Energy Smart Industrial
BPA ENERGY EFFICIENCY

ZIRKLE FRUIT reduces overall energy consumption by 35 percent, saves nearly $185,000 per year.

UTILITY
Benton PUD

PROJECT
Refrigeration, compressed air, door, and lighting upgrades

ENERGY SAVINGS
3,441,532 kWh/y

ENERGY COST SAVINGS
$184,741 per year

PROJECT COST
$1,257,633

INCENTIVE
$880,343

PAYBACK
Just over 2 years

Apples are harvested once per year, but market demand is ever present. To provide a year-round supply and avoid dips in revenue, producers must keep their picked crops fresh until the next harvest. For Zirkle Fruit, which has several facilities in the state of Washington, this requires a series of controlled atmosphere (CA) rooms that essentially put the apples to sleep until they are ready for retail distribution, keeping them from over ripening.

The CA rooms must maintain precise conditions at all times, including finite oxygen and temperature control bands. They also have to manage the carbon dioxide emitted from the picked apples.

"Keeping our produce fresh throughout the year is a complex process with no margin for error," says Jeff Gill, project manager at Zirkle Fruit. "But there is always room for improvement, and we like to take advantage of modern techniques and technologies. Investing in our future, staying ahead of the competition, and being as environmentally sustainable as possible are key elements of our culture."

Zirkle Fruit's operations in Prosser, Washington, provide a recent and noteworthy example. Company leaders had long wanted to upgrade and modernize the aging facility, which features a number of CA rooms. The cost and expertise required for capital upgrades and the projected payback period, however, were prohibitive. Enter the Bonneville Power Administration's (BPA) Energy Smart Industrial (ESI) program. BPA ESI works in collaboration with Northwest public utilities to offer project management, technical assistance, and financial incentives for industrial customers seeking to reduce their energy consumption.

"There are lots of opportunities out there for energy efficiency improvements, and financial incentives for achieving them," says Kevin Fischer, energy efficiency advisor for Benton PUD, Zirkle Fruit's serving utility. "Our industrial and agricultural customers just need to get in touch with us. We can take a look and see what's feasible, and then we'll bring in the right people and resources to make it happen."

Accordingly, a team of energy engineering experts assembled by BPA ESI and Benton PUD visited Zirkle Fruit's Prosser facility to identify energy conservation opportunities. A detailed study was conducted—with data collection, baseline modeling, and in-depth analyses—to quantify the potential savings. The team identified more than a dozen

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energy efficiency measures that would qualify for ESI incentives, help modernize Zirkle Fruit's Prosser facility, and significantly reduce the company's energy consumption and costs.

"The project team was very good at identifying, quantifying, and explaining the opportunities at hand," says Gill. "Not just in engineering terms, but in business terms. If we can save money and energy without harming our product, and receive financial assistance for doing so, why not?"

ENERGY EFFICIENCY UPGRADES SAVE NEARLY $185,000 ANNUALLY

With support from BPA and Benton PUD and with help from the ESI team, Zirkle Fruit implemented a series of energy efficiency upgrades at its Prosser facility. Freon compressors typically used in commercial environments were replaced with large ammonia compressors designed for industrial environments. Variable frequency drives (VFDs) were installed on evaporator and condenser fans to improve part-load efficiency. System pressures were reduced through the use of new control valves. And CA system software was upgraded, increasing the control and automation of the company's evaporators, condensers, and compressors.

In addition to refrigeration and computer control improvements, old-fashioned cold storage doors were replaced with state-of-the-art insulated doors, which use infrared sensors to open and close quickly and automatically. And energy efficient fluorescent lights were installed in the Zirkle Fruit offices.

"The entire project was much simpler than we anticipated. These are complex things, but the project team made them easy," explains Gill. "The bulk of the energy reductions came from the VFDs, but all of the upgrades had a positive impact. And the combined results were incredible."

All told, the upgrades reduced the overall energy consumption of Zirkle Fruit's Prosser facility by a staggering 35 percent, representing nearly 3.5 million kilowatt hours per year. The company will save just under $185,000 in annual energy costs as a result.

"We try to give back to our communities, and energy conservation helps," says Gill. "These improvements are good for our company, they are good for our community, and they are good for our planet."

While the upgrades had a total price tag of $1.2 million, an ESI rebate of more than $880,000 ensures the project will pay for itself within two years. And the energy savings will continue year after year, just like Zirkle Fruit's apple crop.

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For more information about BPA ESI:

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