

# City of Ferndale Performance-Based Energy Efficiency Solutions Program

State of Michigan  
Department of Energy,  
Labor & Economic Growth

Bureau of Energy Systems

## Rebuild Michigan CASE STUDY

### Background

In 2003 as part of the State of Michigan Rebuild Michigan program, the City of Ferndale had an introductory energy evaluation (IEE) completed for seven public buildings. The results led to completing an in-depth Technical Energy Analysis (TEA) and implementing that study's recommendations.

After completion of the TEA, the City began a 10-year Performance Contract Agreement to implement and monitor a wide variety of energy improvement measures.



*Controls were installed at  
City Hall/ Police Station*



*Boiler replacement at  
Department of Public Works*

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## Energy Conservation Measures (ECMs)

The planned energy-saving measures (outlined in the following chart) were completed within approximately 260 days:

Energy-Saving Action	City of Ferndale Facility	Benefits
<b>Install building automation system controls (BAS)</b>	Department of Public Works, City Hall/Police Station, District Courthouse, Public Library, Fire Stations #1 and #2, and Kulick Community Center	<ul style="list-style-type: none"> <li>• <i>User-friendly interface</i></li> <li>• <i>Energy efficiency</i></li> <li>• <i>Reduce maintenance/operational costs</i></li> <li>• <i>Time-of-day, day-of-year, optimal start/stop, warm-up/cool-down control</i></li> <li>• <i>Centralized communication, remote diagnostics, and expandable</i></li> </ul>
<b>Install carbon dioxide sensors</b>	City Hall/Police Station, Public Library, and Kulick Community Center	<ul style="list-style-type: none"> <li>• <i>Detect carbon dioxide</i></li> <li>• <i>Regulate outdoor air intake for energy savings</i></li> </ul>
<b>Replace boilers with 84%-efficient boilers</b>	Department of Public Works, City Hall/Police, and Fire Station #1	<ul style="list-style-type: none"> <li>• <i>Energy efficiency</i></li> <li>• <i>Reduce maintenance/operational costs</i></li> </ul>
<b>Install low-intensity natural gas radiant heaters</b>	Department of Public Works	<ul style="list-style-type: none"> <li>• <i>Energy efficiency</i></li> </ul>
<b>Install thermostatic radiator valves</b>	Kulick Community Center	<ul style="list-style-type: none"> <li>• <i>Energy efficiency</i></li> </ul>
<b>Insulate steam pipes</b>	Kulick Community Center	<ul style="list-style-type: none"> <li>• <i>Energy efficiency</i></li> </ul>
<b>Install LED traffic signals</b> 	Throughout the community	<ul style="list-style-type: none"> <li>• <i>Energy efficiency</i></li> <li>• <i>Reduce maintenance/operational costs</i></li> </ul>
<b>Upgrade vending machines with occupancy-based power On/Off</b>	Department of Public Work, Fire Station #2, and Kulick Community Center	<ul style="list-style-type: none"> <li>• <i>Energy efficiency</i></li> </ul>
<b>Retrofit lighting</b> <ul style="list-style-type: none"> <li>• Retrofit T12 lights with T8 systems</li> <li>• Replace incandescent lamps with compact fluorescents</li> <li>• Replace HID lights with T8 systems</li> <li>• Replace incandescent exits signs with LED sign</li> <li>• Install occupancy sensors</li> </ul>	Department of Public Works, City Hall/Police Station, District Courthouse, Public Library, Fire Stations #1 and #2, Kulick Community Center, and a pump station	<ul style="list-style-type: none"> <li>• <i>Energy efficiency</i></li> <li>• <i>Improve lighting environment – color and light levels</i></li> <li>• <i>Better space use</i></li> <li>• <i>Reduce maintenance/operational costs</i></li> </ul>

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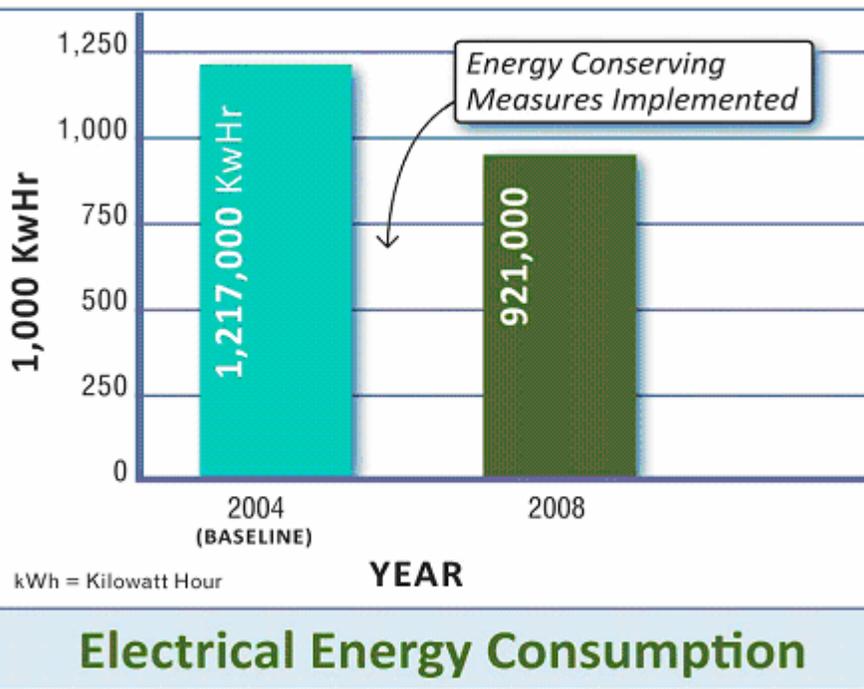
Lighting Retrofits

## Cost and Estimated Payback

The initial cost to implement all the ECMs was \$984,152 (total of \$1,237,299 with the interest to finance). The estimated simple payback was 17.3 years for energy only and 8.5 years for the combined energy and operational savings.

## The Results

For the four years of this study, the results show an average 35% energy use reduction, not including savings from the traffic light retrofit. The actual cost savings have exceeded the Performance Contractor's guaranteed savings by 44%.



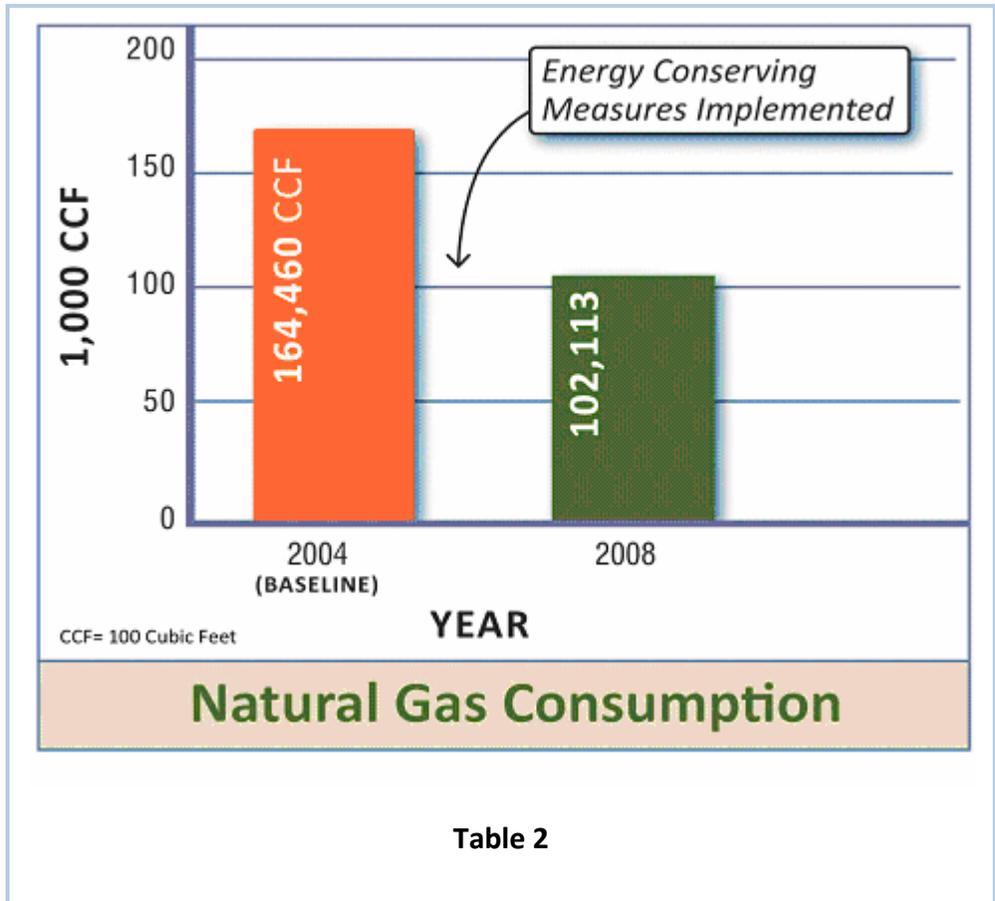
**Table 1** compares the before and 4<sup>th</sup>-year electric energy usage.

Table 1

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**Table 2** compares the before and 4<sup>th</sup>-year natural gas consumption.



***“I wholeheartedly recommend this program to other municipalities”***  
—Jack Crowley, DPW  
Superintendent

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