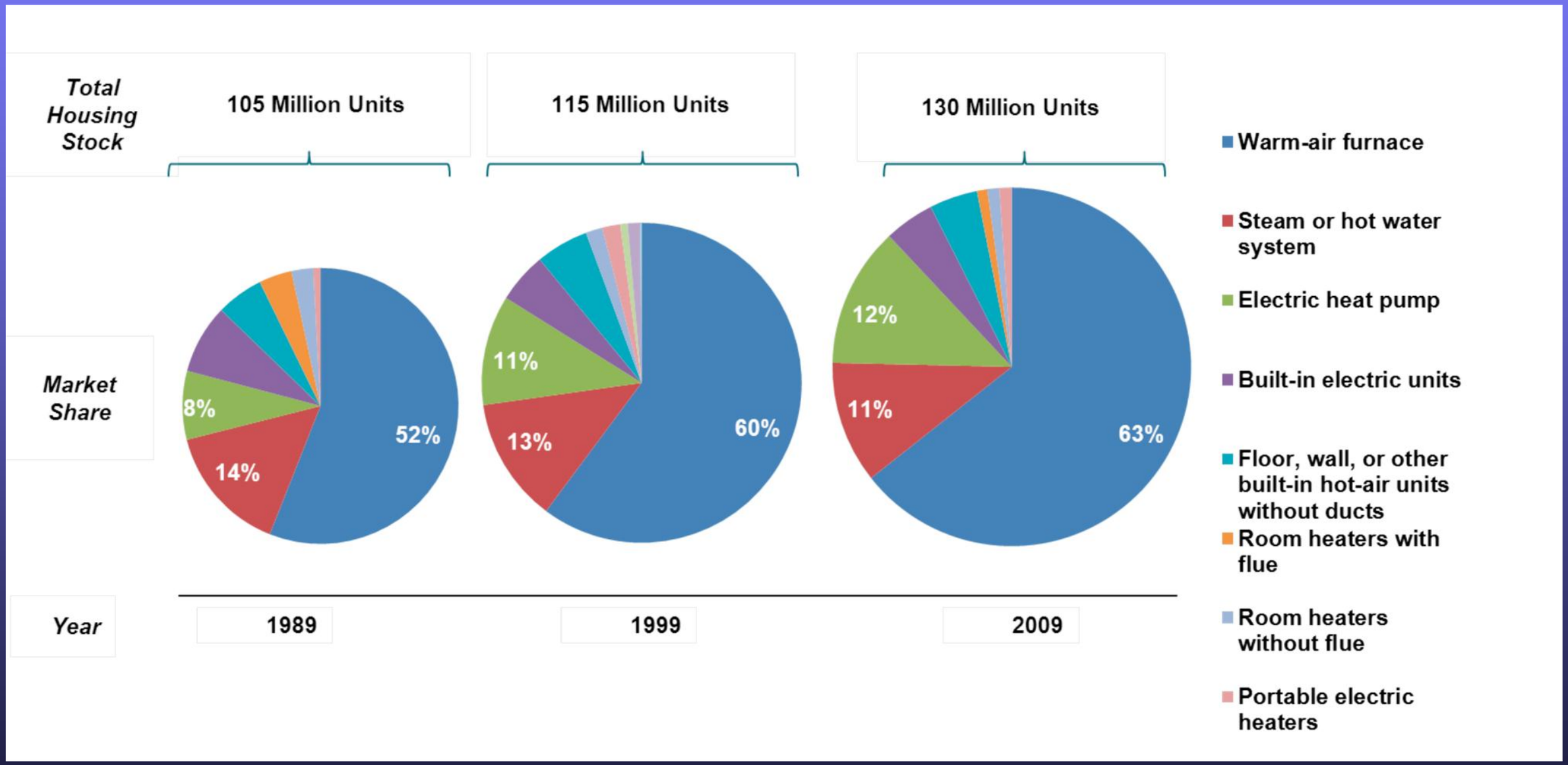
Heat Pump Share of U.S. Housing Stock



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Heat Pump Water Heaters

- Of interest in NA since the 1970s
- By mid-1980 more than 15 manufacturers
- Market dissipated by end of the ‘80s
- General Electric introduced GeoSpring HPWH in 2008 – now 8 -10 mfgrs on the market
- Total U.S. sales of HPWH estimated at 60,000 units in 2010 vs. ~ 15,000 in 2008

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Ground Source Heat Pumps

- Interest in GSHPs languished in the early part of the last decade
- In recent years sales have grown – stimulated by incentives and greater awareness
- Study reported at 2008 IEA HP Conf indicated doubling of sales 2004 – 2007
- U.S. Dept of Energy data shows continuing growth with current sales of ~ 100,000/yr
- Nearly 30 Manufacturers selling GSHPs in U.S.

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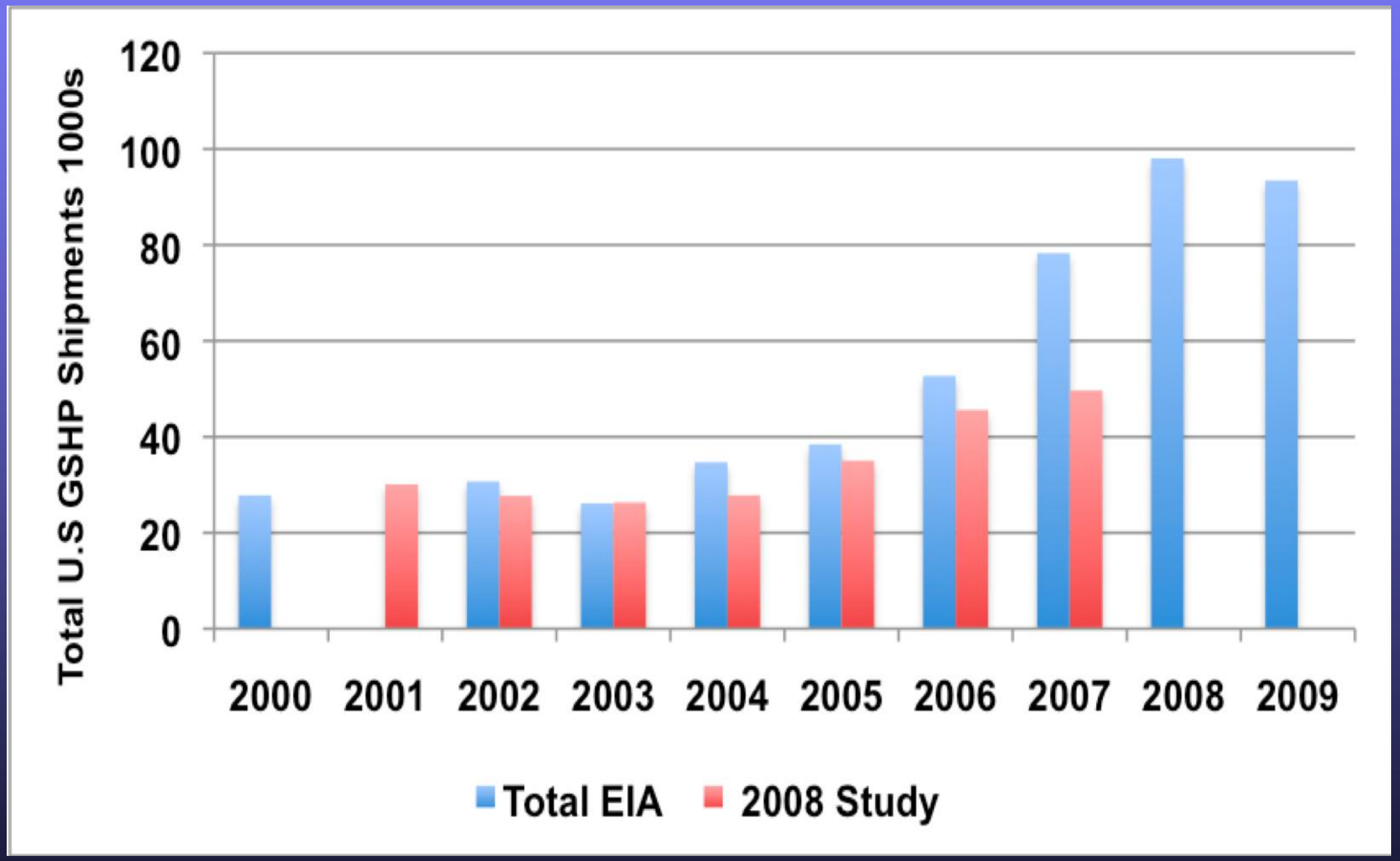
Ground Source HP Sales



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Minimum Energy Performance Standards

- Energy Policy & Conservation Act of 1975
  - Prescribed MEPS for residential furnaces, a.c. units and hps (AFUE, SEER, HSPF – dynamic test & rating)
  - Charged DOE to determine more stringent standards when technically and economically justified
- Standards amended several times – 2006 latest
- These MEPS have been effective in driving efficiency improvement of HPs and ACs – leading to nearly 50% increase in shipment-weighted SEERs since 1992

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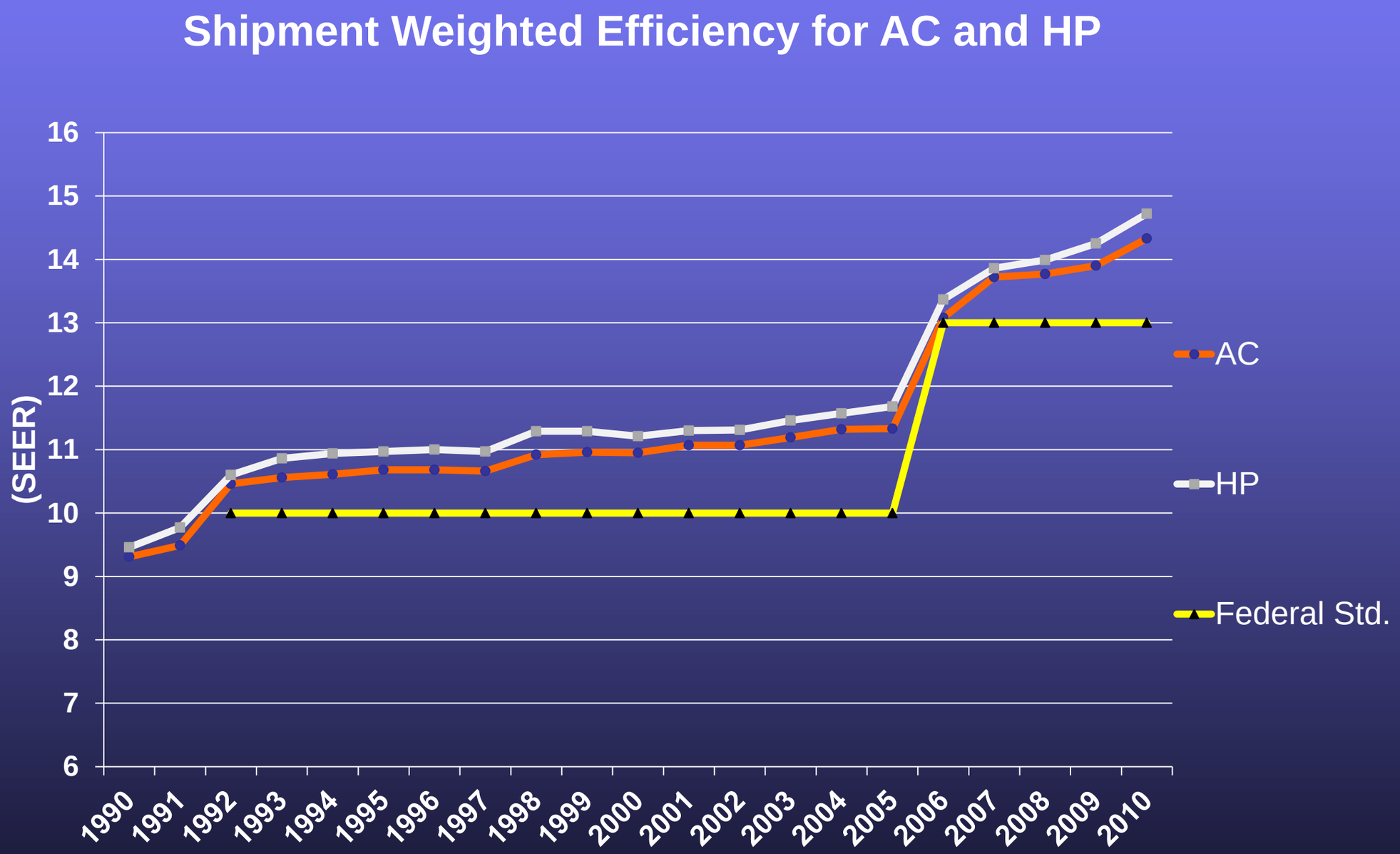
U.S. Shipment-Weighted Seasonal Efficiency History



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Changing Performance Standards

- National standards have served their purpose but as SEER levels have risen – with resulting higher product costs – their cost-effectiveness has come into question

- This past year a consortium of mfgrs, conservation organizations and AHRI petitioned the U.S. Congress and DOE to establish regional standards to recognize climate differences and different operational requirements

- In June, 2011 DOE published a new proposed ruling, establishing 3 distinct regions with different MEPS for residential gas furnaces and air conditioners – hps and oil furnaces will have national MEPS. In the SW split a.c. units will have minimum EER as well as SEER standards.

- These standards are to become effective in 2015 for a.c. units, hps and indoor furnaces. Outdoor furnace standards are to be effective in 2013

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New Minimum Performance Standards

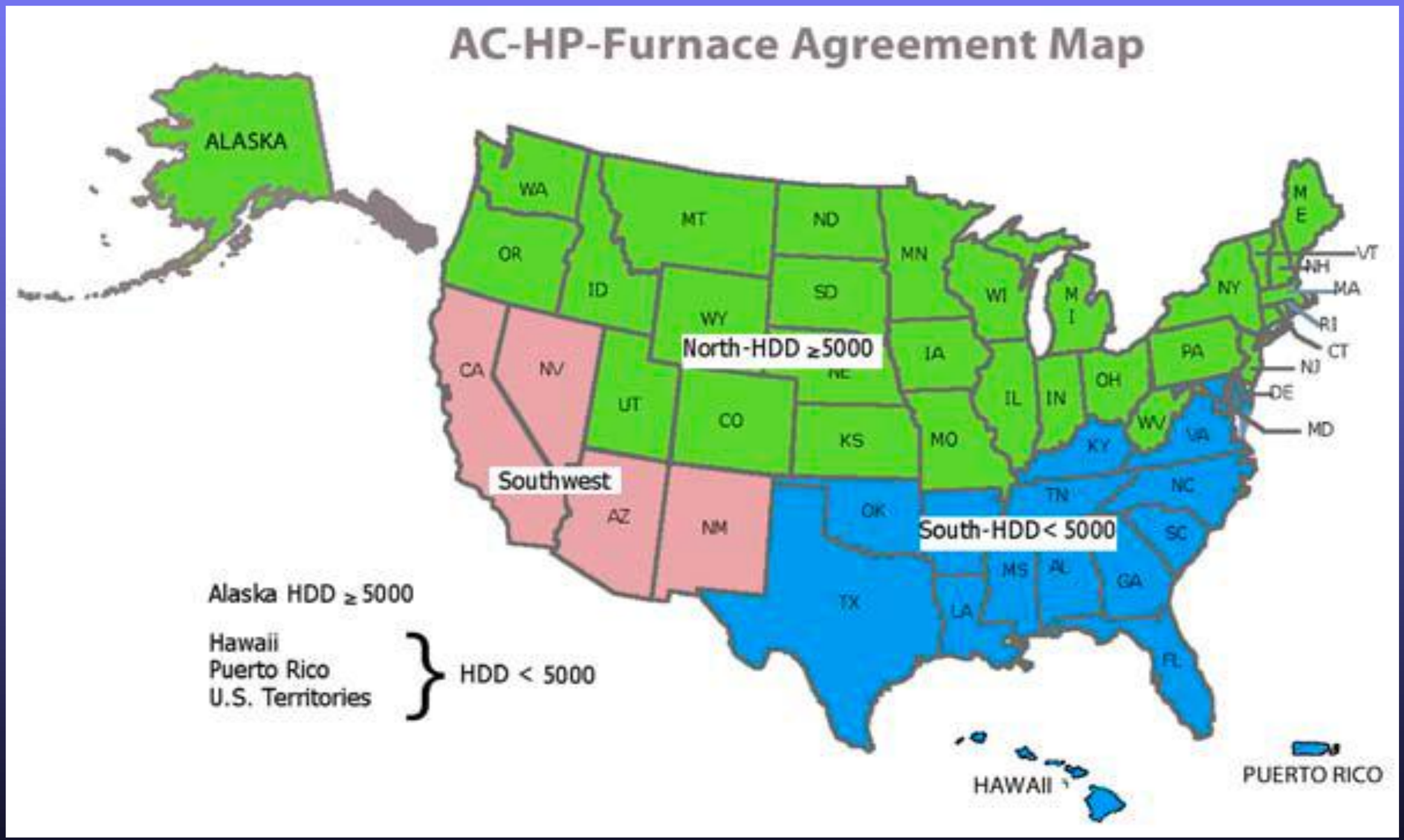

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Table 1: New Minimum Federal Standards (Retrofits)

System Type	≥ 5000 HDD	< 5000 HDD	CA/AZ/NM/NV
Split A/C	13 SEER	14 SEER	14 SEER /12.2 EER <45,000 Btu/h 14 SEER /11.7 EER ≥45,000 Btu/h
Split HP	14 SEER /8.2 HSPF	14 SEER /8.2 HSPF	14 SEER /8.2 HSPF
Package A/C	14 SEER	14 SEER	14 SEER/11.0 EER
Package HP	14 SEER/8.0 HSPF	14 SEER/8.0 HSPF	14 SEER/8.0 HSPF
Gas-Pack (weatherized)	14 SEER/81% AFUE	14 SEER/81% AFUE	14 SEER/81% AFUE
Gas Furnaces (non-weatherized)	90% AFUE	80% AFUE	80% AFUE
Oil Furnaces (non-weatherized)	83% AFUE	83% AFUE	83% AFUE

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Table 2: New Energy Efficiency Standards for Performance-Based Building Codes (for new construction and significant-upsizing only)

System Type	≥ 5000 HDD	< 5000 HDD	CA/AZ/NM/NV
A/C	14 SEER	15 SEER	15 SEER/12.5EER<45,000 Btu/h 15 SEER/12.0 EER ≥45000 Btu/h
HP	15 SEER /8.5 HSPF	15 SEER /8.5 HSPF	15 SEER /8.5 HSPF
Gas Furnaces	92% AFUE	90% AFUE	92% AFUE
Oil Furnace (non-weatherized)	85% AFUE	85% AFUE	85% AFUE

Note: Performance-based codes will also allow 14 SEER/8.0 HSPF packaged systems and 81% AFUE weatherized gas furnaces, provided additional efficiency measures are installed to compensate for the difference in energy use between these systems and the corresponding values for the region in Table 2

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Minimum Energy Performance Standards

- Final Ruling made by DOE on October 23. First deadline will be May 2013 for non-weatherized furnaces. The next deadline will be January 2015 for air conditioners and heat pumps.
- Requirements apply to residential single-phase a.c. and hps less than 65,000 Btu/hr of cooling capacity and single-phase indoor and outdoor furnaces below 225,000 Btu/hr heat input.

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Prospects for the Future

- Heat pump market in NA is mature and continues to grow
- Federal minimum efficiency standards and environmental concerns have driven technology development
- Sales of ground-coupled hps and hpwhs will grow with greater consumer awareness of climate-change issues and higher fuel costs
- Overall, the prospects for heat pumps in NA are very bright!

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