Residential HVAC Brown Bag
March 15, 2016

Presenters:

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Jessica Kramer, Residential Senior Program Support

Bonnie Watson, HVAC Market Research Lead

Michelle Lichtenfels, Commercial Program Manager

Discussion Topics

PTCS Quality Assurance

- Improving Installation Performance
- Informing Program Design

Market Research

- Leveraging HVAC Sales Data
- Informing Program Design

PTCS & Air NW

- Collaboration between Residential and Commercial HVAC

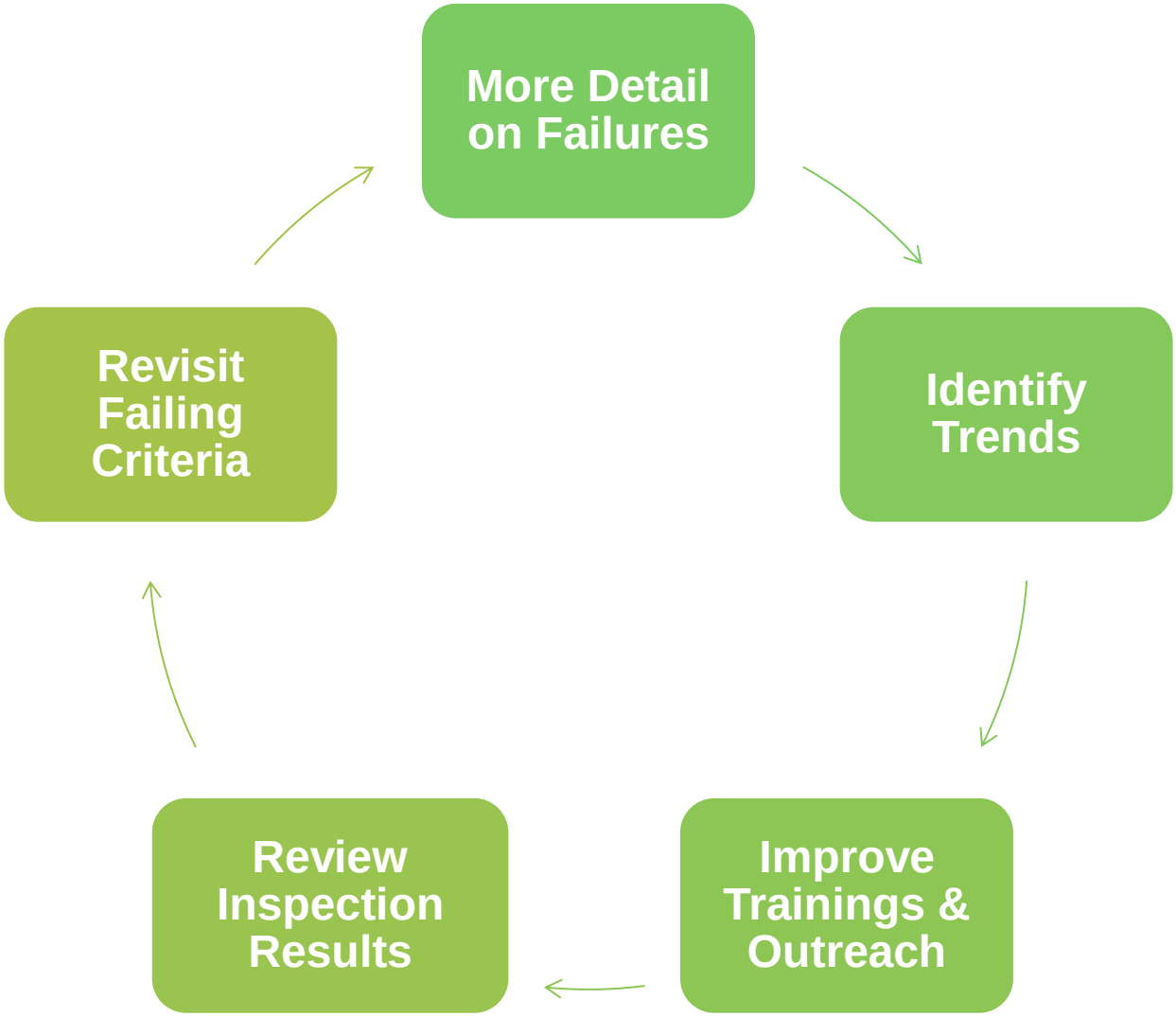
History & Evolution of QA Process

Pre May 2015

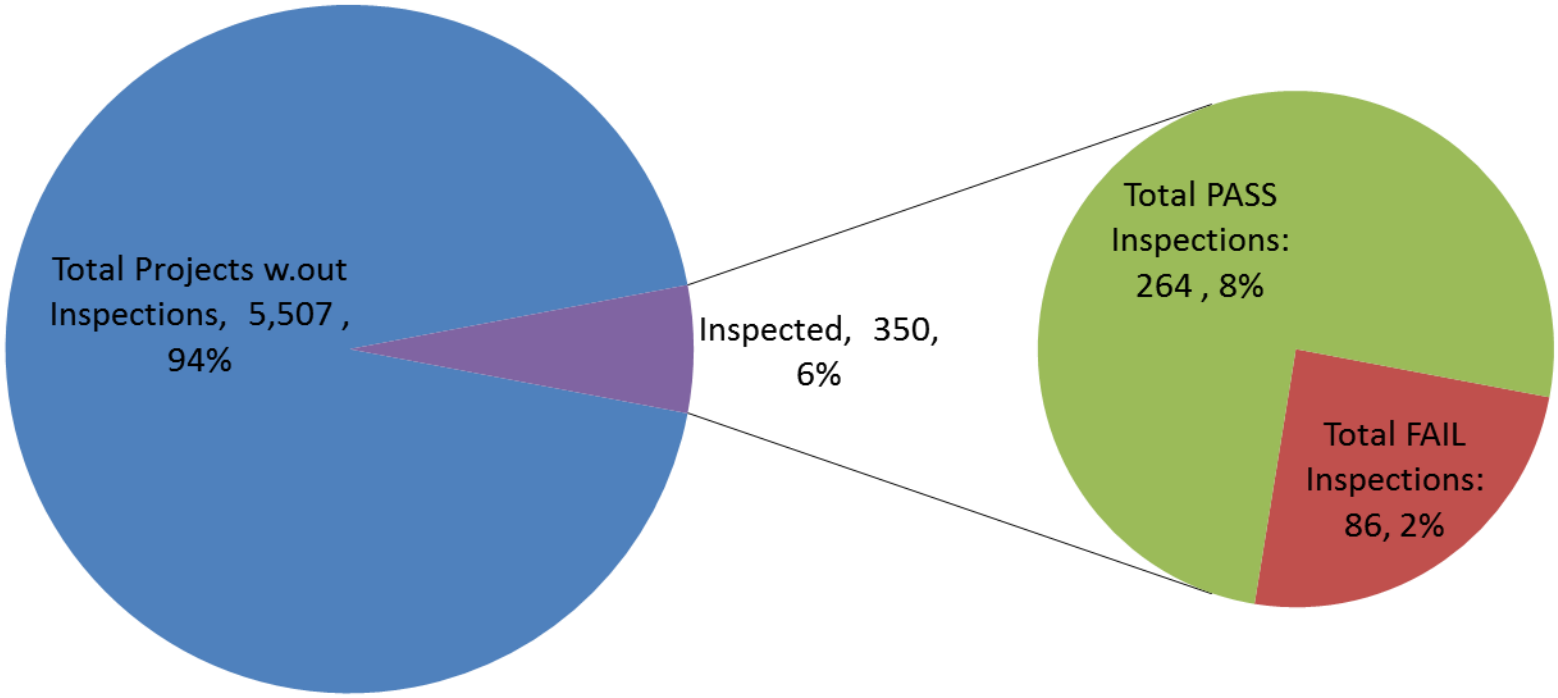
Post May 2015

Inspectors: 9 utilities and CLEAResult

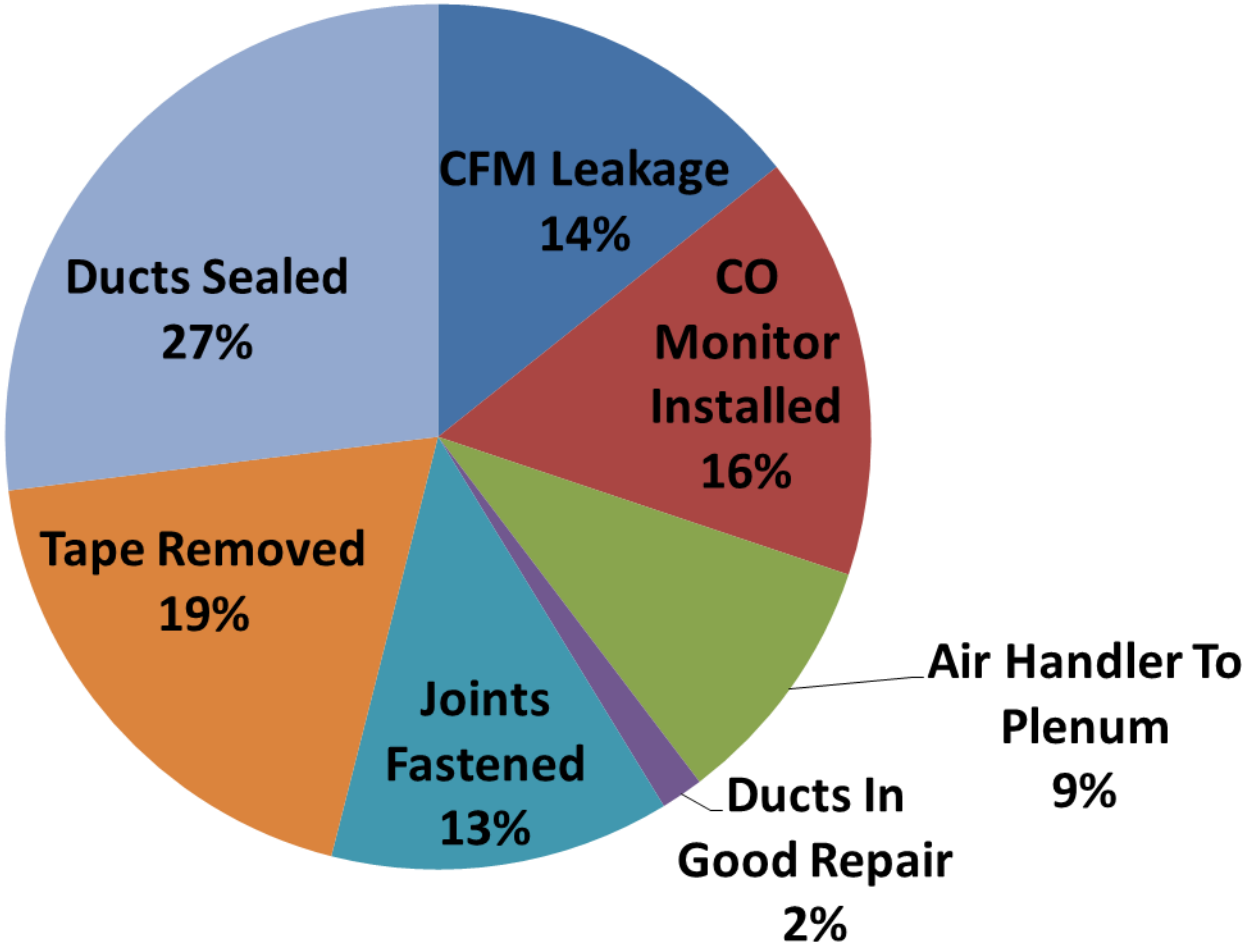
Gains from Grading Model



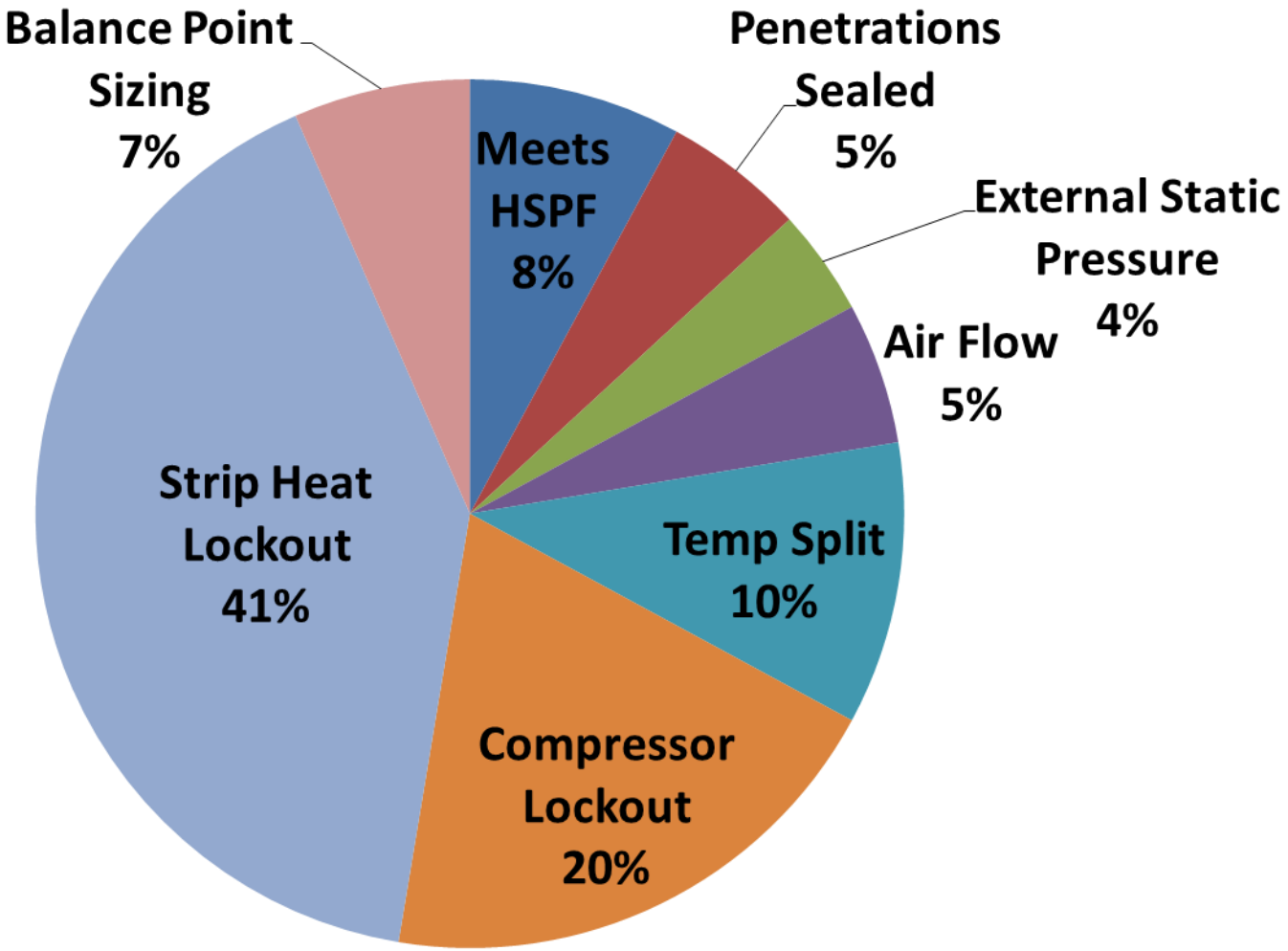
2015 Projects: Passes & Fails



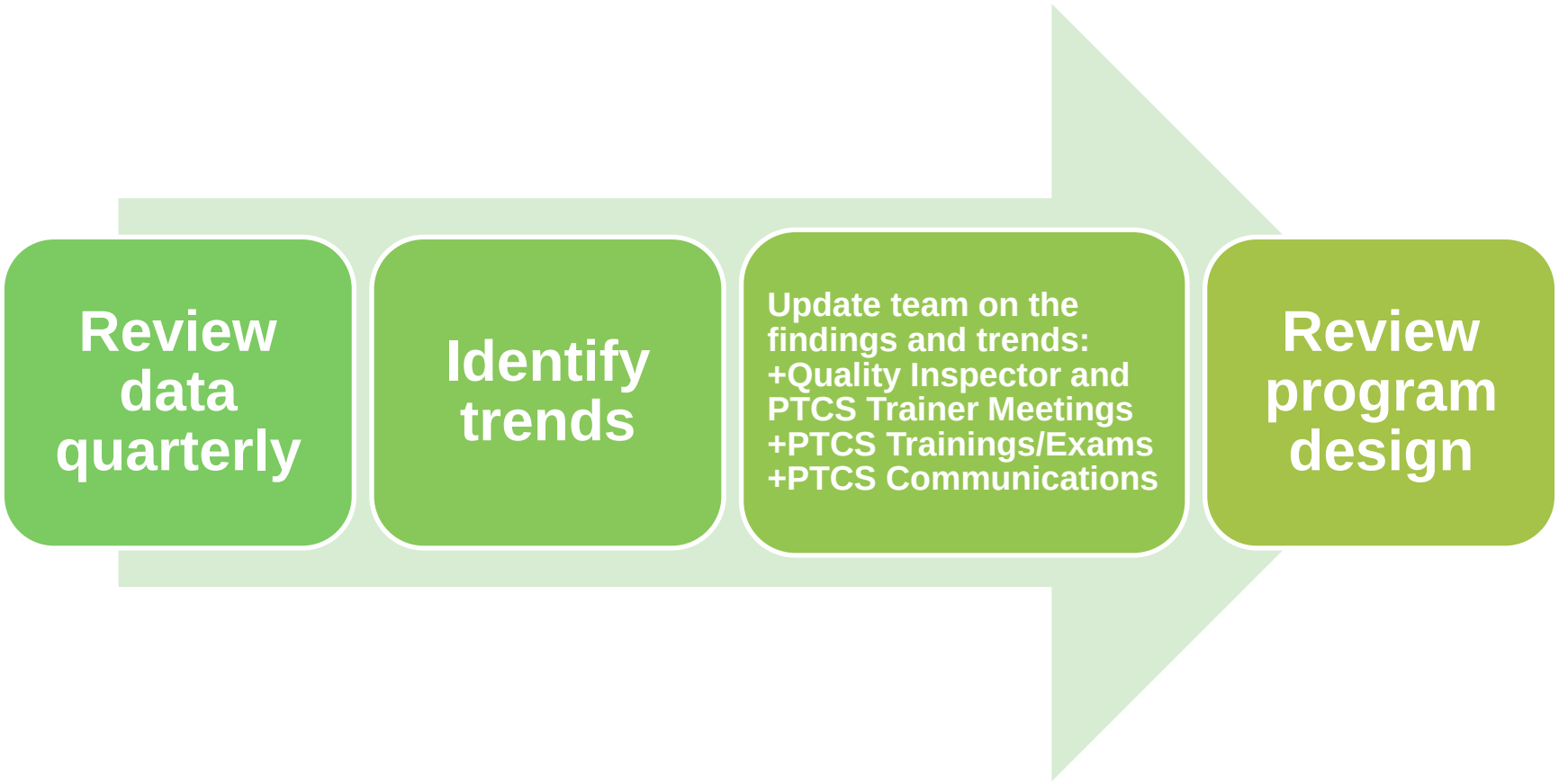
PTCS Duct Seal "F" Grades FY 2015



ASHP Inspection "F" Grades FY 2015



Next Steps


Review data quarterly
Identify trends
Update team on the findings and trends:
+Quality Inspector and PTCS Trainer Meetings
+PTCS Trainings/Exams
+PTCS Communications
Review program design

HVAC Market Research

A preview into what we learned about the HVAC market

Residential HVAC Supply Chain

Manufacturers

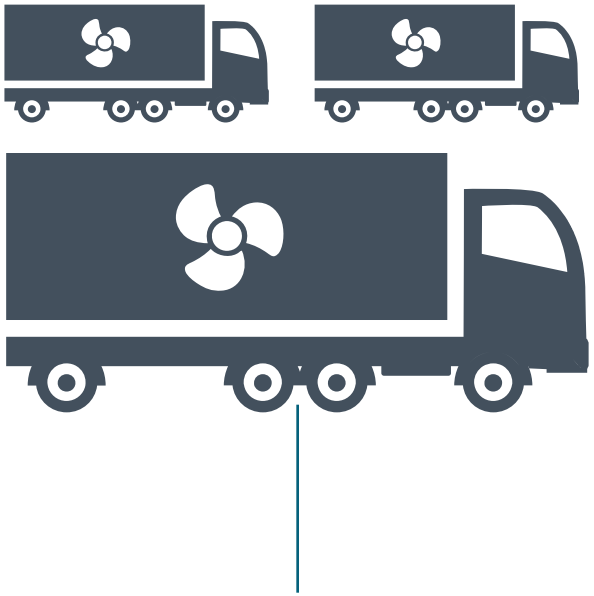
Distributors

Contractors & Builders

End Users

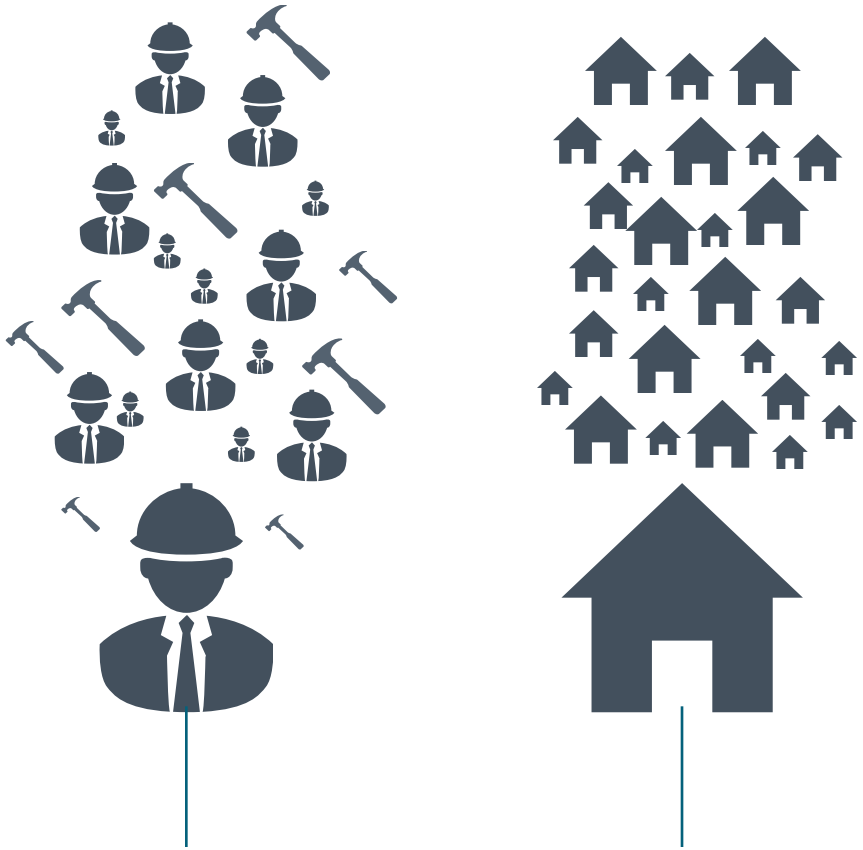
Consolidated Market Players

Manufacturers



Distributors

Fragmented Market Players



Contractors & Builders

End Users

When do People Need a New Heat Pump?

When units burn out

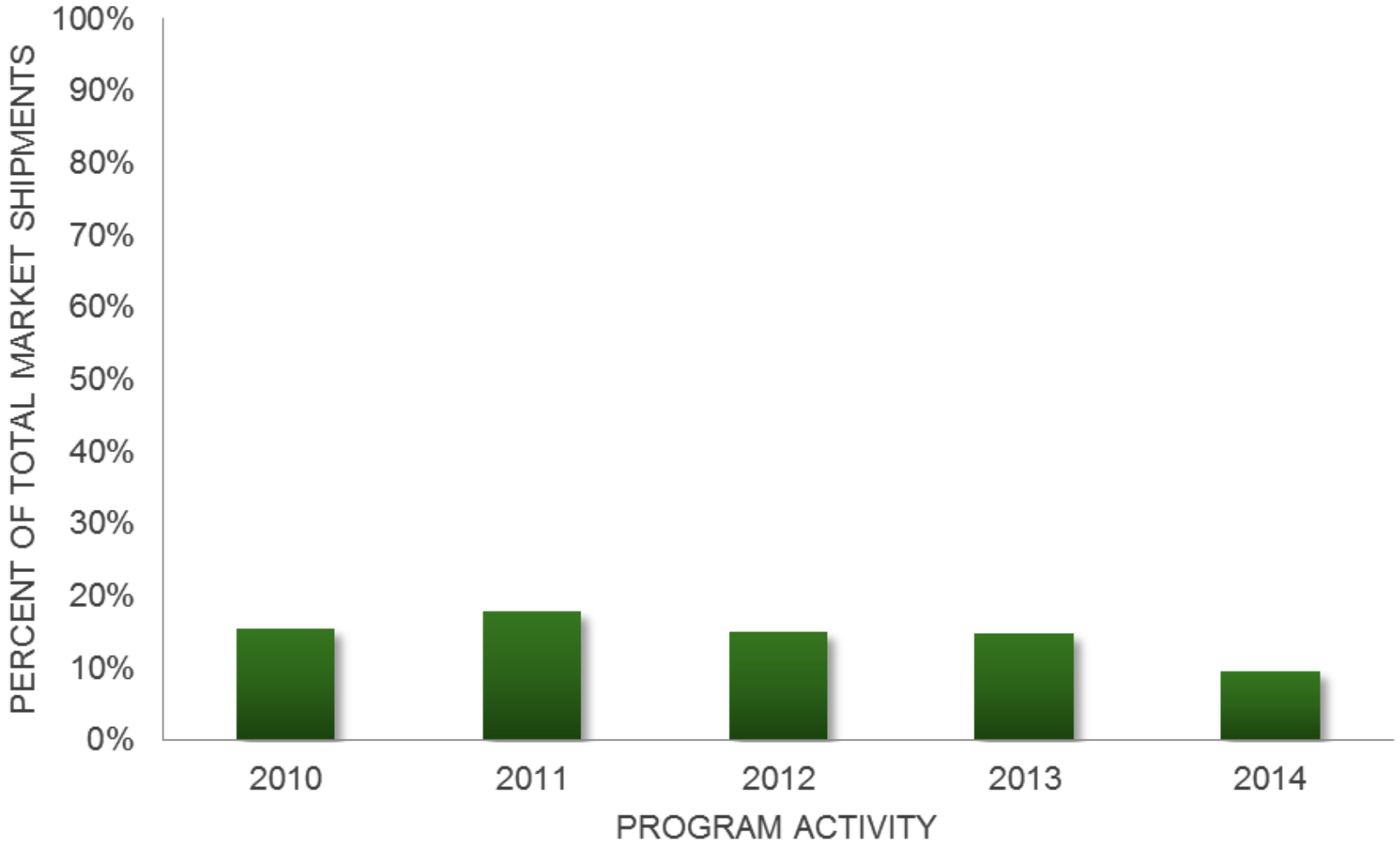
~56%

When new homes are built

~44%

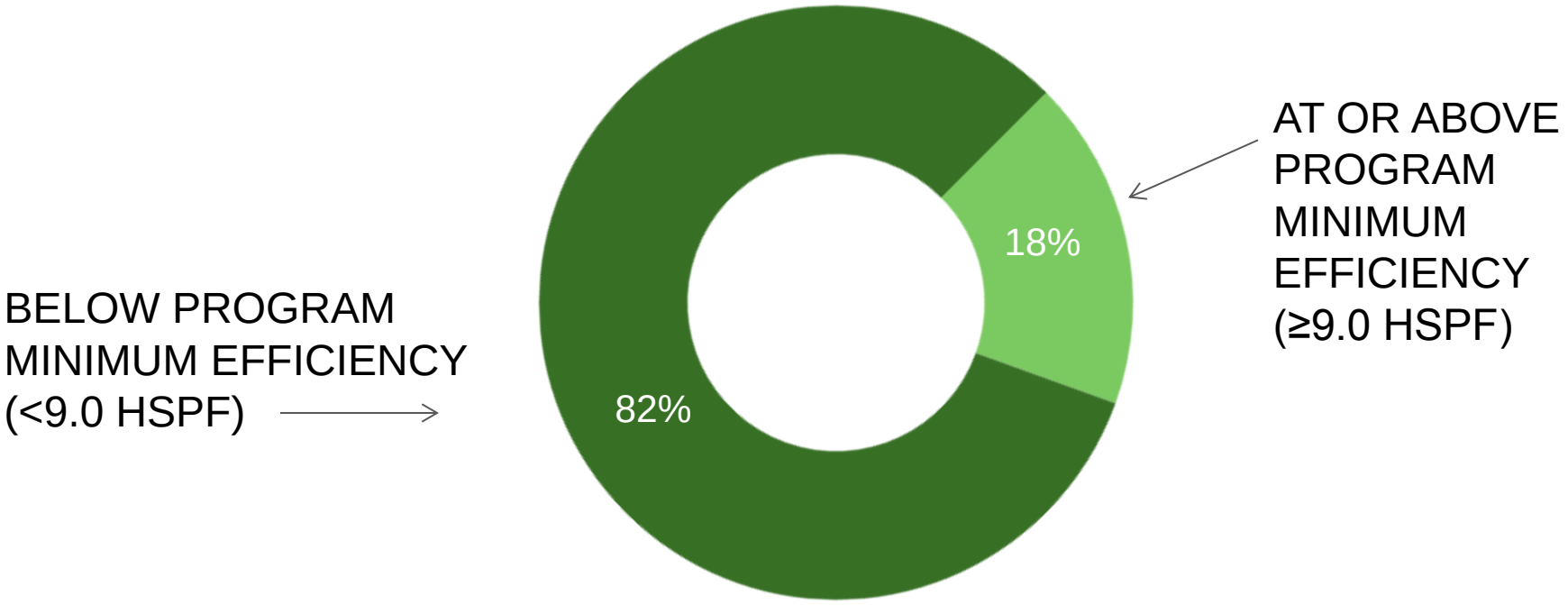
Source: Momentum Savings model, PENRES (1992) and RBSA (2011) data

What Utilities Touch Today



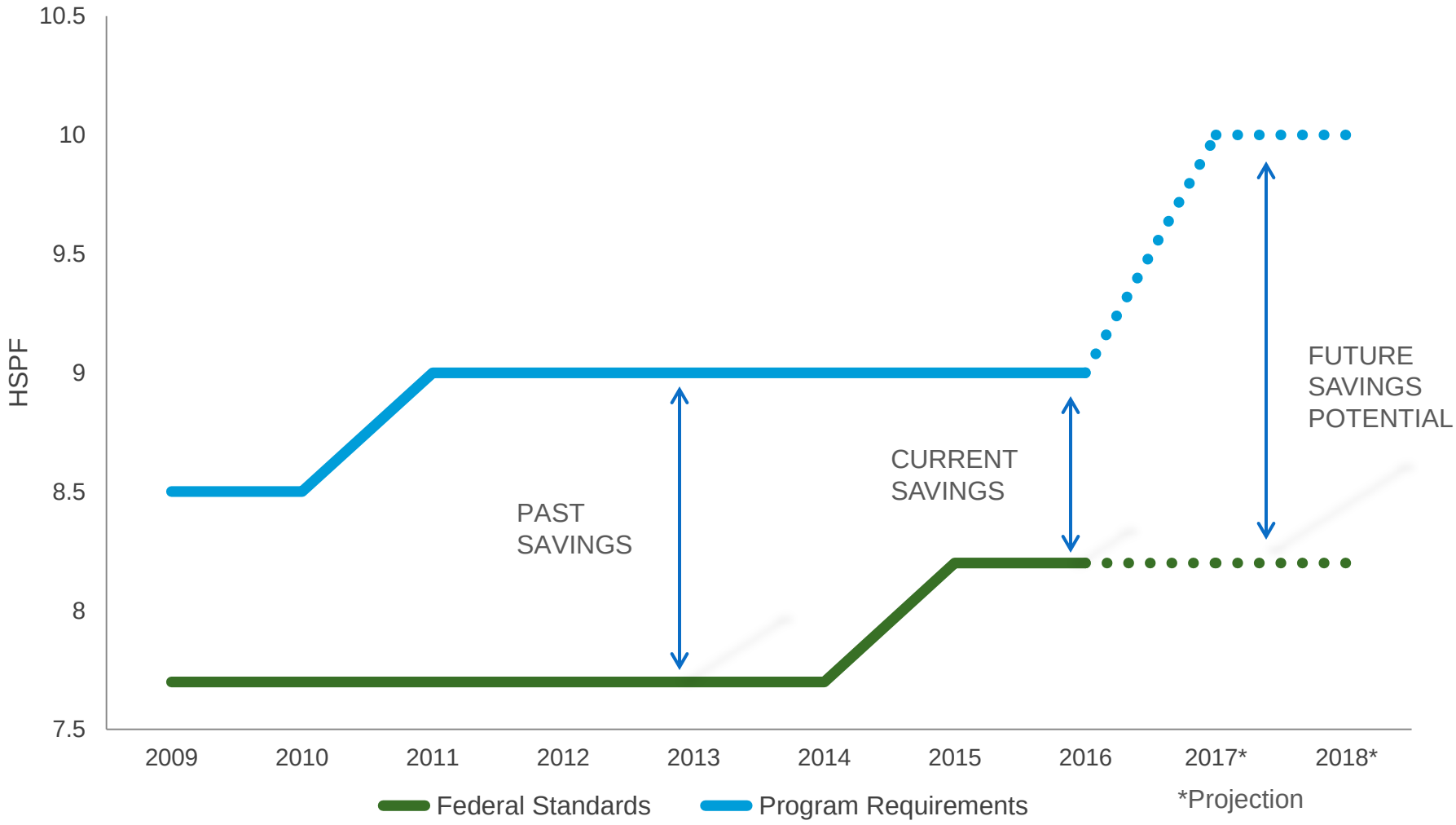
Source: Regional utility program data (publics and IOUs) and AHRI shipment data

High-Efficiency HVAC Sales Need a Boost



Source: Distributor sales data for 2013 and 2014

ASHP Efficiency Requirements

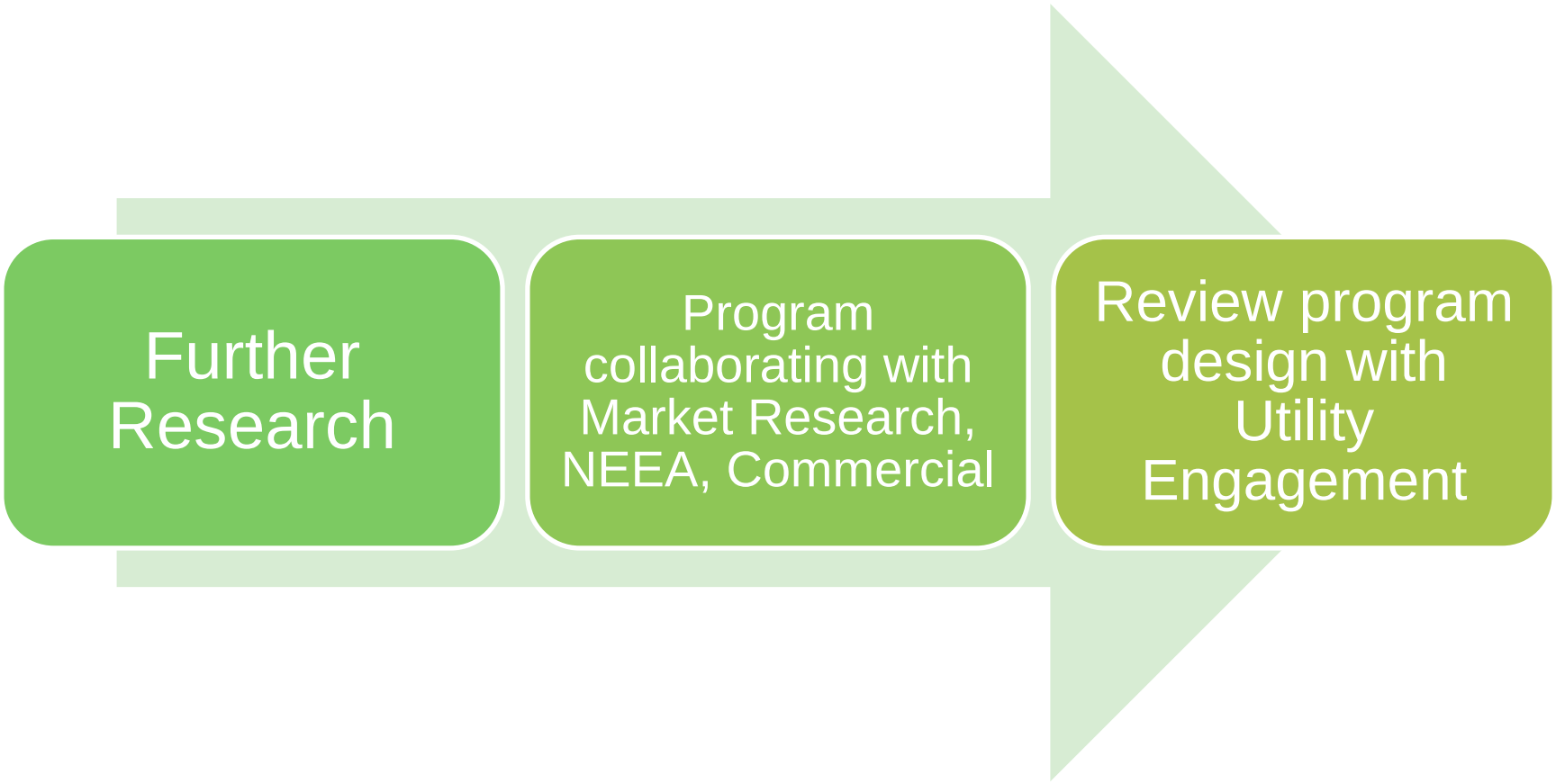


Conclusion

Still lots of opportunity to help the HVAC industry become more efficient

Opportunity to engage with partners that influence decision-making

Next Steps


Further Research
Program collaborating with Market Research, NEEA, Commercial
Review program design with Utility Engagement

Residential and Commercial HVAC Collaboration

QUESTIONS? DISCUSSION

Contact

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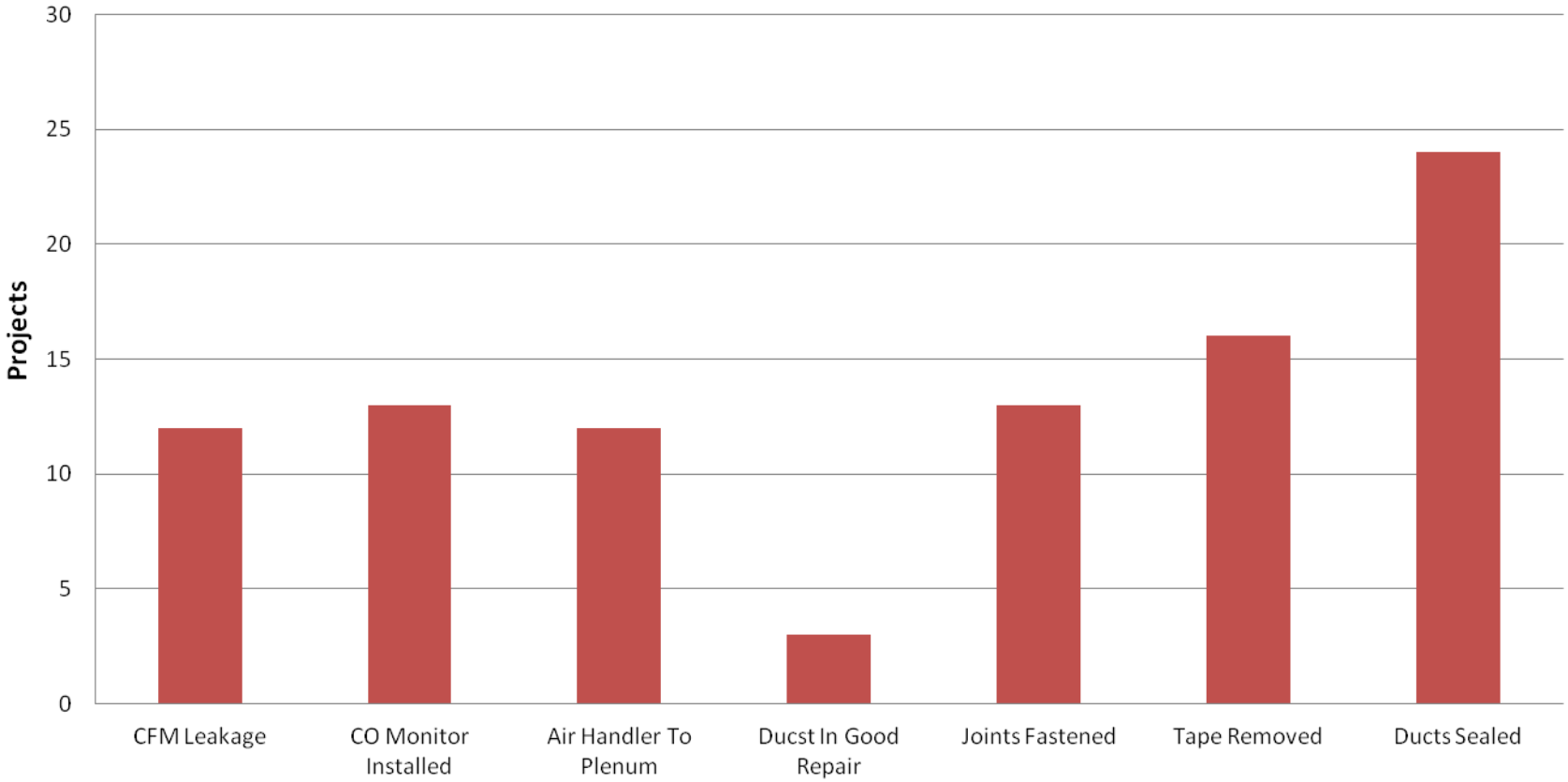
- Michelle Lichtenfels, melichtenfels@bpa.gov

Appendix

PTCS Duct Seal "F" Grades FY 2015



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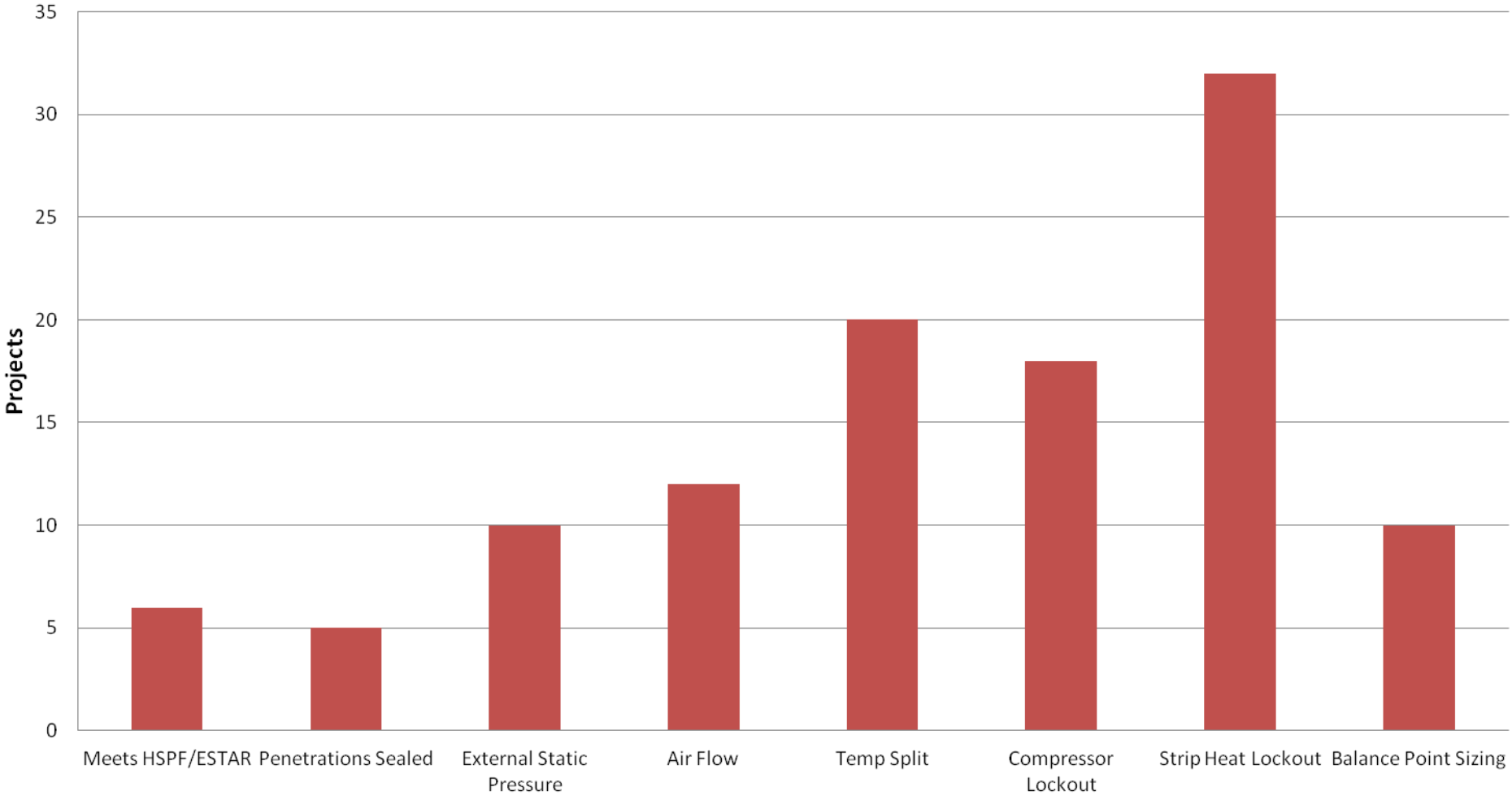
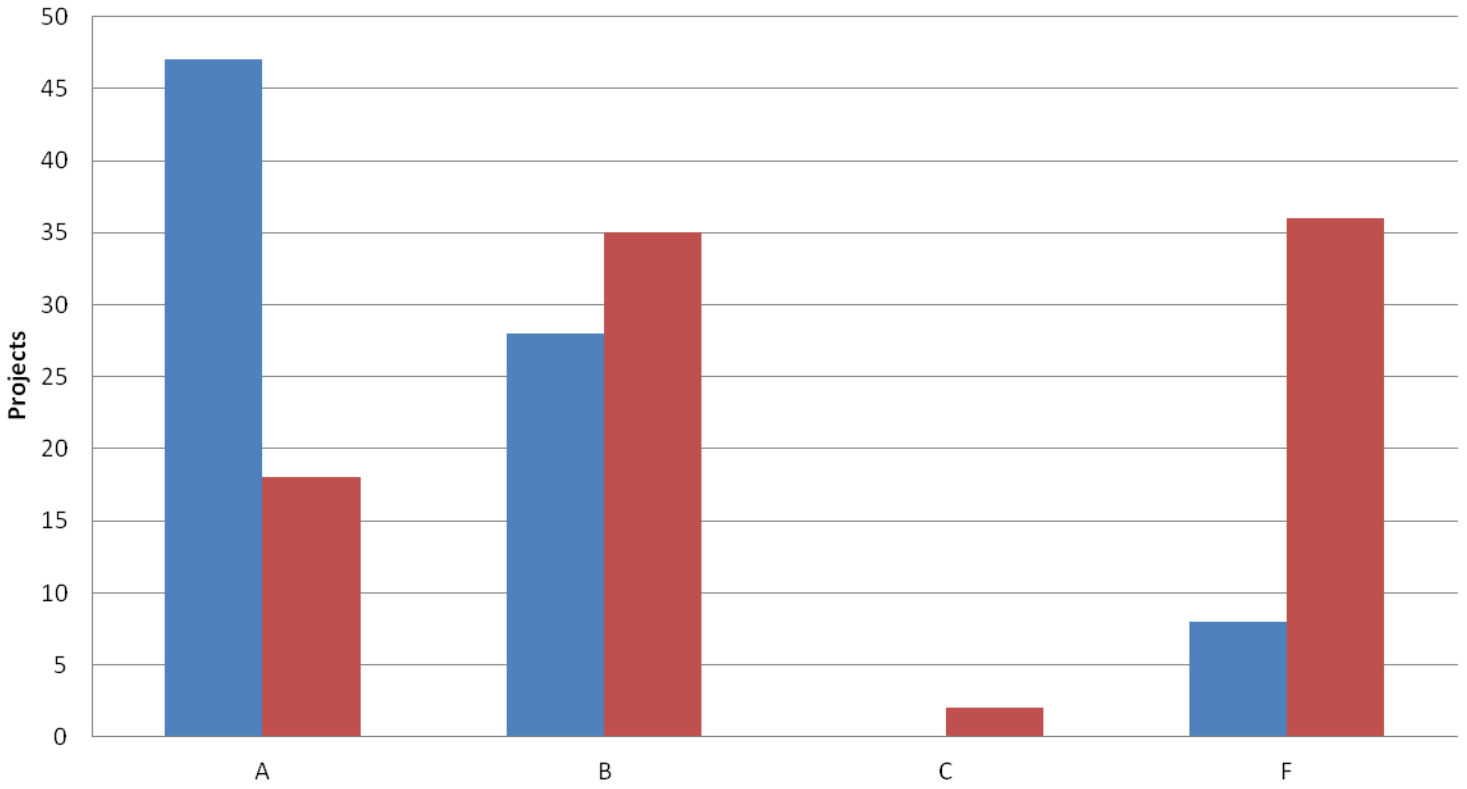


CR Inspectors vs. Utility Inspectors



Time period reviewed: Since Grading System Implemented

Example of Grading Model

Air Source Heat Pump QA Grading Criteria

	A (Above spec)	B (Meets spec)	C (Passable)	F (Fails)	Grade 'F' is Automatic Fail
Meets HSPF or CC&S	9.0 or higher (Fed stnd for CC&S) and matches what tech reported	9.0 or higher (Fed stnd for CC&S)		Below 9.0 or Federal Standard	X
Penetration(s) Sealed	All exterior penetrations sealed exceptionally well	All exterior penetrations sealed		Not sealed	
ESP	Below 0.6 H2O (150 Pa)	Up to 0.8 H2O (200 Pa)	> 0.8 H2O (200 Pa) but ≤ 0.85 H2O (212 Pa)	> 0.85 H2O (212 Pa)	
Air Flow (CFM)	325 – 450 and matches tech's # within ±10 CFM	325 – 450	300 – 324 or 451 – 500	Less than 300 or greater 500	
Temp Split	> table value up to positive 5F	Equals table value	Within 3F variance	Greater than 3F variance (or more than +5F)	
Compressor Low Ambient (LAL) Lockout	Not set or set less than 5F	Set to 5F		Set to incorrect number (above 5F)	
Strip Heat Lockout	Set to less than 35F and actually does inhibit the strip heat from coming on	Set to 35F and actually does inhibit the strip heat from coming on		Set to incorrect number	X
Balance Point	Less than 30F (but not less than 20F for single speed units)	30F	31F – 35F	Greater than 35F or not provided	X

- DS and HP add the total projects slides…
- Is it possible to show in the HP that is VSHP please do this.