



Business Case Study: *Roche Bioscience*

Background

- Type of Business: Health care, research and development
- Location: Palo Alto, Calif.
- Size: 1,000 employees; multi-building campus
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Summary

Roche Bioscience, as part of a Swiss-based health care company, is focused on the discovery and early clinical development of innovative new medicines to treat diseases affecting people worldwide. In response to California's energy crisis in 2001, Roche Bioscience worked quickly and aggressively to ramp up its established Energy Reduction Program to help prevent blackouts in the City of Palo Alto. The program included installation of 60 variable speed motor controllers to modulate supply and exhaust fans, three large high-efficiency water chillers for the heating ventilation and air conditioning (HVAC) system and lighting retrofits.

Roche received funds through the City of Palo Alto Commercial Advantage program and participated in the Palo Alto Utilities Load Curtailment program, which called for it to reduce energy by 15 percent within 30 minutes of a Stage 3 alert. These efficiencies resulted in a 16 percent decrease in electricity consumption and a 23 percent decrease in natural gas usage for 2001 compared with 2000.

Referenced in Business Guides:

- #2, "Reduce Energy Use in Industrial and Manufacturing Facilities Through Conservation and Efficiency Measures"

The reduction in electricity for 2001 was 10 million-kilo-watt-hours and the natural gas reduction for the year was 610,000 Therms. Roche saved more than \$320,000 in electric costs. Methods employed under the program have sustained research productivity. Roche also took a leadership role in uniting 180 Silicon Valley Manufacturers Group member companies in a conservation project.

Plan

As part of its ongoing energy reduction program, Roche Bioscience has been collecting energy use data for each building system for over five years. This data, along with an inventory of equipment and lighting systems, has provided the basis for determining the greatest opportunities for energy reduction. The data was collected from individual meters for each building and temporary meters on some equipment, to determine equipment operating hours, efficiency and performance. In anticipation of summer energy shortages, the City of Palo Alto Utilities worked with several of its larger customers, including Roche, to get a head start on energy-saving opportunities. As recommended and funded by the City of Palo Alto Utilities, an energy audit was conducted by a consulting firm to identify opportunities to reduce energy consumption.

Using the recommendations from the consulting report, Roche Bioscience created a list of conservation projects that could be implemented quickly and without disruption to business operations. The projects were reviewed with the City of Palo Alto Utilities and several contractors.

Projects were selected based on how quickly they could be completed, the greatest potential for energy savings and the estimated cost effectiveness for Roche Bioscience. Projects were also chosen based on whether it was feasible to complete the majority of the work by July 1, 2001, the start of the peak summer demand period. The selected projects focused on upgrading the interior lighting fixtures and making the HVAC systems more energy efficient.

Programs: Conservation

✓ **Load curtailment:** Roche Bioscience participated in the Palo Alto Utilities Load Curtailment Program and demonstrated its ability to reduce energy consumption during a Stage 3 alert by 20 percent (2.0 MW) within 30

minutes of notification. Roche Bioscience was able to reduce energy use by adjusting HVAC controls and through employee involvement. E-mail and voicemail messages were sent to all employees to advise of Stage 3 alerts, make employees aware that HVAC systems adjustments would result in higher office building air temperatures and a reduction of fresh air in some buildings. Employees were highly responsive when asked to conserve energy.

Programs: Efficiency

✓ **HVAC:** Replaced primary HVAC chillers. During the summer, the water chillers that provide cooling for buildings are the single largest use of power at Roche Bioscience. By replacing three older chillers with new chillers that are 60 percent more efficient, the company reduced power demand on warmer days. The total cooling capacity of the new centrifugal chillers was 3,200 tons. They were designed to meet the highest energy efficiency operational standards currently available for centrifugal chillers. Equipment features included maximizing the design and surface areas of heat exchangers and installing variable speed drives to allow savings at reduced loads.

✓ **Lighting:** Retrofit more than 85 percent of lighting (27,000) at the Palo Alto site to energy-efficient models, without a reduction in lighting levels. In addition, more than 700 offices and labs were equipped with occupancy sensors to turn off lights during unoccupied periods.

A lighting survey identified the location of three- and four-tube T12 fluorescent light fixtures that could be converted to two T8 tube fixtures with reflectors. Incandescent lamps were changed to compact fluorescent. Exit signs with light bulbs were converted to LED exit signs. The work, which was completed in six weeks, was performed after business hours. The reduction in lighting wattage also reduced the need for cooling in office buildings.

✓ **Fan motors:** Installed variable frequency drives (VFDs) on HVAC supply and exhaust fan motors for office and laboratory buildings to control fan speed. Controls were added to adjust fan speed based on the time of day, day of week and building ventilation needs during business hours. Given that fans in the laboratory buildings run 24 hours a day, these controls resulted in significant cost savings. In most cases it was feasible to install the VFDs next to fans – rather than remotely – which saved installation time. The average VFD installation took two days.

Programs: Employee Outreach

✓ **Communication:** At Roche Bioscience's February 2001 employee quarterly meeting, the Site Utility Operations manager delivered a presentation on the site's energy

use and strategy for meeting possible summer energy shortages, as well as for providing guidance on energy conservation at home. Roche Bioscience provided ongoing information through e-mail, meetings, voicemail and online news vehicles, including information on available rebates from local and state organizations for conservation in the home.

Programs: Public Outreach

✓ **Partnerships:**

- Roche Bioscience President Dr. James Woody helped establish a "blackout busters" program for the 180 member companies of the Silicon Valley Manufacturing Group, of which he is chair.
- Partnered with the Bay Area Council to support Gov. Davis's energy conservation initiatives for business during the summer of 2001.
- Based on Roche Bioscience's consistent energy reduction achievement, the Site Utility Operations manager, was asked to field questions directed toward industry at a special Palo Alto City Council meeting held on Jan. 31, 2001. Roche Bioscience was the only company invited to participate in the session.
- Participated in a case study for the joint National Resources Defense Council/Silicon Valley Manufacturing Group report, "Energy Efficiency Leadership in a Crisis: How California is Winning, August 2001." The report highlighted what companies are doing to reduce electricity demand as well as economic and environmental damage associated with the California energy crisis.

Budget and Finance

Roche Bioscience chose projects based on the cost, amount of rebates or grants, energy savings and expected time of payback. The company received rebates from the City of Palo Alto Utilities Department for energy-use reduction and a rebate from the California Energy Commission (CEC) for demand reduction.

Results

Roche Bioscience's building submetering system enabled the company to continuously review energy use and efficiency and look for new ways to reduce energy consumption.

In 2001, Roche Bioscience's energy-use reduction surpassed expectations. Electricity consumption for 2001 was 16 percent lower than in 2000, and 2001 natural gas consumption was 23 percent lower than in 2000. The capital investment provided through rebates, grants and Roche

Bioscience's investment kept utility expenses from exceeding budget. The company realized energy savings of 10 million kWh for 2001 and \$320,000 in avoided operating costs. The 2002 utility consumption was on pace to be nearly 10 percent lower than 2001. Roche Bioscience's energy costs would have been much higher had it not been for the investment in ongoing energy-management and energy-reduction projects. Methods employed under the program have sustained research productivity.

To obtain rebates and grants from the City of Palo Alto Utilities Department and the CEC, Roche Bioscience provided documentation that quantified and substantiated energy reduction after project completion.

Much of Roche Bioscience's energy conservation success could be attributed to its employees, who were aggressive in implementing company guidelines, such as turning off lights and other nonessential equipment, re-scheduling experiments and limiting lab equipment to non-peak hours. Some employees suggested additional savings measures.

Lessons Learned

Roche Bioscience initially faced several obstacles, including:

- Sustaining R&D productivity while analyzing and implementing change and dealing with the threat of blackouts,
- Managing internal resources, and
- Time constraints, such as developing and implementing energy-saving measures in time to meet deadlines for rebate applications that were contingent on proven results.

However, the company learned that having a common, universal goal to quickly identify, design and implement energy reduction plans made it possible for the company to overcome the obstacles. Good preparation and a dedicated team allowed for all the projects to be completed on time, within budget and meeting or exceeding the desired results.

Roche Bioscience also learned that meter-reading documentation and excellent equipment data were critical for pinpointing accurately where energy was being used and therefore which projects should be implemented.