ENERGY SAVINGS BLOOM FOR GREENHOUSE GROWERS

EFFICIENCY IMPROVEMENTS CUT ENERGY COSTS AND BOOST PRODUCTION

Operating a commercial greenhouse or nursery is a delicate balancing act, with the need to tightly control temperature, humidity, ventilation and light. Optimizing such variables can be highly energy intensive and take an increasing bite out of profits. Three Oregon growers—Bauman's Farm and Garden, Pam's Sunnyside Greenhouse and Iwasaki Bros., Inc.—turned to Energy Trust of Oregon to help improve energy efficiency in some of their greenhouses. With technical assistance and cash incentives from Energy Trust, these growers trimmed greenhouse energy use by as much as 25 percent. Some improvements, such as upgrading to energy-efficient glazing, paid for themselves in less than one year while also increasing yields.

To make improvements affordable, Energy Trust offers rebate-style and custom incentives. Oregon customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas are eligible to participate.

ENERGY-EFFICIENCY IMPROVEMENTS CAN HELP:

- Lower operating costs
- Improve control of temperature, humidity, ventilation and light
- Increase crop production throughout the year
- Reduce energy costs

Energy Trust of Oregon

BAUMAN'S FARM & GARDEN PROJECT-AT-A-GLANCE

EQUIPMENT INSTALLED

- Triple-wall polycarbonate endwalls and infrared polyethylene film on three houses
- Triple-wall polycarbonate walls on one house
- Condensing unit heaters replaced power-vented heaters in three houses
- Condensing unit heaters replaced gravity-vented heaters in retail house

ESTIMATED ANNUAL SAVINGS

- 26,705 annual therms
- 156 tons of carbon dioxide

FINANCIAL ANALYSIS

- $60,274 project cost
- $25,336 cash incentive from Energy Trust
- $26,769 estimated annual energy cost savings

"Thanks to energy savings, I haven't had to raise my basket prices as much as my competitors. Every little bit helps because it's a competitive world out there."

Rick Bauman, owner
Bauman's Farm and Garden

Gaining a competitive edge through energy efficiency

Rick Bauman, owner of Bauman's Farm and Garden in Gervais, had wanted to trim energy costs for some time. When his equipment supplier told him about Energy Trust's services for greenhouse and nursery growers, he was quick to act. "Energy Trust connected us with an experienced consultant who recommended several energy-saving improvements for three of our houses," said Bauman. "Now, we're saving more than $26,000 per year, and I've been able to expand operations while keeping my hanging flower basket prices competitive."

Bauman replaced the endwalls on three houses and the sidewalls on one house with energy-efficient triple-wall polycarbonate material that helps keep heat from escaping. All three greenhouses also boast new infrared polyethylene film, which reflects heat back inside while admitting more light and reducing condensation.

Energy Trust also recommended replacing inefficient unit heaters in all three greenhouses, plus the retail store, with energy-efficient condensing heaters. The old heaters were rated between 400,000 and 500,000 British thermal units, Btu, per hour and had an efficiency rating of 80 percent. Each of the new condensing heaters does the job better with only 320,000 Btu per hour at 93 percent efficiency. "Not only are we using a lot less energy, but the condensing heaters remove moisture from the air, keeping the houses dryer," said Bauman.

As a busy grower, Bauman has little time for paperwork. "Working with Energy Trust was so easy," he said. "They always returned my calls promptly. They helped pay for a lot of the project costs. And their Program Delivery Contractor, Cascade Energy, Inc., completed all the paperwork for us. All I had to do was review and sign."

Optimizing conditions for greater yield

Pam's Sunnyside Greenhouse, a Cottage Grove grower that produces bedding plants, dahlias and indoor foliage, turned to Energy Trust for help upgrading the energy efficiency on four of its 10 greenhouses. "We'd already replaced the roof on one house and wanted to add a thermal night curtain because we heat that house a lot," said Janet Tidrick, who co-owns Pam's Sunnyside with her husband Jim. Energy Trust provided a cash incentive on the new curtain and accompanying electronic controls. "The curtain is like a blanket that helps keep heat in and plants warmer all night long," said Tidrick. "As soon as you walk in, you can definitely feel how much warmer it is. Our plants are really thriving."

Pam's Sunnyside also replaced single-wall fiberglass roofing with twin-wall polycarbonate roofing on three houses and swapped fiberglass for twin-wall polycarbonate walls on one house. "The fiberglass not only wasted energy, it was cracking, yellowing and offered poor light transmission," said Tidrick. "With the polycarbonate, our plants are growing faster and more upright and we're able to make full use of all of our benches year round." The installation of new roofing and walls earned about $7,000 in Energy Trust incentives and is cultivating natural gas savings of 7,004 annual therms.

Energy Trust helped us breathe new life into a greenhouse that we were able to use only two months of the year. With energy improvements, that house now produces plants all year long.

Janet Tidrick, partner
Pam's Sunnyside Greenhouse

PAM'S SUNNYSIDE PROJECT-AT-A-GLANCE

EQUIPMENT INSTALLED

- Twin-wall polycarbonate roofing on three houses
- Twin-wall polycarbonate walls on one house
- 10,498 square foot thermal curtain with controls

ESTIMATED ANNUAL SAVINGS

- 10,518 annual therms
- 62 tons of carbon dioxide

FINANCIAL ANALYSIS

- $47, 430 project cost
- $10,315 cash incentive from Energy Trust
- $10,543 estimated annual energy cost savings

Building efficiency into greenhouse retrofits

With more than 300 greenhouses on 50 acres, Iwasaki Bros., Inc. in Hillsboro is always making improvements. After a successful solar electric project with Energy Trust, the wholesale grower decided to tap in to Energy Trust's greenhouse efficiency services and cash incentives as part of an upgrade of several greenhouses.

Iwasaki upgraded the glazing on one house from inefficient, single-wall corrugated polycarbonate to twin-wall polycarbonate. "The twin-wall polycarbonate is an excellent product. That house is now less drafty, and we're getting more light than with the corrugated surface," said Dan Aceves, maintenance manager. Two houses received new thermal curtains with electronic controls that Aceves can adjust from a laptop computer. On yet another house, Iwasaki replaced an old inefficient unit heater with a new 93 percent efficient condensing heater.

The biggest project—a new high-efficiency condensing boiler, plus accompanying under-bench heating—allows Iwasaki to efficiently deliver hot water to several more greenhouses. "We already have 30 to 40 houses using under-bench heating, and this project allows us to expand on that," said Aceves. "The high-efficiency boiler cycles on and off much less often, giving us more heat for our dollar." On the boiler and under-bench heating projects, Iwasaki used Energy Trust's simple rebate process for standard, pre-approved improvements. "The rebates for standard improvements are so easy to do. I just completed a form, sent it in and the check arrived in four to six weeks."

Take control of your energy costs. Visit **www.energytrust.org/ag** or call **503.928.3154.**

IWASAKI BROS., INC. PROJECT-AT-A-GLANCE

EQUIPMENT INSTALLED

- Twin-wall polycarbonate glazing on one house
- Thermal curtains on two houses
- Condensing unit heater in one house
- High-efficiency boiler (enough to serve several houses)
- Under-bench heating for several houses

ESTIMATED ANNUAL SAVINGS

- 174,532 annual therms
- 1,021 tons of carbon dioxide

FINANCIAL ANALYSIS

- $445,781 project cost
- $146,035 cash incentive from Energy Trust
- $174,952 estimated annual energy cost savings

"Energy Trust rebates and cash incentives make it easy for us to move forward on projects. We don't have to invest a lot of time in filling out forms. We already are considering doing another Energy Trust project."

Dan Aceves
maintenance manager
Iwasaki Bros., Inc.

Energy Trust of Oregon 421 SW Oak St., Suite 300, Portland, OR 97204 1.866.368.7878 503.546.6862 *fax* **energytrust.org**