



GREENHOUSES CREATE THE RIGHT CLIMATE FOR EFFICIENCY

HEATING UNITS, THERMAL CURTAINS AND COVERING UPGRADES CULTIVATE OPERATIONAL SAVINGS

Greenhouses must maintain a perfect growing environment year round, which can be challenging when it's cold outside, because aging structures and heating expenses can make them costly to operate and maintain. Peoria Gardens in Albany, Oregon, worked with Energy Trust of Oregon to complete several energy-efficient greenhouse upgrades, which improved growing conditions while controlling energy-related operating costs and also qualified for cash incentives.

Peoria Gardens is a wholesale bedding plant nursery producing greenhouse starts for independently owned garden centers in western Oregon and Washington. Ben Verhoeven is the owner, president and general manager of the family-owned company, founded by his father in 1983. "Looking for energy-efficiency measures to help our business is my dad's legacy," said Verhoeven. "We improve our facilities and save money, which is right for the nursery and the environment."

Propagating greener greenhouses

In fall 2015, Peoria Gardens installed 46 new high-efficiency condensing unit heaters in its greenhouses and in 2009 replaced old boilers with two new high-efficiency condensing boilers in one of its propagating greenhouses. The new heaters and boilers are expected to save the greenhouse an estimated 76,100 therms and \$63,100 in energy costs each year. Energy Trust provided \$68,700 in cash incentives toward these equipment upgrades.

A team of skilled nursery employees helped keep the project costs low by installing the new equipment during the company's offseason. "Another advantage of these upgrade projects is that we have productive work to keep people employed more of the year," said Verhoeven.

PROJECT-AT-A-GLANCE

Greenhouse heaters

- Two high-efficiency condensing boilers
- 46 high-efficiency condensing unit heaters

Financial analysis

- \$270,429 total project costs
- \$68,746 in cash incentives from Energy Trust
- \$63,159 estimated annual savings

Estimated annual energy savings

- 76,095 therms

Thermal curtains

Financial analysis

- \$7,334 total project costs
- \$2,194 in cash incentives from Energy Trust
- \$9,915 estimated annual savings

Estimated annual energy savings

- 11,946 therms

Greenhouse covering

- Triple-wall polycarbonate walls and roof

Financial analysis

- \$263,055 total project costs
- \$111,382 in cash incentives from Energy Trust
- \$46,223 estimated annual savings

Estimated annual energy savings

- 55,691 therms

Solar electric system

- 38-kilowatt rooftop solar electric system

Financial analysis

- \$224,947 total project costs
- \$36,782 in cash incentives from Energy Trust
- \$2,496 estimated annual savings

Estimated annual energy generation

- 40,319 kWh

To help reduce heat loss during winter nights, the nursery also installed thermal curtains on some of its greenhouses in 2011 and 2014. The curtains are programmed to automatically deploy in winter, and also work as shade curtains when needed in the summer. Thermal curtains now cover three acres—about half of the nursery's greenhouses—and save an estimated 12,000 therms annually, helping to reduce heating needs and produce better quality plants.

An energy study identified that one of Peoria Gardens' older greenhouses with aging single-wall polycarbonate would benefit from a new triple-wall polycarbonate covering for its roof and walls. Used for propagating holiday poinsettias, among other plants, the greenhouse requires a warm climate during cooler months. In addition to insulating more effectively and saving an estimated 55,700 therms annually, the new cover is clearer and lets in more light than the aging poly that it replaced. "Our plants depend on steady temperatures and good light," said Verhoeven. "When we can make improvements that save money on our gas bill and improve the growing environment, that's a solid business decision." The project qualified for \$111,400 in Energy Trust incentives, along with other grants and tax credits.

In addition to the natural gas projects, Peoria Gardens also installed a 38-kilowatt rooftop solar electric system on the roof of the main warehouse to help cut electricity costs. The system, which qualified for \$36,800 in Energy Trust incentives, now generates one-third of the electricity the nursery uses.

Room to grow more savings

While Peoria Gardens has received a total of \$219,100 in Energy Trust incentives for these projects, the nursery is not done yet. "We weigh the upgrade options with what our facilities will need in the future," said Verhoeven. "While the energy-efficient option may come with a higher price tag upfront, Energy Trust makes the payback doable."



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Ben Verhoeven, owner,
president and general manager,
Peoria Gardens