

# ENERGY DESIGN REVIEW FOR A NEW DAIRY

## Background

An energy analysis was performed on the planned construction of a new dairy facility to be located in Chowchilla, CA. This energy analysis is divided into various sub-systems at the facility, including the lighting, refrigeration system, process equipment, pumps and motors. The total area of the proposed winery is over 340,000 ft<sup>2</sup>.

## Potential Energy Savings

The energy efficiency measures recommended could save an estimated 895,984 kWh of electrical energy per year and reduce the facility's demand by approximately 120 kW. Based on an assumed average cost of electricity of \$0.11/kWh, this translates into an annual electrical cost savings of \$98,557 per year. The total incremental cost of the measures recommended in this project was estimated to be \$190,615.

The utility offers incentives for these energy efficiency measures, based on the energy consumption of installed equipment and construction relative to a baseline design. The incentive for all of the recommended measures in this project was estimated to be \$58,231. The total incremental cost after the incentives is estimated to be \$132,384, resulting in an average simple payback period of 1.3 years.

<b>SUMMARY OF ENERGY EFFICIENCY MEASURE SAVINGS AND INCENTIVES</b>						
<b>Energy Efficiency Measure</b>	<b>Energy Savings (kWh/yr)</b>	<b>Demand Reduction (kW)</b>	<b>Energy Cost Savings (\$/yr)</b>	<b>Incremental Cost (\$)</b>	<b>Potential Incentive for Measures (\$)</b>	<b>Payback Period with Incentive (yrs)</b>
1. High Efficiency Lighting	306,147 kWh/yr	53.2 kW	\$33,676/yr	**	\$18,369	N/A
2. Automatic Daylighting Control	35,157 kWh/yr	12.0 kW	\$3,867/yr	\$1,674	\$1,406	0.1
3. High Volume Low Speed Fans	205,404 kWh/yr	34.2 kW	\$22,594/yr	\$153,600	\$20,540	5.9
4. Variable Frequency Drive on Vacuum System	133,621 kWh/yr	15.3 kW	\$14,698/yr	\$11,350	N/A	0.8
5. Variable Frequency Drives on Milk Pumps	11,332 kWh/yr	1.3 kW	\$1,247/yr	\$6,600	\$1,133	4.4
6. Premium Efficiency Motors	16,129 kWh/yr	3.1 kW	\$1,774/yr	\$4,641	\$1,613	1.7
7. Variable Frequency Drive on Chilled Water Pump	5,727 kWh/yr	0.9 kW	\$630/yr	\$2,250	\$573	2.7
8. Groundwater Precooling Using Plate Heat Exchangers	182,467 kWh/yr	0.0 kW	\$20,071/yr	\$10,500	\$14,597	Immed.
<b>Totals</b>	<b>895,984 kWh/yr</b>	<b>120.0 kW</b>	<b>\$98,557/yr</b>	<b>\$190,615</b>	<b>\$58,231</b>	<b>1.3</b>

\* Non-lighting total incentive is limited to one-half of the non-lighting total incremental cost.