# TAG Members

## THANK YOU FOR YOUR PARTICIPATION!

| | | | |
|---|---|---|---|
| David Baylon | Ecotope | Ira Krepchin | E Source |
| Michael Blasnik | Nest Labs, Google | Bruce Manclark | CleaResult |
| Christopher Coll | NYSERDA | Chris Mattock | Habitat Design & Consulting |
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| Randy Foster | Artisan's Group | Alan Shedd | Touchstone Energy |
| Theresa Gilbride | PNNL | Joel Smith | Puget Sound Energy |
| Jackie Goss | Energy Trust of Oregon | Charlie Stephens | NEEA |
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| Lars Henrikson | Seattle City Light | Iain Walker | LBNL |
| Katrin Klingenberg | Passive House Institute US | Eric Werling | DOE |

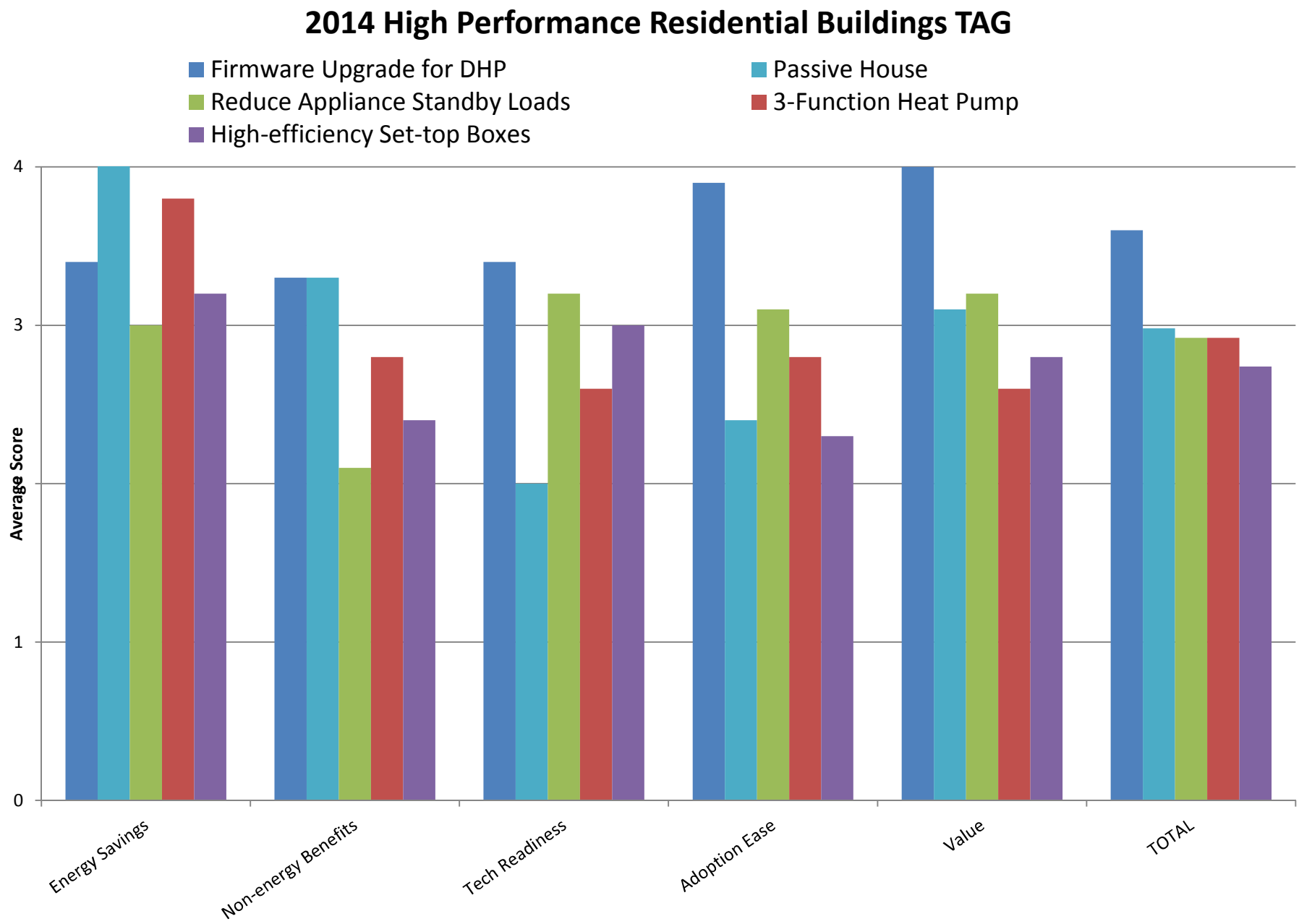
# ResTAG Agenda – June 20, 2014

- Present scoring results
- Discussion
- BPA “final” words

| | Firmware Upgrade for DHP | Passive House | Reduce Appliance Standby Loads | 3-Function Heat Pump | High-efficiency Set-top Boxes |
|---|---|---|---|---|---|
| **Energy Savings** | 3.4 | 4.1 | 3.0 | 3.8 | 3.2 |
| **Non-energy Benefits** | 3.3 | 3.3 | 2.1 | 2.8 | 2.4 |
| **Tech Readiness** | 3.4 | 2.0 | 3.2 | 2.6 | 3.0 |
| **Adoption Ease** | 3.9 | 2.4 | 3.1 | 2.8 | 2.3 |
| **Value** | 4.0 | 3.1 | 3.2 | 2.6 | 2.8 |
| **TOTAL** | **3.6** | **3.0** | **2.9** | **2.9** | **2.7** |

| Legend |
|---|
| 1st place |
| 2nd place |
| 3rd place |

| | Firmware Upgrade for DHP | Passive House | Reduce Appliance Standby Loads | 3-Function Heat Pump | High-efficiency Set-top Boxes |
|---|---|---|---|---|---|
| **Energy Savings** | **3** | **1** | 5 | **2** | 4 |
| **Non-energy Benefits** | **1** | **1** | 5 | **3** | 4 |
| **Tech Readiness** | **1** | 5 | **2** | 4 | **3** |
| **Adoption Ease** | **1** | 4 | **2** | **3** | 5 |
| **Value** | **1** | **3** | **2** | 5 | 4 |
| **TOTAL** | **1** | **2** | **3** | **4** | **5** |


2014 High Performance Residential Buildings TAG
Firmware Upgrade for DHP
Passive House
Reduce Appliance Standby Loads
3-Function Heat Pump
High-efficiency Set-top Boxes
Average Score
4
3
1
0
Energy Savings
Non-energy Benefits
Tech Readiness
Adoption Ease
Value
TOTAL

# High-efficiency Set-top Boxes

- Energy savings
  - Equipment controlled by providers
  - Consumer vs. regional
- Technology readiness
  - Exists
  - Service provider barriers
- Ease of Adoption
  - End user lack of choice
- Value
  - Uncertain, regional benefit vs end user

# Reduce Appliance Standby Loads

- Energy savings
  - End use incentives not needed
  - Not significant for end users
  - Biased toward high use per unit equipment
- Technology readiness
  - Some alternatives
- Ease of adoption
  - Low cost, simple to install
  - Plugging it in correctly not easy
  - Barriers if only available in high-end products
- Value
  - Expensive
  - Regional vs end user

# Three-Function Heat Pump

- Energy savings
  - Significant
  - Altherma vs CO2
- Non-energy benefits
  - Fewer outdoor units
  - Lower climate change potential
  - Radiant floors not warm with low load house
- Technology readiness
  - Altherma ready, CO2 near future
  - Installer network
  - Cost

# Three-Function Heat Pump

- Ease of adoption
  - No behavior change
  - Disruptive, expensive
  - Retrofit vs. new construction
- Value
  - Very long payback period
  - Better, lower cost alternatives
  - Assume leveling of installation costs over time

# Firmware Upgrade for DHP

- Energy savings
  - Significant, needs constant M&V
  - Unclear
- Non-energy benefits
  - Longer product life, improved comfort
- Technology readiness
  - Depends on manufacturers – some yes
- Ease of adoption
  - Through contractors
  - Easy
- Value
  - Good
  - Warranty issue, should be free to end user

# Passive House

- Energy savings
  - Considerable
  - House usually not large
- Non-energy benefits
  - Durability of envelope
  - Healthy IAQ, enhanced comfort, thermal & acoustic
  - IAQ could be impacted if don't comply with ventilation standards

# Passive House

- Technological readiness
  - Resistance to new approaches
  - Expensive and imported technologies
  - Change in code needed
  - Need consultants
- Ease of adoption
  - Design rigor a barrier
  - Expense
  - High learning curve for trades

# Passive House

- Value
  - Cost effectiveness
  - Good if built properly
  - Over life, good value, not first years though

# Thank you!!!

**BPA and WSU E3T appreciates your expertise, time and energy to make this a successful TAG!**