

# BPA DHP COST EFFECTIVENESS STRATEGY

---

Brown Bag | *November 14, 2019*

Paul Hawkins, Programs  
Robert Weber, Engineering  
Phillip Kelsven, Planning & Evaluation

Bonneville  
POWER ADMINISTRATION



INTRO

---

01

---

02

---

03

---

04

---

*+The Issue*

*+Internal  
Analysis*

*+Draft  
Approach*

*+Next  
Steps*



The BPA ductless heat pump (DHP) measures are cost effective for this rate period

(Oct. 1, 2019 – Sept. 31, 2021)

**Energy Savings**

**Cost**



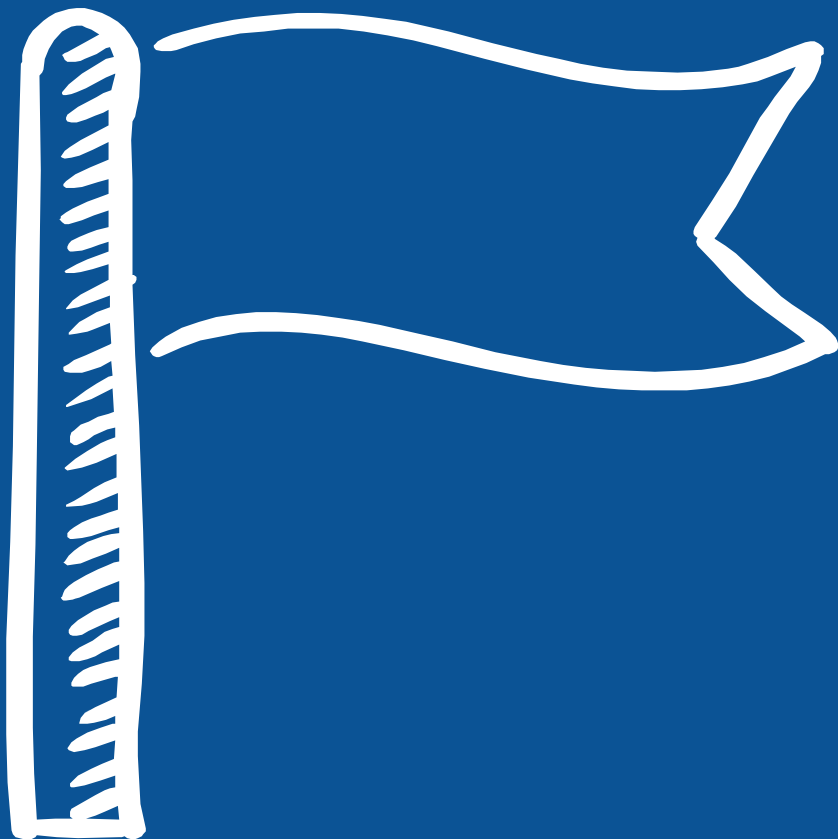
# The Issue:

1. Regional Technical Forum updates to Zonal DHPs make the measure set not cost effective
  2. There are savings issues – evaluated savings are lower than modeled savings
  3. There are cost issues – costs are increasing
- 



# Our Goal:



Reduce installed costs and identify installations with reliable energy savings to ensure a cost effective measure.



BPA will take a methodical approach and is focused on achievable tasks.

Work must be complete by December, 2020.

# Updated Regional Technical Forum (RTF) Measures

| Measure   | Category         | Measure Description  | HSPF  | Average TRC  | Sunset Date |
|---|------------------|--|-------|--|-------------|
| <u>Ductless Heat Pump for Forced Air Furnace SF and MH</u>    | proven           | <p><b><u>4 measures</u></b></p> <ul style="list-style-type: none"> <li>SF &amp; MH</li> <li>HZ1 &amp; HZ2</li> </ul>   | 9.0+  | 1.175  | 30-Sep-21   |
| <u>Ductless Heat Pumps for Zonal Heat SF</u>                  | proven           | <p><b><u>81 measures</u></b></p> <p>“Any” or “Screened”</p> <ul style="list-style-type: none"> <li>HZ/CZ 1-3</li> <li>Screened measures include ‘pass/fail’ and four kWh usage bins for each HZ/CZ</li> </ul>  | 9.0+  | ~0.4  | 31-Oct-24   |
| <u>Ductless Heat Pumps for Zonal Heat MH</u>                  | small saver      | <p><b><u>81 measures</u></b></p> <p>“Any” or “Screened”</p> <ul style="list-style-type: none"> <li>HZ/CZ 1-3</li> <li>Screened measures include ‘pass/fail’ and four kWh usage bins for each HZ/CZ</li> </ul>  | 9.0+  | ~0.4  | 31-Oct-24   |
| <u>Ductless Heat Pumps for New Construction Single Family</u> | planning         | <p><b><u>14 measures</u></b></p> <ul style="list-style-type: none"> <li>ID HZ 1-3</li> <li>MT HZ 2&amp;3</li> <li>OR HZ 1-3                             <ul style="list-style-type: none"> <li>HPWH w/ vintage</li> <li>HPWH w/o vintage</li> <li>Gas WH ≥ 0.85</li> </ul> </li> </ul> | 10.0+ | >5   | 31-Jan-21   |
| <u>Ductless Heat Pumps for Multifamily</u>                    | planning         | <p><b><u>3 measures</u></b></p> <ul style="list-style-type: none"> <li>HZ 1-3</li> </ul>   | 9.0+  | 0.43   | 30-Sep-21   |
| <u>DHP for FAF with Optimized Controls</u>                    | to be determined | 5/23/2018: RTF Staff Plan: Incorporate this as an additional application in the existing FAF measure   |       |  |             |

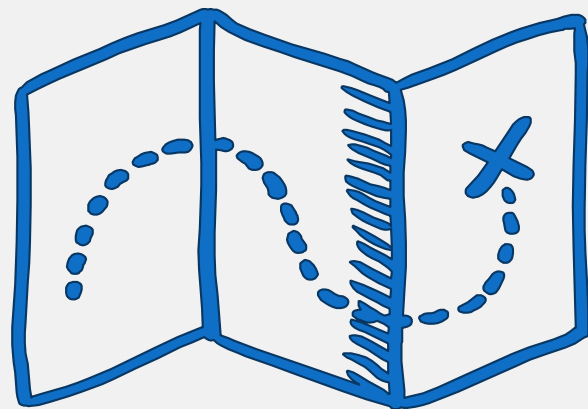
# Internal Analysis

We prioritized what BPA can do within the timeline and our current budget. Today's presentation will cover:

- Programmatic cost reduction
- Engineering technology research
- Evaluation of granular trends that impact savings



# Draft Approach



## Programs

- Research cost reduction strategies
- Research association between HSPF and cost
- Research delivery models that screen homes for kWh usage or supplemental fuels
- Research impact of multi-head or ducted applications on cost
- Learn from new construction DHP costs



# Program Questions:

- What factors influence the installed cost of a ductless heat pump in your service territory?
- Have you engaged in tactics to reduce DHP costs in your territory?
- What screening of program participants do you perform? (If any)
- How common are multi-head or short-run ducted DHPs in your territory?



# Draft Approach



## Engineering

- Research high performance/cold climate equipment to evaluate new measure opportunities
  - Control strategies - Maximizing the Mini-Split
  - Measure screening i.e. heating signature
  - Testing procedure EXP-07
-

# Technology Questions:

- How to determine the best cold-climate equipment for specific heating climates?
- How can control strategies improve DHP energy savings?
- How does specific equipment type or configuration correlate to performance?



# Draft Approach



## Planning & Evaluation

- Evaluate DHP savings by dependent variables (i.e. HSPF, SEER, home size, vintage, supplemental fuels)
  - Evaluate energy savings from cold climate equipment
  - Participant survey (HZ 2/3)
  - Properly value the benefit of peak savings in the region
  - Alternative baselines for DHPs
  - Evaluate cost effectiveness at a higher portfolio level
-

# Evaluation Questions:

- What are the drivers of energy savings and/or lack of energy savings?
- Given a predicted regional capacity shortage, how much are the peak savings really worth to the system?
- How can we ensure we are installing DHPs in the right application?
- Are we getting the cost effectiveness paradigm right?



# Other Questions?



# Possible 2021 Outcomes

1. No change (unlikely)
2. Revised measures with more stringency (more likely):
  - ? HSPF requirement changes
  - ? Cold Climate mandate
  - ? Screened measure applications
3. Loss of DHP measures (unlikely, last resort)



# Next Steps

1. Conduct DHP research through Nov. 2020



2. Analyze opportunities for a cost effective measure  
(rank possibilities)



3. Come back to utility customers for review and final  
input (December 2020)



4. Notice change in April 2021, change measure in  
Oct, 2021 IM to reflect a cost effective approach



# Questions?

**Programs:** Paul Hawkins, [PAHawkins@bpa.gov](mailto:PAHawkins@bpa.gov)

**Engineering:** Robert Weber, [RMWeber@bpa.gov](mailto:RMWeber@bpa.gov)

**Planning  
& Evaluation:** Phillip Kelsven, [PAKelsven@bpa.gov](mailto:PAKelsven@bpa.gov)

