

FIRE

Food Processing
Industry
Resource
Efficiency

RESOURCE EFFICIENCY THROUGH COLLABORATION



CASE STUDY KETTLE FOODS INC.

Benefits of solar energy

- Reduced energy costs
- Avoidance of CO₂ emissions
- Low maintenance
- Positive publicity

Sun shines bright for this Oregon food processor

Executive summary

As a producer of all-natural snacks, Kettle Foods, Inc. of Salem, Oregon depends on the sun to grow their raw product. Now the company is relying on the sun to produce some of the electricity used in their food processing operations.

Kettle Foods, Inc. installed a 114 kilowatt (kW) solar electric system on the roof of their processing plant and company headquarters in September 2003. The array — the largest in the Pacific Northwest — produces clean, renewable energy even in a state best known for its “liquid” sunshine. It saves the firm \$8,400 in energy costs each year and will avoid 2,500 tons of CO₂ emissions over the life of the system.



AES Owner and Installer of the system David Parker (left) and Kettle Foods Facilities Manager Russ Read in front of the 114 kW-solar electric system on the roof of Kettle Foods headquarters in Salem.

Kettle Foods made its decision to undertake this project because:

- Company management and the Board of Directors wanted to reduce energy use and cost and move the company towards greater levels of sustainability.
- The project had an acceptable financial rate-of-return after incentives were applied.
- There were no other projects competing for capitalization dollars at the time.
- The installation and maintenance of a solar system was relatively easy.

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Financial Overview

Installation cost:	\$675,000
Energy Trust of Oregon incentive:	\$112,000
Oregon Business Energy Tax Credit:	\$235,705
Federal Energy Tax Credit:	\$56,860
Oregon depreciation value:	\$35,562
Federal depreciation value:	\$181,754
Energy cost savings expected:	\$8,400/yr.
Average rate of return:	7 percent*
Net present value:	\$55,500**

* Over 40-year period assuming inverter replacement at 20 years and energy price increase of 2 percent per year

** Assumes 5 percent discount rate

Background

In 2003, management of a printing facility adjacent to Kettle Foods asked Facilities Manager Russ Read if his all-natural snacks plant could use the waste heat from a proposed co-generation system that the printing facility was considering. The waste heat was not useful to Kettle Foods at the time, but the request prompted Read to look at more innovative ways to conserve energy at his facility. Kettle Foods uses considerable electricity in its processing. The firm's management expected energy prices to continue to rise and wanted the company to be a better environmental steward.

About that time, Read saw a solar electric installation on the Pacific Cooperative building in Eugene. He called the project's installer David Parker, owner of Advanced Energy Systems (AES), to see if a solar installation would be an appropriate addition to Kettle Food's headquarters. Parker said it was and made a proposal.

Internal stakeholders met several times over the ensuing weeks to discuss the concept, scope, and justification of a solar electric system. Once the stakeholders approved the project, staff from Kettle Food's Engineering, Operations, and Finance Departments evaluated its feasibility. Finally, managers presented it to the Board of Directors for review and approval.

Successful approval of the project was due to several factors:

- The company management, accounting team, and Board of Directors had set a goal to reduce energy use and cost and move the company towards greater levels of sustainability. They welcomed and encouraged new and innovative ideas to meet that goal.
- The available cash incentives and tax credits combined with energy cost savings made the project financially feasible with an acceptable rate of return.
- There were no other projects competing for capitalization dollars at the time. (The company already had planned to install a variable frequency drive on an air compression system, recycled spent cooking oils into biodiesel fuel to power the vehicle fleet, and revegetated and maintained a wetland adjacent to the Salem facility.)

Installation of the system went smoothly. It took only six weeks from design to commissioning and did not interfere with production in any way. The installation did not require much modification to the facility (only replacing the roof with wood to support the weight of the panels). Now that it is installed, it requires little maintenance and will have a long life.

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Installation Cost

Materials: \$540,000

Labor: \$110,000

Roofing: \$8,000

Permits and fees: \$17,000

Total: \$675,000

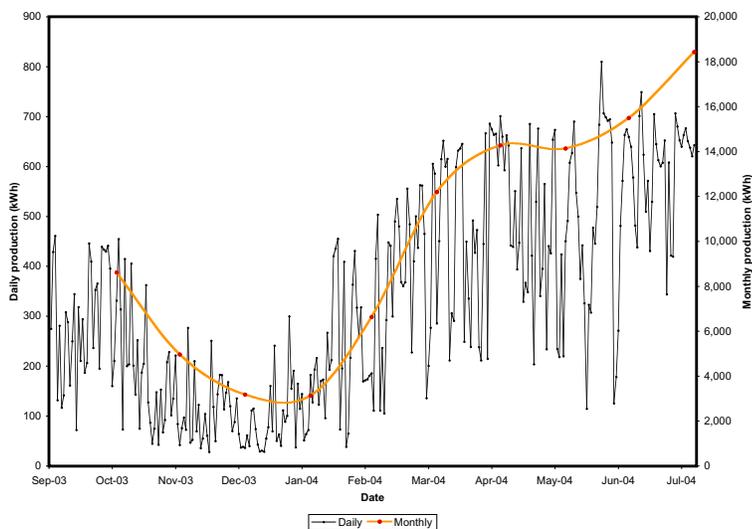
Features

- 616 Sharp photovoltaic panels (185 W each) rack-mounted on a flat roof 190 feet wide and 120 feet long; the panels are tilted at a 30 degree angle from horizontal and face south.
- Panels send approximately 400 volts DC current to an inverter and isolation transformer that convert the current to 480/277 volts AC three-phase power; the power feeds directly to the plant's main power supply.
- A net metering arrangement with Portland General Electric (PGE) allows system power generation to offset power that would have come from the grid, and any power generation in excess of plant usage is sent to the grid and sold at the retail rate.
- The inverter is expected to last 15 to 20 years; the panels carry a 25-year warranty on power production but should produce power for 40 years or more

Benefits

- The system is expected to produce 123,000 kilowatt-hours (kWh)/year or about 2 percent of annual facility electricity use for an expected savings of about \$8,400 in energy costs per year.
- The sun provides free fuel that is clean and renewable.
- The system will offset about 2,500 tons of CO₂ over the life of the system.
- Minimal training is necessary to teach employees to use the system.
- The only required maintenance is cleaning the panels at least twice a year.
- The project has led to positive publicity for the company.
- According to Read and other managers, sustainability measures are likely to increase sales of product because consumers are more willing to support a company with a demonstrated environmental ethic.

Daily and monthly electricity production of Kettle Foods' solar electric system (September 2003 through July 2004)



CASE STUDY

KETTLE FOODS INC.

Incentives

Business Energy Tax Credit

35 percent of incremental costs taken over five years

State Energy Loan Program

Low-interest, fixed rate, long-term loans

Federal tax credit

Up to 10 percent of project costs taken over three years

Federal accelerated depreciation

Energy Trust of Oregon*

Open Solicitation Program available for larger systems; \$2.25/installed DC watt available for smaller systems
*(*Available for businesses in PGE, Pacific Power or NW Natural service territories in Oregon)*

Local utility incentives

Resources

Project owner

Kettle Foods, Inc., (503) 364-0399
www.kettlefoods.com
Russ Read, Facilities Manager
rread@kettlefoods.com

General contractor

Advanced Energy Systems (AES)
David Parker, Owner
Office: (541) 683-2345
Cell: (541) 554-2440
david@energizeoregon.com

Business Energy Tax Credit

Oregon Department of Energy
1-800-221-8035 (inside Oregon)
(503) 378-4040
www.energy.state.or.us

Federal tax credit

U.S. Department of Energy
206-553-1004
Chris Cockrill, Senior Project Manager
Office: 816-873-3299
Cell: 206-459-0142
chris.cockrill@ee.doe.gov

Cash incentive

Energy Trust of Oregon
1-866-368-7878 (inside Oregon)
www.energytrust.org

Electric utility

Portland General Electric (PGE)
1-800-822-1077

Replication

Keep in mind the following guidelines when considering solar:

- A rough estimate of power production is 1 kWh/year/installed DC watt in the Willamette Valley and 1.3 kWh/year/installed DC watt in Eastern Oregon. A 20 kW system would therefore produce about 26,000 kWh/year in Eastern Oregon.
- The Willamette Valley receives as much solar energy annually as the U.S. average. Eastern and Southern Oregon receive 20 to 30 percent more than the Willamette Valley — as much as or more than Florida. Under cloudy conditions, solar produces 10 to 30 percent of its maximum output. However, because solar energy systems become less efficient when hot, Oregon's cooler climate helps make up for the cloudy days.
- Installation costs (without incentives or tax credits) for a large system typically run \$6 to \$7 per installed DC watt; a smaller system runs \$7 to \$8 per installed DC watt.
- The cost of power production over the life of the system is only slightly more than utility power if one takes advantage of all available incentives and credits which can cover up to 60 percent of installation costs.
- Inverters typically last 10 to 20 years; panels typically have a 25-year warranty on power output but should produce power for 40 years or longer.

What characteristics should your business have to make it an ideal candidate for the installation of a solar electric system?

- Clear exposure to the south
- Adequate roof or ground area for mounting the solar panels
- Expectation of federal and state tax liabilities for the years immediately after installation of the system to allow your business to claim all available tax credits
- Management that is willing to spend time selecting and working with a solar electrical contractor
- A utility with a supportive interconnection policy
- Management that is willing to investigate how the company currently uses energy. There may be conservation opportunities that can be incorporated into the overall project for a better financial and environmental impact than just solar alone.
- Management that desires to “green” a company's operation and image
- Management that desires to produce and use renewable energy
- Management that is willing to accept a payback period of 10 years or longer

FIRE

FoodProcessing Industry Resource Efficiency

Through collaboration, the nation sustains the most resource efficient and globally competitive food industry.

Northwest Food Processors Association

California League of Food Processors

California Energy Commission

Del Monte Foods

Idaho Energy Division

Lawrence Berkeley National Laboratories

Northwest Energy Efficiency Alliance

Oregon Department of Energy

U.S. Department of Energy

Washington State University Energy Program

In 2004 the Northwest Food Processors Association and the California League of Food Processors will deliver additional expert information and services to their members, helping them make continuous improvements in energy and resource efficiency. The work is funded under contract to the National Association of State Energy Officials, recipient of a U.S. Department of Energy grant.

www.nwfpa.org

Lessons Learned

Russ Read, facilities manager for Kettle Foods, provides the following advice to an organization that has made the decision to go solar:

- **Consider all available incentives, including cash incentives and credits from private sources, state and federal agencies.** A thorough financial analysis can turn a previously non-viable project into a profitable investment.
- **Ensure support.** Make sure that the Board of Directors and other top management and stakeholders support the project from an early stage.
- **Complete your solar project within your fiscal year.** Completing a solar array project before the end of your company's fiscal year allows your company to apply tax credits to that fiscal year.