Biotech
Success Story

Genentech

Integrated Case Study: Energy Efficiency, Savings By Design, Demand Response

Total Savings Since 2005

$1.25 million in rebates and incentives

10 million annual kWh savings

2,600 kW savings

280,000 annual therm savings

Genentech's "Green" Genes

Considered the founder of the biotechnology industry, South San Francisco-based Genentech employs about 11,550 people company wide. Genentech uses human genetic information to develop and manufacture new medicines to treat patients with serious or life-threatening medical conditions.

For more than ten years, Genentech has worked closely with Pacific Gas and Electric Company (PG&E) to find better ways of managing energy consumption at its Northern California facilities. Genentech was acquired in 2009 by the Roche Group, a Swiss-based international health care company. Genentech will continue to focus on energy efficiency consistent with broad company sustainability goals.

Rebate-Driven Energy Upgrades

For both business and environmental reasons, Genentech has made energy management a top priority; since 2005 the company has completed more than 160 new construction and retrofit projects to reduce energy consumption. Each project has been driven and supported by rebates from PG&E incentive programs like Savings by Design, also known as Non-Residential New Construction, and Demand Response. Genentech has received about $1.25 million in PG&E rebates and incentives for projects that have saved about 2,600 kilowatts (kW), 10 million kilowatt hours (kWh) and 280,000 therms over the last five years.

Several of the Genentech projects made possible through PG&E incentives include:

- **HVAC:** A multi-year, air balancing and variable air volume project in the Genentech facility earned $121,000 in PG&E incentives for heating, ventilation and air conditioning (HVAC) controls that saved 859,000 kWh and non-process boiler heat recovery measures that saved 65,000 therms.
- **Lighting:** A lighting retrofit project at the same facility in 2008 involved the replacement of T12 lamps with premium T8 and T5 lamps and the installation of occupancy sensors, saving 340,000 kWh and earning a PG&E rebate of $36,000.
- **Server Virtualization:** In 2008, a server virtualization project at an administrative facility reduced energy use by 643,000 kWh and earned $32,000 in PG&E incentives.
- **Garage Lighting:** Three facilities in South San Francisco upgraded their parking garage lighting in 2008 by replacing HID (high-intensity discharge) fixtures with high-efficiency T8 fluorescent lamps, saving 50 kW, more than 500,000 kWh and earning $56,000 in PG&E incentives.
- **Retrofit:** In 2007, an air handling retrofit at the South San Francisco facility involving HVAC controls, motors, high-efficiency chillers and adjustable speed drives reduced energy use and earned $22,000 in PG&E incentives.

"Genentech has an ongoing commitment to energy management. We have a series of in-house projects devoted to finding new ways of reducing our energy costs, short-term and long-term. We look for proven solutions that allow us to be early adopters instead of first adopters, and PG&E is a regular source of those proven solutions."

John Kelley, Senior Project Manager, Genentech

Genentech's Energy Program Management staff works closely with their PG&E account manager to identify and execute programs that return maximum business value in addition to energy savings. "Working together with a customer like Genentech for the past decade has been a pleasure because of their ongoing commitment to total cost of ownership, which means implementing energy upgrades that not only reduce their costs but improve operations," said Eric Jansen, senior PG&E account manager for Genentech. "Our Savings By Design program is so ingrained in the relationship that any new construction projects are automatically submitted for PG&E rebates and incentives."

Power Quality and Reliability

One key to the success of the long-term relationship between PG&E and Genentech has been PG&E's ongoing attention to Genentech's top operational priority – the quality and continuity of electrical power to its facilities. Even small interruptions or fluctuations in power are potentially devastating to Genentech's laboratory facilities, where cutting-edge biological research is conducted under demanding standards with high financial stakes. Genentech has backup uninterruptible power supply (UPS) flywheels and battery systems deployed in all of its research buildings, but the switchover from mainline power to a backup system inevitably causes a momentary power fluctuation that can disrupt everything from IT and computer operations to laboratory refrigeration and air-handling equipment.

"We have UPS protection on our most sensitive equipment, but it's simply not possible to have UPS on everything. Interruptions and fluctuations in power are hugely problematic for us in such sophisticated buildings," stated John Kelley, a senior project manager at Genentech. "The restart process requires significant manpower, and the delay can have a significantly negative impact on our research and production processes."

To accommodate Genentech's highly sensitive power environment, PG&E has worked to find new ways of delivering uninterruptible power to their facilities. "PG&E has been tremendously responsive to our needs for quality power continuity," stated Elena Powers, a senior manager at Genentech. "They've made extensive local improvements such as additional dedicated feeder lines into our campus, and switchovers from problematic circuits. As a result, they've virtually eliminated extended power outages and most of the local flickers. We have very high criteria for satisfaction in this area, and PG&E has worked continuously to meet them. We know we can rely on them to make our top priority their top priority as well, and that has continued to build the trust in our relationship."

Demand Response

Genentech also participates in PG&E's Demand Response program, earning incentives by reducing energy use during times of peak demand. Genentech installed software in the building management systems of three administrative facilities to direct reductions in lighting and air conditioning systems through decreased fan speeds and increased chill water temperatures. Because of these efforts, Genentech has the capacity to reduce its overall energy demand by about 500 kW during a Demand Response event.

Savings By Design

PG&E's Savings By Design program was essential to the construction of four new Genentech buildings at the South San Francisco facility in 2007.

Genentech's engineers worked closely with a third-party vendor which used proprietary energy analysis software to analyze Genentech's pre-construction designs and drawings. At Genentech's

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Elena Powers
Senior Manager, Energy Program Management, Genentech

request, EnergySoft recommended and designed energy conservation measures that would not just meet but exceed the requirements of California's Title 24 Building Energy Efficiency Standards.

High-efficiency, third-generation T8 lighting systems were installed in all four new buildings, using one-, two-, three- and four-lamp fixtures and ballasts. More than 1,500 units were installed in one building alone. Occupancy sensors were also widely distributed to maximize lighting efficiency. The HVAC systems incorporated energy-efficient chillers with variable speed drives (VSD) and premium efficiency pump motors (hot water and chilled water circulation) and fan motors, also with VSDs. Motors equipped with VSDs save energy and reduce motor wear by varying the power output in response to demand changes without requiring the motor to cycle on and off at full power.

Additionally, all outside windows were upgraded with high-performance Low-emissivity (Low-E) dual-pane glass. Low-E glass uses a low Solar Heat Gain Coefficient (SHGC) glazing to maximize natural light while minimizing incoming heat by reflecting certain heat-producing wavelengths. This reduces each building's energy requirements for both area lighting and air conditioning.

The resulting improvements in energy efficiency were outstanding:

- In a four-story, 108,000 square foot office building, power consumption was reduced by more than 162,000 kWh, surpassing Title 24 requirements by 12.6 percent and generating an incentive of more than $21,000 from PG&E.
- In a three-story, 93,500 square foot laboratory facility, energy use was reduced by 164 kW, 210,000 kWh and nearly 17,000 therms, performing 23.5 percent better than Title 24 limits and earning a $65,000 incentive from PG&E.
- In a three-story 83,500 square foot laboratory building, projected power demands were reduced by 152 kW and nearly 259,000 kWh while saving more than 10,000 therms, representing a 27 percent improvement over the Title 24 standards, with an earned PG&E incentive of nearly $75,000.
- In a 55,000 square foot laboratory facility, energy was reduced by 74 kW, more than 100,000 kWh and well over 6000 therms, exceeding Title 24 requirements by more than 17 percent and earning a PG&E rebate of nearly $23,000.

"We consider ourselves an aggressively green company, but our energy conservation measures are primarily driven by the business case," said Elena Powers. "PG&E rebates are absolutely critical to justifying that business case because they dramatically impact our payback, the time required for us to recover our investment on the project."

Next Steps with PG&E

To learn how PG&E can help your business manage energy consumption and reduce costs, contact your PG&E Account Manager, call our **Business Customer Service Center** at **1-800-468-4743**, or visit **www.pge.com/mybusiness**.

March 2010 CTM-1009-0158