## PCC Newberg

- PCC Newberg EUI = 22kBtu/sf/yr Typical Academic Building EUI = 120 kBtu/sf/yr
- Newberg meets the 2030 Challenge for the year 2020. It uses approximately 80% less energy than standard higher education academic buildings in the United States.
- Through sustainable design, the building uses 55.5% less energy than allowed by the Oregon Energy Code.
- 22% of the remaining energy needs will be met with the current 25.35kW bi-facial solar panel array. The array will generate 29,430kWh/yr or the energy needed to power three American homes.
- The building was designed using only electricity for power (no natural gas) so that when the additional 75kW solar panels are installed, the building will truly generate all of the power it needs.

## Achieving Net Zero

### Daylighting:

- The building skylights are integrated into a sloped ceiling system designed to bring even and diffused light to the classroom and office spaces without the need for electric lights. The design reduces the building's energy use by over 15%.

### Natural Ventilation/Cooling:

- When open, the louvers on the exterior wall of the building draw in fresh air from outside and release hot air out through the five stacks along the building's central spine.
- The ventilation turbines spin at very small wind speeds to create a vacuum effect to help pull the hot air out of the building. If there is no wind, a small motor at each turbine can be engaged to start them spinning.
- If additional cooling is needed, ceiling fans throughout the building can be turned on. With the additional air movement from the fans, the building will feel 3 degrees cooler.

### Heat Recovery Ventilators:

- Each classroom and the office space are equipped with a Heat Recovery Ventilator (HRV). When outside temperatures are below 55 degrees, the HRV will bring in fresh outside air that is warmed by transferring heat from the hot air being exhausted from the space.

**Thermal Mass:**

- The exposed concrete slab and concrete shear walls act as thermal mass in the building, helping to maintain even indoor temperatures all year long. The concrete, which has better storage capacity for heating and cooling than the surrounding air, absorbs and stores heat or cold and then releases it many hours later. This prevents large changes of indoor temperature as the outdoor temperatures rise or fall.

**Radiant Slab/Heating:**

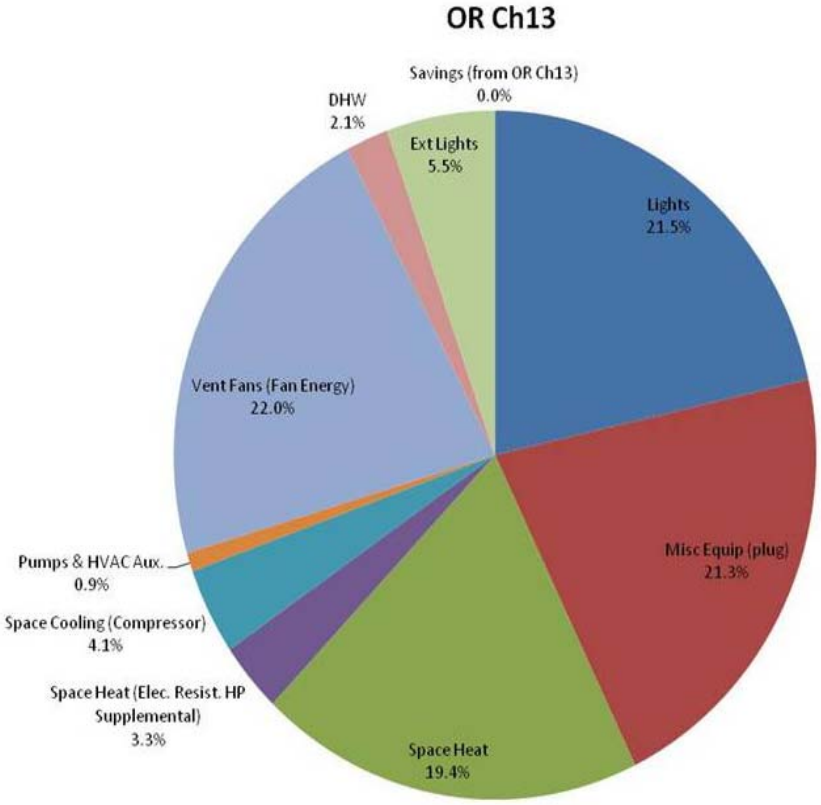
- The concrete slab has tubing with 90 degree water running through it to heat the building to 68F.
- Radiant heat is the most efficient because it heats people instead of the air. It is also the most comfortable heat because it does not create drafts like forced air.

**Expanded Temperature Range:**

- PCC's standard temperature ranges are 69F for heating and 77F for cooling. Expanding that range by just one degree in each direction reduces the amount of energy required to operate the building.
- PCC Newberg is set to:
    - 68F for heating
    - 78F for cooling for Classrooms and Office Areas
    - 82F for cooling for the Commons. With the large ceiling fans in the Commons, the temperature will feel like 78F because of the additional air movement.

**Energy Modeling Results:**

Standard Baseline Building -




PCC Newberg Energy Model -