# TAG Members

**THANK YOU FOR YOUR PARTICIPATION!**

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Baylon</td>
<td>Ecotope</td>
</tr>
<tr>
<td>Michael Blasnik</td>
<td>Nest Labs, Google</td>
</tr>
<tr>
<td>Christopher Coll</td>
<td>NYSERDA</td>
</tr>
<tr>
<td>Doug Dickson</td>
<td>SnoPUD</td>
</tr>
<tr>
<td>Ron Domitrovic</td>
<td>EPRI</td>
</tr>
<tr>
<td>Randy Foster</td>
<td>Artisan's Group</td>
</tr>
<tr>
<td>Theresa Gilbride</td>
<td>PNNL</td>
</tr>
<tr>
<td>Jackie Goss</td>
<td>Energy Trust of Oregon</td>
</tr>
<tr>
<td>Gary Hamer</td>
<td>BC Hydro</td>
</tr>
<tr>
<td>Lars Henrikson</td>
<td>Seattle City Light</td>
</tr>
<tr>
<td>Katrin Klingenberg</td>
<td>Passive House Institute US</td>
</tr>
<tr>
<td>Ira Krepchin</td>
<td>E Source</td>
</tr>
<tr>
<td>Bruce Manclark</td>
<td>CleaResult</td>
</tr>
<tr>
<td>Chris Mattock</td>
<td>Habitat Design &amp; Consulting</td>
</tr>
<tr>
<td>Gary Nordeen</td>
<td>WSU Energy Program</td>
</tr>
<tr>
<td>Brady Peeks</td>
<td>NW Energy Works</td>
</tr>
<tr>
<td>Alan Shedd</td>
<td>Touchstone Energy</td>
</tr>
<tr>
<td>Joel Smith</td>
<td>Puget Sound Energy</td>
</tr>
<tr>
<td>Charlie Stephens</td>
<td>NEEA</td>
</tr>
<tr>
<td>Eli Volem</td>
<td>EWEB</td>
</tr>
<tr>
<td>Iain Walker</td>
<td>LBNL</td>
</tr>
<tr>
<td>Eric Werling</td>
<td>DOE</td>
</tr>
</tbody>
</table>
ResTAG Agenda – June 20, 2014

• Present scoring results
• Discussion
• BPA “final” words
## Firmware Upgrade for DHP

### Reduce Appliance Standby Loads

- High-efficiency Set-top Boxes

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

### Legend

- **1st place** color
- **2nd place** color
- **3rd place** color
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

Bar chart showing average scores for different categories:
- Energy Savings
- Non-energy Benefits
- Tech Readiness
- Adoption Ease
- Value
- TOTAL

Scores range from 0 to 4.
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!