



Guide to Calculating the Potential Incentive for an Electric-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 \$.08/kWh or \$.09/kWh. If the application was signed before January 1, 2009 or the project physically started before January 1, 2009, the payout rate will be \$.08/kWh. Otherwise the rate will be \$.09/kWh.

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! 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 examples 3 and 4 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 or by calling the Program at 1.800.845.6038.

IMPORTANT! In consultation with you, APEP staff will perform all incentive calculations if so desired. Note that they will double-check all calculations anyway.

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 50% or more (40% if a submersible pump).

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 \$1,406. The lower number is the Potential Incentive.

Section A – Incentive Calculation from Energy Savings

Annual kilowatt hour usage ("Annual kWh"): 75,000, using:

Last 12 months' energy use - submit documentation of the previous 12 months' energy use. Log onto 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 50% (40% if a submersible pump).

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: **52**. This is "Pre-OPE" in the equation below.
b. Enter the estimated post-retrofit overall pumping efficiency: **64**. This is "Post-OPE" in the equation below.

$$\text{Potential Incentive} = \text{RATE} \times (\text{Annual kWh} - (\text{Annual kWh} \times \text{Pre-OPE} / \text{Post-OPE})) = \$ \underline{\hspace{2cm}}$$
$$\text{Potential Incentive} = .09 \times (75,000 - (75,000 \times 52 / 64)) = \$ 1,266$$

The calculations proceed in the following order:

1. Divide 52 by 64 (equals .8125)
2. Multiply the result of step 1. by 75,000 (equals about 60,938)
3. Subtract the result of step 2. from 75,000 (equals 14,062)
4. Multiply the result of step 3. by .09

Depending on how you rounded decimals, the answer will be more or less \$1,266.

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 - \$ **1,266**

EXAMPLE 2 – USING THE ASSUMED 25% REDUCTION IN ENERGY USE

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 50% or less (40% if a submersible pump) 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 Potential Incentive calculated based on the assumed 25% reduction in annual energy use is \$3,000. The lower number is the Potential Incentive. This project started 10/15/2008- thus, the payout RATE is \$.08/kWh.

Section A – Incentive Calculation from Energy Savings

Annual kilowatt hour usage ("Annual kWh"): 150,000, using:

Last 12 months' energy use - submit documentation of the previous 12 months' energy use. Log onto 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 50% (40% if a submersible pump) and you retrofit/replace either the impeller or bowl of the pump, or both

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

$$\text{Potential Incentive} = .08 \times .25 \times 150,000 = \$ 3,375$$

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.

$$\text{Potential Incentive} = .50 \times \text{Project Cost} = \$ \underline{\hspace{2cm}}$$

$$\text{Potential Incentive} = .50 \times 5,000 = \$ 2,500$$

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 A BASIS

Assume the following:

- Pre-retrofit pumping efficiency is tested at 38%.
- Post-retrofit pumping efficiency is tested at 62%.
- The customer chose to use the next 12 months’ energy use as the basis and billing data indicates 100,000 kilowatt hours 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 \$.09/kWh

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

$$\text{Net Required Energy} = .62 \times 100,000 = 62,000 \text{ kWh}$$

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

$$\text{Pre-project Gross Energy Use} = 62,000 / .38 = 163,158 \text{ kWh}$$

The theoretical savings are 63,158 kWh but this is more than 50% of the reported energy use of 100,000 kWh. Thus, the Energy Savings Basis is 50,000 kWh

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

$$\text{Incentive} = \text{RATE} \times .25 \times (\text{Annual Energy Use} + \text{Energy Savings Basis})$$

$$\text{Incentive} = .09 \times .25 \times (100,000 + 50,000) = \$3,375$$

Since the incentive calculated from energy savings is less than the 50% cap due to project cost, the incentive to the customer is \$3,375.

EXAMPLE 4 – USING THE NEXT 12 MONTHS’ ENERGY USE AS A BASIS

Assume the following:

- Pre-retrofit pumping efficiency is tested at 52%.
- Post-retrofit pumping efficiency is tested at 65%.
- The customer chose to use the next 12 months’ energy use as the basis and billing data indicates 300,000 kilowatt hours 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.
- Although the project started 01/15/2009, the application was signed 10/15/2008- thus, the payout RATE is \$.08/kWh

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

$$\text{Net Required Energy} = .65 \times 300,000 = 195,000 \text{ kWh}$$

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

$$\text{Pre-project Gross Energy Use} = 195,000 / .52 = 375,000 \text{ kWh}$$

The theoretical savings are 75,000 kWh. Since this is less than 50% of the reported energy use of 300,000 kWh the Energy Savings Basis is 75,000 kWh

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

$$\begin{aligned} \text{Incentive} &= \text{RATE} \times \text{Energy Savings Basis} \\ \text{Incentive} &= .09 \times 75,000 = \$6,750 \end{aligned}$$

Since the incentive calculated from energy savings is more than the 50% cap due to project cost of \$4,000, 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 200 kWh/AF – thus, 155 acres x 3.2 AF/acre x 200 kWh/AF = 99,200 kWh
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 kW demand of 140 kW – thus, 2,200 hr x 140 kWh = 308,000 kWh