TRADE ALLY TRAINING

PUD Heat Pump Installer & Sales Training

October 7, 2014
Training Agenda

- Introduction
- Program Overview
- Paperwork
- Quality Control
- Warranty Requirements
- Specifications
- PUD Resources and Contacts
Why PUD invests in Energy Efficiency

- Helps customers lower their bills
- State law mandates targets
- PUD Goal – 1st resource of choice

Energy Efficiency
Residential Sector Efficiency Potential

- Electric Homes, 51%
- Natural Gas Homes, 38%
- Other Fuel Homes, 11%
Annual Residential Potential by End Use

- Cooling
- Envelope New
- Appliances
- Consumer Electronics
- Water Heat
- Envelope Retro
- HP / DHP
- Lighting
Program Overview
2013 - Completed Projects

- Glass: 459
- Ceilings: 187
- Floor: 202
- Walls: 44
- Ducts: 559
- HP-Air: 401
- HP-Geo: 5
- DHP: 578
Your Role

- **Influence and educate customers** about energy efficiency, PUD programs and their benefits

- **Bid jobs:**
  - Use PUD bid forms
  - Review customer owned balances
  - Explain *when insulation is required*

- **Install measures** as authorized and according to specifications

- Handle **customer service** and maintenance issues
Understanding Eligibility

- Must have an active PUD account
  - (Snohomish County or Camano Island)
- Permanently Installed Electric Heat in Existing Structures
- Weatherization Work may be Required
- Obtain Jurisdictional Required Permits
- No work in non-living areas of the home, even if heated
- Not a remodel program
# Single Family Incentives

<table>
<thead>
<tr>
<th>Eligible Measure</th>
<th>Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat pumps, ducted air source conversion 9.0 HSPF</td>
<td>$1,500</td>
</tr>
<tr>
<td>Heat pumps, ducted air source upgrade to 9.0 HSPF</td>
<td>$600</td>
</tr>
<tr>
<td>Ductless Heat Pump (no pre-approval)</td>
<td>$600 - $800</td>
</tr>
<tr>
<td>Single head 9.0 HSPF</td>
<td></td>
</tr>
<tr>
<td>Multi-head 8.0 HSPF</td>
<td></td>
</tr>
<tr>
<td>Geothermal Heat Pump</td>
<td>$2,000</td>
</tr>
<tr>
<td>Geothermal w/dedicated Domestic Hot Water</td>
<td>$2,500</td>
</tr>
<tr>
<td>Duct Sealing &amp; Insulation</td>
<td>$5 per lineal foot (up to $450)</td>
</tr>
<tr>
<td>Manufactured homes</td>
<td>$200 single wide $400 double wide</td>
</tr>
</tbody>
</table>

*Note: Programs and incentives subject to change. Always check [www.snopud.com/weatherization](http://www.snopud.com/weatherization) for current offerings.*
Paperwork
www.snopud.com/weatherization

For Homeowners

- Program guidelines
- Incentive amounts
- Financing links
- Testimonials, podcasts, educational materials
- Easy access to necessary forms
How to Participate

**Forms & Process Info for Homeowners**
- Participation Application & Agreement
- DHP Rebate Application
- Links to Contractor Lists

**Conservation**
- How to Participate
- Ductless Heat Pumps
- Heating Contractors
- Insulation Contractors
- Window Contractors

**Required Forms**
- Participation Application & Agreement
- Signed PUD Bid Form from a PUD Registered Contractor

**Useful Information**
- If you are also applying for a heat pump, only one application packet is required.
- Read the Incentive Program Guidelines.
- Check out our PUD Registered Contractor Lists.
- While only one bid is required, you are encouraged to get as many bids as you want (see our Registered Contractor Lists).

**Program Guidelines**
- Heating Projects
- Insulation Projects
- Windows Projects

**Energy Hotline**
- 425-783-1700 (Mon-Fri, 8am-5pm)
- Submit your conservation question...

**LEARN ~ CONNECT ~ SAVE**
Submitting Complete Application

- Signed & Dated
  - Application & Participation Agreement
  - Bid Sheet(s) (optional)
- Should be submitted by homeowner
- DHP separate application
- INCLUDE ALL DOCUMENTS TO PREVENT DELAYS
Submitting DHP Rebate Application

▶️ NO PRE-APPROVAL REQUIRED

▶️ Should be submitted by homeowner

▶️ Customer choice:
  ▶️ Rebate to be applied to their PUD bill
  ▶️ Rebate to be paid to the contractor.

▶️ Signed & Dated
  ▶️ Customer Bid Sheets or Contractor invoice
  ▶️ Sign and date second page
Program Specific Uniform Bid Sheets

- All bids are good for a minimum of 60 days
- Bid sheets are available:
  - Online
  - Editable PDF’s
- Obtain all required permits
- Submit **AHRI Certification number** on bid sheet
DON’T FORGET TO SIGN YOUR BIDS

ELECTRONIC SUBMITTALS:
Be sure to check electronic submittal box
Completed Bid Sheet

- Manufacturer Rebates should be listed in the comment section
- We will deduct rebate after tax
Submitting Paperwork

- **Email**
  - [CE@snopud.com](mailto:CE@snopud.com)
    - BE SURE TO CHECK ELECTRONIC SIGNATURE BOX

- **Fax**
  - 425-267-6762

- **Mail**
  - Community Energy MS E2 PO Box 1107 Everett WA 98206

*When submitting via email or fax **DO NOT MAIL.***
Only submit via one method to avoid duplicate efforts.
**Application Status**

**FIRST** check with your customer to see if they submitted their application with your bid.

Then, to check if an application has been received and/or authorized:

- **CE@SnoPUD.com**

For applications that have been assigned to an inspector contact the designated inspector:

- **Jay Snyder** 425-783-1721
  jasnyder@snopud.com
- **Aaron Stewart** 425-783-1726
  apstewart@snopud.com
- **Ed Walstad** 425-783-8158
  edwalstad@snopud.com
The Energy Services Authorization (ESA) is your approval to start work.
The Energy Services Authorization

- When work is complete, remember to **sign and date** the Contractor box.
- Then return signed ESA form to the PUD at [CE@snopud.com](mailto:CE@snopud.com)
Quality Control
Contractor Requirements

- Manufacturer Training Once a Year
- 2 Year Parts & Labor Warranty
- 24-Hour Phone Service
- DHP Installers Require NEEA Certification
# Inspection Schedule

<table>
<thead>
<tr>
<th>Eligible Measure</th>
<th>Inspection Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ducted Air Source Heat Pump (Ducted Mini-Splits)</td>
<td>Pre &amp; Post In-Progress for duct seal (48 hr notice)</td>
</tr>
<tr>
<td>Geothermal Heat Pump</td>
<td>Pre &amp; Post In-Progress for loop &amp; duct seal (48 hr notice)</td>
</tr>
<tr>
<td>Geothermal w/dedicated Domestic Hot Water</td>
<td>Pre &amp; Post In-Progress for loop &amp; duct seal (48 hr notice)</td>
</tr>
<tr>
<td>Ductless Heat Pump</td>
<td>Post</td>
</tr>
</tbody>
</table>
Inspections: MD’s & Remedials

Minor Deficiencies
- Not paid until fixed
- Not Health/Safety related
- Limited work needed

Remedials
- Health & Safety related
- Excessive amount of MD’s

Must be completed within 30 days.
Penalty: Suspension
# Performance Monitoring

## Requirements

- **Pass Rate**: 80% over past 6 months
- **Jobs**: Complete within 3 months (or request Extension)
- **Minors/ Remedials**: Complete within 30 days
- **Insurance & License Renewals**: Submit before expiry
- **Written Complaints**: Not to exceed 1 in any 12 month period

*See Residential Installer Monitoring, Suspension & Delisting Procedures for full details.*
Performance Monitoring

**Automatic 30-day Suspension**
- Job not completed within 3 months (without filing for extension)
- Minor/remedial not completed within 30 days
- Insurance/License expiry

**During Suspension**
- New bids will not be accepted
- ESA’s will not be issued
- Name will be removed from customer-facing lists

*See Residential Installer Monitoring, Suspension & Delisting Procedures for full details.*
Performance Monitoring

**Delisting**
- Multiple Suspensions
- Extended sub-80% pass rate
- Less than 4 jobs in past 12 months
- 2 written customer complaints in past 12 months
- Program violations or unlawful activities

**After Delisting**
- Two to five years before reinstatement

*See Residential Installer Monitoring, Suspension & Delisting Procedures for full details.*
Heat Pump Specifications
Eligibility

- Electric Heat Pumps Only - No Dual Fuel
- Sized to Heating Load not Cooling
- No Oversized Equipment (5T system on 3T heat load)
- Equipment Needs to be in the AHRI Registry
DHP Eligibility Specification Changes

- DHPs are eligible in manufactured homes and homes with existing electric forced air.
- Ducted, Multi-Zonal Mini Split Systems are now eligible.
  - Are considered air source heat pumps and must adhere to those installation specifications.
  - Do not qualify for the DHP rebate

<table>
<thead>
<tr>
<th>PUD Ductless Heat Pump Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSPF ≥ 9.0 Single head</td>
</tr>
<tr>
<td>HSPF ≥ 8.0 Multi-head</td>
</tr>
<tr>
<td>SEER ≥ 14</td>
</tr>
<tr>
<td>EER = N/A</td>
</tr>
</tbody>
</table>
Equipment Requirements

- UL Listed & AHRI Certified
- Starting Requirements = Start Assist
  - Locked Rotor Amps
    - Greater than 4Ton ≤ 140 LRA
    - 4Ton or less ≤ 127 LRA

### PUD Air Source Heat Pump Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSPF</td>
<td>≥ 9.0</td>
</tr>
<tr>
<td>SEER</td>
<td>≥ 14</td>
</tr>
<tr>
<td>EER</td>
<td>= N/A</td>
</tr>
</tbody>
</table>
Equipment Selection

- Heat Loss Calculation
- Balance Point Ranges
- Supplemental Heater Size
  - See Handouts

Spec F1-F3
Balance Point Sheet

- Sizing
- Stages
- Auxiliary heat

Spec O1-O4
# Heat Loss Calculation Sheet (BTUH)

## I. Conduction Heat Loss

(U-Value x Area) x ΔT = Heat Loss (BTUH)

<table>
<thead>
<tr>
<th>Description</th>
<th>R-Value</th>
<th>U-Value</th>
<th>Area (ft²)</th>
<th>ΔT (°F)</th>
<th>Heat Loss (BTUH)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceilings</strong></td>
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<tr>
<td>1. Vented Attic</td>
<td>R11 to R38</td>
<td>.036</td>
<td>1456</td>
<td>50</td>
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<tr>
<td><strong>Floors</strong></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>1. Vented Crawl</td>
<td>R.0 to R-25</td>
<td>.035</td>
<td>1456</td>
<td>50</td>
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<td><strong>Glass</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Vinyl</td>
<td></td>
<td>.4</td>
<td>183</td>
<td>50</td>
<td></td>
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<td>2.</td>
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<tr>
<td><strong>Doors</strong></td>
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<td>.4</td>
<td>38</td>
<td>50</td>
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<td>2.</td>
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<td><strong>Walls</strong></td>
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<td></td>
</tr>
<tr>
<td>1. Board Siding</td>
<td>R-7</td>
<td>.098</td>
<td>Net Area</td>
<td>1251</td>
<td>50</td>
<td></td>
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<td>2.</td>
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</tbody>
</table>

Conduction Subtotal = 

## II. Infiltration Loss

<table>
<thead>
<tr>
<th>Volume</th>
<th>Cₚ for Air</th>
<th>Air Changes/Hour</th>
<th>ΔT (°F)</th>
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<tr>
<td></td>
<td>(.018)</td>
<td>(.5)</td>
<td>50</td>
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## III. Duct Losses

<table>
<thead>
<tr>
<th>R-Value</th>
<th>Total From I&amp;II (BTUH)</th>
<th>%</th>
<th>Multiplier</th>
<th>Duct Loss (BTUH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.9</td>
<td>.08</td>
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</tr>
</tbody>
</table>

**Total From I, II, & III**

BTUH

KW

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[Image: Registered PUD Contractor]

[Image: Learn ~ Connect ~ Save]
Balance Point
A-Frame Heat Loss
## Heat Loss Calculation

### Heat Loss Calculation Sheet (BTUH)

#### I. Conduction Heat Loss

\[(U-\text{Value} \times \text{Area}) \times \Delta T = \text{Heat Loss (BTUH)}\]

<table>
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<tr>
<th>Description</th>
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<tr>
<td>1. No Attic Gyp Board</td>
<td>R19</td>
<td>.049</td>
<td>1472</td>
<td>50</td>
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<td>2.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>1. Vented Crawl w/ducts</td>
<td>R-11</td>
<td>.055</td>
<td>1040</td>
<td>50</td>
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<tr>
<td>1. Metal 1/2&quot;</td>
<td>.4</td>
<td></td>
<td>341</td>
<td>50</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Wood</td>
<td>.4</td>
<td></td>
<td>42</td>
<td>50</td>
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<td>2.</td>
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<td></td>
</tr>
<tr>
<td>1. Board Siding</td>
<td>R-7</td>
<td>.083</td>
<td>1143</td>
<td>50</td>
<td></td>
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<td>2.</td>
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Conduction Subtotal =

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<td></td>
<td>(.018)</td>
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</tr>
</tbody>
</table>

#### III. Duct Losses

<table>
<thead>
<tr>
<th>R-Value</th>
<th>Total From I&amp;II (BTUH) (BTUH)</th>
<th>%</th>
<th>Multiplier</th>
<th>Duct Loss (BTUH)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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Total From I, II, & III

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</table>

**LEARN ~ CONNECT ~ SAVE**
Balance Point

![Graph showing balance point range with MBTU and degree markings.](image)
Equipment Installation

- Accessibility (can you service equipment)
- Outdoor units (Manufacturers & PUD Clearances)
- Refrigerant piping
- Geothermal loops

Spec G1-G3
Duct Design

- Static Pressure Limitations
  - Supply .08 PSI to .10 PSI
  - Return .05 PSI to .06 PSI
- 400 CFM per Ton Single Stage
- 350 CFM per Ton Two Stages

Spec H1-H5
Duct Install

- Minimum clearances 18” in crawlspace
- 30’ limit of flex duct (supply or return)
- Balancing dampers **required in new duct work**
- Duct sealing & nominal R-8
- Routine human contact (FSK type material required)
Repairing and Sealing of Ductwork

Needs to be sealed

All ductwork leaks
Repairing and Sealing of Ductwork

- All accessible ductwork must be sealed
- Mastic from below or tape from above
- New Codes & PUD
- Sealing building cavities
Air Filter

- 100% of RA will pass through filtration
- High efficiency required
  - Electronic air cleaner
  - 4” media filter
- Easy access
- Must review maintenance requirements
Noise & Vibration Abatement

✦ Indoor Units
  ✦ 2” sound liner
  ✦ Flexible connections

✦ Outdoor Units
  ✦ 5’ property line
  ✦ Be mindful of placement (below bedroom windows)

Spec L1-L3
Refrigerant Piping

- Line hide
- UV tape
- Seal penetrations

Spec M1-M7
Condensate Piping

- Do not use existing plumbing
- Installed in accordance with manufacturer requirements
- Need to be drained to exterior
- Seal all penetrations

Spec N1-N5
Equipment Mixing

- Addition of coils to existing electric furnace (FEH) assembly will not be approved unless:
  - UL Approved coil and FEH combination
  - Heat elements staged in increments of 10kW or less
  - **FEH is heat pump ready**
  - Blower sizing meets minimum CFM requirement
Indoor/Outdoor Thermostats

- Must provide O & M Manual
- Advanced System Recovery
- Review stat operation
- Outdoor thermostats lockout control shall be set at **32 or 35 degrees**
PUD Resources & Contact Information
www.snopud.com/TradeAllies

>>>Information for Weatherization & Heating contractors

- Bookmark or save to your “favorites”
- Get the latest program documents & reference materials here:

<table>
<thead>
<tr>
<th>Logo guidelines</th>
<th>This PPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bid Forms</td>
<td>Training PPTs</td>
</tr>
<tr>
<td>Contractor Agreement</td>
<td>Orientation PPT</td>
</tr>
<tr>
<td>Monitoring Procedures</td>
<td>Newsletters</td>
</tr>
<tr>
<td>Financing Options</td>
<td>Bulletins</td>
</tr>
</tbody>
</table>
Trade Allies: Weatherization & Heating

Thank you for your interest in becoming a PUD Registered Contractor. Information about our conservation programs and the forms you need to complete to become a PUD Registered Contractor are available here. To get started, you first need to complete, initial each page, sign and return the Energy Efficiency Contractor Agreement (see documents below). Contractors submitting a completed Energy Efficiency Contractor Agreement will automatically be placed on our contact list for the next orientation meeting. Orientations are held twice a year; in the spring and fall.

For more information, please click on the link below for "New Weatherization/Heat Pump Contractors."

Weatherization & Heating Documents
- New Weatherization/Heat Pump Contractors Overview & instructions on signing up for our registered contractor list
- Energy Conservation Participation Application & Agreement® (2180)
- Revised 8/15
- Energy Efficiency Contractor Agreement Revised 2/13
- Installer Performance Monitoring
- Balance Point & Heat Loss Forms
- Heat Pump Start-up Checklist® (2037)
- Heat Pump Bid Form® (2182)
- Insulation Bid Form® (2187)
- Window Installation Bid Form® (2180)
- W-2 IRS Form
- Weatherization Specifications

Related Documents
- PUD Logos Guidelines for Trade Allies
- Trade Ally Newsletter February 2014
- Trade Ally Newsletter Issue 2, August 2012
- Trade Ally Newsletter Issue 1, July 2013

Weatherization & Heating
- Bulletin Update - 07/18
  Program changes effective 8/1/13
- New Trade Ally Orientation October 2013
- Heat Pump Installer & Sales Training October 2013
- Insulation Installer & Sales Training October 2013
- Window Installer & Sales Training October 2013

Program Details
- View details of this program
- Find financing options for customers

Jump To...
Marketing Support

What you can do

- Use the Registered Contractor logo
- Leverage program promotions & tools
  - Online, Bill Inserts, Advertising, Website, Events
  - EnergyAdvisor online audit, calculators
- Regularly check your online directory listing
  - description, contact info
- Make sure we have the right contact info for you
  - “Generic” email recommended
Registered Contractor Logo

- All use must be **pre-approved**
- Logo must be **unaltered**
- [www.snopud.com/tradeallies](http://www.snopud.com/tradeallies) for specifications & guidelines
- For use on print materials and website
- **Cannot be used in context of**
  - “We are the...
    - #1 PUD Installer
    - best PUD Installer
    - most experienced PUD installer…”

Cathy Anderson
425-783-1798
cjanderson@snopud.com
Contact Info

Program Managers

- Kevin Watier  425-783-1714  kjwatier@snopud.com
- Cathy Anderson  425-783-1798  cjanderson@snopud.com

Inspectors

- Jay Snyder  425-783-1721  cell 425-239-1053  jasnyder@snopud.com
- Aaron Stewart  425-783-1726  cell 425-315-6185  apstewart@snopud.com
- Ed Walstad  425-783-8158  cell 425-231-2797  edwalstad@snopud.com
Contact Info

- **PRIMARY Email**: CE@snopud.com
- **Office Support Staff**
  - Carolyn Beebe
  - Kim Wilcox
  - Andrea Duffy
- **Fax**: 425-267-6762
- **Energy Hotline**: 425-783-1700
  - Hotline Specialist Mordecai Cooke
- **Mailing Address**: Residential Programs
  - PO BOX 1107 MS E2
  - Everett, WA 98206-1107
Thank You...

for helping
PUD customers...