

# Performance Agreement: Energy Savings for Kalamazoo County

State of Michigan  
Department of Energy,  
Labor & Economic Growth

Bureau of Energy Systems

## Rebuild Michigan CASE STUDY

### Background

Kalamazoo County Government initiated energy saving plans with a 2002 Rebuild Michigan Introductory Energy Evaluation of ten buildings in the Kalamazoo, Michigan area. The evaluation recommended various actions to reduce electrical, natural gas, and water consumption. In 2005, the county government entered into a Performance Agreement with a controls contractor to implement energy retrofits and provide an annual energy analysis. The work in this agreement included energy retrofits at seven of the ten buildings originally evaluated, and the Performance Agreement will

continue for a ten-year period. The

buildings included the Administration Building built in 1979, Michigan Avenue Courthouse built in 1937, Family Court built in 1977, Law Enforcement Center built in 1972, County Center at the fairgrounds built in 1959, the Nazareth Building built in 1960, and the Animal Control/Maintenance Facility built in 1984. The retrofit work was completed in 2006.



*The Kalamazoo County Administration Building received HVAC control upgrades including variable-speed drives on air handling units.*

Case Study prepared by  
Kingscott Associates, Inc.  
[www.kingscott.com](http://www.kingscott.com)

## Actions Taken

The action items having the shortest payback period were implemented.

These energy conservation upgrades included:

- Lighting retrofits implemented at the Michigan Avenue Courthouse, Family Court, Nazareth Building and the Animal Control/Maintenance Facility. The retrofit consisted of replacing incandescent light fixtures with compact fluorescent fixtures and replacing T12 fluorescent lamps and magnetic ballasts with energy-efficient T8 lamps and electronic ballasts. Recessed fluorescent fixtures were fitted with polished reflectors, and some de-lamping was implemented.
- Exit signs using incandescent lamps were replaced with low energy LED type.
- Heating, ventilating and air conditioning (HVAC) controls were configured to provide night set back at all buildings except the Law Enforcement Center. During heating season the night temperature minimum is 62°F, and during cooling season the night time temperature maximum is 78°F. Exhaust fans are automatically shut off of during non-occupied hours.
- HVAC system pneumatic controls were calibrated, and defective thermostats were replaced.

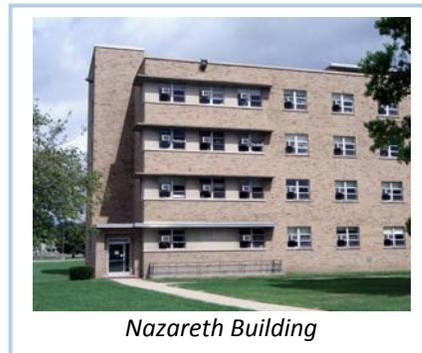


*Michigan Avenue Court Building received lighting system replacement and HVAC control upgrades.*

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## Rebuild Michigan CASE STUDY

- Window-mounted air conditioners at the Nazareth Building were electrically interlocked with operable windows to shut off the air conditioner if an adjacent window is open.
- Timers were installed on the vending machines to turn off machine lights and cycle the compressor at a lower rate during unoccupied building hours.
- Variable-speed drives were installed on the separate heating and cooling air handling units in the Administration Building to provide better control of the airflow and energy savings.
- Automatic shut off of domestic hot water circulator pumps was added in all buildings except the Administration Building and the Law Enforcement Center. This reduced the energy use to operate pumps, as well as reduced the heat loss through the domestic hot water piping systems.
- Water conservation measures were implemented at the Administration Building, the Michigan Avenue Courthouse, and the Law Enforcement Center. The retrofit consisted of placing aerators on existing faucets and providing water conserving flush valves on 115 jail cell steel toilets located in the Law Enforcement Center. The jail cell toilets' 3.5 gallons per flush valve diaphragms were replaced with 2.4 gallon per flush units.



## The Results

Kalamazoo County is nearly three years into the energy retrofit Performance Agreement, and the verified savings prove that energy conservation measures were a wise investment. The retrofit program was implemented for a cost of \$727,000. The energy conservation measures have yielded a verified savings of \$279,000 since the program started. At the current savings rate the simple payback for the program will be seven to eight years.

Figures are based on data received from owner or owner's performance contractor. Kingscott does not guarantee accuracy of data.

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**Rebuild Michigan CASE STUDY**

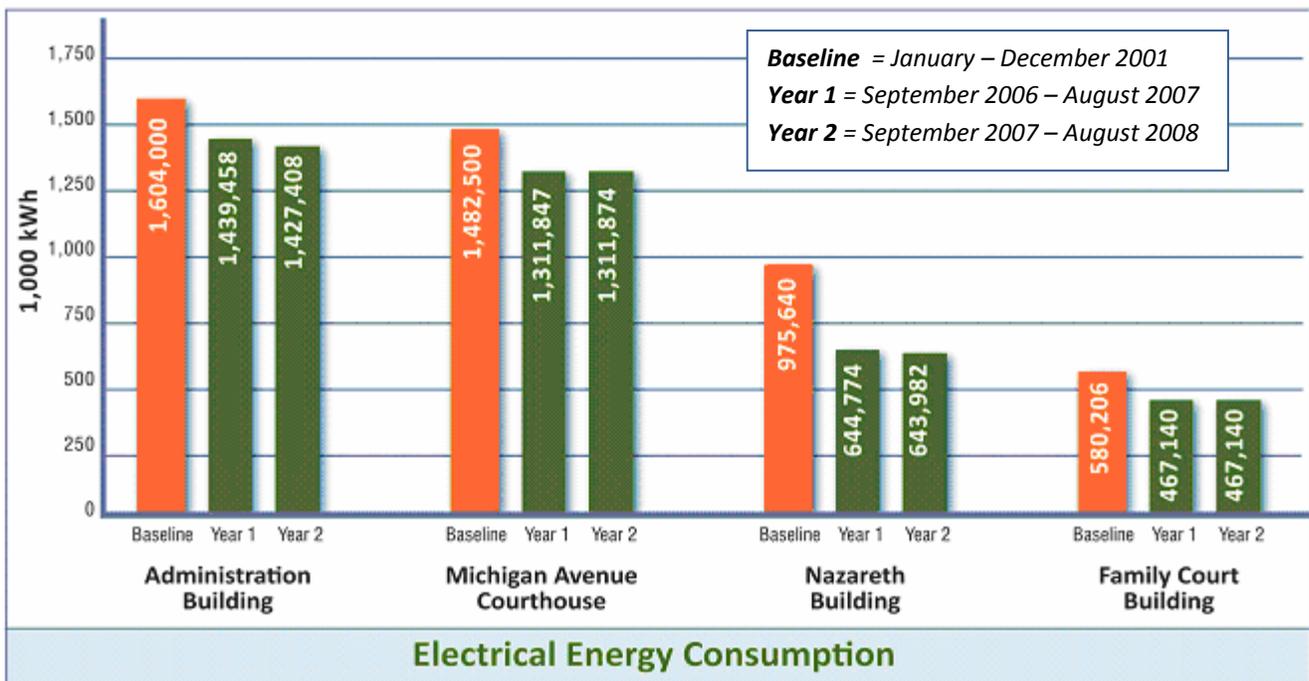
According to Mr. David McCaffery, Department of Buildings & Grounds Director, the original scope of the retrofit work was reduced to satisfy budget constraints. He is pleased with the outcome.

The lighting retrofits have reduced the electrical consumption by approximately 630,000 kWh per year and reduced the peak demand load by 238 kW yielding a savings of about \$53,000 per year.

The HVAC heating and cooling temperature setbacks have reduced energy consumption by approximately 367,000 kWh per year – resulting in savings of about \$44,500 per year.

Prior to the water conservation retrofit the annual water consumption for the County buildings was about 22,000,000 gallons costing more than \$50,000 per year. The implementation of retrofits has reduced consumption on the order of 3,234,000 gallons or 15% – yielding a savings of about \$10,000 per year.

**Table 1** illustrates electrical energy consumption for four of the buildings. It shows consumption dropping for the first two years of the program compared to the baseline year 2001.



**Table 1**