HVAC

MARKET RESEARCH

Bonneville
POWER ADMINISTRATION

May 26, 2016

Agenda

1. Methodology
2. Residential market intelligence
3. Commercial market intelligence
4. Big cross-sector changes and drivers

Method

1. Distributor sales data
2. Interviews with market actors
3. Discussions with BPA program staff
4. Secondary data
5. 2016 AHR Trade Show Interviews

RESIDENTIAL

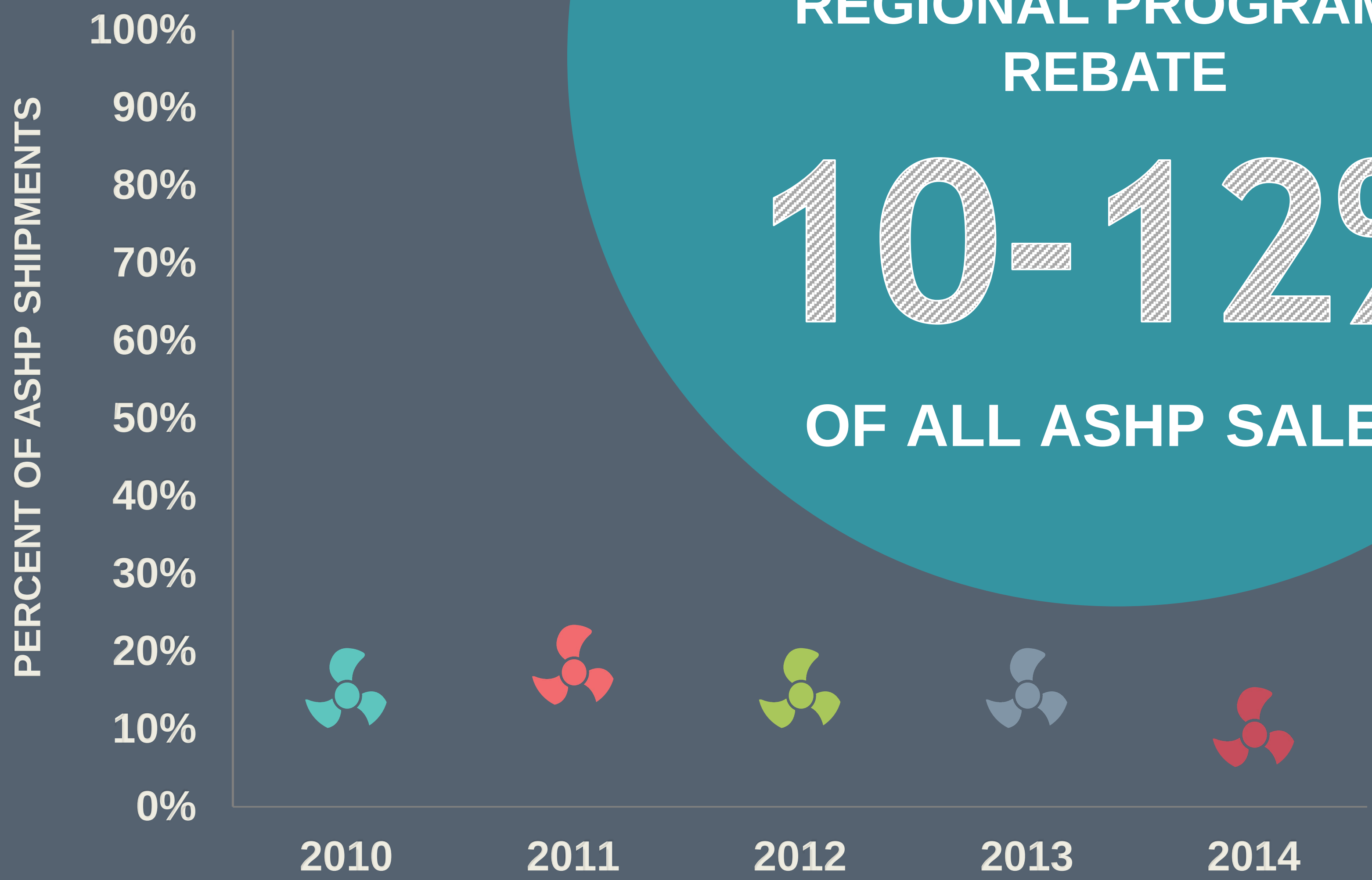
MARKET INTELLIGENCE


ELECTRICALLY-
HEATED HOMES
55%
HAVE DUCTS

REGIONAL PROGRAMS REBATE

10-12%

OF ALL ASHP SALES



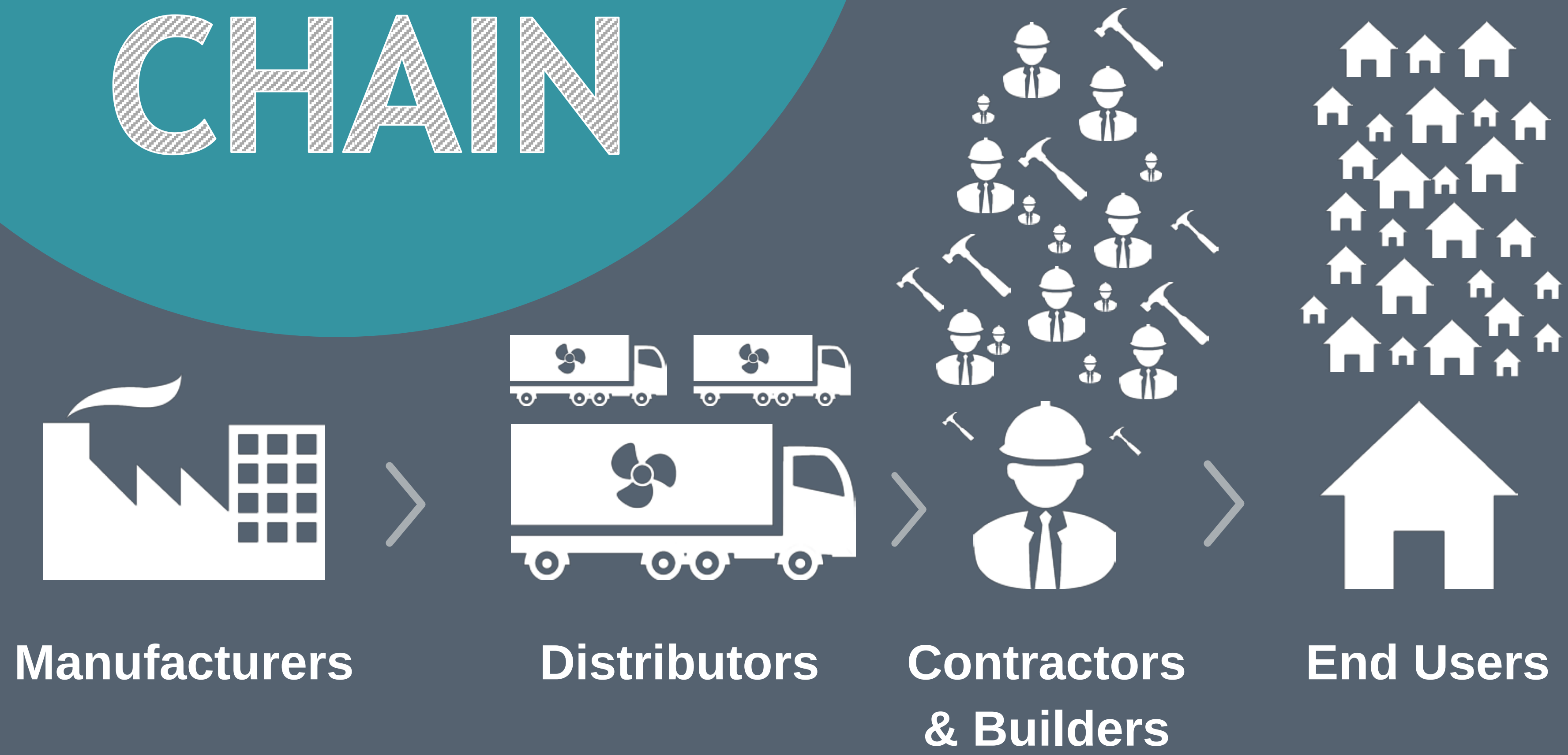

80%
OF ASHP SALES ARE
BELOW 9.0 HSPF


HEAT PUMPS
LAST FOR
15+ yrs.


INSTALLATION
PRACTICES
86%
OF HEAT PUMP
SAVINGS


HIGH-EFFICIENCY
HVAC SALES MAY NEED A
BOOST

SUPPLY CHAIN

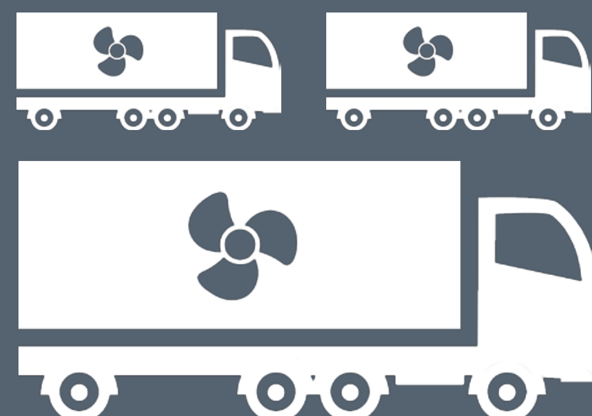



SUPPLY CHAIN
LAYERS

Consolidated

MARKET PLAYERS

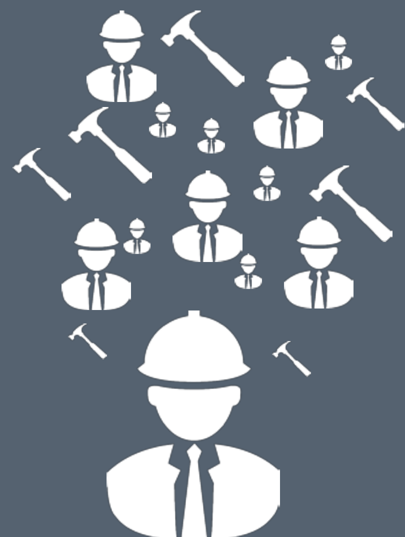
Manufacturers



Distributors

Fragmented

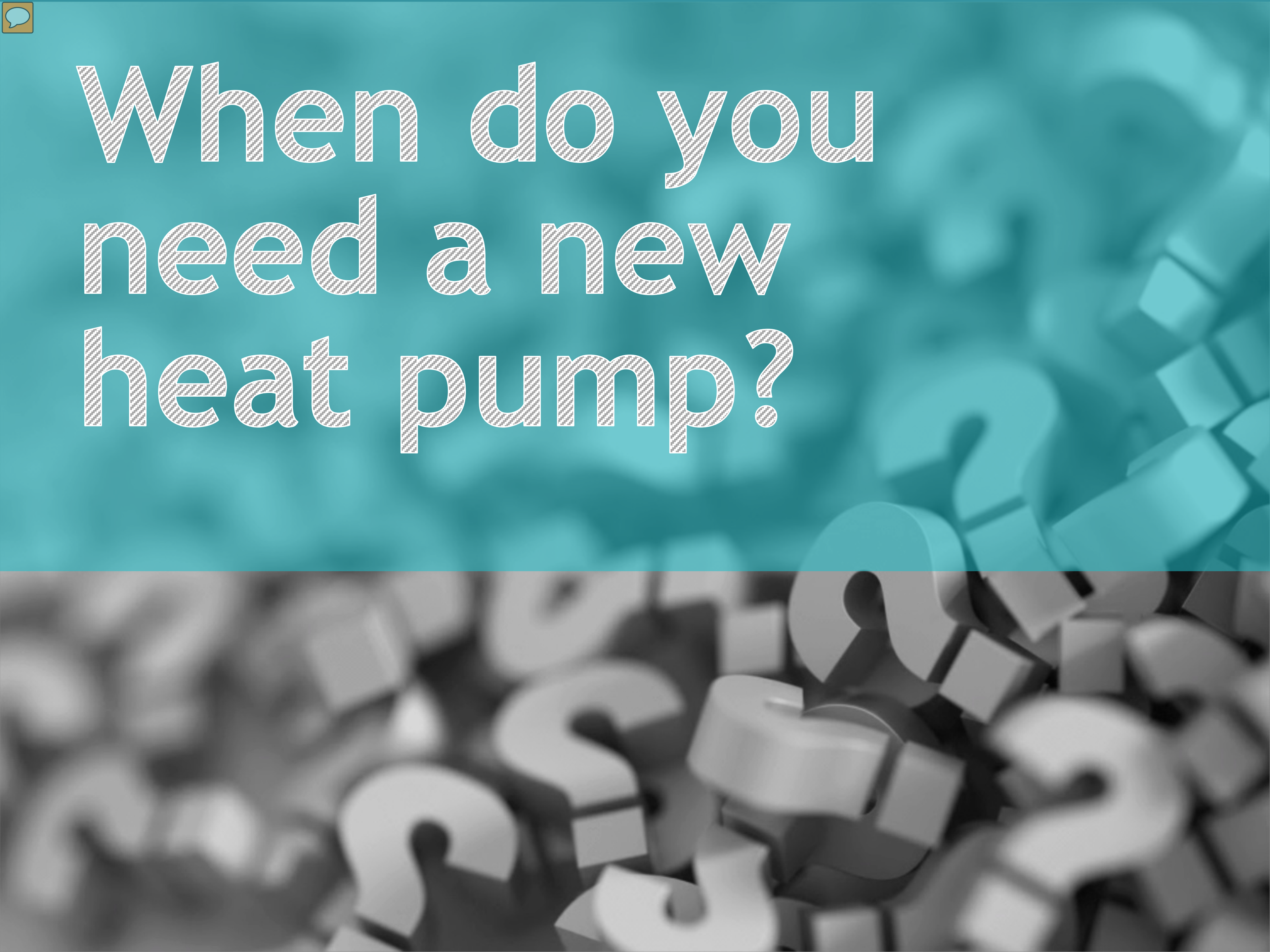
MARKET PLAYERS



Contractors & Builders

End Users

BRING IN
Distributors + Manufacturers

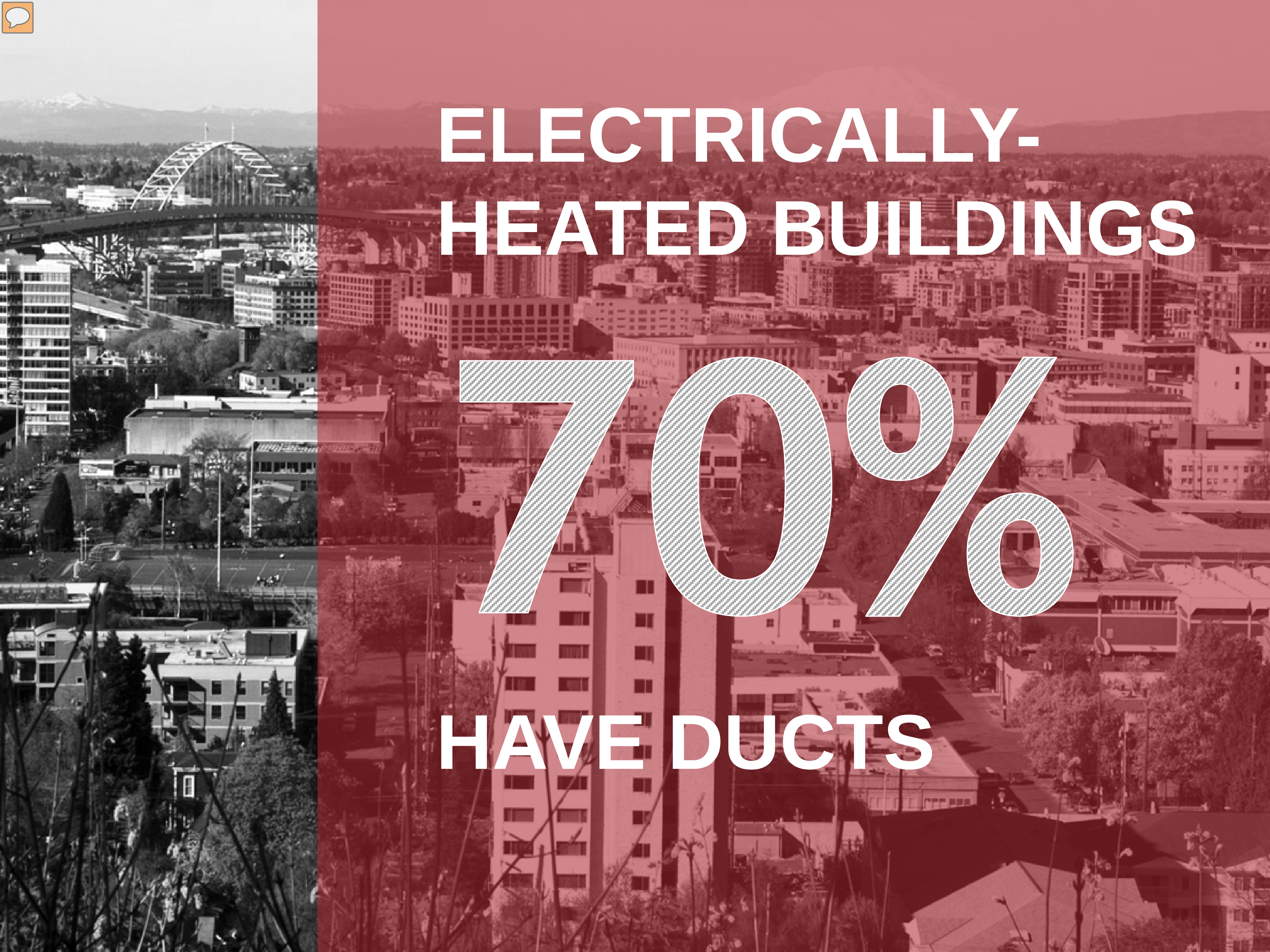

When do you need a new heat pump?


When units get
OLD
~56% of sales


When
New Homes
are built
~44% of sales

COMMERCIAL

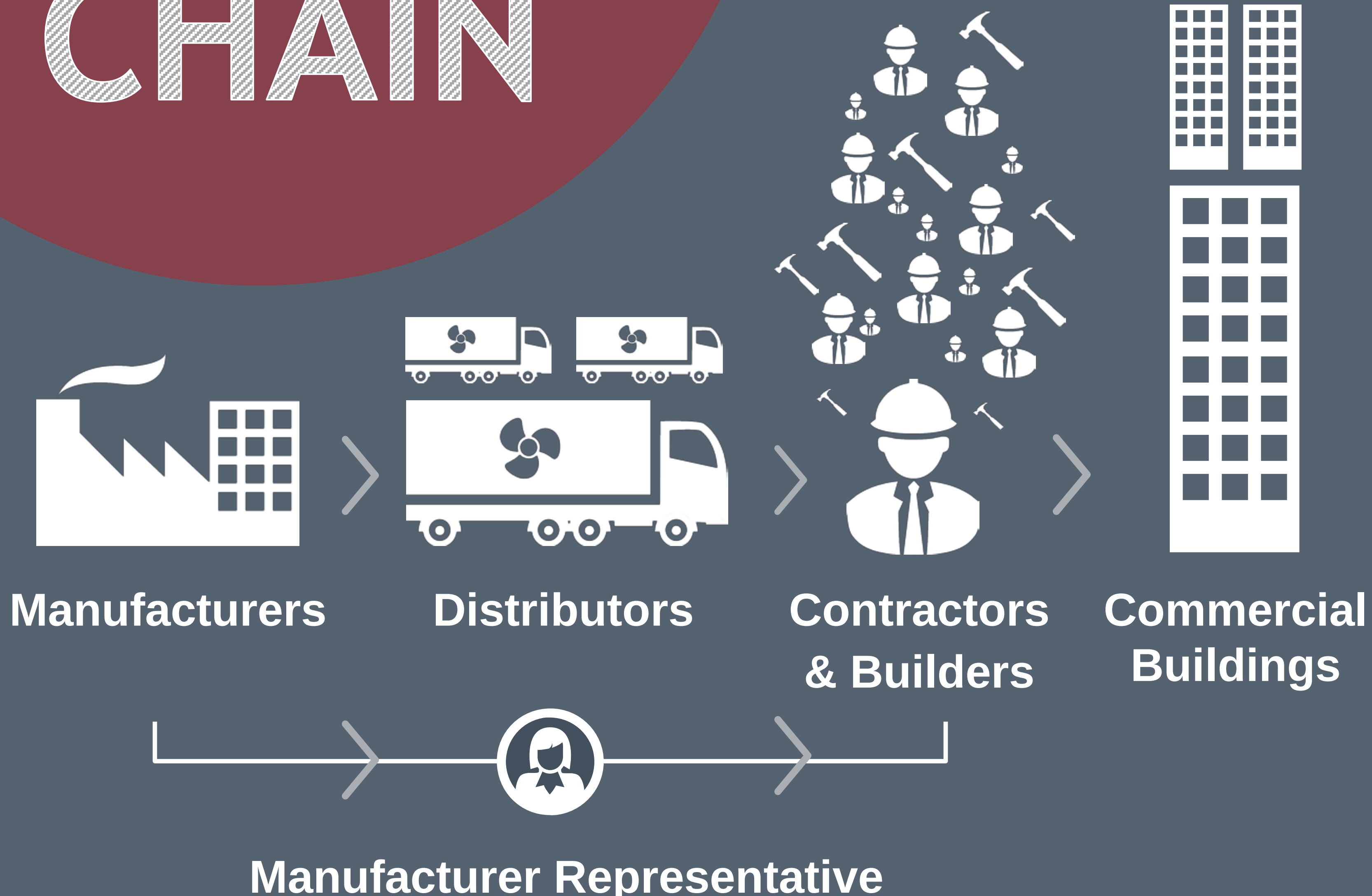
MARKET INTELLIGENCE


ELECTRICALLY-
HEATED BUILDINGS
70%
HAVE DUCTS


97%
OF ASHP SOLD WERE
STANDARD
EFFICIENCY


82%
OF PACKAGED AC SOLD WERE
STANDARD
EFFICIENCY

SUPPLY CHAIN



DECISION CHAIN

2 APPROACHES

PLAN + SPEC

OWNER/OWNER'S REPRESENTATIVE

ARCHITECT/ ENGINEERING FIRM

MECHANICAL CONTRACTOR

DESIGN-BUILD

OWNER

DESIGN-BUILD FIRM

DISTRIBUTOR


BUILDING
SPECIFIERS
INFLUENCE
PLAN + SPEC

DISTRIBUTORS & DESIGN-BUILD FIRMS

INFLUENCE DESIGN-BUILD PROJECTS

WHAT ABOUT NATIONAL ACCOUNTS?

BIG

CROSS-MARKET

CHANGES AND DRIVERS


STANDARDS
ARE RAISING
THE BAR

The industry is excited about

DUCTLESS

YORK HITACHI

Goodman DAIKIN

Daikin acquired Goodman

Midea LENNOX

Lennox announced VRF line December 2013

Carrier TOSHIBA

Carrier launched VRF January 2015

TRANE

Trane Launched VRF May 2013

MITSUBISHI

Brand is strong enough in US to stand alone

Ducted Partner

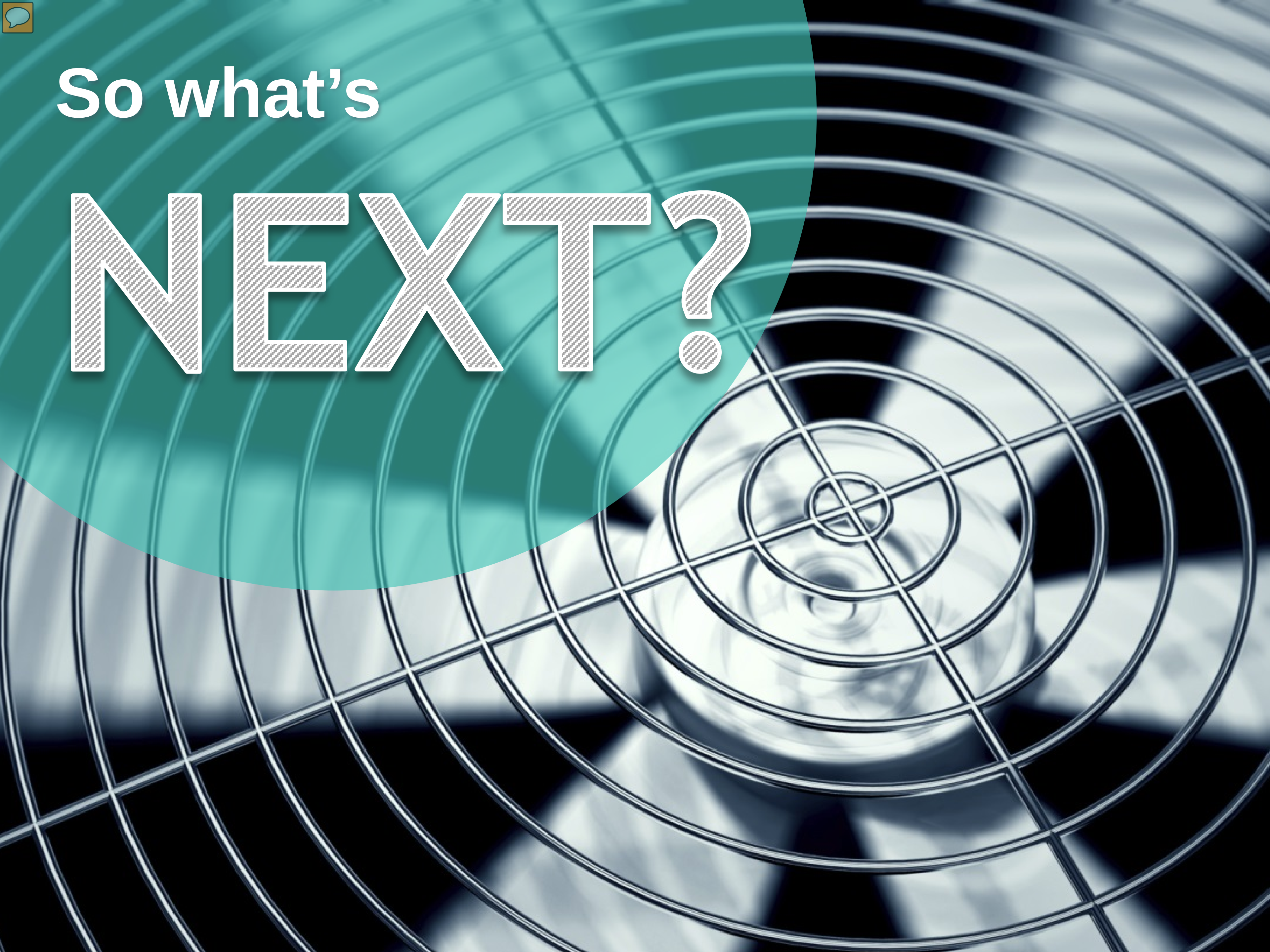
Ductless Partner

$1Billion

TECHNOLOGY

VRF


Market actors
WAY UP
the supply chain


So what's
NEXT?

Learn More!

Bonnie Watson
bfwatson@bpa.gov

www.bpa.gov/goto/HVAC

MOMENTUM SAVINGS

MOMENTUM SAVINGS METHODOLOGY

Annual Market Size

×

UEC

WEIGHTED BY	WEIGHTED BY
Baseline Efficiency Mix	Actual Efficiency Mix
=	=
Baseline Consumption	Actual Consumption
=	=
	Total Market Savings
	−
	Program Savings
	=
	Momentum Savings

WHY THESE NUMBERS ARE DRAFT

Incomplete sales data

Prevalence of conversions vs. upgrades

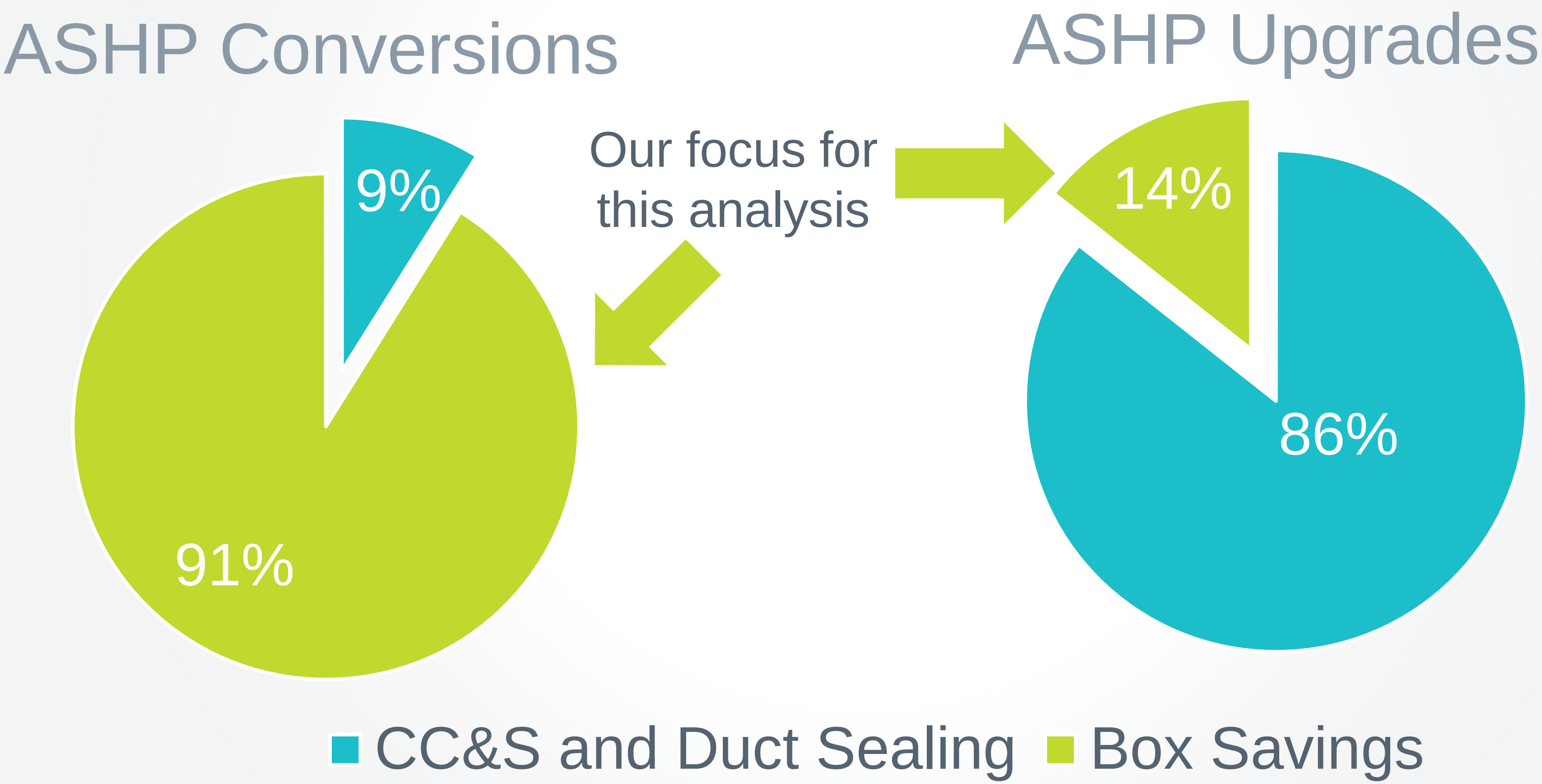
Installation context by home type

QUESTION 1

What is the Market?

Newly installed ducted air source heat pumps in single family and manufactured homes in the entire four state region.

SAVINGS FROM THE UNIT ITSELF (AKA “BOX SAVINGS”) ARE THE FOCUS OF THIS ANALYSIS



How BIG is the Market?

HVAC units sold per year from 2010-2014 using stock turnover model calibrated to AHRI data.

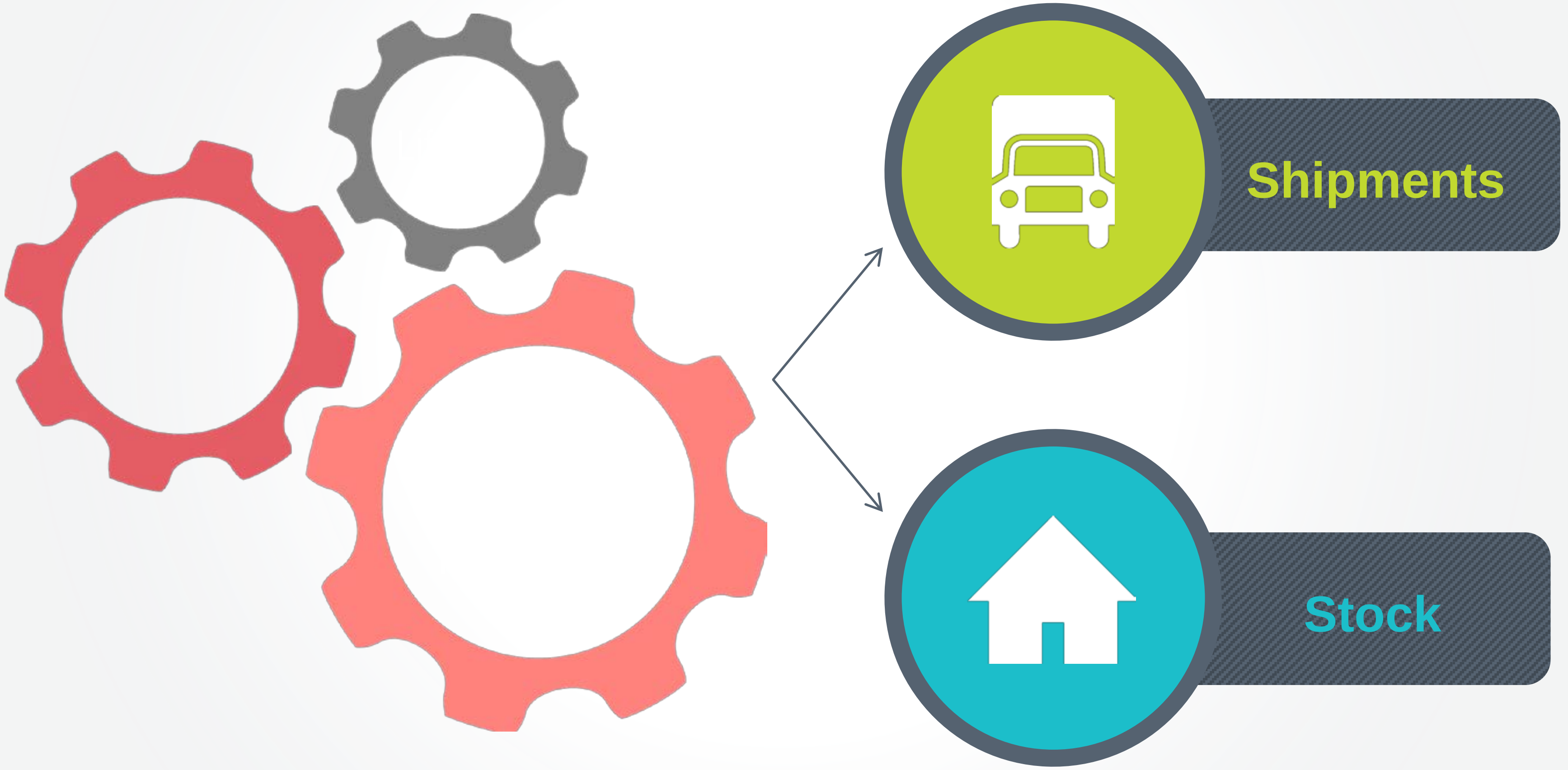
QUESTION 2

FLOW

STOCK

INSTALLED STOCK IN 2010

STOCK TURNOVER MODEL OVERVIEW



KEY CONCEPT: CONVERSION VS. UPGRADE

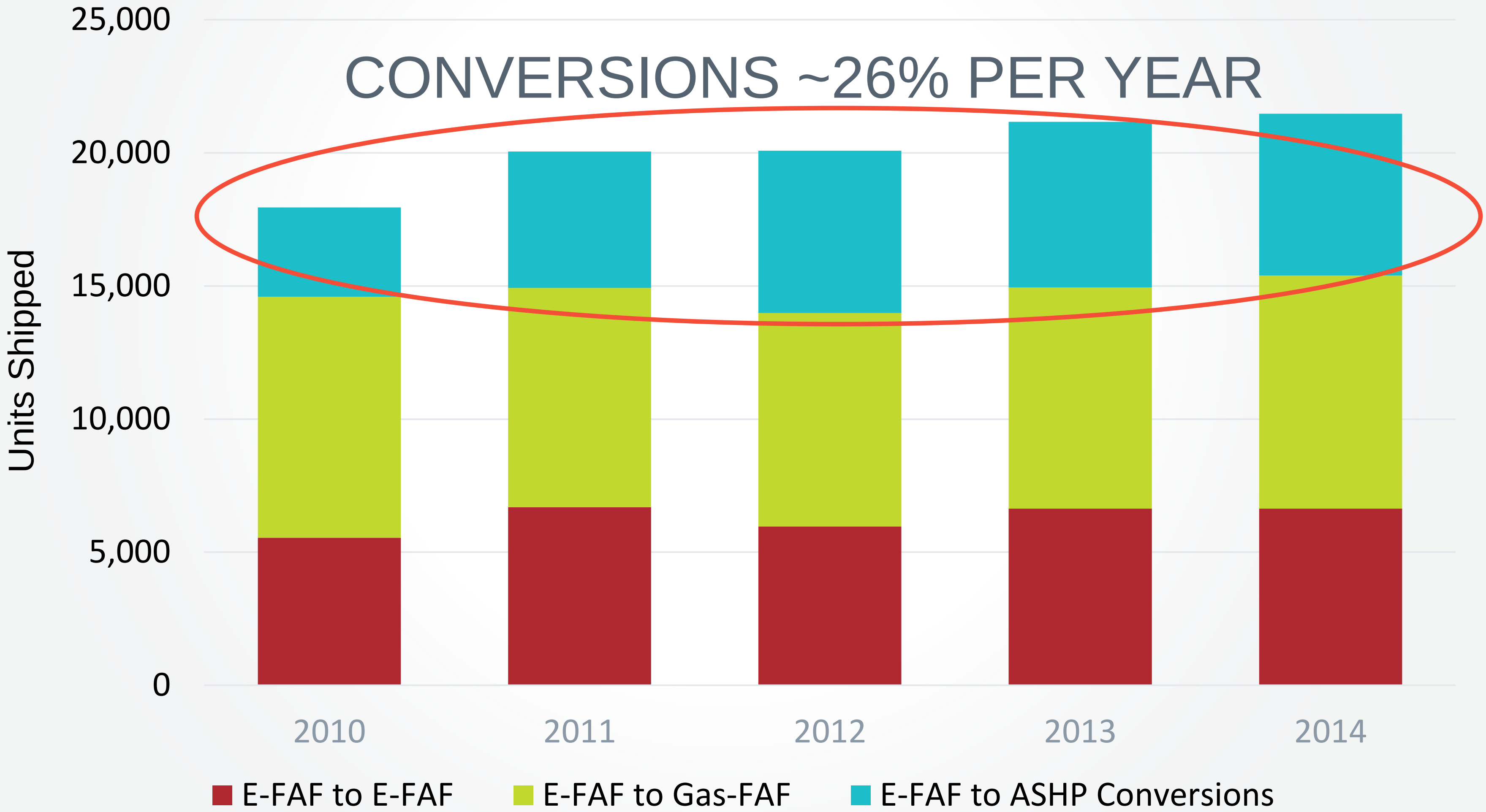
Conversion = Electric Forced Air Furnace → Air Source Heat Pump

Upgrade = Air Source Heat Pump → Air Source Heat Pump

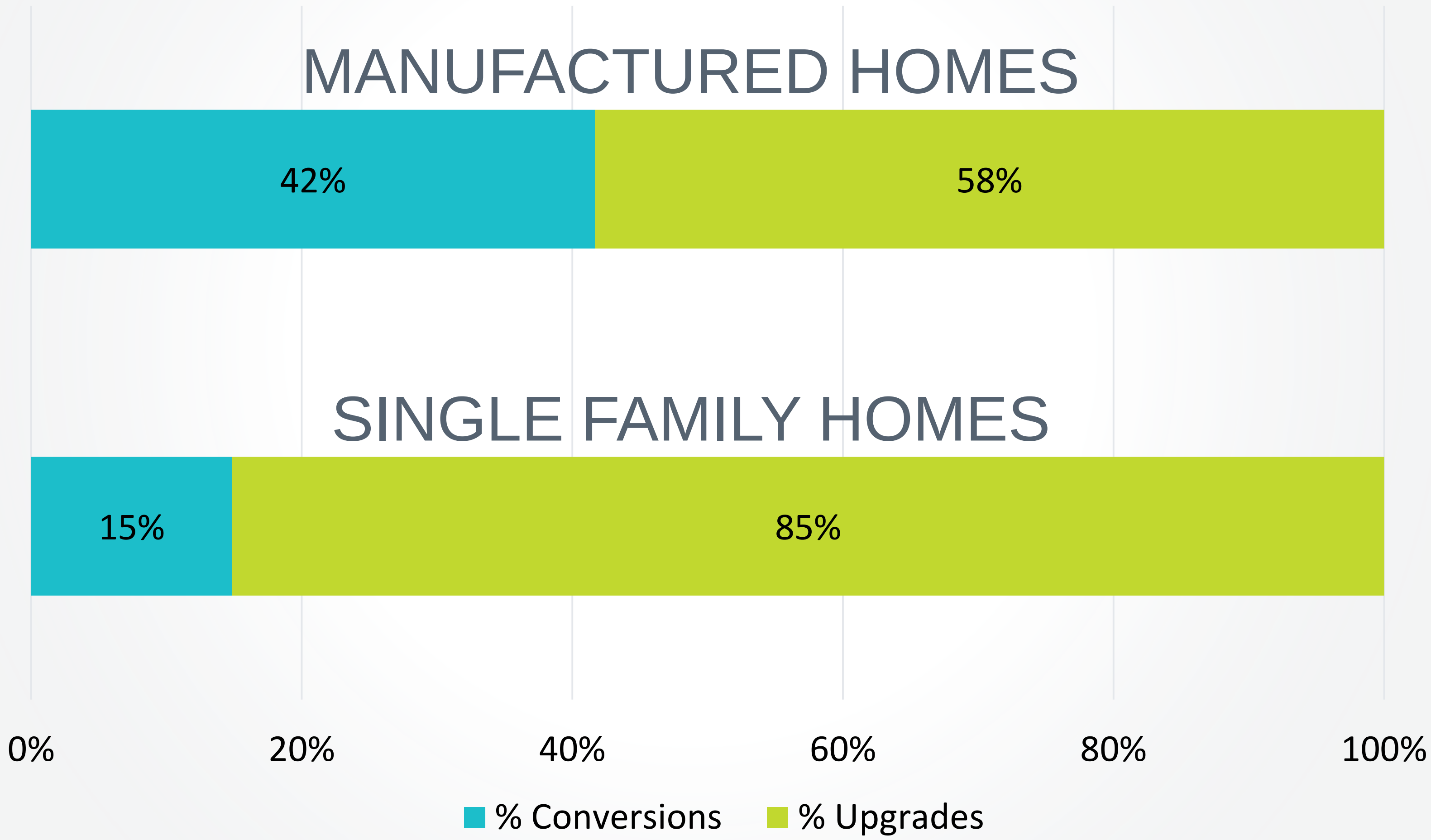
KEY CONCEPT: CONVERSION VS. UPGRADE
CONVERSIONS SAVE MORE

Conversion	=	Electric Forced Air Furnace	→	Air Source Heat Pump HSPF 7.7	=	41.5% kWh Reduction
Upgrade	=	Air Source Heat Pump HSPF 7.7	→	Air Source Heat Pump HSPF 8.5	=	4.8% kWh Reduction

HVAC UNITS REPLACING ELECTRIC FURNACES



THE MAJORITY OF ASHP SALES ARE INSTALLED AS UPGRADES (2014 DATA)



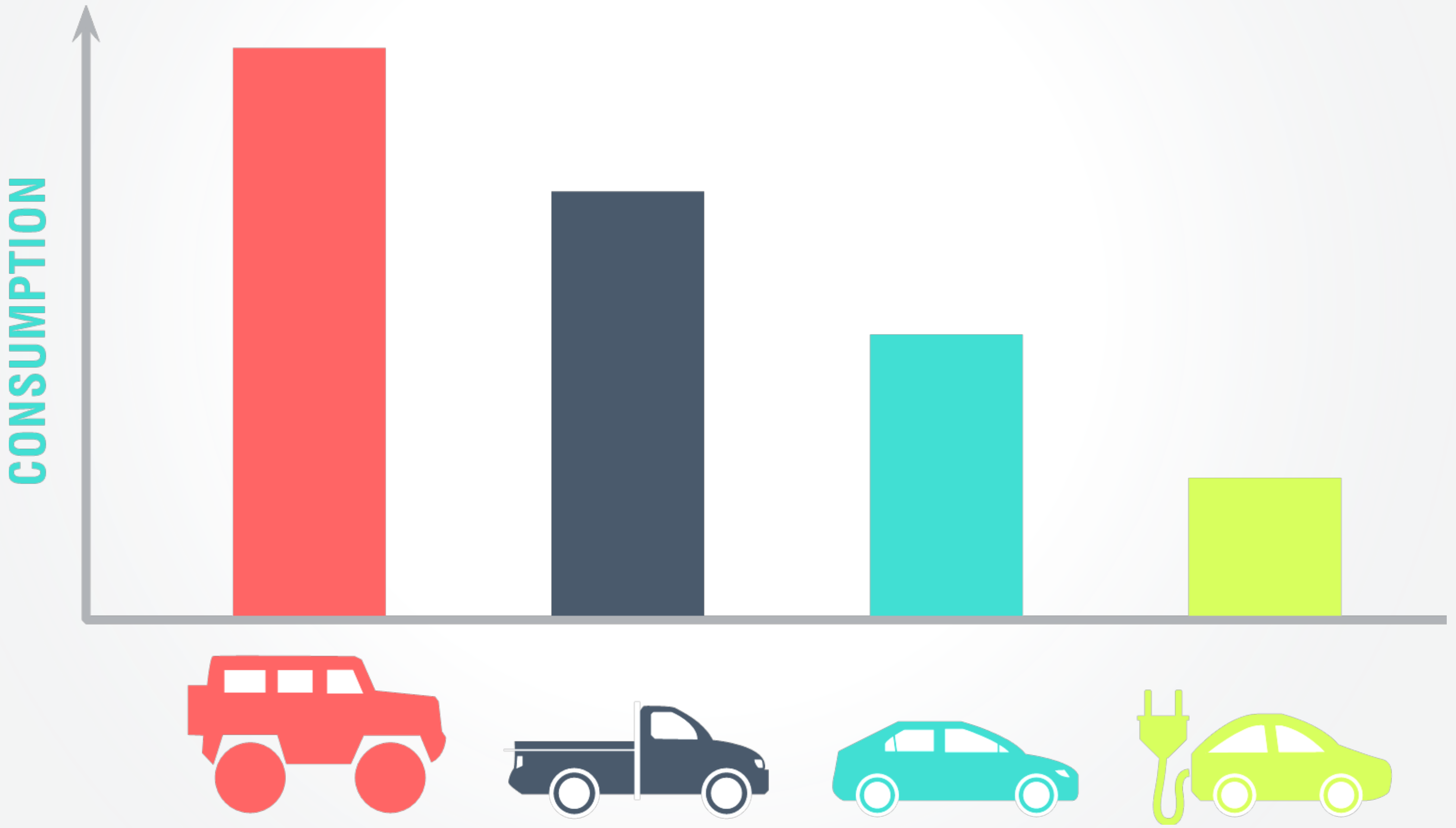
QUESTION 3

What are the total market savings?

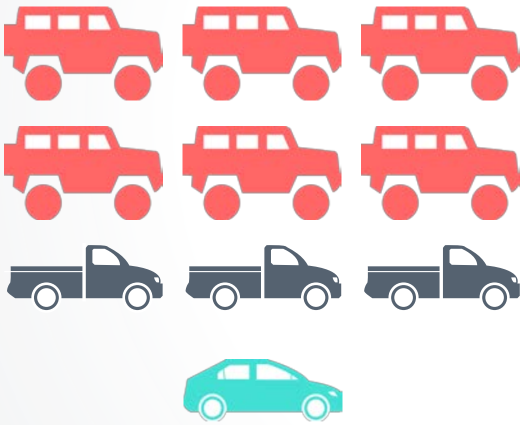
TOTAL MARKET SAVINGS = MARKET AVERAGE kWh − COUNCIL BASELINE kWh

MOMENTUM SAVINGS = TOTAL MARKET SAVINGS − PROGRAM SAVINGS

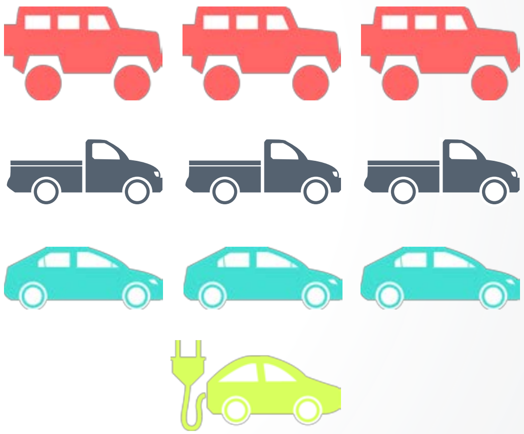
KEY CONCEPT: UNIT ENERGY CONSUMPTION (UEC)



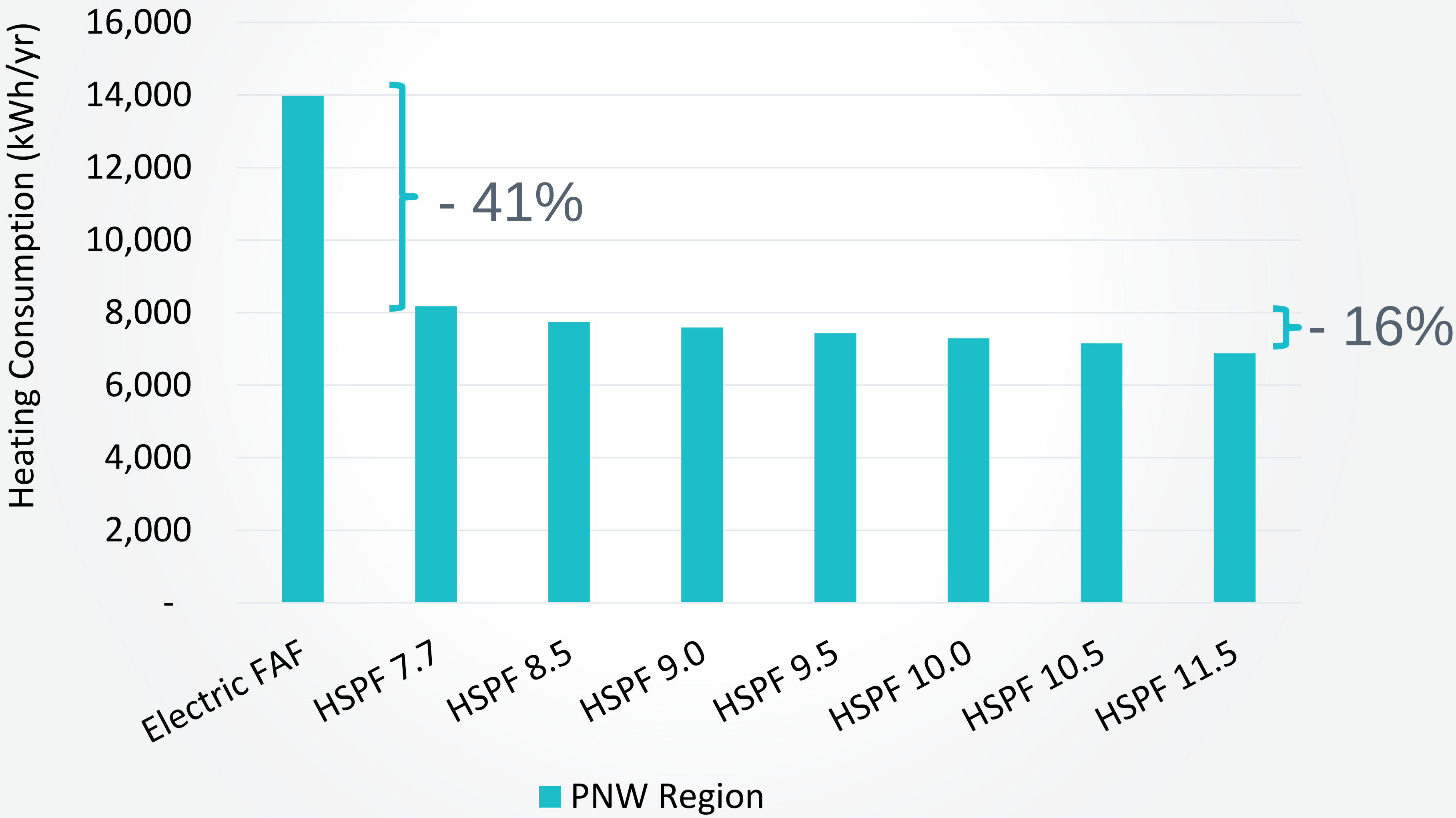
BASELINE
EFFICIENCY MIX



ACTUAL
EFFICIENCY MIX



UEC FOR RESIDENTIAL HVAC EQUIPMENT (SINGLE FAMILY)

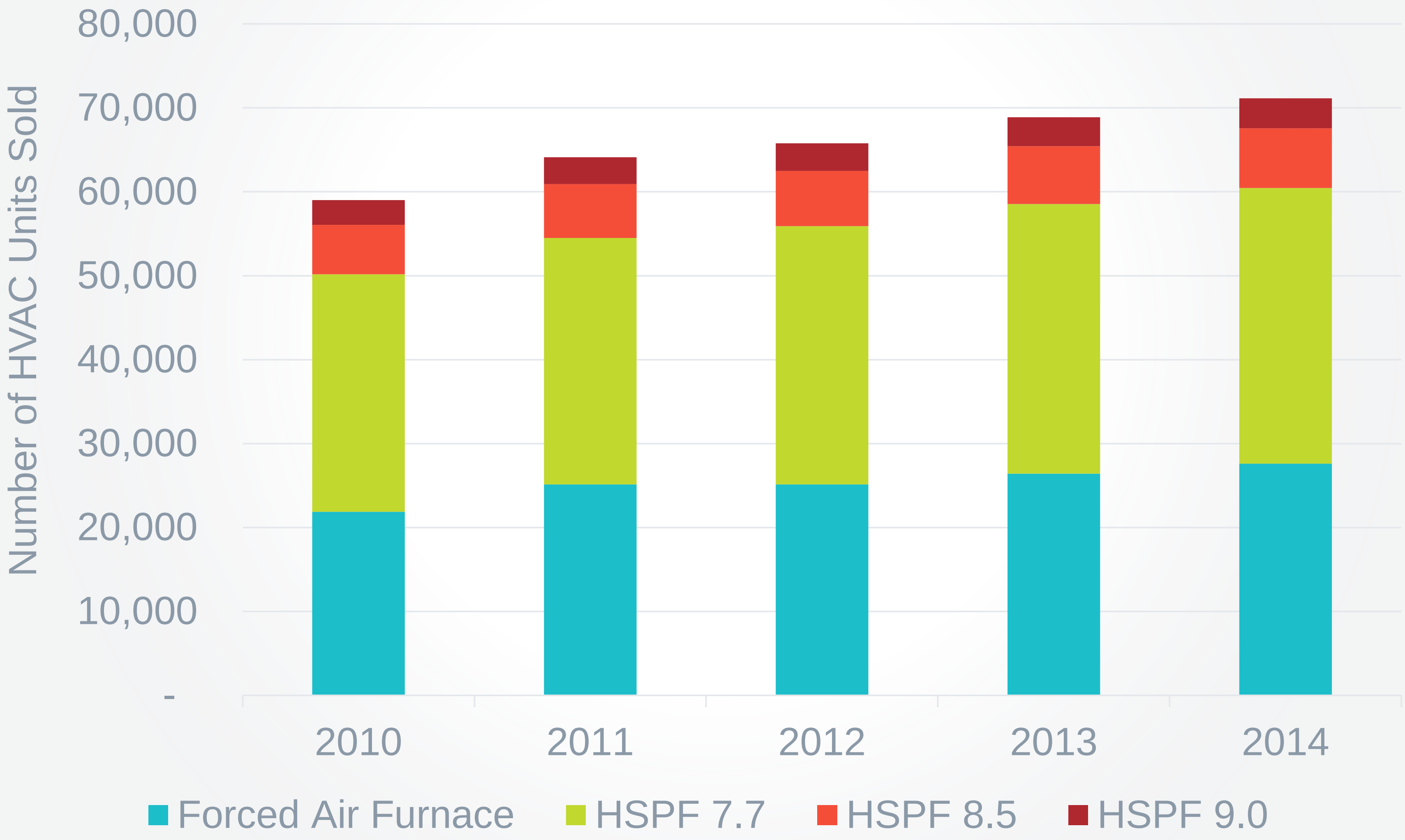


QUESTION 3a

What was the energy use when the Power Plan was written?

Calculated baseline consumption according to **baseline efficiency mix** from the Sixth Plan

TOTAL UNITS SHIPPED BY EFFICIENCY LEVEL – BASE CASE

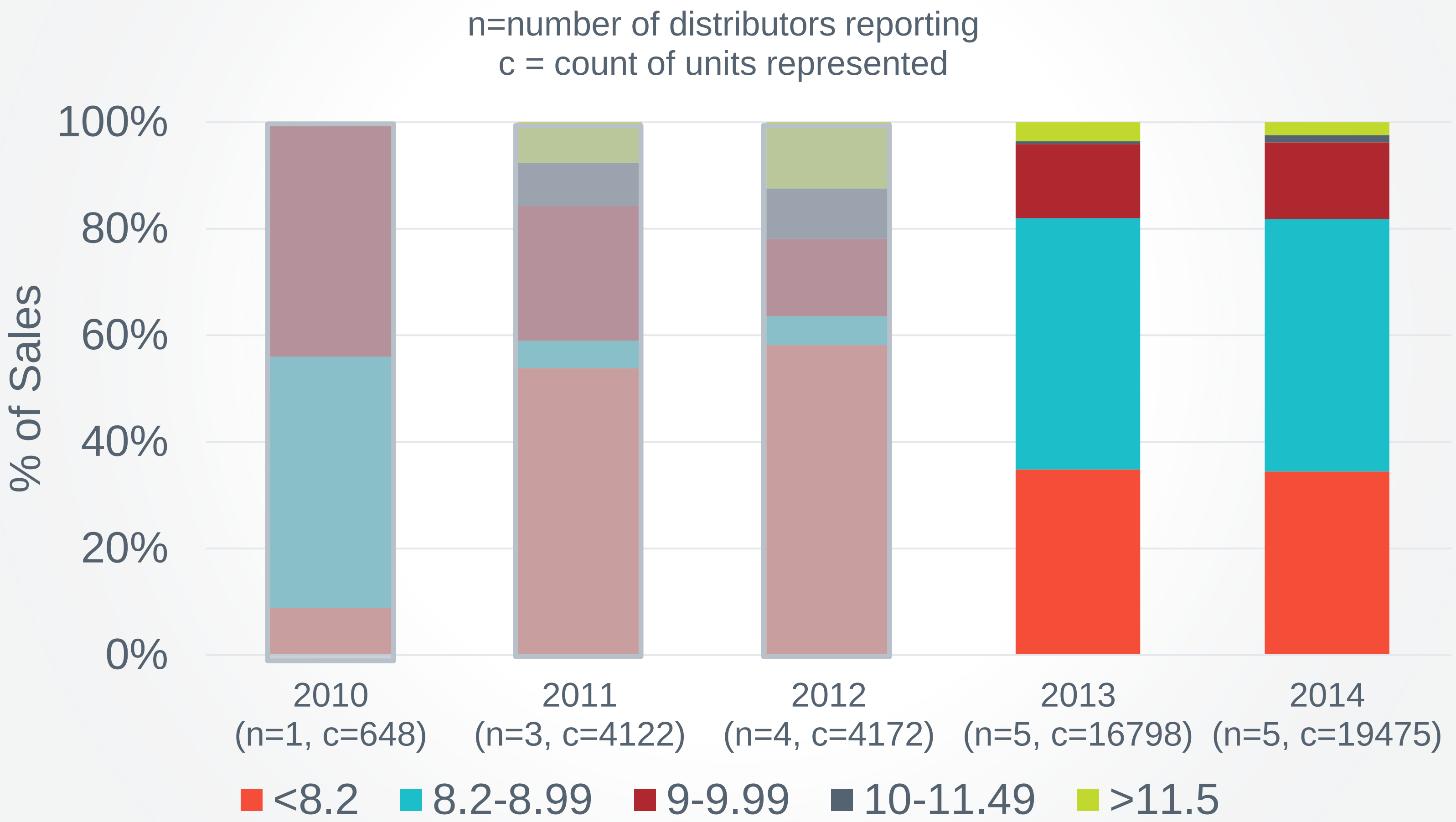


QUESTION 3b

What was the energy use in following years?

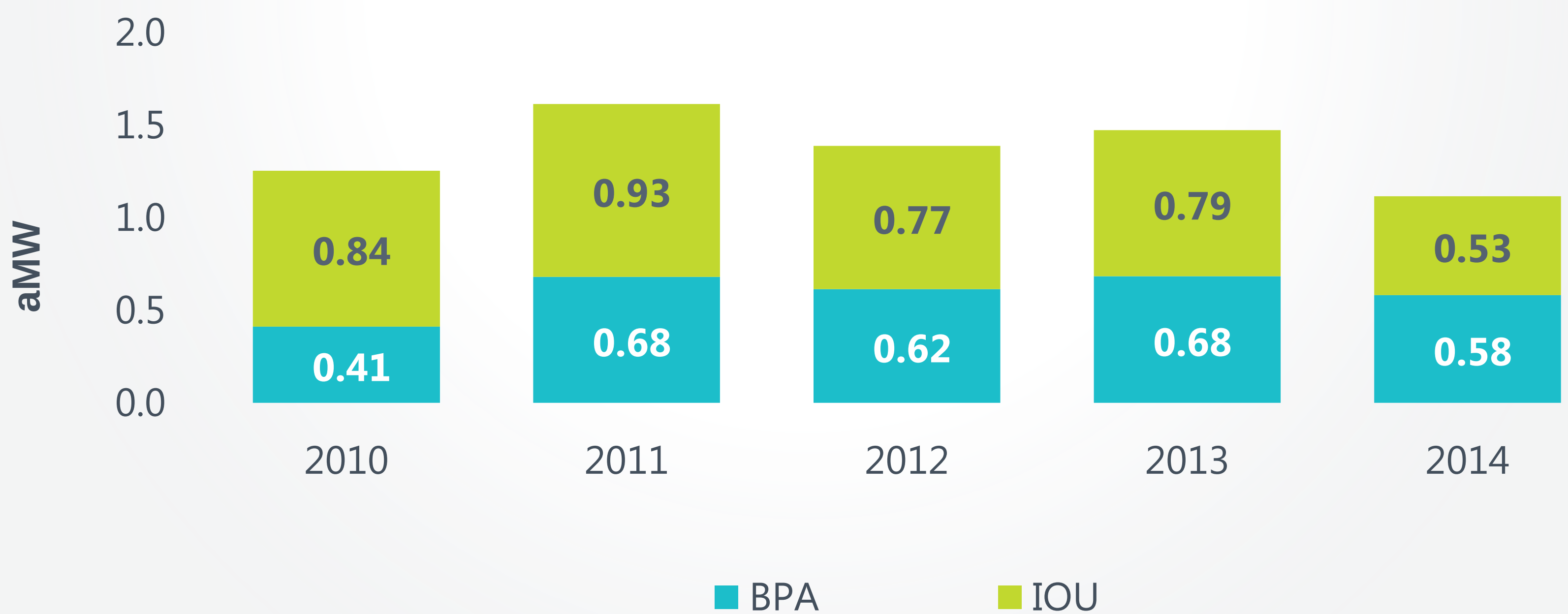
Calculated actual consumption using distributor sales data representing roughly half of the market

RESIDENTIAL AIR SOURCE HEAT PUMP SALES BY EFFICIENCY CATEGORY



QUESTION 4

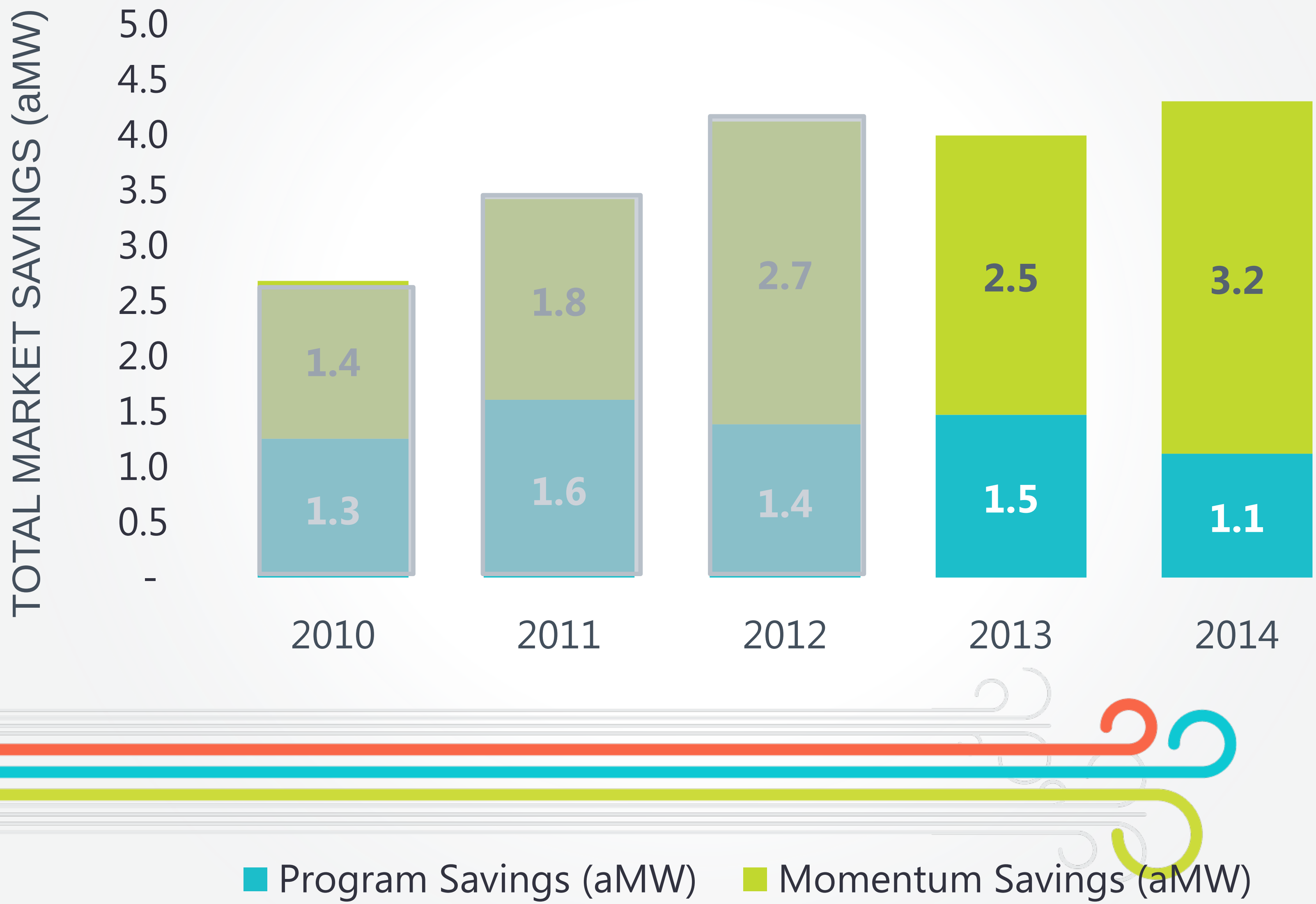
What are the program savings?



CALCULATING MOMENTUM SAVINGS— THE RESULTS (DRAFT)

MOMENTUM SAVINGS = TOTAL MARKET SAVINGS − PROGRAM SAVINGS

TOTAL MARKET SAVINGS FROM THE RESIDENTIAL ASHP MARKET



DATA GAPS AND FUTURE PLANNED RESEARCH

Enhance sales data

Understand prevalence of conversions vs. upgrades

Understand installation context by home type