

# **Energy Use & Cost Savings Project Scope**

*Environmental Advisory Council*

*January 10, 2012*

## **Proposal:**

Environmental Advisory Council (EAC) Carroll County Government Building Assessment on Energy Usage and Cost Savings 2008-2010

## **Summary:**

The project will be implemented under the direction of the EAC. John Modica will administer the assessment, with oversight from the EAC, by directing college interns to accumulate necessary data, and by incorporating that data into the final report as outlined below. The project will benefit from the following:

- Cooperation of Mike Whitson, Chief of Carroll County Bureau of Facilities;
- The data collected by Johnson Controls and the resulting reports that were created between 2008 and 2010;
- The utility data compiled by the EnerNOC Utility Bill Information (UBI) system;
- The free Energy Portfolio Manager offered by Energy Star;
- The Greenhouse Gas Calculator offered by the U.S EPA; and
- The experiences generated from similar efforts in other local governments from around the country.

The goals of the report are to assess and summarize the energy usage within Carroll County buildings and facilities, the investments made in energy upgrades, and the potential for generating increased savings in the future. The report will deal with the time period occurring between 2008 and 2010.

## **Work Scope:**

Stage one:

1. Energy Usage and Cost Savings By Building 2008-2010:
  - a. Compile an annualized summary of the electricity and natural gas usage for each building by utilizing the data collected by Johnson Controls and the EnerNOC UBI System.
  - b. Utilize the EnerNOC UBI graphs that are based upon the historical utility data for each building to demonstrate trends in energy usage, net-cost, and pricing. If the appropriate graphs are not available through the EnerNOC UBI system, then graphs will be created in Microsoft Excel using the data points accumulated on the EnerNOC UBI system and/or the data collected by Johnson Controls.
  - c. Leverage the data and graphs to illustrate savings, or lack thereof, per building over time. The energy consumed in County buildings between 2008 and 2010 will be compared to the energy usage documented in the 2007 Energy Usage Inventory. The

2007 Energy Usage Inventory included data from County school buildings. Since the County does not have control over the management of energy usage in school buildings and is not responsible for their energy bills, the energy data associated with schools will be removed from the 2007 Energy Usage Inventory in order to provide an accurate point of comparison. Energy data from schools will not be collected as a part of this update. All data that was incorporated into the 2007 Energy Usage Inventory, but has not been considered within the scope of the current report, will be removed from the baseline report to ensure accuracy during comparative analysis.

- d. Summarize the analysis.
2. Energy Upgrade Investments: Cost, Energy, and Greenhouse Gasses Saved, and Return on Investment.
  - a. Utilizing the Johnson Controls 2008-2009 and 2009-2010 reports, list the County investments made in energy efficiency per building and the cost of each upgrade.
  - b. Summarize the kWh/therms saved by each investment as documented in Johnson Controls report(s). The report will document both the realized savings generated by energy upgrades as well as their projected lifetime savings. Realized savings account for dollars that the County has already accumulated, while projected lifetime savings account for the estimated savings that the County will accrue over the operational lifetime of the energy upgrades.
  - c. Convert kWh/therm savings into greenhouse gas savings using EPA Greenhouse Gas Calculator and Energy Star Portfolio Manager.
  - d. Summarize the changes in energy pricing that have occurred since 2007 through the County's usage of the EnerNOC UBI system and bulk pricing arrangement. Illustrate the trends that have occurred in pricing by incorporating analysis through graphs, tables, and written summaries.
  - e. Assess the return on investment for energy upgrades in County buildings by referencing Johnson Controls reports, and/or by inputting data into the return on investment (ROI) calculator. Also include analysis for the return on investment that the County has achieved through its contract with EnerNOC.
3. Building Benchmarks: Comparison of each County building to national average for energy use within buildings of similar type.
  - a. Create Energy Star Portfolio Manager Account for Carroll County buildings (free).
  - b. Import building data into the Energy Star portfolio manager by making a service provider request to Johnson Controls and/or EnerNOC. Johnson Controls and/or EnerNOC will upload the information.
  - c. Manually input remaining building characteristics into the portfolio manager as necessary. This information will be accumulated by volunteer interns and through the cooperation of County facilities manager(s).
  - d. Generate Performance Benchmark report for each building. The report will score the energy usage for each building based on a comparison to national averages for buildings of that type.

4. Greenhouse Gas Emissions Per Building 2008-2010
  - a. Using the Energy Star Portfolio Manager and EPA Greenhouse Gas Calculator, convert energy use data (kWh and Therms) from each building during the time period under review into greenhouse gas emissions.
  - b. The County is required to purchase a percentage of its energy from renewable sources. When assessing the greenhouse gas emissions attributed to County buildings, the report will account for the greenhouse gas emissions that have been offset through the purchase of energy generated by renewable sources. Data from the EnerNOC UBI system will illustrate the amount of energy that the County has purchased from renewable sources. The resulting offset in greenhouse gas emissions will be calculated using the U.S. EPA Greenhouse Gas Calculator and/or the Energy Star Portfolio Manager.
  - c. The results of the study will be summarized and graphed. These results will demonstrate greenhouse gas savings, or lack thereof, within County buildings over time, and will be compared to the 2007 Energy Usage Inventory. The 2007 Energy Usage Inventory included data from County school buildings. The data associated with school buildings will be removed from the 2007 Energy Usage Inventory in order to provide an accurate point of comparison.

Stage Two:

1. Success Story Assessment: Summarize and highlight buildings and energy investments that have saved the most within the County since 2007.
2. Room for Improvement Assessment: List buildings that demonstrate room for improvement based on benchmark comparison.
3. Upgrade Potential Assessment: Assess lowest performing building, or buildings, and list areas of possible improvement and estimate cost saving projections for each. This will be accomplished by reviewing the performance reports of higher scoring buildings as offered by Energy Star. This review will demonstrate the upgrades that were made in higher scoring buildings for which corresponding County buildings have yet to be made. Reviewing the results of these upgrades in higher scoring buildings will provide a general estimate for the potential results of applying these upgrades to County buildings.

Stage Three:

1. Recommendations: Interns will speak with representatives from local governments who have implemented successful energy saving campaigns. Interns summarize best practices that will be included within the report as recommendations for future action within the county.

Stage Four:

1. Report Review: The draft report will be presented to the EAC for their review and discussion. Additions or changes may be made based on these discussions.

2. EAC Recommendations: The EAC will review the revised report recommendations and determine which recommendations will have the most beneficial impact.
3. EAC Recommendations and Final Report: The EAC will prepare a memo to the Commissioners referencing and summarizing the report provided to them and outlining the recommendations which the EAC believes will have the most beneficial impacts. The EAC will forward the memo and attachment to the Board for their review and will present their recommendations to the Board during the Board's open session.

\* Data associated with oil consumption may or may not be incorporated within this report. This will depend on the availability of historical utility data for buildings that consume oil. The availability of this data has not been determined.