

SAVINGS BY DESIGN CASE STUDY

*The **Dr. Martin Luther King, Jr. Library in San José** reduced its energy usage by **29.6%** through participation in Pacific Gas and Electric Company's energy-efficiency program **SAVINGS BY DESIGN**.*

The optimization of the 475,000 square foot Library is a joint project undertaken by San José State University and the City of San José. PG&E's SAVINGS BY DESIGN program provided design assistance and incentives for the energy-efficient plan and construction of the eight-story Library, which serves as both the central public library for the City of San José and the academic and research library for San José State University's main campus. The design process for this project began in 1999, when PG&E provided assistance to improve the efficiency of the whole building system. The Library project's potential energy savings increased from 0 to over 2.5 million kWh annually as a result of this design assistance, yielding significant energy savings over the life of the building. The optimized Library design also earned \$250,000 in incentives from PG&E.



ENERGY-EFFICIENCY FEATURES

Much of the building's energy savings were obtained through better glazing and new technology in lighting design and control. The following energy-efficiency measures were implemented in the Library design:

- Upgraded window glazing with low-E glass
- Direct digital coil (DDC) control with programmable electronic climate control mechanism
- Premium-efficiency variable frequency drives (VFDs) on fan motors and circulation pumps
- Reduction of lighting power density (LPD)

INCENTIVES

The SAVINGS BY DESIGN program awarded the Dr. Martin Luther King, Jr. Library with an incentive of **\$250,000** for the energy-efficiency measures installed and influenced by the program engineers and the design team. The high-performance design of the library has also earned the design team, facilitated by Flack & Kurtz and implemented by Carrier Johnson Architects, an incentive of **\$50,000**.

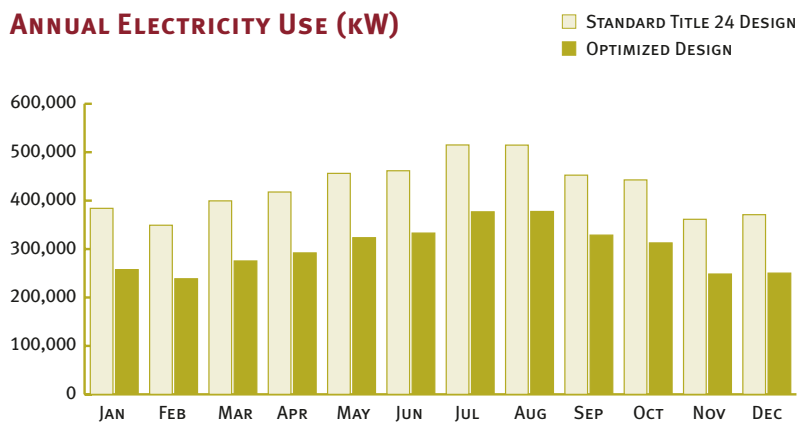
This program is funded by California utility customers and administered by Pacific Gas and Electric Company, San Diego Gas and Electric, Southern California Edison Company, and Southern California Gas Company under the auspices of the California Public Utilities Commission.



ENERGY SAVINGS

The energy-efficient technologies installed have an **expected energy savings of 1,511,107 kWh and a reduction of 435.3 kW annually**. The implemented glazing and lighting technologies reduced the cooling and heating requirements of the building by 44% and 31% respectively. Overall, **the Library uses 29.6% less energy than allowed by the Title 24 Energy Code** with the installed energy-efficiency measures.

ANNUAL ELECTRICITY USE (kW)



EMISSIONS REDUCTION SUMMARY

Producing electrical energy from non-renewable resources (such as fossil fuels) can generate a significant amount of waste; in particular carbon dioxide (CO₂), sulfur dioxide (SO₂), and nitrous oxide (NO_x). These pollutants have been linked to ecological problems including global warming and acid rain. Decreasing electricity and natural gas use helps curb the production of harmful pollutants. The optimized building design for **the Dr. Martin Luther King, Jr. Library is estimated to produce 29% fewer air pollutants than the base design**.

LIFECYCLE (20 YEARS)

	Standard Title 24 Base	Optimized Design
CO ₂ Produced	53,643 tons	37,830 tons
NO _x Produced	30.86 tons	21.76 tons
SO ₂ Produced	18.86 tons	13.3 tons

Disclaimer: These emission avoidance estimates are based on the factors used in the PROMOD model which was used to estimate emissions in the PG&E service territory. However, these factors are currently under review and subject to change.

ANNUAL ENERGY SAVED—ELECTRIC (kWh)

Standard Design.....	5,126,059
As Installed.....	3,614,952
TOTAL SAVINGS.....	1,511,107

ANNUAL REDUCTION (kW)

Standard Design.....	2,079.1
As Installed.....	1,643.8
TOTAL SAVINGS.....	435.3

LIGHTING FOR LIBRARY (W/SqFt)

Title 24 Allowed.....	1.456
As Installed.....	1.097

SAVINGS BY DESIGN is a statewide program encouraging high performance nonresidential building design and construction. Sponsored by California's four investor-owned utilities, the program offers building owners and design teams a wide range of services:

- **Design Assistance** provides analysis and information to help you design energy-efficient buildings
- **Owner Incentives** help pay for the investment of energy-efficient buildings
- **Design Team Incentives** reward designers who meet ambitious energy-efficiency targets
- **Energy Design Resources** offers a valuable palette of tools and resources to help facilitate the design of high performance facilities.

Please visit www.savingsbydesign.com and www.energydesignresources.com for more information, or call us at (415) 973-3803, or email savingsbydesign@pge.com.

