# ENERGY SAVINGS FOR A FAST FOOD RESTAURANT

## Background

The facility studied in this audit is a fast-food restaurant located in Southern California. The facility had an annual electrical energy consumption of over 305,000 kilowatt-hours (kWh) per year and an annual natural gas consumption of over 7,000 therms per year. The total energy costs were estimated to be approximately $33,000 each year.

## Potential Energy Savings

The energy efficiency opportunities recommended could potentially save an estimated 58,796 kWh of electrical energy each year, or about 19% of the facility's total electrical energy usage. The recommendations could reduce the facility's electrical demand by about 10 kW. The recommendations could increase their natural gas consumption by 1,873 therms/yr, or an increase of about 26% of the current usage. The potential total annual cost savings due to implementing all of the recommended measures was estimated to be $4,323 per year, which represents about 13% of the facility's total energy costs. Total estimated implementation cost was about $15,675 giving an average simple payback of 3.6 years.

**SUMMARY OF ENERGY EFFICIENCY OPPORTUNITIES SAVINGS AND COSTS**

| Description | | Potential Energy Conserved | Demand Savings (kW) | Potential Savings ($/yr) | Implem. Cost ($) | Simple Payback (years) |
|---|---|---|---|---|---|---|
| 1 Replace Incandescent Lighting with Compact Fluorescent Lighting | | 3,652 kWh/yr | 1.24 | 328 | 320 | 1.0 |
| 2 Replace the Electric Water Heaters with Gas-Fired Hot Water Heaters | | 25,130 kWh/yr -857 therms/yr | 4.05 | 1,828 | 3,355 | 1.8 |
| 3 Install High Efficiency T8 Fluorescent Lighting | | 6,187 kWh/yr | 1.02 | 555 | 2,400 | 4.3 |
| 4 Replace the Electric Food Warming Basins with Gas-Fired Units | | 23,827 kWh/yr -1,016 therms/yr | 3.84 | 1,632 | 9,600 | 5.9 |
| **Totals** | **(Electricity)** | **58,796 kWh/yr** | **10.2 kW** | **$4,343/yr** | **$15,675** | **3.6 years** |
| | **(Natural Gas)** | **-1,873 therms/yr** | | | | |

* Two year figures.

## Major Opportunities for Energy Efficiency

Summaries of some of the major energy conservation measures are briefly described as follows.

*Measure 2 – Replace the Electric Water Heaters with Gas-Fired Hot Water Heaters*

The restaurant has two instantaneous electric water heaters. The hot water heaters are used to produce hot water for reconstituting food and hot drinks. It was recommended that the existing hot water heaters be replaced with "instant" natural gas-fired hot water heaters. Natural gas-fired hot water heater would be less expensive to operate, since the cost of natural gas energy is substantially lower than the cost of electrical energy and any demand charges would be eliminated altogether. It was estimated that replacing the existing electric water heaters with natural gas-fired units would result in an electrical energy savings of 25,130 kWh per year and potentially reduce the demand by 4 kW, but would increase the natural gas usage by 857 therms per year.

*Measure 4 – Replace the Electric Food Warming Basins with Gas-Fired Units*

The restaurant has two food warming basins integrated into a central food service island. It was recommended that natural gas-fired food warming basins be installed in place of the existing electrically heated basins. Natural gas-fired unit will be less expensive to operate, since the cost of natural gas energy is substantially lower than the cost of electrical energy. This would result in an electrical energy savings of 23,827 kWh per year and can reduce the demand by 3.8 kW, but would increase the natural gas usage by 1,016 therms per year.