About us

- Independent nonprofit
- Providing access to affordable energy
- Generating homegrown, renewable power
- Serving 1.8 million customers of Portland General Electric, Pacific Power, NW Natural, Cascade Natural Gas and Avista
- Building a stronger Oregon and SW Washington
A clean energy power plant

820 average megawatts saved

136 aMW generated

79 million annual therms saved

Enough energy to power 815,000 homes
and heat 150,000 homes for a year

Avoided 36.2 million tons of carbon dioxide
PAE Vision
WHO WE STRIVE TO BE

Why
ARE WE IN BUSINESS AT PAE?
We help solve the planet’s energy and water challenges

What
DO WE DO?
We work with clients to design the nation’s highest performing built environments

How
DO WE DO IT?
We listen to our clients
We hire and retain the best staff
We provide innovative solutions that work
LEADERS IN SUSTAINABLE DESIGN

10 Living Buildings
60 LEED Platinum
09 Passive House
33 Net Zero
The current Path to Net Zero offering
Path to Net Zero

• Increased incentives for early design, technical assistance, installation and post-occupancy
• Technical resources and assistance from start to finish
• Incentives for zero energy certification
### Whole Building and Path to Net Zero incentives

<table>
<thead>
<tr>
<th>Service</th>
<th>Incentive</th>
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<tbody>
<tr>
<td>Early design assistance</td>
<td>Up to $6,000</td>
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<tr>
<td>Solar</td>
<td>Various incentives to support solar planning</td>
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<tr>
<td>Technical assistance</td>
<td>60% of cost up to $40,000</td>
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<td>Whole Building installation</td>
<td>$0.25/kWh and $0.80/therm</td>
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<tr>
<td>Path to Net Zero installation</td>
<td>$0.40/kWh and $1.20/therm</td>
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<tr>
<td>Energy metering</td>
<td>50% of cost up to $20,000</td>
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<td>Zero Energy certification</td>
<td>Up to $2,000</td>
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Common measures to achieve Path to Net Zero

- Envelope
- HVAC
- Lighting
- Domestic hot water
- Renewables

<table>
<thead>
<tr>
<th>Measures</th>
<th>Total</th>
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<tr>
<td>Building orientation</td>
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<tr>
<td>Condensing boiler/furnace</td>
<td>13</td>
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<tr>
<td>Daylighting</td>
<td>44</td>
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<td>DOAS</td>
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<tr>
<td>Energy recovery ventilator</td>
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<td>Geothermal heat pumps</td>
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<tr>
<td>Heat recovery chiller</td>
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<tr>
<td>High performance envelope</td>
<td>57</td>
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<tr>
<td>High performance lighting</td>
<td>59</td>
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<tr>
<td>High performance window</td>
<td>45</td>
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<tr>
<td>Natural ventilation</td>
<td>24</td>
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<tr>
<td>Radiant cooling/chilled beam</td>
<td>10</td>
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<tr>
<td>Radiant heating</td>
<td>26</td>
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<tr>
<td>Reduced building loads</td>
<td>36</td>
</tr>
<tr>
<td>Renewable generation</td>
<td>29</td>
</tr>
<tr>
<td>Shading</td>
<td>11</td>
</tr>
<tr>
<td>SHW Efficiency</td>
<td>28</td>
</tr>
<tr>
<td>VRF</td>
<td>32</td>
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Path to Net Zero development and history
The Path to Net Zero timeline

- 2009 pilot
- 2014 offering launch
- 2019 offering update
<table>
<thead>
<tr>
<th>Building type</th>
<th>Project count</th>
<th>Total project sq. ft.</th>
<th>Average sq. ft.</th>
<th>Average target EUI (kBtu/sf/sf)</th>
<th>Modeled EUI (kBtu/sf)</th>
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<tbody>
<tr>
<td>Assembly/Community</td>
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<td>166,464</td>
<td>33,293</td>
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<td>College/University</td>
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<td>842,814</td>
<td>49,577</td>
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<td>Gym/Athletic Club</td>
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<td>Hospital</td>
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<td>128,548</td>
<td>64,274</td>
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<td>Infrastructure</td>
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<td>Institution/Government</td>
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<td>2,379,703</td>
<td>99,154</td>
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<td>K-12 School</td>
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<td>2,015,654</td>
<td>87,637</td>
<td>20</td>
<td>21</td>
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<td>Multifamily/Assisted Living</td>
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<td>2,329,874</td>
<td>70,602</td>
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<td>Office</td>
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<td>1,123,492</td>
<td>70,218</td>
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<td>Other</td>
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<td>212,500</td>
<td>106,250</td>
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<td>Other Health</td>
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<tr>
<td>Manufacturing</td>
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<td>6,405</td>
<td>3,203</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>127</strong></td>
<td><strong>10,427,645</strong></td>
<td><strong>82,107</strong></td>
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## Savings for 2020 Path to Net Zero projects

<table>
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<tr>
<th>Project stages</th>
<th>2020 Count</th>
<th>kWh</th>
<th>Therms</th>
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<tr>
<td>Interested</td>
<td>30</td>
<td>3,067,936</td>
<td>23,665</td>
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<tr>
<td>Preliminary</td>
<td>42</td>
<td>7,066,255</td>
<td>42,484</td>
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<tr>
<td>Confirmed</td>
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<td>1,067,421</td>
<td>315</td>
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<tr>
<td>Post Occupancy</td>
<td>10</td>
<td>4,574,080</td>
<td>75,074</td>
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<tr>
<td>Complete</td>
<td>8</td>
<td>1,829,959</td>
<td>15,546</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>95</strong></td>
<td><strong>17,605,651</strong></td>
<td><strong>157,084</strong></td>
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</table>
Outreach strategies

- Project identification
- Owner commitment
- Design teams
- Continuous outreach
Case studies
Yellowhawk Tribal Health Center

New health center serving the Confederated Tribes of Umatilla Indian Reservation

- Passive strategies
  - Daylighting
- VRF system
- Upgraded building envelope
- Reduced Lighting Power Density

- $294,900 in Energy Trust cash incentives
- 646,800 annual kWh savings
Clackamas Fire & Rescue Station 16

Construction of new Path to Net Zero fire station with EUI 28

- High performance envelope
- High efficiency HVAC w/DOAS & ERV
- LED lighting
- Solar panels

- $30,500 in Energy Trust cash incentives
- $3,350 in estimated annual energy cost savings
- 39,700 annual kWh savings
- 370 annual therms saved
Multnomah County Central Courthouse

Path to Net Zero new construction with EUI 23

- Passive strategies
- Natural ventilation
- Daylighting
- High-efficiency envelope
- Chilled beams, heat recovery, boilers & chillers
- LED lights & controls

- $600,000 in Energy Trust cash incentives
- $425,000 in estimated annual energy cost savings
- 1.7 million annual kWh savings
- 64,300 annual therms saved
Oregon Zoo Education Complex

New Path to Net Zero classroom and exhibit buildings

- High efficiency mechanical with VRF and ERV
- Heat pump water heaters
- Lighting power reduction
- Thermal mass and high efficiency envelope

- $83,600* in Energy Trust cash incentives
- 126,700 annual kWh savings

*Solar PV not included
Reynolds School District

First three elementary schools enrolled in Trust’s Path to Net Zero

• LED lighting
• Advanced daylighting
• High-efficiency water heating
• Variable refrigerant flow with heat recovery

• $61,000 in estimated annual energy cost savings
Peavy Hall
Oregon State University

- New construction of classroom & lab building
- Cross-laminated timber
- Passive strategies
  - Natural ventilation
  - Daylighting
  - High-efficiency envelope
- VRF + DOAS mechanical system
- Solar ready construction

- $133,800 in Energy Trust cash incentives
- 340,500 annual kWh savings
- $25,500 in estimated annual energy cost savings
Cautionary tales

- Project budget
- COVID impacts
- Changing design landscape
Thank you

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