CASE STUDY

Improving Pump Efficiency in Vineyards
Learn How to Get Big Energy Savings with Pump Efficiency

“It costs a lot of money to move water. If your pump is not providing the right flow and pressure to your irrigation system, it can mean decreased distribution uniformity and result in decreased irrigation efficiency in the field.”
- BILL GREEN, EDUCATION MANAGER, CENTER FOR IRRIGATION TECHNOLOGY

PG&E’s Advanced Pump Efficiency Program

Operating costs for agricultural pumps are increased if pumps are in need of repair, poorly matched to the pumping load, or incorrectly installed. A pump efficiency test can assess pump performance to determine if retrofits or maintenance is needed. Some problems can be corrected with inexpensive, simple adjustments (such as impeller adjustments), while others may require more expensive repairs.

Funded by Pacific Gas and Electric Company (PG&E), the Advanced Pumping Efficiency Program (APEP), which is administered by the Center for Irrigation Technology on the Fresno campus of California State University, is intended to address important resource management problems in California including, energy and water conservation and water and air quality. The twin goals of the program consist of improving the efficiency of the hardware in the field, including updating pumps, irrigation systems, and water distribution systems, and ensuring that the hardware is managed correctly.

The program helps agricultural producers and other non-residential users test the efficiency of their irrigation pumps and make necessary repairs or enhancements to improve the overall efficiency of their pumps. APEP offers free educational seminars and technical assistance, subsidies for pump efficiency tests, and cash rebates for pump retrofits. For additional information about the AEP, visit: http://www.pumpefficiency.org.

How Can I Tell if My Pump is Inefficient?

An inefficient pump will use more energy than normally required. However, another common problem is a pump that does not supply the pressure and flow appropriate to the demands of the pumping system. This may lead to decreased distribution uniformity (how evenly water is applied by the system) and poor irrigation efficiency. The end result is more water having to be pumped to fully irrigate the vineyard and thus, more energy used than actually required. It may also impact both the quality and quantity of harvest.

The first step to maintaining an efficient pump system is to perform periodic pump testing. A pump test will measure flow rate, total dynamic head (TDH), which includes well lift and discharge pressure, and the energy input to the pumping plant from the meter. Regular monitoring is also recommended through the use of pressure gauges and flow meters. These devices will enable you to check that the pump is continuing to work as needed and will make it possible to identify issues as they arise.

A Pump Efficiency Test Measures:

- Flow Rate
- Pumping Lift & Discharge Pressure
- Energy Input to the Pumping Plant from the Meter
“The pump is the heart of the irrigation system in the vineyards. It’s where there’s some of the biggest energy savings that you’re going to find. A 25% efficiency improvement is about a 33% energy savings. That’s huge!”
– NANCY COMSTOCK, PUMPING EFFICIENCY TESTING SERVICES

How Can Pump Testing Help?
AREP can subsidize the cost of a pump test making it an affordable way to check on your pump’s performance. The pump test will tell you how efficiently your pump is running by calculating the overall pumping efficiency (OPE). OPE is a benchmark for performance that measures how much energy in the form of water flow and pressure is produced by the energy input to the pump. For example, if your OPE is 40%, then 60% of the energy you purchase is not being used. If your OPE is much below 50% or the measured flow rate and discharge pressure does not match your irrigation system’s requirements, these are indications that you should investigate the benefits and costs of a pump retrofit. An optimal OPE is around 65%, depending on the type of pump and pumping requirements.

The pump test report also contains a pumping cost analysis. This will provide an estimate of energy cost savings if a retrofit to improve pump efficiency is performed. However, the cost of the retrofit will depend on the exact actions needed. Always consult with an experienced pump specialist.

Money Back Solutions
PG&E offers money-saving rebates and incentives for vineyards and wineries. Rebates enable businesses to receive money back for energy-saving products that have already been purchased, while incentives are payments that businesses can receive for using energy-efficient products in new projects. Once an incentive is approved, PG&E works with customers to create a customized energy efficiency plan that includes design advice, onsite energy audits, training workshops and more.

CSWA & PG&E Partnership
The California Sustainable Winegrowing Alliance (CSWA), a non-profit organization that promotes the adoption of sustainable practices by California wineries and vineyards, has been partnering with PG&E since 2005 to host workshops and develop educational materials to help vintners and growers improve the energy efficiency of their operations. For more information and a calendar of upcoming workshops, visit www.sustainablewinegrowing.org.

“If you don’t take care of your pump, give it proper maintenance, or pay attention to it, it’s going to fall apart on you, and it will likely happen at the very worst time possible.”
– NANCY COMSTOCK, PUMPING EFFICIENCY TESTING SERVICES

Next Steps with PG&E
Contact your PG&E Account Representative to enhance your operation’s overall energy efficiency potential and to take advantage of potential cost savings and rebates.

For more information, call the Agricultural Customer Service Center at 1 877 311 FARM (3276) or visit www.pge.com/wineries.