PTCS Program Redesign
Draft Recommendations

Amy Burke, BPA
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Hello!

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The Agenda

- Current Snapshot
- The Process
- What We Heard
- Two Optional Paths
- Draft Recommendations
- Feedback and Next Steps
We are looking for your written feedback following this presentation.
Current Program Snapshot

- Utility participation is around 40% and decreasing
- Participating technicians slightly decreasing
- Claims for most PTCS measures slightly decreasing
- Non-variable speed heat pumps slightly decreasing
- Variable speed heat pumps increasing!

Significantly more market opportunity for efficient heat pumps.
Current Program Snapshot

```
graph

- aMw
- Target

- 2012 to 2018
```

<table>
<thead>
<tr>
<th>Year</th>
<th>aMw</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>2.0</td>
</tr>
<tr>
<td>2013</td>
<td>1.8</td>
</tr>
<tr>
<td>2014</td>
<td>1.5</td>
</tr>
<tr>
<td>2015</td>
<td>1.2</td>
</tr>
<tr>
<td>2016</td>
<td>1.3</td>
</tr>
<tr>
<td>2017</td>
<td>1.1</td>
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<tr>
<td>2018</td>
<td>1.0</td>
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</table>

- Target: 1.0
Two Main Camps of Utilities

Very supportive
- Have resources to implement
- Trained technicians in their territory and participating

Too difficult
- No or few resources to implement
- No trained technicians available or aren't participating
“To ask the right question is already half the solution of a problem.”

~ C.G. Jung
Who We Talked To

Expertise Gathered

- Compliance, Planning, & Evaluation
- Engaged Utilities
- Heat Pump Field Study
- Research Projects
- Engineering & National HVAC Experts
- IT Systems Team
- Contractor Network
- Manufacturer Data & Interviews
- Marketing & EERs
- Program Data & Market Trends

Who We Talked To
# Utility Workgroup

Thank you, participants!

<table>
<thead>
<tr>
<th>Alicia Harmanson, Lewis County PUD</th>
<th>Jim Maunder, Ravalli Electric</th>
<th>Michael Currie, Clallam PUD</th>
<th>Ryan Perry, Tillamook PUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anita Clever, Klickitat PUD</td>
<td>Jody Howe, Central Electric Co-Op</td>
<td>Michelle Ehrlich, Cowlitz PUD</td>
<td>Sara Bernards, McMinnville Water and Light</td>
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<tr>
<td>Brandy Neff, PNGC</td>
<td>Joe Hull, Midstate Electric</td>
<td>Nancy Phillip, Benton PUD</td>
<td>Scott Mayfield, Kootenai Electric</td>
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<tr>
<td>Charles Schifferdecker, Eugene Water &amp; Electric</td>
<td>Kevin Watier, Snohomish PUD</td>
<td>Pat Didion, Milton-Freewater</td>
<td>Todd Williams, Inland Power</td>
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<tr>
<td>DuWayne Dunham, Clark PUD</td>
<td>Lindsey Hobbs, Inland Power</td>
<td>Penny Brambrink, Flathead Electric</td>
<td>Wid Ritchie, Idaho Falls Power</td>
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<tr>
<td>Eric Miller, Benton REA</td>
<td>Mattias Jarvegren, Clallam PUD</td>
<td>Ryan Davies, Central Electric Co-Op</td>
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Utilities: What We Heard

- Stringency increases installation cost
- Call-backs are an issue
- Inspections valued but challenging
- Training valued but challenging
- Documentation and reporting are frustrating
- Difficult for small utilities to implement
- Technical complexity is out-of-date and adds cost
- Keep the high standard and just change implementation
- Many new testing tools available
Primary Goals

- Lower installation cost
- Reduce callbacks
- Update specs to reflect current technology
- Simplify reporting
- Improve quality of work from installers
- Decrease barriers to entry
- Streamline training & continuing education
- Decrease burdens for smaller utilities
- Improve oversight
- Increase uptake!
Primary Challenges

✓ Technical rigor and complexity adds cost for homeowners, technicians, and utilities

✓ How to modify the program specs and implementation without significantly impacting savings

✓ How to find balance between equipment cost, installation cost, quality installation, savings, comfort, customer service, a changing market, and verification requirements to satisfy both camps of utilities
Areas We Focused On

- Specifications research with focus primarily on heat pumps
- Training Process
- Documentation Requirements
- Registry Reporting System
- Quality Assurance Process
- Engagement
Two Optional Paths

**Option A:**
**Gold Star Energy Savings**

- **Heat Pump airflow test:** Allow external static pressure lookup in addition to TrueFlow test without the required correction factor
- Increase focus on proper sizing
- Keep the Registry requirement with many added features
- Likely keep installation costs high
- Adopt all other program changes

**Option B:**
**Contractor Friendly**

- **Heat Pump airflow test:** Remove this test entirely
- Increase focus on proper sizing
- Lean up the Registry verification requirements but add streamlining features
- Likely reduce homeowner installation costs
- Adopt all other program changes
Draft
Recommendations
Take Note

- These are draft recommendations.
- All recommendations are pending utility feedback, RTF review, and IT approval.
- All changes will be piloted and tested extensively.
Technical Specifications

Goals:

- Reduce installation time, cost, and complexity
- Identify any specifications that could be updated or removed without significantly impacting savings
- Update to reflect current technology

Resources:

- Regional Heat Pump Field Study
- National expert, utility, and manufacturer interviews
- National literature review
- Engineering expertise
- Quality assurance inspection data
- Independent research results
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Sizing</td>
<td>Keep</td>
<td>This might have a high impact on savings. This is however a difficult spec to enforce.</td>
<td>High</td>
<td>PTCS Benefit Questionable</td>
<td>More non-PTCS were right-sized than PTCS, but more non-PTCS were also undersized than PTCS.</td>
<td>Contractors manipulate sizing for the equipment they want to install; not a big driver of savings; duct work must be changed to get a BP of 30F</td>
<td>Not a big driver of savings; nearly impossible to fix after-the-fact</td>
<td>High Impact on savings. Keep at 30F. Moving from 30F to 35F balance point could decrease savings between 20-25%.</td>
<td>2.0%</td>
<td>98.0%</td>
</tr>
<tr>
<td>Airflow</td>
<td>Keep</td>
<td>Airflow that is too low reduces capacity and efficiency. Airflow that is too high is inefficient and may reduce the ability to dehumidify in cooling mode and provide adequate comfort.</td>
<td>High</td>
<td>PTCS Irrelevant</td>
<td>No measurable difference between PTCS and non-PTCS</td>
<td>Bad airflow could shorten equipment life; proper airflow makes the home more comfortable; customers would prefer to keep this to maintain the gold-star standard and utilities that can’t meet this should use the non-PTCS measure</td>
<td>Keep</td>
<td>Keep</td>
<td>6.5%</td>
<td>93.3%</td>
</tr>
<tr>
<td>External Static Pressure</td>
<td>Keep</td>
<td>External static pressure is a measure of the restrictiveness of a duct system and is directly connected to airflow and efficiency.</td>
<td>High</td>
<td>PTCS Irrelevant</td>
<td>No measurable difference between PTCS and non-PTCS</td>
<td>Good to make the compressor and blower motor last; an example of a HP that had an out-of-control static pressure failed after 6 yrs.</td>
<td>Keep</td>
<td>Keep</td>
<td>4.7%</td>
<td>95.3%</td>
</tr>
<tr>
<td>Refrigerant Charge</td>
<td>Keep/Modify</td>
<td>Remove the temp split option and rely solely on measuring subcooling.</td>
<td>high</td>
<td>PTCS Irrelevant</td>
<td>No measurable difference between PTCS and non-PTCS</td>
<td>Spec for subcooling not clear; temp split is very accurate and helpful in the winter</td>
<td>Keep</td>
<td>Keep</td>
<td>6.3%</td>
<td>93.7%</td>
</tr>
<tr>
<td>Compressor Lockout</td>
<td>Remove</td>
<td>This is an outdated spec that should be removed.</td>
<td></td>
<td>PTCS Made a Difference</td>
<td>Measurable difference between PTCS and non-PTCS</td>
<td>No real preference</td>
<td></td>
<td></td>
<td>5.3%</td>
<td>94.7%</td>
</tr>
<tr>
<td>Strip Heat Lockout</td>
<td>Keep with additional research suggested</td>
<td>But didn’t find much concrete evidence that this was a big driver of savings.</td>
<td></td>
<td>PTCS Made a Difference</td>
<td>Measurable difference between PTCS and non-PTCS</td>
<td>Utilities prioritizes lockout. Important spec.</td>
<td>Keep</td>
<td></td>
<td>13.8%</td>
<td>86.2%</td>
</tr>
</tbody>
</table>

*Limited quantifiable savings data*
Technical Specifications

**Option A:** Gold Star Energy Savings

- **Heat Pump airflow test:** Allow technicians to estimate the airflow based on the External Static Pressure and the manufacturer look-up tables.
- Increase focus and training on proper heat pump sizing and incorporate real-time inspections.
- Continue supporting the TrueFlow test and remove the correction factor requirement.

**Option B:** Contractor Friendly

- **Heat Pump airflow test:** Remove this test entirely.
- Increase focus and training on proper heat pump sizing and incorporate real-time inspections.
- Significantly reduces time, cost, and overall implementation of airflow requirement alone.
## Summary of Spec Recommendations

<table>
<thead>
<tr>
<th>Specification</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSPF/SEER</td>
<td>Keep: No Change</td>
</tr>
<tr>
<td>Balance Point Sizing</td>
<td>Keep Spec &amp; Modify Implementation</td>
</tr>
<tr>
<td>Airflow</td>
<td><strong>Option A)</strong> Allow ESP Estimate and TrueFlow</td>
</tr>
<tr>
<td>External Static Pressure</td>
<td>Keep: No Change</td>
</tr>
<tr>
<td>Refrigerant Charge</td>
<td>Keep &amp; Modify Language</td>
</tr>
<tr>
<td>Compressor Low Ambient Lockout</td>
<td><strong>Remove</strong></td>
</tr>
<tr>
<td>Auxiliary (Strip) Heat Lockout</td>
<td>Keep &amp; Improve Implementation</td>
</tr>
<tr>
<td>Duct Sealing (PTCS &amp; Prescriptive)</td>
<td>Minor clean-up</td>
</tr>
<tr>
<td>Ground Source Heat Pumps</td>
<td>Combine open and closed loop specs into one and align with ASHP spec changes</td>
</tr>
</tbody>
</table>
Training Process

**Goals:** Increase availability and decrease cost

**Recommendations:** Pilot a remote training program and topic-specific training. All new techs would have their first project inspected and have a test proctored. In-person training would still be an option for interested utilities.

**Benefits:**
- Reduces administrative time
- Reduces contractor’s loss of work
- Reduces barriers for technicians to participate
- Makes training more accessible in rural areas
- Improves technician education and real-time support
**Goal:** Reduce documentation required by BPA to be in the customer file

**Recommendations:** Remove the heat load/heat loss and balance point (ASHPs and GSHPs) and loop design (GSHPs) documentation requirements

**Benefits:**
- Reduces contractor administrative time
- Reduces utility administrative time
- Reduces barriers for utilities, COTRs during oversight, and QA inspectors

**Utilities can still request any additional documentation**
Registry Reporting Requirements

**Drawbacks:** Burdensome administrative requirement adding staff time and cost

**Benefits:** Automates review of a rigorous specification and provides insight into poor performance

9 scenarios to answer the questions:

- **Who would bear the burden of verification without a central system?**
- **How do we streamline the central reporting process but maintain accuracy?**
Recommendations: If the specification remains rigorous, maintain the automated verification system, but reduce the touch points to the bare minimum with the following added features:

- Offline entry
- Entering a project without a sign-in requirement
- Document upload feature
- Automatically email documents and all measure details to utility
- Automatically email utility if measure details are edited
- Suggest appropriate RefNo(s)
- Improve process for reconciliation with IS2.0 data
Registry Reporting Requirements

Benefits:

- Reduces administrative time
- Reduces time on site
- Improves customer service to homeowner
- Improves technician education and accountability
- Reduces barriers for utilities and COTRs during oversight

*Time and cost estimates completed for all options*, but final approval to being development pending
Quality Assurance Inspections

**Goal:** Reduce contractor call-backs

**Recommendation:** Pilot a remote inspection program with real-time inspection results and allow more utilities to self-inspect

**Benefits:**
- Allows techs to troubleshoot on site with real-time results
- Reduces time
- Reduces inspection call-backs
- Reduces cost to contractor
- Improves customer service to homeowner
- Improves technician education and accountability
# Two Optional Paths

<table>
<thead>
<tr>
<th></th>
<th><strong>Option A: Gold Star Energy Savings</strong></th>
<th><strong>Option B: Contractor Friendly</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary</strong></td>
<td>Allowing an easier heat pump airflow test, removing TrueFlow correction factor, and adopting all other updates</td>
<td>Removing heat pump airflow test, further simplifying reporting, and adopting all other updates</td>
</tr>
<tr>
<td><strong>Specifications</strong></td>
<td><strong>Heat Pump Airflow:</strong> Allow ESP lookup and TrueFlow tests and increase focus on sizing</td>
<td><strong>Heat Pump:</strong> Remove airflow test entirely and increase focus on sizing</td>
</tr>
<tr>
<td><strong>Training</strong></td>
<td>Remote with hands-on support</td>
<td>Remote with hands-on support</td>
</tr>
<tr>
<td><strong>Documentation</strong></td>
<td>Limited changes</td>
<td>Limited changes</td>
</tr>
<tr>
<td><strong>Reporting</strong></td>
<td>Keep the Registry and add new features</td>
<td>Keep the Registry but reduce data verification and add new features</td>
</tr>
<tr>
<td><strong>QA Inspections</strong></td>
<td>Remote and on-site</td>
<td>Remote and on-site</td>
</tr>
<tr>
<td>Primary <strong>Challenges</strong></td>
<td><strong>Proposed Solutions</strong></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| **Laborious Documentation and Reporting**| ✓ Offline registry access  
✓ Automatically emailing data to utility  
✓ Document upload feature for quick utility, contractor, and COTR access  
✓ New reporting features to limit the amount of registry interaction |
| **High Cost**                             | ✓ (Pending discussion) Leaning up on airflow specification, reducing equipment cost  
✓ Less time off of work with remote training  
✓ Less unpaid time necessary to remediate with real-time inspections  
✓ Reduced call-backs |
| **Lengthy Training Process**              | ✓ Remote training  
✓ On-demand resources and videos  
✓ Automated participation application process  
✓ In-person field visit to inspect new technician’s first project |
| **Time Consuming**                        | ✓ Less time in the registry  
✓ Less administrative time reporting project data  
✓ Less testing time in the field  
✓ Less time tracking documentation |
Feedback
Please submit your written feedback to your EER or Jess Kincaid (jbkincaid@bpa.gov) by December 12th.
Non-participating utilities:

What did you hear today that **might help you participate**?

What barriers we talked about removing **won’t help you participate**?
Do you feel these changes will help you all and technicians to increase uptake?

Do you have any concerns or questions about any recommendations?
Participating utilities:

Which would you prefer: Option A) **Gold Star Standard** or Option B) **Contractor Friendly**? Why?

What feedback do you have about changing the airflow testing specification?
Participating utilities:

Do you have any concerns about more focus on remote implementation?

Would any of these recommendations help reduce the installation cost?
Next Steps

**Fall Roundtables**
- Brown Bag
- **AUG ~ OCT**

**Early 2020**
- Get us your written feedback
- Internal Decisions Based on Feedback
- **DEC 12th**
  - Deadline for Customer Feedback

**OCT 2020**
- RTF Discussions, System and Tool Development, Implementation Pilots, Extensive Field Testing
- **2020**
  - Remove requirements that can be removed mid-cycle

**OCT 2021**
- Implement Redesigned Program
- Go live!

**Deadline for Customer Feedback**
- DEC 12th

**Get us your written feedback**
- NOV 21st

**Remove requirements that can be removed mid-cycle**
- OCT 2020

**Implement Redesigned Program**
- OCT 2021

**Go live!**
- OCT 2021
Please contact your EER or Jess Kincaid (jbkincaid@bpa.gov) with any written feedback or questions.

These slides and an additional handout will be available on the BPA events page by tomorrow.