



## Guide to Calculating the Potential Incentive for a Natural Gas-Powered Pump Retrofit Incentive Application

### WHO IS ELIGIBLE?

**IMPORTANT!** A pre-project pump test performed within 5 years prior to project start but after June 1, 2002 and a test performed within 6 months after the project are required. Also, projects cannot have started before January 1, 2006.

**IMPORTANT!** As of March 1, 2010 the ONLY project eligible for an incentive is retrofit or replacement of either or both of the pump impeller and bowl.

Eligibility extends to all owners or users of a non-residential, PG&E electric or natural gas utility account that is primarily used for pumping water for production agriculture, landscape or turf irrigation, or municipal purposes, including potable and tertiary-treated (reclaimed) water but excluding pumps used for industrial processes, raw sewage, or secondary-treated sewage, and who are paying the Public Purpose Programs Charge. Customers should call APEP first if there is a question concerning their eligibility.

#### **IMPORTANT!**

*Other factors may apply. Carefully read the Policies and Procedures Manual, especially sections VII. and VIII., or contact the APEP Program Office for full eligibility criteria.*

### WHAT IS THE BASIS FOR THE INCENTIVE?

Determining the incentive for a pump retrofit requires a comparison of two numbers, one based on the total cost of the project and one based on the improvement in overall pumping efficiency. The total cost of the project is involved since **the incentive can be no more than 50% of the project cost.**

There are two options for estimating the potential incentive due to the improvement in overall pumping efficiency (called "OPE"). One option is based on actual tests of efficiency before and after the retrofit. The second option assumes a 25% reduction of annual energy use.

The incentive calculated due to the improvement in OPE will depend on the payout rate, which will be either \$.80/therm or \$1.00/therm. If the application was signed before January 1, 2009 or the project physically started before January 1, 2009, the payout rate will be \$.80/therm. Otherwise the rate will be \$1.00/therm.

The estimated incentive will be the lower of the two numbers, either 50% of the project cost, or the incentive calculated based on the improvement in pumping performance.

**IMPORTANT!** For each of the options you have the choice of using the previous 12 months' energy use or an estimate of the next 12 months' use as the basis for the Potential Incentive. If using the future energy use you must submit a reasonable and documentable estimate of the future energy use. Examples are shown at the end of this document. Also, the actual incentive will be based on the actual future 12 months' energy use, not the estimate and the incentive will not be paid until the actual energy use has

been documented. When using the next 12 months' energy use, APEP calculates the incentive in a different manner (refer to example 3 below).

Following are examples of calculating the incentive using each of the options. Additional information can be found on the Program's web site at [WWW.PUMPEFFICIENCY.ORG](http://WWW.PUMPEFFICIENCY.ORG) or by calling the Program at 1.800.845.6038.

### EXAMPLE 1 – USING THE ACTUAL IMPROVEMENT IN EFFICIENCY

This example uses Method 2, the ratio of OPE before and after the project. You MUST use this option if the pre-retrofit pump test shows an OPE of 16% or more.

Submittal requirements include:

- 1) The results from both the pre and post-retrofit tests. The tests do not have to be done by a Participating Pump Test Company but must be considered valid by APEP. Note that APEP reserves the right to audit the post-retrofit pump test with its own independent pump test company.
- 2) Utility billing records for the previous 12 months' energy use or a reasonable and documentable estimate of the future 12 months' energy use.
- 3) The completed Application Form.

In the example below, 50% of the cost of the project is \$5,200. The incentive calculated based on the improvement in pumping efficiency is \$2,730. The lower number is the Potential Incentive.

## Section A – Incentive Calculation from Energy Savings

Annual therm usage ("Annual Therm"): 15,000, using:

Last 12 months' energy use - submit documentation of the previous 12 months' energy use. Log onto [www.pge.com](http://www.pge.com) and your account for a record of billing history, or contact PG&E's Business Customer Service Center at 1-800-468-4743.

Estimate of next 12 months' energy use – submit a reasonable and documentable estimate of the next 12 months' energy use (examples are seen at the bottom of the Certificate of Completion page). Your incentive will only be paid after the actual next 12 months' energy use is documented to APEP by you. That is, you are responsible for submitting copies of PG&E billing for the next 12 months when they become available. The incentive will be based on the actual energy use, not the estimate supplied with the application.

**METHOD 2** – Use this method if the pre-retrofit efficiency test indicates an Overall Pumping Efficiency of more than 16%.

**The following are requirements for submitted pump efficiency tests when using this Option:**

- If this is a water well, the pump tests must be at similar discharge pressures (+/- 5 psi of the before-repair discharge pressure) and with a similar standing water level (+/- 10% of the before-repair level).
- If this is a booster pump, either a) the same pump and impeller trim (if applicable) must be in place before and after the repair/retrofit or b) the tests are at the same operating condition (+/- 10% of before-repair flow and total dynamic head).

- a. Enter the pre-retrofit overall pumping efficiency: **18.** This is "Pre-OPE" in the equation below.  
b. Enter the estimated post-retrofit overall pumping efficiency: **25.** This is "Post-OPE" in the equation below.

$$\text{Potential Incentive} = \text{RATE} \times (\text{Annual Therm} - (\text{Annual Therm} \times \frac{\text{Pre-OPE}}{\text{Post-OPE}})) = \$ \underline{\hspace{2cm}}$$
$$\text{Potential Incentive} = .8 \times ( 15,000 - ( 15,000 \times \frac{18}{25} )) = \$ 3,360$$

The calculations proceed in the following order:

1. Divide 18 by 25 (equals .72)

2. Multiply the result of step 1. by 15,000 (equals 10,800)
3. Subtract the result of step 2. from 15,000 (equals 4,200)
4. Multiply by the payout RATE of \$.80 (project started prior to January 1, 2009) = \$3,360

## Section B – Incentive Calculated from Project Cost

Enter the estimated, or actual, Project Cost: 10,400 Project Costs include all Time (labor or engineering) and Materials that are used to complete the project.

$$\begin{aligned}
 \text{Potential Incentive} &= .50 \times \text{Project Cost} = \$ \underline{\hspace{2cm}} \\
 \text{Potential Incentive} &= .50 \times 10,400 = \$ 5,200
 \end{aligned}$$

You estimated incentive is the lower of the **Potential Incentives** calculated in Section A and Section B – Enter the lower number here - \$ **4,200**

### Example 2 – Using the standard 25% savings

This example uses an assumption of 25% reduction in annual energy use. This is the simplest option for calculations. However, note that you can only use this option when the pre-retrofit pump test show an OPE of 16% or less AND you are retrofitting either the bowl and/or the impeller.

Submittal requirements include:

- 1) The results from both the pre-retrofit and post-retrofit pump efficiency tests. The tests do not have to be done by a Participating Pump Test Company but must be considered valid by APEP. Note that APEP reserves the right to audit the after-project pump test with its own independent pump test company.
- 2) Utility billing records for the previous or a reasonable and documentable estimate of the future 12 months' energy use.
- 3) The completed Application Form.

In the example below, 50% of the cost of the project is \$2,500. The incentive calculated based on the assumed 33% improvement in pumping plant efficiency is \$3,000. The lower number is the Potential Incentive.

## Section A – Incentive Calculation from Energy Savings

Annual therm usage ("Annual Therm"): 15,000, using:

Last 12 months' energy use - submit documentation of the previous 12 months' energy use. Log onto [www.pge.com](http://www.pge.com) and your account for a record of billing history, or contact PG&E's Business Customer Service Center at 1-800-468-4743.

Estimate of next 12 months' energy use – submit a reasonable and documentable estimate of the next 12 months' energy use (examples are seen at the bottom of the Certificate of Completion page). Your incentive will only be paid after the actual next 12 months' energy use is documented to APEP by you. That is, you are responsible for submitting copies of PG&E billing for the next 12 months when they become available. The incentive will be based on the actual energy use, not the estimate supplied with the application.

**METHOD 1** – Use this method if the pre-retrofit pump test indicates an Overall Pumping Efficiency less than or equal to 16%.

$$\text{Potential Incentive} = \text{RATE} \times .25 \times \text{Annual Therm} = \$ \underline{\hspace{2cm}}$$

$$\text{Potential Incentive} = 1.00 \times .25 \times 15,000 = \$ 3,750$$

## Section B – Incentive Calculated from Project Cost

Enter the estimated, or actual, Project Cost: 5,000 Project Costs include all Time (labor or engineering) and Materials that are used to complete the project.

$$\begin{aligned} \text{Potential Incentive} &= .50 \times \text{Project Cost} = \$\_\_\_\_\_\_ \\ \text{Potential Incentive} &= .50 \times 5,000 = \$ 2,500 \end{aligned}$$

You estimated incentive is the lower of the **Potential Incentives** calculated in Section A and Section B – Enter the lower number here - \$ **2,500**

### Example 3 – Using the next 12 months' energy use as basis

Assume the following:

- Pre-retrofit pumping efficiency is tested at 8%.
- Post-retrofit pumping efficiency is tested at 18%.
- The customer chose to use the next 12 months' energy use as the basis and billing data indicates 15,000 therms were used in the 12 months after the retrofit/replacement.
- The replacement costs \$8,000. 50% of \$8,000 = \$4,000, which is the absolute maximum incentive for this project.
- The project started 01/15/2009 and the application was signed 01/05/2009- thus, the payout RATE is \$1.00/kWh

The net required energy is the post-project OPE x the energy use:

$$\text{Net Required Energy} = .18 \times 15,000 = 2,700 \text{ therms}$$

The Pre-project Gross Energy Use is the NRE divided by the pre-project OPE:

$$\text{Pre-project Gross Energy Use} = 2,700 / .08 = 33,750 \text{ kWh}$$

The theoretical savings are 18,750 therms but this is more than 50% of the reported energy use of 15,000 therms. Thus, the Energy Savings Basis is 7,500 kWh

Because the pump tested at below 50% before the project, the potential incentive is calculated as:

$$\begin{aligned} \text{Incentive} &= \text{RATE} \times .25 \times (\text{Annual Energy Use} + \text{Energy Savings Basis}) \\ \text{Incentive} &= 1.00 \times .25 \times (15,000 + 7,500) = \$5,625 \end{aligned}$$

Since the incentive calculated from energy savings is more than the 50% cap due to project cost, the incentive to the customer is \$4,000.

### Examples of documentable estimates of the next 12 months' energy use:

1. This pump irrigates about 155 acres of mature almonds. Gross water application is about 3.2 acre-feet per acre per year. The pre-retrofit pump test indicates 40 Therms/AF – thus, 155 acres x 3.2 AF/acre x 40 Therm/AF = 19,840 Therms

2. This well pump is the main water supply for approximately 250 acres and will operate in the range of 2,200 hours/year. The pre-retrofit pump test indicates an input Therm use of 20 Therms/hr – thus,  $2,200 \text{ hr} \times 20 \text{ Therm/hr} = 44,000 \text{ Therms}$