

**Agricultural Energy Efficiency Program -
Narrative Description of Methodologies and Assumptions
Used in Attachment B Part 2**

General:

The main purpose of Attachment B Part 2 is to determine the following:

1. total financial incentives for 2006-2008;
2. total gross kWh/yr savings for 2006-2008;
3. total gross kW reduction for 2006-2008.

This document describes how each of the above 3 items were derived. These 3 items, as well as other findings and assumptions documented in Attachment B Part 1 and Attachment B Part 2 ultimately serve as inputs into the E3 program cost-effectiveness calculator. Each of the program components (pump efficiency improvement, farm equipment energy-efficiency improvement, non-specialized equipment energy-efficiency improvements, and voluntary demand response bidding) will be addressed separately in the following sections.

Pump Efficiency Improvement

Please refer to the worksheet called "Pumping Impacts."

The purpose of this worksheet is to determine the following:

1. # of pumps to be repaired or retrofitted;
2. total gross kWh/yr and kW savings due to pump repairs/retrofits;
3. gross kWh/yr and kW savings per pump;
4. # of pumps to receive incentives;
5. total amount of incentives to be paid by the program.

Items #1, #2, and #3 above were determined using figures for 2005 (assumed to be the same as reported in SCE's Pump Test Reporting System for 2004) as a basis. The figures for 2006-2008 were found by escalating the 2005 numbers by escalation rates and taking into account other factors such as the implementation rate, realization rate, and savings potential (please see the notes listed in the Pumping Impacts worksheet for more details). Once the total savings are computed, the savings per pump repaired/retrofitted can be computed by taking item #2 divided by item #1.

Since the incentive budget had already been determined in Attachment B Part 1, and the amount of incentives to be paid per pump was assumed to be the same as that documented in CSU Fresno's Agricultural Pumping Efficiency Program workbook (\$3,350 per pump), item #4 above was determined by finding the number of pumps that could receive incentives within the given budget.

Item #5 can be computed simply by taking item #4 multiplied by \$3,350 per pump.

Also note that measure incremental costs and measure life were assumed to be the same as that used in CSU Fresno's workbook. These are inputs to the E3 calculator.

Farm Equipment Efficiency Improvement

Please refer to the worksheet called "Farm Equip."

This program area covers measures that are also currently being promoted in EnSave Energy Performance Inc.'s two California agricultural programs (high-efficiency ventilation fans and dairy farm equipment measures).

The purpose of this worksheet is to determine the following:

1. # of measures of each type to be installed;
2. total gross kWh/yr and kW savings due to farm equipment efficiency improvement;
3. gross kWh/yr and kW savings per normalizing unit;
4. total amount of incentives to be paid by the program.

First and foremost, it is important to note that EnSave's data from their two existing California agricultural programs were heavily used in this computation. Major EnSave data used included the following: incentives paid per installation and kWh/yr and kW savings per installation. Please see the notes in the Farm Equip worksheet for more details.

Since the incentive budget had already been determined in Attachment B Part 1, and the amount of incentives to be paid per installation was assumed to be the same as that documented by EnSave, item #1 above was determined by finding the number of installations that could be installed and receive incentives within the given budget.

Item #2 is obtained by multiplying item #1 by savings per installation data from EnSave.

Item #3 involves converting the savings per installation data into units of savings per normalizing unit. The normalizing unit depends on the type of measure. For example, savings due to high-efficiency ventilation fans were converted from kWh/yr per fan to kWh/yr per horsepower. The conversion was done using additional information provided by EnSave staff (documented in the tables below).

Item #4 can be found by taking the produce of item #1 and the incentives paid per installation.

Note that EnSave also provided information on measure incremental costs and lifetime, which are inputs to the E3 calculator.

**Savings Summary for
California Multi Measure Farm Program 2004 – 2005
Operated by EnSave Energy Performance, Inc.**

MEASURE	UNIT GOALS	GROSS COINCIDENT PEAK DEMAND REDUCTION PER UNIT (kW)	GROSS ANNUAL ENERGY SAVINGS PER UNIT (kWh/yr)	Gross Incremental Measure Cost (IMC)	Life (yr)	Normalizing Unit	Typical or average normalizing unit associated with this type of measure/installation
Vacuum Pump VSD	5	8.81	45,000	\$6,500	15	horse power	15.82
Milk Plate Cooler	20	3.13	16,000	\$3,500	15	pound of milk produced	5,685,700
Milk Pump VSD	20	0.98	5,000	\$3,000	20	pound of milk produced	26,436,000
Compressor Heat Recovery	18	4.38	16,000	\$2,400	10	gallon of hot water used	175
Scroll Compressor	18	1.57	8,000	\$200	12	pound of milk produced	5,400,500

Note: The source of this information is EnSave's proposal for the 2004-2005 Multi-Measure Farm Program except for the normalized unit data (which was provided to Global Energy Partners by EnSave staff).

**Savings Estimates for the
Agricultural Ventilation Fan Efficiency Program
2004 – 2005
Operated by EnSave Energy Performance, Inc.**

The following table of information is taken directly from EnSave's program workbook. No installations have taken place in this program as of this date.

MEASURE	UNIT GOALS	GROSS COINCIDENT PEAK DEMAND REDUCTION PER UNIT (kW)	GROSS ANNUAL ENERGY SAVINGS PER UNIT (kWh/yr)	Gross Incremental Measure Cost (IMC)	Life (yr)	Typical or average HORSEPOWER associated with this type of fan
12" - 14" fan	39	0.0380	289.36	\$475.00	15	0.25 hp
16" - 18" fan	126	0.1380	1,060.98	\$500.00	15	0.25 hp
20" - 26" fan	94	0.0520	397.01	\$550.00	15	0.33 hp
27" - 30" fan	160	0.1510	1,163.25	\$650.00	15	0.5 hp
36" fan	600	0.2390	1,839.35	\$750.00	15	0.5 hp
48" fan	165	0.2070	1,586.98	\$800.00	15	1.0 hp
50" - 56" fan	125	0.4400	3,378.81	\$850.00	15	1.0 hp
8' - 24' HVLS fan	170	1.0400	8,011.53	\$4,000.00	15	1.5 hp

Note: The information in this table was provided to Global Energy Partners by EnSave staff.

Non-Specialized Equipment Efficiency Improvement

Please refer to the worksheet called "Non Special Equip" and "Non-Special Equip (Summary)."

This program area covers measures under the existing Standard Performance Contracting (SPC) and Express Efficiency programs that would be influenced by the implementation of the Agricultural Energy Efficiency Program. As such, the entire list of measure from these two programs were replicated in the worksheet called Non Special Equip, with the objective of determining how many installations would be attributable to the Agricultural Energy Efficiency Program. Therefore, all inputs such as measure impacts, incremental costs and life are the same as that indicated for the SPC and Express Efficiency programs with the exception of the number of installations.

The number each measure to be installed (that is attributable to the Agricultural Energy Efficiency Program) was determined by taking a percentage of the original SPC and Express Efficiency program goals. The following percentages were used (selected to yield a total incentive cost that is within the allocated budget detailed in Attachment B Part 1):

Year	% of Original Installation Goals
2006	0.7 %
2007	0.9 %
2008	1.0 %

The worksheet called "Non-Special Equip (Summary)" provides a summary of this program component's total incentives and savings by grouping the measures into six major categories: HVAC, lighting, refrigeration, irrigation, motors, and other.

Voluntary Demand Response Bidding

Please refer to the worksheet called "DR Bidding."

The purpose of this worksheet is to determine the following:

1. # of participants;
2. total gross kW curtailable load;
3. total amount of incentives to be paid by the program.

It is assumed that only a few large agricultural customers with an average demand of 2 MW are targeted in this program. Given this assumption, the number of participants (item #1) was estimated using Global Energy Partners' experience with implementing demand response programs for the California Energy Commission (CEC). These customers are assumed to have interval meters, and thus there are no additional program costs for meter installation.

For Item #2, it was assumed (again based on Global Energy Partners' experience) that approximately 10% of large customers' total loads are actually curtailable. Item #3 can be estimated by taking the product of item #2 and an incentive payment of \$70 per kW

(this level of incentive is typical of the CEC demand response programs implemented by Global Energy Partners). Please refer to the worksheet called DR Bidding for more details.

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