

Hamilton County 2011 Energy Management and Utility Usage Report



DEPARTMENT OF COUNTY FACILITIES

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Mission Statement

The Hamilton County Facility Department is committed to providing strategies, equipment, guidelines and methodologies to achieve tenant comfort in all buildings managed by the Facility Department while aggressively minimizing taxpayer costs and benchmarking the energy efficiency of the facilities managed in the process.

Executive Summary

The following information is a summary of what is contained in this report. Supporting calculations, data, charts and graphs can be found later in this report and the appendices.

DOLLAR SAVINGS

- In 2011 over \$1,130,000 was directly saved through the bidding out of electricity; bulk purchase of natural gas with over 50 other counties; and utilizing an Interruptible Rate Tariff.
 - \$1,017,000 was saved in 2011, (\$940,000 major accounts, \$76,800 smaller accounts), by purchasing electricity through competitive bidding. This was the second year in this type of cost avoidance contract. Deregulated electricity supply for County buildings from Duke Energy Retail Sales was procured in 2009. The purchase of market electricity began in January 2010. The contract with Duke Retail Sales will continue through 2012. This is approximately a 25% reduction from the established rates for Duke Energy customers. This does not include the savings achieved by the County Engineer, DDS (formerly MRDD), and PBS which "piggyback" on the bid process and entered into their own separate agreements.
 - \$70,500 in taxpayer dollars were saved in 2011 by purchasing deregulated gas through the Commissioners' Association of Ohio (CCAO) bulk gas purchasing contract. The county has saved \$541,000 in the last eleven years by participating in deregulated natural gas commodity through the CCAO.
 - \$44,900 taxpayer dollars were saved by utilizing the Duke Energy Interruptible Rate Tariff (IT) in 2011. This is accomplished by allowing the Courthouse boiler plant to provide all the steam requirements of the Justice Center, thus, meeting the minimum summer time tariff requirements. This savings is expected to continue annually, and has so far saved the taxpayers \$624,000 in gas avoidance cost since 2004.

ENERGY CONSERVATION MASTER PLAN (ECM)

- The Energy Conservation Master Plan (ECM) implemented in conjunction with ThermalTech Engineering in 1998 and updated in 2002 through the Rebuild America Grant has saved the County over \$4 million since plan implementation in avoided energy cost. This has been a savings of \$364,000 annually for the taxpayer.
- In 2010 the process of selecting a vendor contractor was undertaken to provide Performance Contracting for County Facilities. In 2011, the County successfully contracted Ameresco, Inc to perform these duties. On September 9, 2011 Ameresco delivered an Investment Grade Audit for Phase 1 which included Energy Conservation Measures for the 230 East 9th, County Administration, Alms & Doepke and Parkhaus Garage buildings. Work will begin in 2012 on lighting retrofits, boiler replacements, water source heat pump upgrades and domestic heater water improvements.

ENERGY EFFICIENCY

- For several years the Facilities Department has benchmarked the performance of its facilities to the US EPA Energy Star, allowing management to see where improvements in energy efficiency is needed and recognition. The goal is to meet and then exceed the rating of 75. Presently twelve buildings are being input into the EPA Energy Star Portfolio Manager and tracked. Five major buildings have been tracked since late 2004 and two additional major buildings have been added since 2008. Major highlights are noted below:
 - 800 Broadway qualified for and received the Energy Star Award in 2011, and maintains a high Energy Star rating of 86. The facility will be eligible again on September 30, 2012. Both the electric and natural gas consumption of 800 Broadway slightly decreased in 2011 compared to the previous year.
 - The County Administration Building received the building's first EPA Energy Star Award in 2011, with a rating of 94. The facility will be eligible again on August 31, 2012. The County Administration Building electric consumption decreased by 10% compared to 2010. Natural gas consumption increased slightly despite a reduction in summertime gas consumption.
 - 2020 Auburn once again recorded the lowest electric and natural gas consumption for that facility tracked to date, achieving an Energy Star rating of 81 for 2011. The new high-efficiency natural gas boilers installed aided in reducing the natural gas consumption by 18% compared to the previous year (2010 was 12% lower than 2009). Electricity and water consumption decreased as well, by 5% each.
 - 230 East Ninth (William Howard Taft Center) received an EPA Energy Star Award in 2011 for the first time, with a rating of 75. The facility will be eligible again on September 30, 2012. Overall, energy consumption dropped slightly.
 - As a whole, the seven facilities decreased electric consumption by 3% and natural gas consumption increased 2%. Of significance is a 12% reduction in annual electric costs and 7% reduction in natural gas costs for the seven facilities.

Energy Star Ratings for Major County Buildings for Last 5 Years

<i>Buildings</i>	<i>2011</i>	<i>2010</i>	<i>2009</i>	<i>2008</i>	<i>2007</i>	<i>Notes</i>
800 Broadway	86	88*	89*	84*	78	Received Energy Award
County Administration	93	90	60	51	46	Received Energy Award
Justice Center	85	86	93	85	69	Working with EPA on approving facility
YDC (2020)	81	78	66	65	64	Working with EPA on approving facility
230 East Ninth	73	74	73	72	71	Received Energy Award
222 E. Central Parkway	44	48	47	41	44	Need to review model
County Courthouse	41	46	69	63	69	Working with EPA on approving facility

All ratings in **BOLD** are above the 75 rating needed to receive the Energy Star Award. 2008 was when we submitted our first documentation to the US EPA for an Energy Award.

GREENHOUSE EMISSIONS

We have been able to track our greenhouse emissions for our individual buildings since our base year of 1997. The greenhouse gas emission rate is 7% lower on a building area basis than the base year of 1997 for buildings under control of the Facilities Department. Each building tracked reduced the emission of greenhouse gases compared to the previous year, for a total reduction of 2,400tons of CO₂e since the base year. The greenhouse gas (GHG) emissions of the buildings through the consumption of natural gas and electricity totaled 38,000 tons of CO₂e. Over the past decade, the greenhouse gas emissions of the buildings have fluctuated around the emissions of the base year of 1997, as can be seen in the Annual GHG Emissions chart below. Note that the base year for 2020 Auburn is 2000.

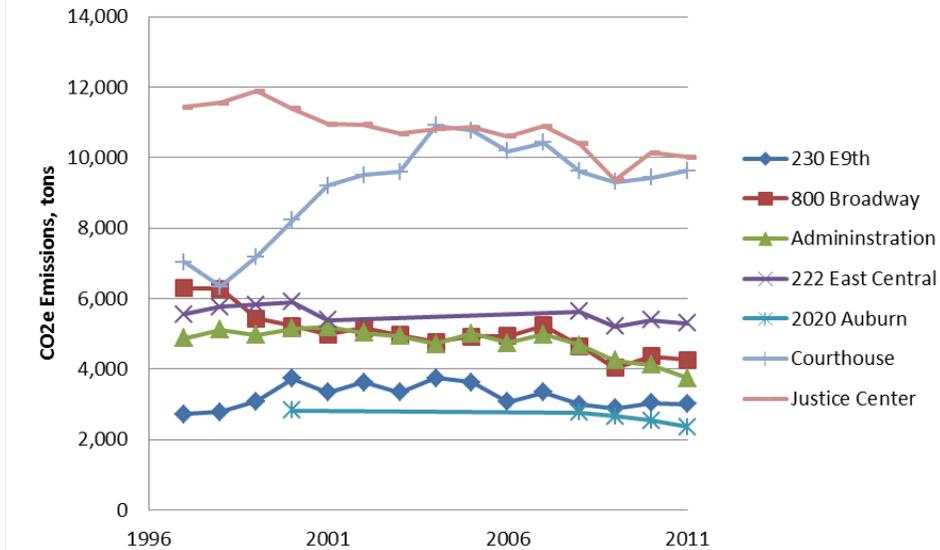


Figure 1: Annual Greenhouse Gas Emissions by Building (Gas & Electric)

The Courthouse and Justice Center make up half of the greenhouse gas emissions out of the buildings considered, as shown in Figure 2. The contribution of each building to the estimated greenhouse gas emission total has remained very similar to that of 2011.

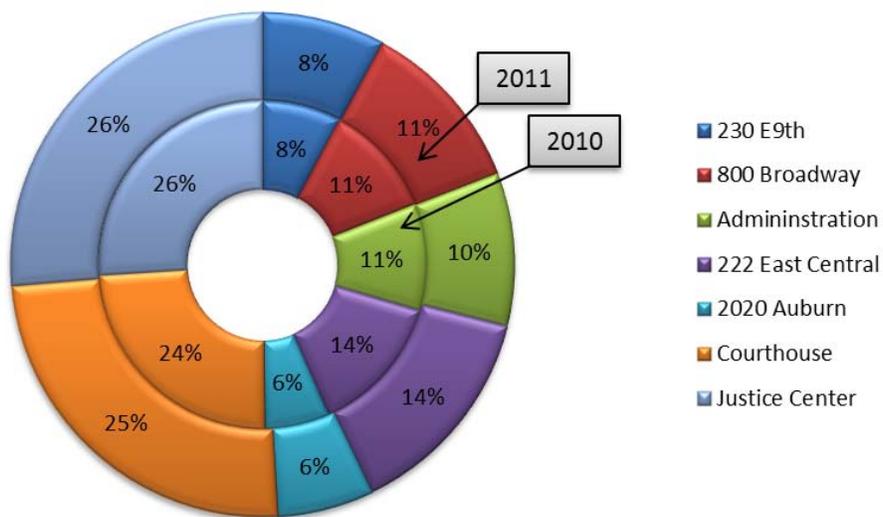


Figure 2: Annual Greenhouse Gas Emissions Change from 2010 to 2011

Vision Statement and Objectives

The Hamilton County Facility Department envisions a continued aggressive energy savings plan by utilizing the following strategies:

- Continue the energy management consulting services which consists of the following:
 - Monthly review of electric, gas and water usage
 - Conducting an annual review of electrical pulse meter data for large accounts
 - Entering and monitoring each building's energy usage and cost through energy usage tracking software and Energy Star Portfolio
 - Document and submit data to US EPA to receive Energy Star Awards
 - All major buildings under Facility control will continue to be entered into the EPA Energy Star program. 800 Broadway received the award in 2008, 2009 and 2010. Other buildings are getting close to the 75% passing criteria and will be submitted for the award by our energy consultant when they qualify.
 - For the buildings that do not qualify in this calendar year, the cost and advantages of ECM projects for these buildings to meet the EPA Energy Star minimum guideline will be evaluated.
 - Prepare bid documents for securing electric power for 2013 through at least 2015

- Pursue shared services in the area of procurement of energy
 - Purchase deregulated natural gas and deregulated electricity through a block managed by an outside firm through the County Commissioner's Association of Ohio Service Corp. (CCAOSC)
 - The County is committed to the CCAO natural gas program until 2012. Before this contract expires in 2012 the options available will be reviewed, and a decision will be reached on how to proceed with natural gas purchases at that time.
 - The County is committed to the Duke Retail Service deregulated electricity contract through 2012. Prior to the contract expiring a decision must be reached as to whether to bid out additional years or sign-on with CCAO.
 - Director of County Facilities will continue to be a member of the CCAOSC Executive Committee and will be directly involved in approval of the purchase of natural gas.

- Continue the use of Performance Contracting with Ameresco, Inc for implementing ECM measures and previously unfunded Energy Savings Measures for the Hamilton County Facilities.
 - Conduct Investment Industrial Grade Audits (IGA) in high energy usage buildings in 2011
 - Negotiate a contract for the selected Energy Service Company (ESCO) to provide a County wide energy audit utilizing House Bill 295 for possible funding options.

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- Implement these projects and further reduce the total County expenditures in electric, water and natural gas cost with the annual savings set aside to pay for the bonds financing the projects.
- Update Energy Conservation Master Plan (ECM) in 2012
- Eliminate inefficient use of energy systems wherever possible by:
 - Purchasing major energy efficiency mechanical equipment (boilers, chillers, cooling towers) per County Life Cycle Cost Analysis Resolution
 - Duke Energy has implemented a Smart \$aver energy efficiency program in the last couple years, providing rebates for energy efficient equipment. The County will continue to take advantage of these rebates while they are available.
 - Involving building managers in tracking and saving energy use and cost in County owned buildings
 - Continuous monitoring of electric, gas and water usage in the buildings will continue to occur monthly in order to ensure anomalies do not occur. This is essential in ensuring that Duke Energy reconciles billing errors expediently.
 - Pursuing energy efficient building operation, including scheduling night and weekend setback in all buildings where tenants are not using the spaces, practicing demand curtailment, turning off non-essential equipment when not in use, setting outdoor air dampers to minimum positions, and reducing lighting and other electrical loads
 - Pursuing that the BOCC will formally adopt a policy that all new computers, appliances and electrical devices meet or exceed LEED-EB Silver standards for energy efficiency
 - Secure a full-time Energy Manager position to manage energy usage/contracts
- Stay on the leading edge of energy saving techniques and implementable solutions for public governments
 - Director maintaining his Building Operations Certification
 - Attending annual energy conferences and energy saving workshops
 - Plans for attendance of the 2011 Annual Ohio Energy Conference in Columbus, OH as a means of improving our energy savings strategies, understandings and techniques are in effect.
 - Department of County Facilities will continue to be a member of the Green Partnership for Greater Cincinnati as a means of exchanging information with the members which include the City of Cincinnati, Cincinnati Public Schools, University of Cincinnati and Duke Energy.
 - Complete the certification of County buildings to the USGBC LEED-EB:O&M Silver Level standard
 - LEED-EB: O&M investigation and possible certification for an existing building is an objective for the next two years. LEED-EB cost estimating was completed in 2010 for 800 Broadway to achieve this goal. A LEED-AP (Accredited Professional) will be required to lead the County in proper documentation to the USGBC to achieve certification.

2011 Summary of Results and Energy Outlook

The usage per square foot graphs included in this year's report show a very consistent downward trend in the last several years for each of the buildings. The average electric and natural gas consumption for all of the buildings has shown great improvement since 2007.

- **Overall Electric** – The buildings are performing more efficiently in 2011 than 1997, meeting an increased demand while consuming less electricity. Electric usage decreased 3% from 2010 to 2011, which can partly be attributed to a decrease in cooling degree days. 230 East Ninth, 800 Broadway, Administration, 222 East Central, 2020 Auburn, the Courthouse, and the Justice Center consumed 35,000,000 kWh in 2011. The utility cost decreased by 12% compared to the previous year.
- **Overall Gas** – In 2011, the buildings used 2% more gas than the year before, with a slight decrease in heating degree days (from 5,000 to 4,600). The downtown campus consumed 119,000 MCF in 2011. Despite the slight increase in consumption, the total cost of natural gas for these buildings decreased 7%.
- **Overall Water/Sewer** – In 2011, the water and sewer consumption increased by 4% overall compared to 2010. About half of the facilities included in this report had a higher consumption than the previous year.

The County faces many energy challenges at the present time. Although Hamilton County Facilities has been proactive in strategically placing the County in a position to benefit from deregulation, lower utility tariffs, enhanced building schedules, night setback, equipment replacements, lighting replacements and energy usage, there still remains more to be done.

- **Electric Power** - The next time to go out for bid for deregulated electricity will be in mid-2012. The County must compare the cost of the proposed 2013-2106 rate structure from Duke Energy Ohio versus deregulated electricity from a forthcoming proposed CCAO offer and decide how to best address the commodity cost for electricity for 2013 and beyond..
- **Electric T&D** - The cost for electric transportation and distribution is expected to continue to increase, but is not known until their rate plan is submitted and approved by the PUCO. New rider mention?
- **Nature Gas Procurement** - In the past year, NYMEX gas futures have recorded their lowest prices for years. The County has been buying forward at these ten year low prices through the CCAOSC, reducing the cost of natural gas consumption compared to previous years.
- **Water/Sewer Usage** - We believe the next big step towards conservation will be in our water usage. Water with its nearly double sewer charge accounts for a large enough portion of the overall utility cost that Facilities will be having the Energy Service Company and its engineering partner investigate water savings strategies that building operators can use to save both use and dollars in the upcoming years through the IGAs.

Energy Star Ratings

Each year for the past several years, the performance of the buildings has been tracked through the Energy Star program. A few buildings have earned the Energy Star award, a national mark of excellence in energy performance, demonstrating that the facilities are energy efficient. In order to become an Energy Star qualified facility, the building must score in the top 25 percent of like facilities based on the EPA's National Energy Performance Rating System.

The graph below illustrates the Energy Star ratings as of December of the last five years.

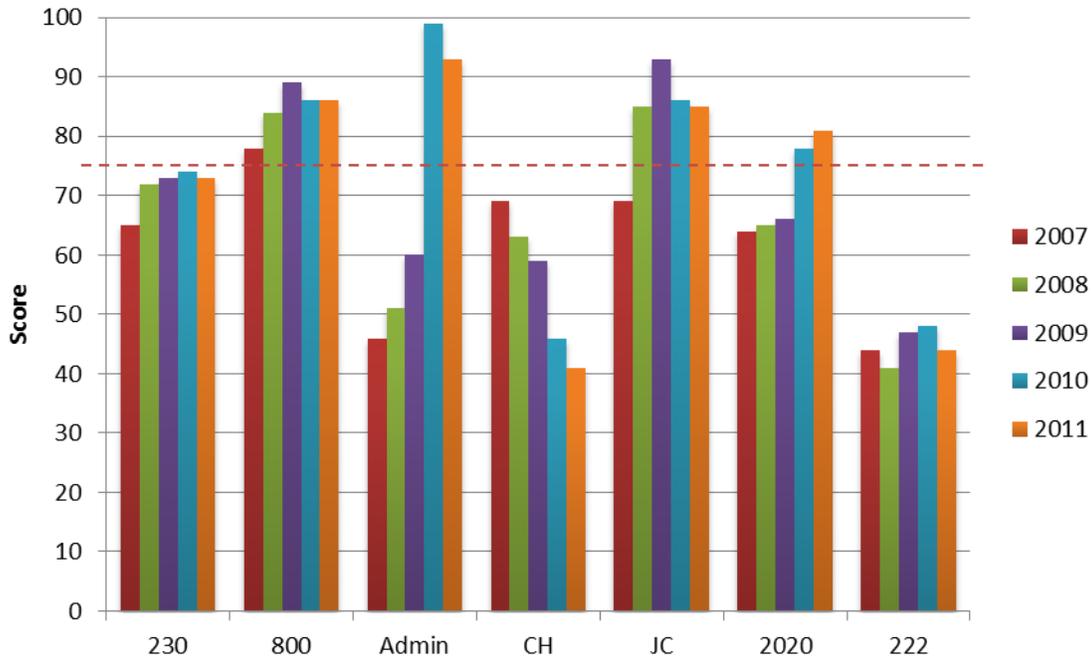


Figure 3: Energy Star Rating Trend

800 Broadway received the Energy Star Award for the fourth year in a row, qualifying at a rating of 87.

County Administration Building received the Energy Star Award for 2011 for the first time with a rating of 94.

230 East 9th Street (William Howard Taft Law Center) also received the Energy Star Award for the first time, with a rating of 75.

2020 Auburn (Youth Detention Center) is not eligible for an award because the facility type is not currently under the scope of Energy Star.

Courthouse and Justice Center cannot qualify at the current time because Energy Star will not accept the meter readings because of the common steam plant between the buildings. County Facilities is looking into adding a steam totalizing meter to the Courthouse so that the steam flows between the buildings could be tracked on a monthly basis to meet the Energy Star requirement.

The Energy Star rating of the Alms & Doepke facility (222) remains below the award threshold.

Annual Energy Usage Spreadsheets

The graph below represents actual data collected for the buildings listed. This data is tabulated from Duke Energy and Broker bills collected by Hamilton County Facilities and ThermalTech Engineering.

Table 1: Annual Energy Usage

1997 (BASE YEAR)												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	2,534,892	\$ 189,390	7,795	\$ 44,303	N/A	N/A	13	0.40	N/A	6.67	1.19	Avg Elec Cost/KWH
800 Broadway	6,035,141	\$ 320,982	15,406	\$ 90,259	N/A	N/A	24	0.62	N/A	12.38	1.64	\$ 0.0558
Administration	5,202,636	\$ 303,122	4,182	\$ 25,061	N/A	N/A	28	0.22	N/A	14.10	1.76	Avg Gas Cost/MCF
222 East Central	5,633,812	\$ 302,832	9,042	\$ 53,826	N/A	N/A	20	0.33	N/A	10.41	1.30	\$ 5.86
2020 Auburn	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	Avg Water Cost/CCF
Courthouse	5,006,743	\$ 335,393	42,844	\$ 252,436	N/A	N/A	11	0.97	N/A	6.18	1.34	N/A
Justice Center	10,897,246	\$ 519,945	28,928	\$ 168,121	N/A	N/A	21	0.55	N/A	10.65	1.31	Total Utility Cost
	35,310,470	\$ 1,971,665	108,198	\$ 634,006	N/A	N/A	17	0.44	N/A	8.63	\$ 1.22	\$ 2,605,671
1998												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	2,646,177	\$ 197,796	7,155	\$ 41,504	N/A	N/A	14	0.37	N/A	6.93	1.22	Avg Elec Cost/KWH
800 Broadway	6,254,453	\$ 340,546	11,926	\$ 68,701	N/A	N/A	25	0.48	N/A	12.75	1.64	\$ 0.0557
Administration	5,477,534	\$ 314,558	4,049	\$ 23,231	N/A	N/A	29	0.22	N/A	14.83	1.82	Avg Gas Cost/MCF
222 East Central	6,015,833	\$ 332,996	6,897	\$ 39,662	N/A	N/A	22	0.25	N/A	11.06	1.36	\$ 5.75
2020 Auburn	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	Avg Water Cost/CCF
Courthouse	4,901,566	\$ 318,143	32,695	\$ 187,115	N/A	N/A	11	0.74	N/A	5.94	1.15	N/A
Justice Center	11,444,456	\$ 540,793	22,797	\$ 131,654	N/A	N/A	22	0.43	N/A	11.12	1.28	Total Utility Cost
	36,740,019	\$ 2,044,832	85,517	\$ 491,866	N/A	N/A	18	0.36	N/A	8.95	\$ 1.21	\$ 2,536,699
1999												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	2,896,569	\$ 214,195	8,467	\$ 44,160	N/A	N/A	15	0.43	N/A	7.61	1.32	Avg Elec Cost/KWH
800 Broadway	5,377,051	\$ 301,888	10,685	\$ 55,564	N/A	N/A	22	0.43	N/A	10.97	1.43	\$ 0.0566
Administration	5,362,660	\$ 309,824	3,243	\$ 16,897	N/A	N/A	29	0.17	N/A	14.50	1.76	Avg Gas Cost/MCF
222 East Central	6,035,575	\$ 329,503	7,600	\$ 4,024	N/A	N/A	22	0.28	N/A	11.11	1.21	\$ 4.86
2020 Auburn	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	Avg Water Cost/CCF
Courthouse	5,237,013	\$ 350,976	41,994	\$ 221,950	N/A	N/A	12	0.95	N/A	6.43	1.30	N/A
Justice Center	11,601,371	\$ 559,854	25,964	\$ 133,602	N/A	N/A	22	0.49	N/A	11.30	1.32	Total Utility Cost
	36,510,239	\$ 2,066,240	97,953	\$ 476,197	N/A	N/A	17	0.39	N/A	8.84	\$ 1.19	\$ 2,542,437
2000												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	3,353,365	\$ 218,605	12,316	\$ 75,113	N/A	N/A	17	0.63	N/A	8.87	1.50	Avg Elec Cost/KWH
800 Broadway	5,229,786	\$ 299,639	9,518	\$ 63,110	N/A	N/A	21	0.38	N/A	10.65	1.45	\$ 0.0570
Administration	5,525,696	\$ 309,865	3,854	\$ 27,051	N/A	N/A	30	0.21	N/A	14.96	1.81	Avg Gas Cost/MCF
222 East Central	6,045,786	\$ 329,857	8,749	\$ 50,099	N/A	N/A	22	0.32	N/A	11.15	1.38	\$ 6.42
2020 Auburn	2,718,734	\$ 201,521	6,646	\$ 59,438	N/A	N/A	16	0.39	N/A	8.19	1.54	Avg Water Cost/CCF
Courthouse	5,658,907	\$ 361,228	52,901	\$ 339,225	N/A	N/A	13	1.20	N/A	7.03	1.59	N/A
Justice Center	11,491,585	\$ 561,592	19,470	\$ 113,954	N/A	N/A	22	0.37	N/A	11.13	1.29	Total Utility Cost
	40,023,860	\$ 2,282,305	113,454	\$ 727,990	N/A	N/A	20	0.50	N/A	10.28	\$ 1.51	\$ 3,010,295
2001												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	3,089,181	\$ 218,213	9,733	\$ 75,233	N/A	N/A	16	0.50	N/A	8.13	1.50	Avg Elec Cost/KWH
800 Broadway	5,027,254	\$ 351,142	8,432	\$ 73,317	N/A	N/A	20	0.34	N/A	10.22	1.70	\$ 0.0585
Administration	5,575,777	\$ 313,994	3,817	\$ 32,821	N/A	N/A	30	0.21	N/A	15.09	1.86	Avg Gas Cost/MCF
222 East Central	5,542,551	\$ 322,955	7,582	\$ 55,969	N/A	N/A	20	0.28	N/A	10.22	1.38	\$ 7.33
2020 Auburn	-	\$ -	6,865	\$ -	N/A	N/A	-	0.40	N/A	0.20	-	Avg Water Cost/CCF
Courthouse	5,797,527	\$ 371,552	67,257	\$ 514,886	N/A	N/A	13	1.53	N/A	7.35	2.01	N/A
Justice Center	11,831,691	\$ 577,352	7,138	\$ 59,876	N/A	N/A	23	0.14	N/A	11.34	1.21	Total Utility Cost
	36,863,982	\$ 2,155,207	110,825	\$ 812,104	N/A	N/A	17	0.48	N/A	8.94	\$ 1.38	\$ 2,967,311
2002												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	3,322,104	\$ 230,119	11,051	\$ 67,757	N/A	N/A	17	0.56	N/A	8.76	1.52	Avg Elec Cost/KWH
800 Broadway	5,213,993	\$ 310,930	8,674	\$ 53,012	N/A	N/A	21	0.35	N/A	10.60	1.46	\$ 0.0568
Administration	5,376,926	\$ 308,864	4,029	\$ 24,651	N/A	N/A	29	0.22	N/A	14.56	1.79	Avg Gas Cost/MCF
222 East Central	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	\$ 6.02
2020 Auburn	3,038,262	\$ 159,302	0	\$ -	N/A	N/A	18	-	N/A	8.94	0.94	Avg Water Cost/CCF
Courthouse	5,629,119	\$ 369,980	74,734	\$ 447,498	N/A	N/A	13	1.70	N/A	7.25	1.86	N/A
Justice Center	11,919,729	\$ 579,042	5,634	\$ 34,083	N/A	N/A	23	0.11	N/A	11.41	1.17	Total Utility Cost
	34,500,133	\$ 1,958,237	104,122	\$ 627,002	N/A	N/A	17	0.42	N/A	8.79	\$ 1.25	\$ 2,585,239

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2003												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	3,060,082	\$ 220,023	10,225	\$ 81,734	N/A	N/A	16	0.52	N/A	8.07	1.54	Avg Elec Cost/KWH
800 Broadway	5,003,235	\$ 279,227	8,535	\$ 69,754	N/A	N/A	20	0.34	N/A	10.18	1.40	\$ 0.0567
Administration	5,251,048	\$ 297,960	4,381	\$ 35,966	N/A	N/A	28	0.24	N/A	14.23	1.80	Avg Gas Cost/MCF
222 East Central	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	\$ 7.92
2020 Auburn	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	Avg Water Cost/CCF
Courthouse	5,664,195	\$ 371,758	75,656	\$ 595,176	N/A	N/A	13	1.72	N/A	7.30	2.20	N/A
Justice Center	11,755,920	\$ 572,356	3,733	\$ 29,362	N/A	N/A	22	0.07	N/A	11.23	1.15	Total Utility Cost
	30,734,480	\$ 1,741,324	102,530	\$ 811,992	N/A	N/A	14	0.41	N/A	7.29	\$ 1.15	\$ 2,553,315
2004												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	3,486,284	\$ 237,667	10,789	\$ 92,538	N/A	N/A	18	0.55	N/A	9.17	1.68	Avg Elec Cost/KWH
800 Broadway	4,861,647	\$ 286,570	7,432	\$ 66,580	N/A	N/A	19	0.30	N/A	9.87	1.41	\$ 0.0565
Administration	5,050,202	\$ 284,856	3,491	\$ 31,644	N/A	N/A	27	0.19	N/A	13.67	1.70	Avg Gas Cost/MCF
222 East Central	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	\$ 7.81
2020 Auburn	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	Avg Water Cost/CCF
Courthouse	5,785,309	\$ 369,013	95,723	\$ 723,847	N/A	N/A	13	2.18	N/A	7.66	2.48	N/A
Justice Center	11,953,018	\$ 582,268	3,058	\$ 25,849	N/A	N/A	23	0.06	N/A	11.41	1.16	Total Utility Cost
	31,136,460	\$ 1,760,375	120,493	\$ 940,458	N/A	N/A	14	0.47	N/A	7.40	\$ 1.21	\$ 2,700,833
2005												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	3,349,484	\$ 282,218	10,769	\$ 84,278	N/A	N/A	17	0.55	N/A	8.82	1.87	Avg Elec Cost/KWH
800 Broadway	4,936,669	\$ 350,206	8,777	\$ 63,827	N/A	N/A	20	0.35	N/A	10.05	1.66	\$ 0.0695
Administration	5,340,852	\$ 371,560	4,376	\$ 32,091	N/A	N/A	29	0.24	N/A	14.47	2.17	Avg Gas Cost/MCF
222 East Central	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	\$ 5.97
2020 Auburn	-	\$ -	0	\$ -	N/A	N/A	-	-	N/A	-	-	Avg Water Cost/CCF
Courthouse	5,760,760	\$ 446,821	93,808	\$ 511,379	N/A	N/A	13	2.13	N/A	7.61	2.18	N/A
Justice Center	12,003,802	\$ 732,428	3,072	\$ 30,173	N/A	N/A	23	0.06	N/A	11.46	1.45	Total Utility Cost
	31,391,567	\$ 2,183,234	120,802	\$ 721,748	-	\$ -	15	0.48	N/A	7.49	\$ 1.33	\$ 2,904,982
2006												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	2,880,850	\$ 281,065	8,300	\$ 101,441	4,652	N/A	15	0.42	0.02373	7.56	1.95	Avg Elec Cost/KWH
800 Broadway	5,034,899	\$ 381,457	7,690	\$ 98,472	13,679	N/A	20	0.31	0.05472	10.22	1.92	\$ 0.0817
Administration	5,140,593	\$ 387,150	2,727	\$ 35,289	20,204	N/A	28	0.15	0.10862	13.89	2.27	Avg Gas Cost/MCF
222 East Central	-	\$ -	0	\$ -	N/A	N/A	-	-	n/a	-	-	\$ 9.93
2020 Auburn	-	\$ 199,852	6,413	\$ -	N/A	N/A	-	0.38	n/a	0.19	1.18	Avg Water Cost/CCF
Courthouse	5,584,574	\$ 472,102	86,657	\$ 870,069	40,173	N/A	13	1.97	0.09130	7.33	3.05	N/A
Justice Center	11,729,713	\$ 759,543	2,716	\$ 32,232	40,173	N/A	22	0.05	0.07652	11.20	1.51	Total Utility Cost
	30,370,629	\$ 2,481,169	114,501	\$ 1,137,503	118,881	\$ -	14	0.47	N/A	7.20	\$ 1.70	\$ 3,618,672
2007												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	3,190,329	\$ 322,722	8,329	\$ 68,277	7,034	19,114	16	0.42	0.03589	8.35	1.99	Avg Elec Cost/KWH
800 Broadway	5,280,263	\$ 427,478	8,871	\$ 73,115	15,549	50,639	21	0.35	0.06220	10.74	2.00	\$ 0.0813
Administration	5,449,103	\$ 449,592	2,220	\$ 18,363	22,312	49,906	29	0.12	0.11996	14.71	2.52	Avg Gas Cost/MCF
222 East Central	-	\$ -	0	\$ -	n/a	n/a	-	-	n/a	-	-	\$ 7.64
2020 Auburn	2,780,557	\$ 224,328	6,470	\$ -	18,556	43,448	16	0.38	0.10915	8.37	1.32	Avg Water Cost/CCF
Courthouse	5,790,747	\$ 516,384	87,608	\$ 707,199	33,057	82,115	13	1.99	0.07513	7.58	2.78	N/A
Justice Center	12,141,860	\$ 876,768	1,437	\$ 11,626	151,296	294,017	23	0.03	0.28818	11.58	1.69	Total Utility Cost
	34,632,859	\$ 2,817,272	114,934	\$ 878,580	247,804	\$ 539,239	17	0.47	N/A	8.76	\$ 1.76	\$ 4,235,091
2008												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	2,771,258	\$ 309,517	8,826	\$ 86,018	6,887	20,571	14	0.45	0.03514	7.29	2.02	Avg Elec Cost/KWH
800 Broadway	4,645,466	\$ 408,454	8,520	\$ 78,615	13,217	52,016	19	0.34	0.05287	9.46	1.95	\$ 0.0850
Administration	5,052,896	\$ 424,386	3,070	\$ 28,523	23,806	56,555	27	0.17	0.12799	13.67	2.43	Avg Gas Cost/MCF
222 East Central	5,778,180	\$ 479,015	8,037	\$ 90,675	9,447	27,481	21	0.29	0.03435	10.65	2.07	\$ 9.97
2020 Auburn	2,637,631	\$ 220,878	6,876	\$ 82,250	8,241	43,039	16	0.40	0.04848	7.96	1.78	Avg Water Cost/CCF
Courthouse	4,838,684	\$ 481,254	88,073	\$ 864,492	39,288	103,185	11	2.00	0.08929	6.50	3.06	N/A
Justice Center	11,572,623	\$ 847,395	1,726	\$ 17,243	102,863	222,625	22	0.03	0.19593	11.04	1.65	Total Utility Cost
	37,296,738	\$ 3,170,900	125,129	\$ 1,247,815	203,749	\$ 525,471	18	0.53	0.0834	9.51	\$ 2.14	\$ 4,944,186

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2009												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	2,646,402	\$ 322,207	8,837	\$ 84,157	4,248	\$ 22,087	14	0.45	0.0217	6.98	2.07	Avg Elec Cost/KWH
800 Broadway	4,104,780	\$ 414,220	6,278	\$ 68,088	5,499	\$ 49,302	16	0.25	0.0220	8.34	1.93	\$ 0.0956
Administration	4,584,677	\$ 452,814	2,668	\$ 29,302	7,489	\$ 42,681	25	0.14	0.0403	12.40	2.59	Avg Gas Cost/MCF
222 East Central	5,371,496	\$ 497,075	7,213	\$ 75,376	4,184	\$ 27,914	20	0.26	0.0152	9.90	2.08	\$ 8.80
2020 Auburn	2,547,017	\$ 231,553	6,631	\$ 64,235	5,696	\$ 35,714	15	0.39	0.0335	7.69	1.74	Avg Water Cost/CCF
Courthouse	4,822,436	\$ 522,247	83,291	\$ 687,801	24,004	\$ 124,206	11	1.89	0.0546	6.43	2.75	\$ 5.15
Justice Center	10,431,013	\$ 857,891	1,478	\$ 14,858	45,808	\$ 197,754	20	0.03	0.0873	9.95	1.66	Total Utility Cost
	34,507,821	\$ 3,298,007	116,395	\$ 1,023,818	96,928	\$ 499,658	17	0.49	0.0392	8.81	\$ 2.12	\$ 4,821,483
2010												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	2,863,713	\$ 281,836	7,990	\$ 63,903	5,204	\$ 28,306	15	0.41	0.0266	7.51	1.76	Avg Elec Cost/KWH
800 Broadway	4,361,863	\$ 378,857	8,094	\$ 66,073	7,264	\$ 58,713	17	0.32	0.0291	8.89	1.78	\$ 0.0872
Administration	4,430,600	\$ 396,183	3,003	\$ 27,071	10,425	\$ 60,563	24	0.16	0.0560	11.99	2.28	Avg Gas Cost/MCF
222 East Central	5,594,460	\$ 477,080	6,813	\$ 56,779	5,019	\$ 33,298	20	0.25	0.0183	10.30	1.94	\$ 7.08
2020 Auburn	2,441,905	\$ 205,494	5,968	\$ 48,154	6,636	\$ 43,764	14	0.35	0.0390	7.36	1.49	Avg Water Cost/CCF
Courthouse	4,961,811	\$ 466,712	83,154	\$ 548,944	26,656	\$ 142,095	11	1.89	0.0606	6.58	2.31	\$ 5.59
Justice Center	11,303,267	\$ 927,573	1,429	\$ 13,125	47,636	\$ 242,021	22	0.03	0.0907	10.78	1.79	Total Utility Cost
	35,957,619	\$ 3,133,736	116,451	\$ 824,048	108,840	\$ 608,760	18	0.49	0.0458	9.06	\$ 1.91	\$ 4,566,544
2011												
	Electric		Gas		Water & Sewer		Electric	Gas	Water	All	All	
	KWH	Cost	MCF	Cost	CCF	Cost	KWH/SF	MCF/SF	CCF/SF	Usage/SF	Cost/SF	
230 E9th	2,851,511	\$ 244,520	7,839	\$ 59,693	6,109	\$ 35,434	15	0.40	0.0312	7.47	1.55	Avg Elec Cost/KWH
800 Broadway	4,247,108	\$ 332,080	7,909	\$ 61,058	8,246	\$ 65,077	17	0.32	0.0330	8.65	1.57	\$ 0.0791
Administration	4,000,303	\$ 325,002	3,066	\$ 25,374	9,928	\$ 62,102	22	0.16	0.0534	10.84	1.88	Avg Gas Cost/MCF
222 East Central	5,441,731	\$ 429,748	7,578	\$ 63,630	4,443	\$ 32,572	20	0.28	0.0162	10.03	1.79	\$ 6.44
2020 Auburn	2,314,128	\$ 181,119	4,919	\$ 37,825	6,272	\$ 47,036	14	0.29	0.0369	6.95	1.29	Avg Water Cost/CCF
Courthouse	4,989,082	\$ 408,941	85,988	\$ 504,457	26,540	\$ 147,649	11	1.95	0.0603	6.65	2.08	\$ 5.86
Justice Center	11,174,656	\$ 847,227	1,338	\$ 12,262	48,135	\$ 252,882	21	0.03	0.0917	10.66	1.64	Total Utility Cost
	35,018,519	\$ 2,768,637	118,637	\$ 764,299	109,673	\$ 642,752	17	0.49	0.0461	8.75	\$ 1.69	\$ 4,175,688

The final tabulations from 2011 show that the electric consumption of these seven buildings decreased by 3% compared to the previous year. The cost of electricity had a more drastic decrease, reducing by 12%. Natural gas consumption increased by 2%, and water consumption increased by 4%. The cooling degree days and heating degree days were more favorable in 2011 than 2010. The following Normalized Master Spreadsheet presents the utility consumption and cost in an "All Things Being Equal" manner.

The following spreadsheet is normalized energy utility tracking data. In this spreadsheet the effects of weather, the timing of meter reading, and changes in utility cost are factored out of the utility consumption and cost to present the data in an easily comparable manner. A comparison between the normalized energy usage in 2011 to 1997 shows an electric consumption reduction of 4,200,000 kWh and an decrease in the amount of natural gas consumed of 2,700MCF. At the average utility rates in 2011, this translates into a savings of \$350,000 in 2011 when compared to the base year.

The base year for the comparisons of the buildings is 1997, with the exception of 2020 Auburn. The data collection for this building began later. The base year for the energy consumed by 2020 Auburn is 2000.

Table 2: Normalized Energy Usage

1997 (BASE YEAR)									
	Electric		Gas		Base Elec	Base Gas	Bldg	5%	see note below for % explanation
	KWH	Cost	MCF	Cost	Cost	Cost	Cost/SF		
230 E9th	2,534,892	\$ 189,390	7795	\$ 44,303	\$ 0.0747	\$ 5.68	\$ 1.19	842	cooling degree days
800 Broadway	6,035,141	\$ 320,982	15406	\$ 90,259	\$ 0.0532	\$ 5.86	\$ 1.64	5,330	heating degree days
Administration	5,202,636	\$ 303,122	4182	\$ 25,061	\$ 0.0583	\$ 5.99	\$ 1.76	\$ 0.0558	avg electric cost /kwh
222 East Central	5,633,812	\$ 302,832	9042	\$ 53,826	\$ 0.0538	\$ 5.95	\$ 1.30	\$ 5.86	avg gas cost /mcf
2020 Auburn	-	\$ -	0	\$ -	\$ -	\$ -	\$ -		
Courthouse	5,006,743	\$ 335,393	42844	\$ 252,436	\$ 0.0670	\$ 5.89	\$ 1.34		
Justice Center	10,897,246	\$ 519,945	28928	\$ 168,121	\$ 0.0477	\$ 5.81	\$ 1.31	YEARLY COST	
	35,310,470	\$ 1,971,665	108,198	\$ 634,006				\$ 2,605,671	

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1998									
Adjusted Electric		Adjusted Gas		Actual	Actual	Bldg			
KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF			
230 E9th	2,556,205	\$ 190,983	6,697	\$ 38,065	\$ 0.0747	\$ 5.80	\$ 1.17	1,238	cooling degree days
800 Broadway	6,041,797	\$ 321,336	11,163	\$ 65,400	\$ 0.0544	\$ 5.76	\$ 1.55	4,168	heating degree days
Administration	5,291,294	\$ 308,288	3,790	\$ 22,709	\$ 0.0574	\$ 5.74	\$ 1.78	\$ 0.0557	avg electric cost /kwh
222 East Central	5,811,290	\$ 312,372	6,456	\$ 38,429	\$ 0.0554	\$ 5.75	\$ 1.28	\$ 5.75	avg gas cost /mcf
2020 Auburn	-	\$ -	-	\$ -	\$ -	\$ -	\$ -		
Courthouse	4,734,909	\$ 317,183	30,604	\$ 180,318	\$ 0.0649	\$ 5.72	\$ 1.13		
Justice Center	11,055,336	\$ 527,488	21,339	\$ 124,016	\$ 0.0473	\$ 5.78	\$ 1.24	YEARLY COST	
	35,490,831	\$ 1,977,650	80,049	\$ 468,937				\$ 2,446,587	
1999									
Electric		Gas		Actual	Actual	Bldg			
KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF			
230 E9th	2,799,253	\$ 209,141	7,984	\$ 45,380	\$ 0.0739	\$ 5.22	\$ 1.30	1,253	cooling degree days
800 Broadway	5,196,398	\$ 276,373	10,076	\$ 59,030	\$ 0.0561	\$ 5.20	\$ 1.34	4,675	heating degree days
Administration	5,182,490	\$ 301,948	3,058	\$ 18,325	\$ 0.0578	\$ 5.21	\$ 1.72	\$ 0.0566	avg electric cost /kwh
222 East Central	5,832,797	\$ 313,528	7,167	\$ 42,663	\$ 0.0546	\$ 0.53	\$ 1.30	\$ 4.86	avg gas cost /mcf
2020 Auburn	-	\$ -	-	\$ -	\$ -	\$ -	\$ -		
Courthouse	5,061,064	\$ 339,032	39,600	\$ 233,321	\$ 0.0670	\$ 5.29	\$ 1.30		
Justice Center	11,211,598	\$ 534,944	24,484	\$ 142,292	\$ 0.0483	\$ 5.15	\$ 1.29	YEARLY COST	
	35,283,600	\$ 1,974,967	92,369	\$ 541,012				\$ 2,515,979	
2000									
Electric		Gas		Actual	Actual	Bldg		Degree Days	
KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF			
230 E9th	3,198,905	\$ 239,001	11,683	\$ 66,403	\$ 0.0652	\$ 6.10	\$ 1.56	914	cooling degree days
800 Broadway	4,988,896	\$ 265,337	9,029	\$ 52,897	\$ 0.0573	\$ 6.63	\$ 1.27	5,187	heating degree days
Administration	5,271,175	\$ 307,115	3,656	\$ 21,907	\$ 0.0561	\$ 7.02	\$ 1.77	\$ 0.0570	avg electric cost /kwh
222 East Central	5,767,310	\$ 310,008	8,300	\$ 49,407	\$ 0.0546	\$ 5.73	\$ 1.31	\$ 6.42	avg gas cost /mcf
2020 Auburn	2,718,734	\$ 201,521	6,304	\$ 59,438	\$ 0.0741	\$ 8.94	\$ 1.54		
Courthouse	5,398,251	\$ 361,619	50,183	\$ 295,676	\$ 0.0638	\$ 6.41	\$ 1.49		
Justice Center	10,962,268	\$ 523,048	18,470	\$ 107,340	\$ 0.0489	\$ 5.85	\$ 1.20	YEARLY COST	
	38,305,538	\$ 2,207,649	107,625	\$ 653,069				\$ 2,860,718	
2001									
Electric		Gas		Actual	Actual	Bldg			
KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF			
230 E9th	2,963,282	\$ 221,397	9,178	\$ 52,162	\$ 0.0706	\$ 7.73	\$ 1.40	1,033	cooling degree days
800 Broadway	4,822,368	\$ 256,480	7,951	\$ 46,583	\$ 0.0698	\$ 8.69	\$ 1.21	4,672	heating degree days
Administration	5,348,536	\$ 311,623	3,600	\$ 21,570	\$ 0.0563	\$ 8.60	\$ 1.79	\$ 0.0585	avg electric cost /kwh
222 East Central	5,316,664	\$ 285,785	7,150	\$ 42,562	\$ 0.0583	\$ 7.38	\$ 1.19	\$ 7.33	avg gas cost /mcf
2020 Auburn	-	\$ -	6,474	\$ 57,900	\$ -	\$ -	\$ 0.34		
Courthouse	5,561,248	\$ 372,538	63,421	\$ 373,671	\$ 0.0641	\$ 7.66	\$ 1.70		
Justice Center	11,349,490	\$ 541,523	6,730	\$ 39,115	\$ 0.0488	\$ 8.39	\$ 1.11	YEARLY COST	
	35,361,587	\$ 1,989,346	104,503	\$ 633,564				\$ 2,622,909	
2002									
Electric		Gas		Actual	Actual	Bldg			
KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF			
230 E9th	3,223,402	\$ 240,831	10,455	\$ 59,420	\$ 0.0693	\$ 6.13	\$ 1.53	1,417	cooling degree days
800 Broadway	5,059,082	\$ 269,070	8,206	\$ 48,075	\$ 0.0596	\$ 6.11	\$ 1.27	4,938	heating degree days
Administration	5,217,174	\$ 303,969	3,812	\$ 22,840	\$ 0.0574	\$ 6.12	\$ 1.76	\$ 0.0568	avg electric cost /kwh
222 East Central	-	\$ -	-	\$ -	\$ -	\$ -	\$ -	\$ 6.02	avg gas cost /mcf
2020 Auburn	2,940,274	\$ 217,942	-	\$ -	\$ 0.0524	\$ -	\$ 1.28		
Courthouse	5,461,874	\$ 365,881	70,701	\$ 416,565	\$ 0.0657	\$ 5.99	\$ 1.78		
Justice Center	11,565,586	\$ 551,834	5,330	\$ 30,976	\$ 0.0486	\$ 6.05	\$ 1.11	YEARLY COST	
	33,467,392	\$ 1,949,528	98,503	\$ 577,875				\$ 2,527,403	
2003									
Electric		Gas		Actual	Actual	Bldg			
KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF			
230 E9th	2,908,339	\$ 217,292	9,699	\$ 55,125	\$ 0.0719	\$ 7.99	\$ 1.39	849	cooling degree days
800 Broadway	4,755,136	\$ 252,904	8,096	\$ 47,430	\$ 0.0558	\$ 8.17	\$ 1.20	5,180	heating degree days
Administration	4,990,660	\$ 290,772	4,156	\$ 24,901	\$ 0.0567	\$ 8.21	\$ 1.70	\$ 0.0567	avg electric cost /kwh
222 East Central	-	\$ -	-	\$ -	\$ -	\$ -	\$ -	\$ 7.92	avg gas cost /mcf
2020 Auburn	-	\$ -	-	\$ -	\$ -	\$ -	\$ -		
Courthouse	5,383,320	\$ 360,619	71,764	\$ 422,828	\$ 0.0656	\$ 7.87	\$ 1.78		
Justice Center	11,172,970	\$ 533,101	3,541	\$ 20,579	\$ 0.0487	\$ 7.87	\$ 1.05	YEARLY COST	
	29,210,426	\$ 1,654,688	97,255	\$ 570,864				\$ 2,225,552	

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2004									
	Electric		Gas		Actual	Actual	Bldg		
	KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF		
230 E9th	3,330,309	\$ 248,818	10,196	\$ 57,949	\$ 0.0682	\$ 8.58	\$ 1.57	941	cooling degree days
800 Broadway	4,644,139	\$ 247,001	7,023	\$ 41,147	\$ 0.0589	\$ 8.96	\$ 1.15	4847	heating degree days
Administration	4,824,258	\$ 281,077	3,299	\$ 19,769	\$ 0.0564	\$ 9.06	\$ 1.62	\$ 0.0565	avg electric cost /kwh
222 East Central	-	\$ -	-	\$ -	\$ -	\$ -	\$ -	\$ 7.81	avg gas cost /mcf
2020 Auburn	-	\$ -	-	\$ -	\$ -	\$ -	\$ -		
Courthouse	5,526,477	\$ 370,209	90,460	\$ 532,986	\$ 0.0638	\$ 7.56	\$ 2.05		
Justice Center	11,418,244	\$ 544,804	2,890	\$ 16,795	\$ 0.0487	\$ 8.45	\$ 1.07		
	29,743,426	\$ 1,691,909	113,868	\$ 668,645					YEARLY COST \$ 2,360,554
2005									
	Electric		Gas		Actual	Actual	Bldg		
	KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF		
230 E9th	3,245,874	\$ 242,510	10,189	\$ 57,909	\$ 0.0843	\$ 7.83	\$ 1.53	1,361	cooling degree days
800 Broadway	4,783,962	\$ 254,437	8,304	\$ 48,649	\$ 0.0709	\$ 7.27	\$ 1.21	4,945	heating degree days
Administration	5,175,643	\$ 301,549	4,140	\$ 24,809	\$ 0.0696	\$ 7.33	\$ 1.75	\$ 0.0695	avg electric cost /kwh
222 East Central	-	\$ -	-	\$ -	\$ -	\$ -	\$ -	\$ 5.97	avg gas cost /mcf
2020 Auburn	-	\$ -	-	\$ -	\$ -	\$ -	\$ -		
Courthouse	5,582,562	\$ 373,966	88,752	\$ 522,925	\$ 0.0776	\$ 5.45	\$ 2.04		
Justice Center	11,632,487	\$ 555,026	2,906	\$ 16,891	\$ 0.0610	\$ 9.82	\$ 1.09		
	30,420,527	\$ 1,727,489	114,292	\$ 671,183					YEARLY COST \$ 2,398,672
2006									
	Electric		Gas		Actual	Actual	Bldg		
	KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF		
230 E9th	2,771,091	\$ 207,037	7,800	\$ 44,330	\$ 0.0976	\$ 12.22	\$ 1.28	1,105	cooling degree days
800 Broadway	4,843,072	\$ 257,581	7,226	\$ 42,337	\$ 0.0758	\$ 12.81	\$ 1.20	4,425	heating degree days
Administration	4,944,739	\$ 288,096	2,563	\$ 15,357	\$ 0.0753	\$ 12.94	\$ 1.63	\$ 0.0817	avg electric cost /kwh
222 East Central	-	\$ -	-	\$ -	\$ -	\$ -	\$ -	\$ 9.93	avg gas cost /mcf
2020 Auburn	-	\$ -	6,026	\$ 53,900	\$ -	\$ -	\$ 0.32		
Courthouse	5,371,804	\$ 359,848	81,438	\$ 479,829	\$ 0.0845	\$ 10.04	\$ 1.91		
Justice Center	11,282,816	\$ 538,342	2,552	\$ 14,831	\$ 0.0648	\$ 11.87	\$ 1.05		
	29,213,522	\$ 1,650,905	107,605	\$ 650,585					YEARLY COST \$ 2,301,489
2007									
	Electric		Gas		Actual	Actual	Bldg		
	KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF		
230 E9th	3,102,139	\$ 231,771	7,838	\$ 44,547	\$ 0.1012	\$ 8.20	\$ 1.41	1,523	cooling degree days
800 Broadway	5,134,302	\$ 273,070	8,348	\$ 48,907	\$ 0.0810	\$ 8.24	\$ 1.29	4,520	heating degree days
Administration	5,298,474	\$ 308,706	2,089	\$ 12,515	\$ 0.0825	\$ 8.27	\$ 1.73	\$ 0.0813	avg electric cost /kwh
222 East Central	-	\$ -	-	\$ -	\$ -	\$ -	\$ -	\$ 7.64	avg gas cost /mcf
2020 Auburn	2,697,122	\$ 199,919	6,088	\$ 54,453	\$ 0.0807	\$ -	\$ 1.50		
Courthouse	5,630,674	\$ 377,189	82,443	\$ 485,748	\$ 0.0892	\$ 8.07	\$ 1.96		
Justice Center	11,806,225	\$ 563,316	1,352	\$ 7,858	\$ 0.0722	\$ 8.09	\$ 1.09		
	33,668,937	\$ 1,953,971	108,157	\$ 654,029					YEARLY COST \$ 2,608,000
2008									
	Electric		Gas		Actual	Actual	Bldg		
	KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF		
230 E9th	2,665,194	\$ 199,126	8,347	\$ 47,442	\$ 0.1117	\$ 9.75	\$ 1.26	1,100	cooling degree days
800 Broadway	4,467,671	\$ 237,615	8,058	\$ 47,210	\$ 0.0879	\$ 9.23	\$ 1.14	4,914	heating degree days
Administration	4,859,508	\$ 283,130	2,904	\$ 17,401	\$ 0.0840	\$ 9.29	\$ 1.62	\$ 0.0850	avg electric cost /kwh
222 East Central	5,557,033	\$ 298,705	7,601	\$ 45,249	\$ 0.0829	\$ 11.28	\$ 1.25	\$ 9.97	avg gas cost /mcf
2020 Auburn	2,528,049	\$ 187,387	6,503	\$ 58,162	\$ 0.0837	\$ 11.96	\$ 1.44		
Courthouse	4,653,494	\$ 311,730	83,296	\$ 490,778	\$ 0.0995	\$ 9.82	\$ 1.82		
Justice Center	11,129,707	\$ 531,037	1,633	\$ 9,489	\$ 0.0732	\$ 9.99	\$ 1.03		
	35,860,658	\$ 2,048,730	118,342	\$ 715,731					YEARLY COST \$ 2,764,460
2009									
	Electric		Gas		Actual	Actual	Bldg		
	KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF		
230 E9th	2,520,083	\$ 188,284	8,338	\$ 47,390	\$ 0.1218	\$ 9.52	\$ 1.20	882	cooling degree days
800 Broadway	3,908,849	\$ 207,894	5,924	\$ 34,704	\$ 0.1009	\$ 10.85	\$ 0.97	4,719	heating degree days
Administration	4,365,839	\$ 254,368	2,517	\$ 15,083	\$ 0.0988	\$ 10.98	\$ 1.45	\$ 0.0956	avg electric cost /kwh
222 East Central	5,115,101	\$ 274,950	6,805	\$ 40,512	\$ 0.0925	\$ 10.45	\$ 1.15	\$ 8.80	avg gas cost /mcf
2020 Auburn	2,415,046	\$ 179,011	6,256	\$ 55,954	\$ 0.0909	\$ 9.69	\$ 1.38		
Courthouse	4,592,249	\$ 307,627	78,587	\$ 463,031	\$ 0.1083	\$ 8.26	\$ 1.75		
Justice Center	9,933,115	\$ 473,943	1,395	\$ 8,106	\$ 0.0822	\$ 10.05	\$ 0.92		
	32,850,283	\$ 1,886,076	109,822	\$ 664,780					YEARLY COST \$ 2,550,857

Hamilton County Department of County Facilities

2010									
	Electric		Gas		Actual	Actual	Bldg		
	KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF		
230 E9th	2,778,690	\$ 207,701	7,567	\$ 43,895	\$ 0.0984	\$ 8.00	\$ 1.28	1418	cooling degree days
800 Broadway	4,232,361	\$ 230,446	7,665	\$ 44,157	\$ 0.0869	\$ 8.16	\$ 1.10	5032	heating degree days
Administration	4,299,057	\$ 246,882	2,844	\$ 16,319	\$ 0.0894	\$ 9.01	\$ 1.42	\$ 0.0872	avg electric cost /kwh
222 East Central	5,428,363	\$ 300,478	6,453	\$ 37,109	\$ 0.0853	\$ 8.33	\$ 1.23	\$ 7.08	avg gas cost /mcf
2020 Auburn	2,369,406	\$ 175,628	5,652	\$ 50,552	\$ 0.0842	\$ 8.07	\$ 1.33		
Courthouse	4,814,496	\$ 312,491	78,750	\$ 450,697	\$ 0.0941	\$ 6.60	\$ 1.73		
Justice Center	10,967,676	\$ 518,264	1,353	\$ 7,813	\$ 0.0821	\$ 9.19	\$ 1.00	YEARLY COST	
	34,890,048	\$ 1,991,889	110,284	\$ 650,542				\$ 2,642,431	
2011									
	Electric		Gas		Actual	Actual	Bldg		
	KWH	Cost	MCF	Cost	Elec Cost	Gas Cost	Cost/SF		
230 E9th	2,754,227	\$ 203,669	7,388	\$ 38,534	\$ 0.0858	\$ 7.61	\$ 1.24	1234	cooling degree days
800 Broadway	4,102,211	\$ 230,314	7,454	\$ 38,762	\$ 0.0782	\$ 7.72	\$ 1.08	4632	heating degree days
Administration	3,863,826	\$ 223,230	2,889	\$ 15,053	\$ 0.0812	\$ 8.28	\$ 1.28	\$ 0.0791	avg electric cost /kwh
222 East Central	5,256,077	\$ 286,948	7,142	\$ 3,782	\$ 0.0790	\$ 8.40	\$ 1.06	\$ 6.44	avg gas cost /mcf
2020 Auburn	2,235,178	\$ 165,678	4,636	\$ 41,462	\$ 0.0783	\$ 7.69	\$ 1.22		
Courthouse	4,818,871	\$ 322,953	81,040	\$ 428,321	\$ 0.0820	\$ 5.87	\$ 1.71		
Justice Center	10,793,414	\$ 520,864	1,261	\$ 6,490	\$ 0.0758	\$ 9.16	\$ 1.00	YEARLY COST	
	33,823,803	\$ 1,953,655	111,811	\$ 572,404				\$ 2,526,059	

Aggregate Energy & Water Usage Graphs

The following graphs demonstrate building usage per square foot and cost per square foot basis. These trends are monitored to ensure that building usage does not rise disproportionately to occupancy and weather demands.

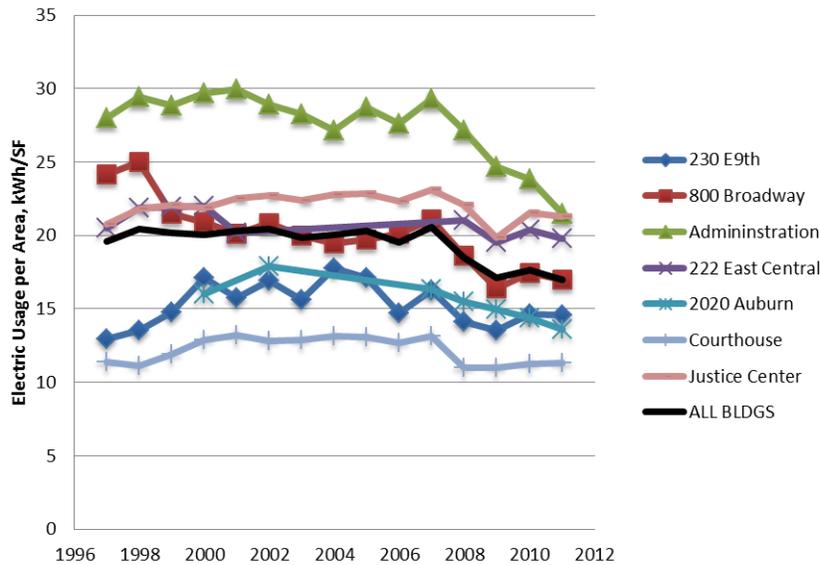


Figure 4: Annual Electric Usage/SF Comparison

In reviewing this chart, one can see that the electric consumption per unit area has decreased since the previous year overall. This data indicates the County buildings are continuing to use electricity at thrifty rate and that attention has been paid to maintain tenant comfort in an efficient manner. 2020 Auburn and the County Administration Building show the most improvement in the past year again, and nearly every other building reduced consumption of electricity as well. The average electric consumption per unit area for all of these buildings has been reducing greatly over the last four years, as indicated by the thick black line on Figure 4.

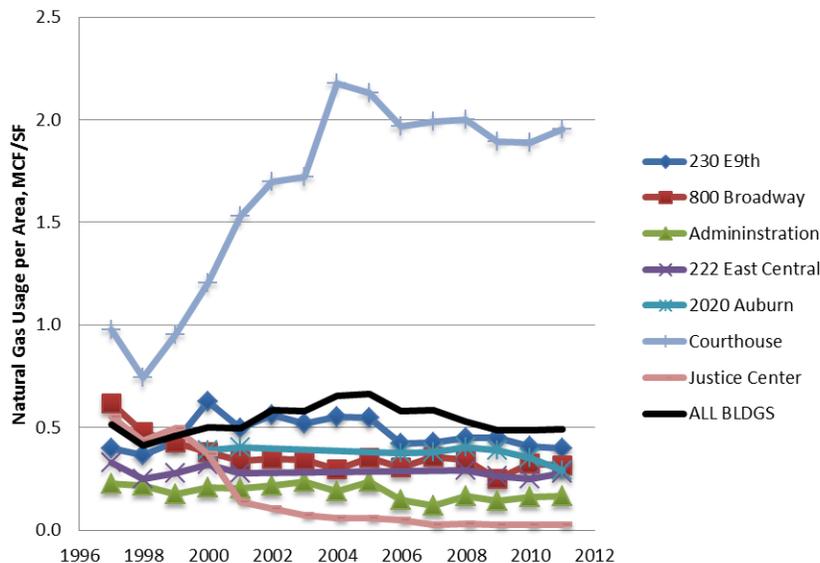


Figure 5: Annual Gas Usage/SF Comparison

The natural gas usage chart indicates that usage over the years is remaining relatively steady, with slight decreases as a general rule. The buildings have operated in a steady and efficient manner

Hamilton County Department of County Facilities

overall. This chart also indicates when the Courthouse started providing natural gas to the Justice Center (note the large increase in Courthouse). This allows the County to purchase natural gas from Duke Energy on the cheaper IT (interruptible gas tariff) rate for both buildings (see Courthouse IT savings later in report). What is good to note is the Courthouse has been steadily declining since 2004 even with the additional usage.

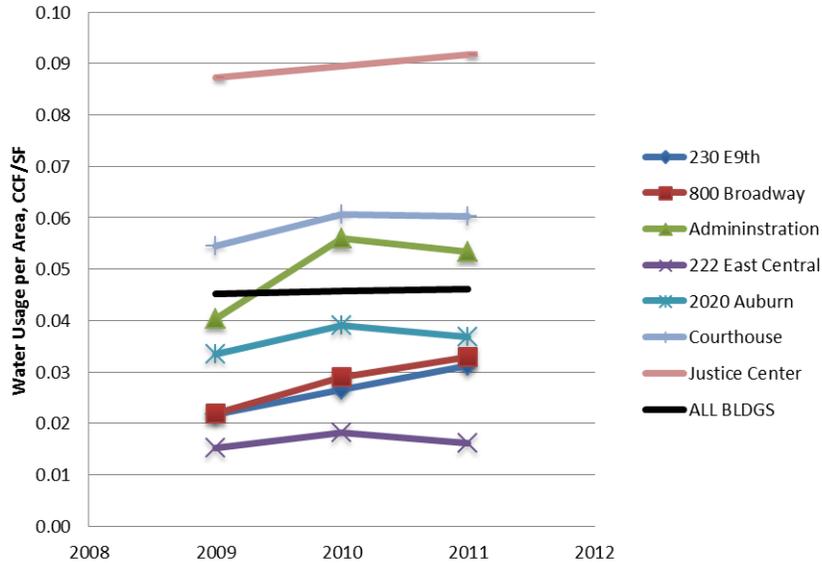


Figure 6: Annual Water Usage/SF Comparison

As shown in the annual water and sewer consumption per square foot chart above, the usage/sf has increased slightly in 2011 compared to 2009 and 2010. The Administration building, 2020 Auburn, and 222 East Central have reduced water consumption, while the Justice Center, 800 Broadway, and 230 E 9th have increased water consumption.

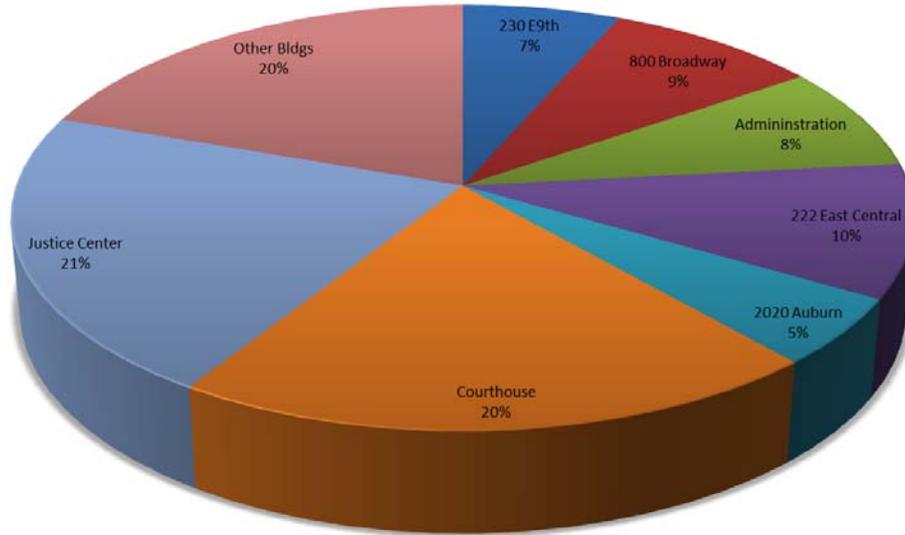


Figure 7: Utility Cost Contributed by Each Building (Electric, Natural Gas & Water)

Other Buildings include: 237 William Howard Taft, Hillcrest Schools, 250 William Howard Taft, Public Works Garages, Sheriff Parking Lot, Patrol Headquarters, Memorial Hall, Communication Center, Coroner's Office, Records Center, the Target Range, and Road Maintenance.

In reviewing the overall utility usage, based on the chart above, it is interesting to note that the Courthouse and the Justice Center continue to be the two largest users of energy by far. This corresponds to these two buildings having the largest area and most hours of operation. The portion of utility cost allocated to "other buildings" has increased drastically, likely partially due to the inclusion of 237 WHT this past year. Overall the buildings are each within 1% of last year, with the exception of the Courthouse which is slightly higher (2% total).

Utility Unit Costs

In 2011, the electric and natural gas cost for the buildings decreased. The electric cost per kWh dropped another 9% from 2010, from \$0.0872 to \$0.0791 per kWh. The average cost of natural gas for the year dropped 9% from the previous year, decreasing from \$7.08 to \$6.44. The graphs below illustrate the upward trend in electricity costs since 2004, and natural gas costs since tracking of the buildings began. Natural gas costs do appear to be nearing base-year rates.

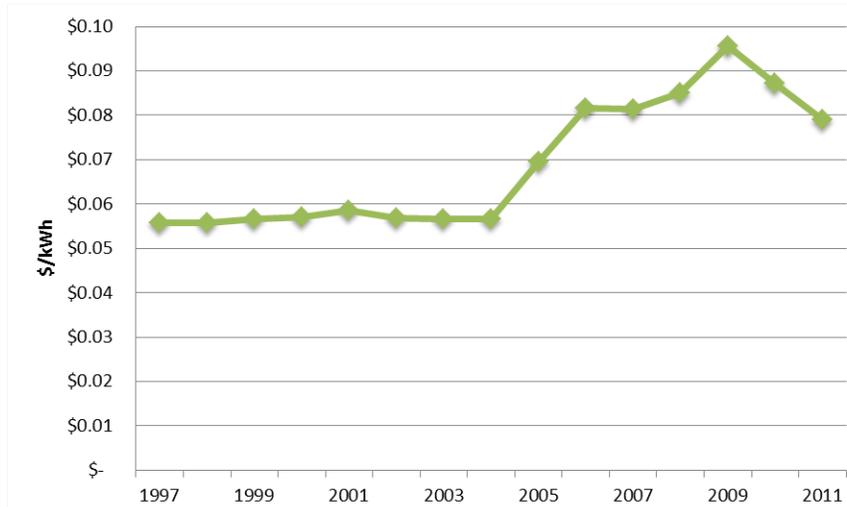


Figure 8: Electric Unit Cost

The unit cost of electric energy has decreased for a second year due to negotiated rates.

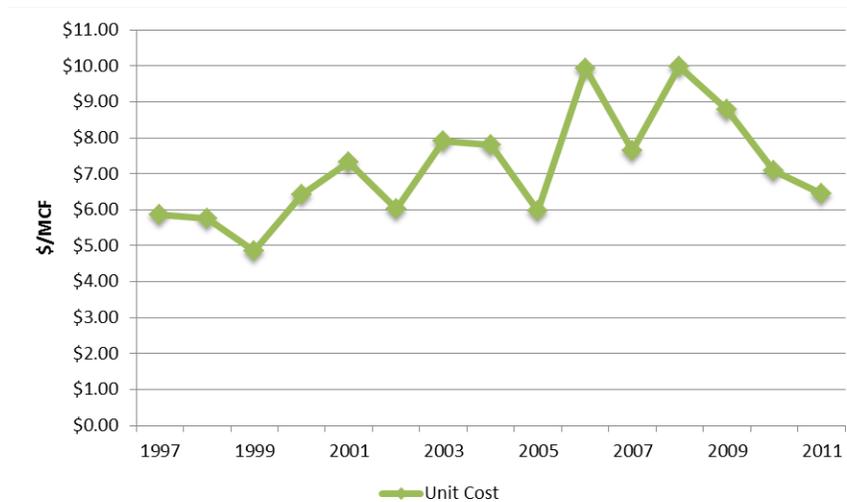


Figure 9: Natural Gas Unit Cost

The cost of natural gas has fluctuated wildly in the past decade, with 2011 costs the lowest they have been in the last several years.

Water and sewer rates increased slightly over the last year, at a total of \$5.70 per ccf.

Building Utility Tracking Graphics

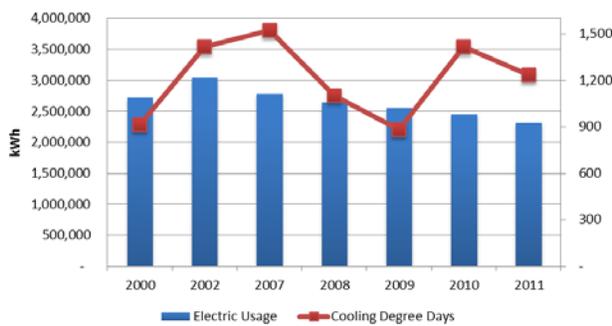
The following tables and figures are visualization and tracking tools used to study, verify and predict usage in the metered buildings on an annual basis. Following each building's data charts is a summary of what observations from these charts and graphs of how well the County has been managing its energy usage.

(beginning on next page)

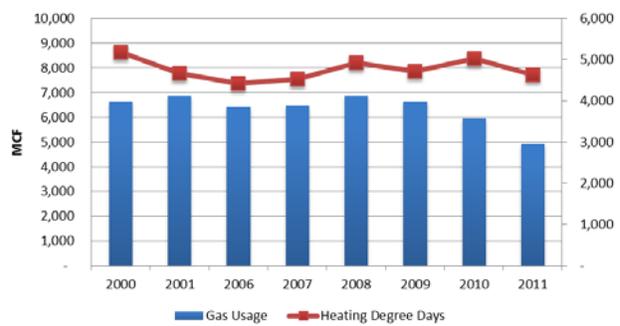
2020 Auburn

2020 - Juvenile Youth Center				ARCHIBUS/FM Bldg Data							
				Bldg Code:	2020						
				Bldg Name:	Juvenile Youth Center						
				Address:	2020 Auburn Ave						
				City:	CINCINNATI						
				State:	OH						
				Postal Code:	45219						
				Site Code:	OTHER LOCATIONS						
				Agency:	Juvenile Court						
				Use:	Jail						
				Const Type:	ConcreteBrick						
Date Built:	1995										
Ext Gross Area:	171,449.94 sf										
Int Gross Area:	164,410.41 sf										
Rentable Area:	158,431.96 sf										
Estimated Area:	0.00 sf										
Total Roof Area:	40,319.30 sf										
Leased/Owned:	Owned										
Floor Count:	6										
Sprinklered? :	Yes										
Property :	088-0007-0020-90										
FI Code	Int Gross	Ext Gross	Vert Pen	Service	Rentable	Usable	Room Area				
01	41,361 sf	42,828 sf	1,201 sf	12,926 sf	40,160 sf	27,234 sf	41,360 sf				
02	29,514 sf	30,891 sf	1,323 sf	4,940 sf	28,191 sf	23,250 sf	29,514 sf				
03	29,611 sf	30,891 sf	1,132 sf	4,678 sf	28,480 sf	23,802 sf	29,611 sf				
04	19,237 sf	20,422 sf	1,132 sf	3,615 sf	18,105 sf	14,489 sf	19,237 sf				
0B	3,179 sf	3,535 sf	0 sf	3,179 sf	3,179 sf	0 sf	3,179 sf				
0R	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf				
LL	41,508 sf	42,884 sf	1,190 sf	19,207 sf	40,318 sf	21,111 sf	41,508 sf				

2020 Auburn Annual Electric Usage



2020 Auburn Annual Gas Usage



The 2020 Auburn Building has continued to improve the annual energy consumption. Electricity usage decreased by 5% and natural gas consumption dropped 18% relative to 2010. Part of this improvement may be contributed to a decrease in both heating and cooling degree days; however, our analysis normalized for weather conditions indicates there is improvement regardless.

(4) High-efficiency condensing boilers have been installed since 2010, and the impact of the improved heating system efficiency is clearly visible. .

The building operators are also employing energy savings strategies to use discarded air to heat and cool the building in free cooling and free heating scenarios.

The heating hot water pumps and 3-ways were modified in 2010 to VFD's and 2-way valves thus eliminating the high energy using constant volume pumping system. The effects are dramatic in the building as the pump volume and pump speeds are dramatically reduced thus showing the decrease in electrical usage even with the rise in degree days in 2010.

Additional controls fine-tuning has continued to improve the operation of this building.

Hamilton County Department of County Facilities

2020-Historical Monthly Electric and Gas Data

The following data is a representation of electrical and gas usage by month for the past three years. The green cells show the minimum usage for the month. The electric and natural gas consumption once gain continued to decrease. Electricity consumption is dropped month after month compared to 2010, while peak electric demand, set in July, remained the same as the previous year. The positive effect of the new boilers at the facility on the natural gas consumption is evident over the past two years, particularly during summer months. The use of water has also decreased, particularly in the first half of the year, totaling a reduction of 5%.

2020 Auburn Electric Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	kWh	195,954	180,241	180,344	198,726	236,122	244,586	249,163	265,811	232,085	169,451	189,207	205,327	2,547,017
	kWa	355	346	511	456	454	494	477	503	496	461	425	344	511
	kWb	460	460	511	463	460	494	478	503	496	466	429	427	511
	Cost	\$ 17,448	\$ 16,781	\$ 16,412	\$ 15,952	\$ 17,177	\$ 21,573	\$ 21,746	\$ 23,245	\$ 22,675	\$ 18,630	\$ 18,985	\$ 20,928	\$ 231,553
2010	kWh	177,128	177,763	165,873	208,430	214,320	240,032	271,039	236,120	215,024	175,628	175,991	184,557	2,441,905
	kWa	346	344	412	458	437	490	480	482	452	410	406	311	490
	kWb	427	427	427	458	439	490	480	482	455	417	417	417	490
	Cost	\$ 15,150	\$ 15,191	\$ 14,423	\$ 17,471	\$ 17,700	\$ 19,871	\$ 21,864	\$ 19,580	\$ 18,056	\$ 15,134	\$ 15,158	\$ 15,896	\$ 205,494
2011	kWh	158,224	156,707	156,612	184,979	202,870	226,286	276,637	229,511	206,632	180,093	165,314	170,263	2,314,128
	kWa	311	304	456	427	467	467	488	482	458	420	416	300	488
	kWb	417	417	458	432	467	467	488	482	458	423	420	415	488
	Cost	\$ 12,576	\$ 12,478	\$ 12,918	\$ 14,635	\$ 16,006	\$ 17,410	\$ 20,808	\$ 17,704	\$ 16,019	\$ 14,094	\$ 13,119	\$ 13,352	\$ 181,119

2020 Auburn Gas Data

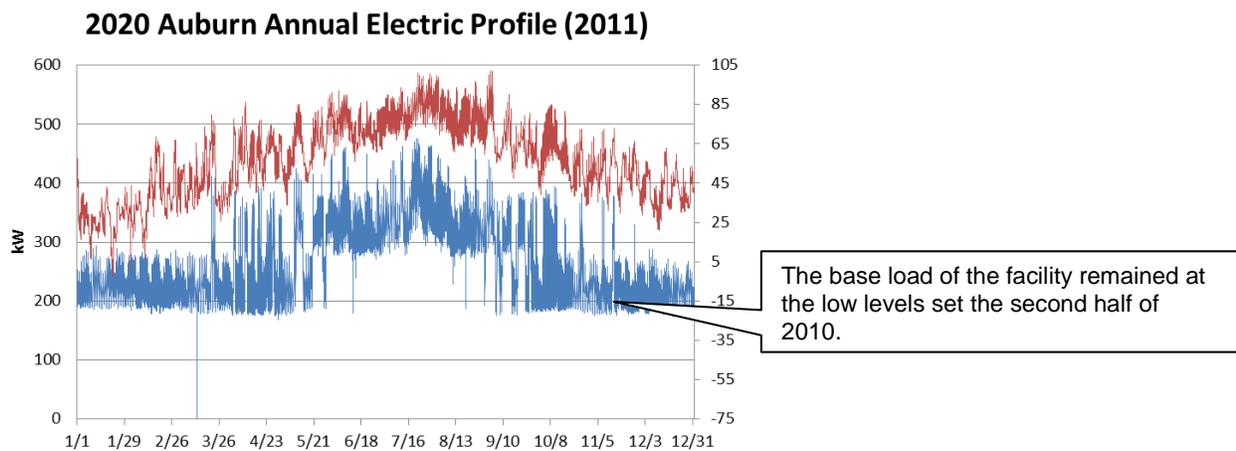
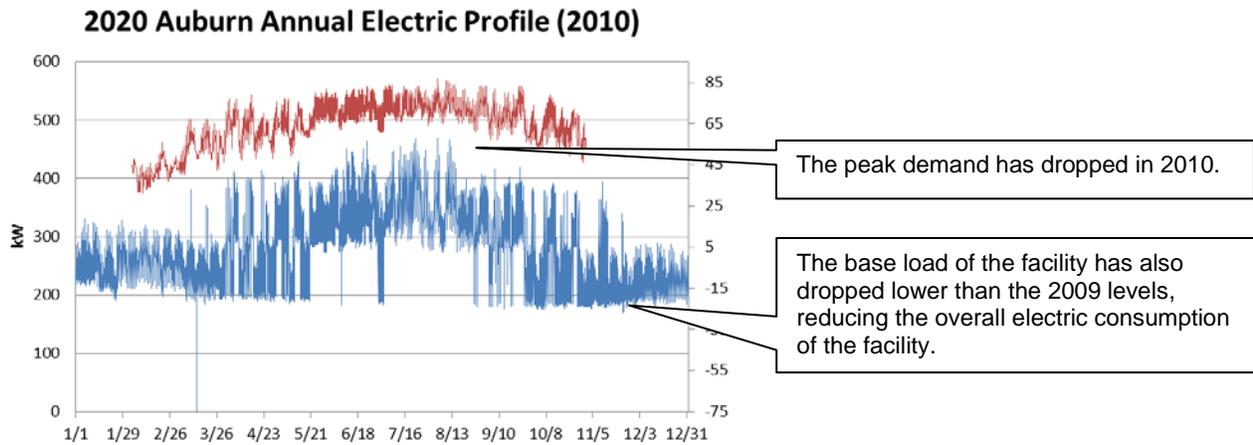
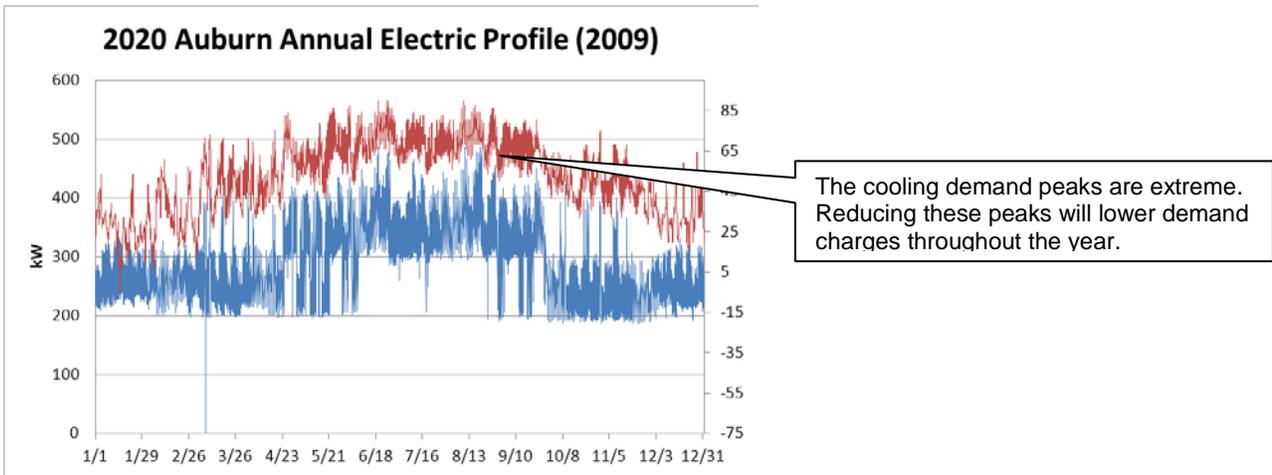
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	10,622	7,850	5,421	4,349	4,007	3,661	4,073	3,975	3,864	4,244	5,214	9,025	66,305
	Cost	\$ 12,650	\$ 9,670	\$ 7,684	\$ 3,117	\$ 2,826	\$ 6,120	\$ 2,844	\$ 2,912	\$ 2,583	\$ 2,772	\$ 4,046	\$ 7,011	\$ 64,235
2010	CCF	11,479	9,569	5,263	3,986	3,840	2,369	1,725	1,490	1,846	2,676	5,150	10,289	59,682
	Cost	\$ 9,585	\$ 7,928	\$ 4,103	\$ 3,065	\$ 2,995	\$ 1,857	\$ 1,463	\$ 1,306	\$ 1,512	\$ 2,140	\$ 4,063	\$ 8,137	\$ 48,154
2011	CCF	9,256	7,118	4,916	3,445	2,515	1,875	1,452	1,463	2,256	3,175	4,649	7,067	49,187
	Cost	\$ 7,347	\$ 5,578	\$ 3,588	\$ 2,661	\$ 2,039	\$ 1,601	\$ 1,269	\$ 1,263	\$ 1,811	\$ 2,359	\$ 3,403	\$ 4,906	\$ 37,825

2020 Auburn Water Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	469	375	516	370	414	632	593	592	640	370	370	355	5,696
	Cost	\$ 2,790	\$ 2,463	\$ 3,463	\$ 2,443	\$ 2,619	\$ 3,807	\$ 3,457	\$ 3,499	\$ 3,817	\$ 2,339	\$ 2,554	\$ 2,462	\$ 35,714
2010	CCF	354	342	365	496	445	756	701	767	991	668	345	406	6,636
	Cost	\$ 2,486	\$ 2,557	\$ 2,951	\$ 3,280	\$ 2,999	\$ 4,737	\$ 4,368	\$ 4,638	\$ 5,886	\$ 4,226	\$ 2,566	\$ 3,071	\$ 43,764
2011	CCF	459	209	449	364	391	701	503	798	1,031	438	520	409	6,272
	Cost	\$ 3,242	\$ 2,000	\$ 3,375	\$ 2,756	\$ 2,900	\$ 4,368	\$ 3,480	\$ 5,082	\$ 6,407	\$ 3,161	\$ 7,102	\$ 3,163	\$ 47,036

Minimum of month for past 3 years

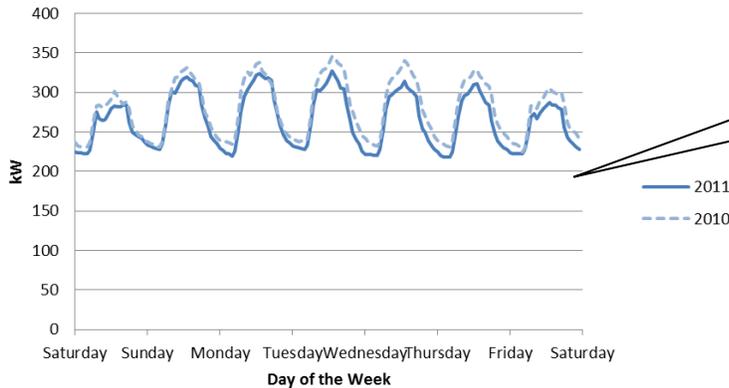
2020-Three Year Electrical Review



2020-Electric Profile Review

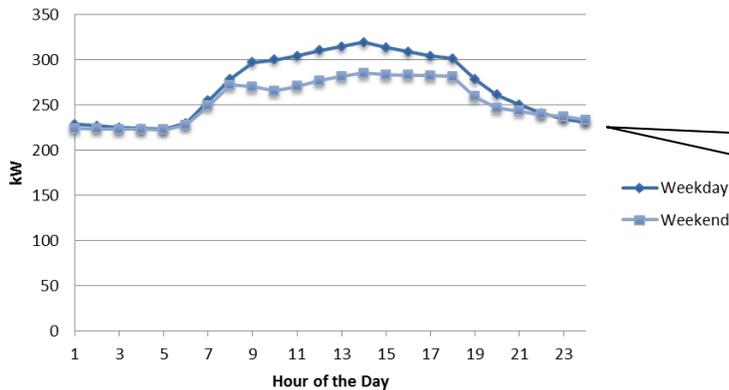
The graphs below illustrate the power requirements of the facility throughout a typical week, typical day and the year. The typical week and typical day profiles are averaged throughout the year in order to view how the electric demand varies during the day and across the week. The load duration curve represents the demand as a function of cumulative time for the year.

2020 Auburn Typical Week Profile



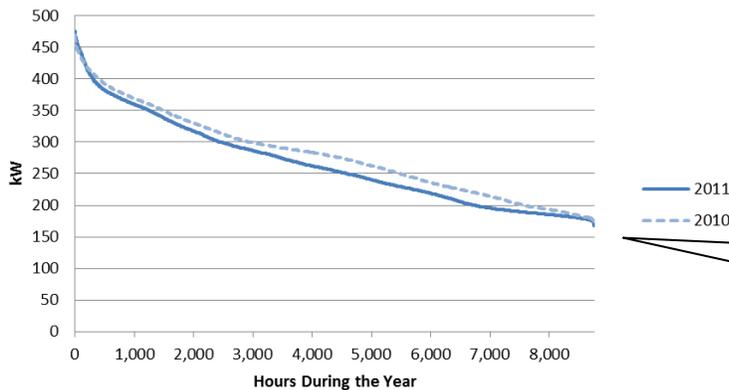
The electric demand has once again been reduced from that of the previous year consistently throughout the week.

2020 Auburn Typical Day Profile (2011)



The power requirement for weekdays and weekends is very similar, because this facility is used every day of the week.

2020 Auburn Load Duration Curve



This curve also demonstrates the consistent reduction in demand throughout the year. The peak demand; however, remained nearly the same.

2020-Energy Star Review

General Information Edit	
Address: 2020 Auburn Avenue , Cincinnati, OH 45219	
Year Built: 1995	
Property Type: (not set)	
Baseline Rating: 65	Current Rating: 81
<input type="checkbox"/> View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	Energy Period Ending Dates Current: November 2011 Baseline: December 2006
Eligibility for the ENERGY STAR	
Eligible to Apply for the ENERGY STAR	

This building earned an Energy Star rating of 81 when classified as an office space and dormitory, unfortunately the facility type is not currently eligible under Energy Star requirements.

2020 Auburn Energy Conservation Measures and Recommendations

Electric – The 2020 Auburn facility achieved the lowest tracked electric consumption for the facility, with a 4% decrease compared to 2009.

Gas – Natural gas consumption decreased to the lowest tracked level as well, with a 12% decrease from the previous year’s consumption. The installation of new high-efficiency boilers and much lower summer natural gas consumption contributed to this accomplishment.

Previous ECM's

- Boiler replacement with high-efficiency condensing boilers.

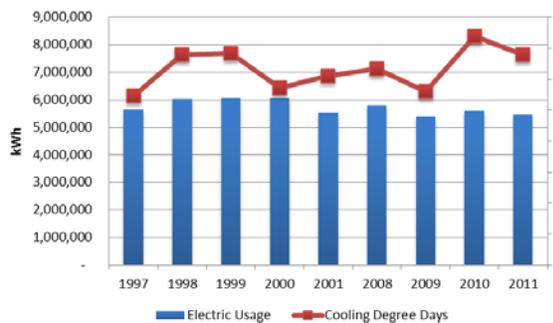
Proposed ECM's

- Perform a full ECM audit using the Ameresco/ThermalTech team.

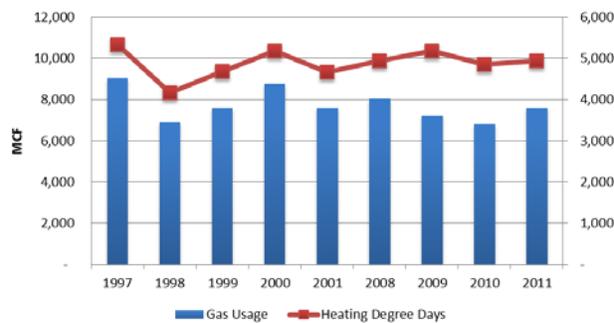
222 Central Parkway

0222 - Alms & Doepke Building				ARCHIBUS/FM Bldg Data							
				Bldg Code:	0222						
				Bldg Name:	Alms & Doepke Building						
				Address:	222 East Central Parkway						
				City:	CINCINNATI						
				State:	OH						
				Postal Code:	45202						
				Site Code:	COUNTYCAMPUS						
				Agency:	Job/Family Services						
				Use:	Office						
				Const Type:	Brick						
Date Built:	1878										
Ext Gross Area:	278,611.88 sf										
Int Gross Area:	260,361.49 sf										
Rentable Area:	249,800.68 sf										
Estimated Area:	0.00 sf										
Total Roof Area:	0.00 sf										
Leased/Owned:	Owned										
Floor Count:	8										
Sprinklered? :	Yes										
Property :	075-0004-0240-00										
FI Code	Int Gross	Ext Gross	Vert Pen	Service	Rentable	Usable	Room Area				
01	37,349 sf	39,398 sf	1,432 sf	5,301 sf	35,917 sf	30,616 sf	24,610 sf				
02	37,707 sf	40,218 sf	1,467 sf	3,183 sf	36,240 sf	33,056 sf	24,001 sf				
03	37,766 sf	40,236 sf	1,406 sf	3,502 sf	36,360 sf	32,857 sf	27,015 sf				
04	37,835 sf	40,218 sf	1,457 sf	3,158 sf	36,378 sf	33,220 sf	24,916 sf				
05	37,981 sf	40,932 sf	1,355 sf	3,412 sf	36,626 sf	33,214 sf	24,096 sf				
06	29,458 sf	31,598 sf	1,694 sf	3,118 sf	27,764 sf	24,646 sf	22,437 sf				
07	4,950 sf	5,460 sf	376 sf	475 sf	4,574 sf	4,098 sf	3,704 sf				
0B	37,315 sf	40,552 sf	1,372 sf	6,602 sf	35,943 sf	29,341 sf	31,443 sf				
OUT	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf				
SB	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf				

222 East Central Annual Electric Usage



222 East Central Annual Gas Usage



The 222 Central Parkway has been trended over the last three years, with several years of historical data collected for comparison. The Facilities Department took over building operation at this facility in 2008. The building continues to become more energy efficient as indicated by both the electric & natural gas usages over the last couple of years. Electric consumption is up slightly from 2009; however this 4% increase corresponds to a 60% increase in cooling degree days for the year and an increase in occupancy. This is a good trend overall.

Hamilton County Department of County Facilities

222-Historical Monthly Electric and Gas Data

The following data is a representation of electrical and gas usage by month. The green cells show the minimum usage for the month. In 2011, the electric consumption decreased compared to 2010, as discussed previously and as indicated by the green shades in half a dozen months. The peak electric consumption increased compared to the previous year, setting a higher ratchet charge following the summer of 2011. Natural gas consumption increased by 11% overall, and water consumption decreased by 11%.

222 East Central Electric Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	kWh	443,468	433,881	389,183	399,433	440,196	519,451	517,550	528,948	499,830	396,855	383,180	419,521	5,371,496
	kWa	892	903	1,159	1,036	1,074	1,134	1,130	1,103	1,110	1,091	1,042	886	1,159
	kWb	1,014	1,010	1,159	1,036	1,074	1,134	1,130	1,103	1,110	1,091	1,042	964	1,159
	Cost	\$ 39,632	\$ 38,509	\$ 39,196	\$ 34,081	\$ 36,121	\$ 39,905	\$ 47,337	\$ 48,086	\$ 46,806	\$ 43,374	\$ 41,754	\$ 42,274	\$ 497,075
2010	kWh	390,572	382,129	398,069	430,623	432,077	531,265	597,538	619,216	535,662	438,404	384,756	454,147	5,594,458
	kWa	786	889	1,051	1,256	1,119	1,232	1,136	1,171	1,090	1,089	1,058	1,018	1,256
	kWb	985	964	1,051	1,256	1,119	1,232	1,136	1,171	1,090	1,089	1,058	1,048	1,256
	Cost	\$ 33,695	\$ 32,967	\$ 34,712	\$ 38,521	\$ 37,522	\$ 44,945	\$ 48,685	\$ 50,483	\$ 44,320	\$ 38,110	\$ 34,314	\$ 38,806	\$ 477,080
2011	kWh	493,010	417,153	372,969	418,225	409,510	483,565	599,942	559,803	491,436	405,187	405,297	385,634	5,441,731
	kWa	880	912	867	1,063	1,109	1,155	1,312	1,109	1,138	1,081	1,073	1,013	1,312
	kWb	1,047	1,047	1,047	1,063	1,109	1,155	1,312	1,115	1,138	1,115	1,115	1,115	1,312
	Cost	\$ 37,730	\$ 32,796	\$ 29,922	\$ 33,501	\$ 33,184	\$ 38,309	\$ 46,581	\$ 42,805	\$ 38,489	\$ 32,565	\$ 32,572	\$ 31,294	\$ 429,748

222 East Central Taft Gas Data

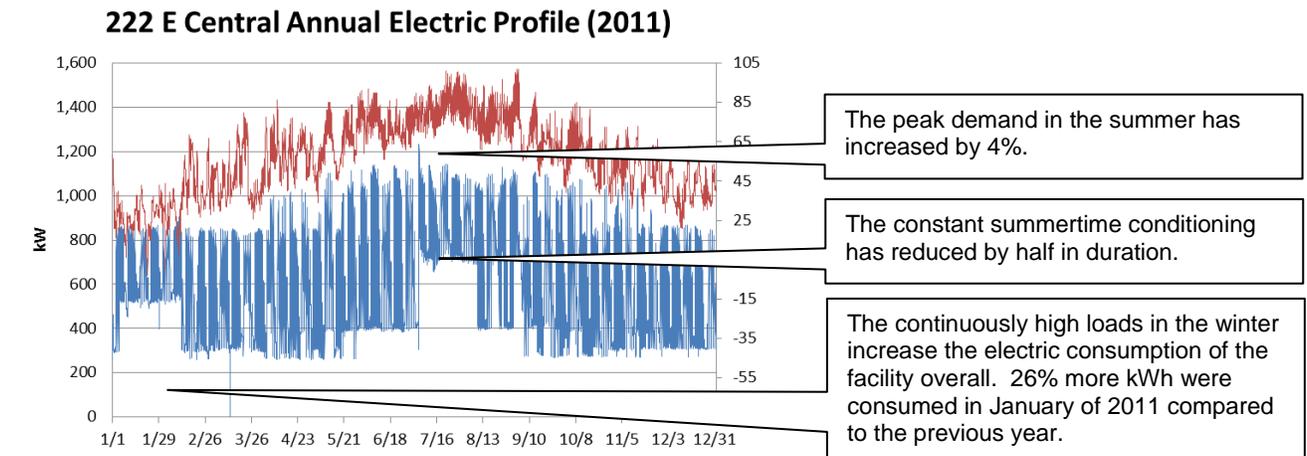
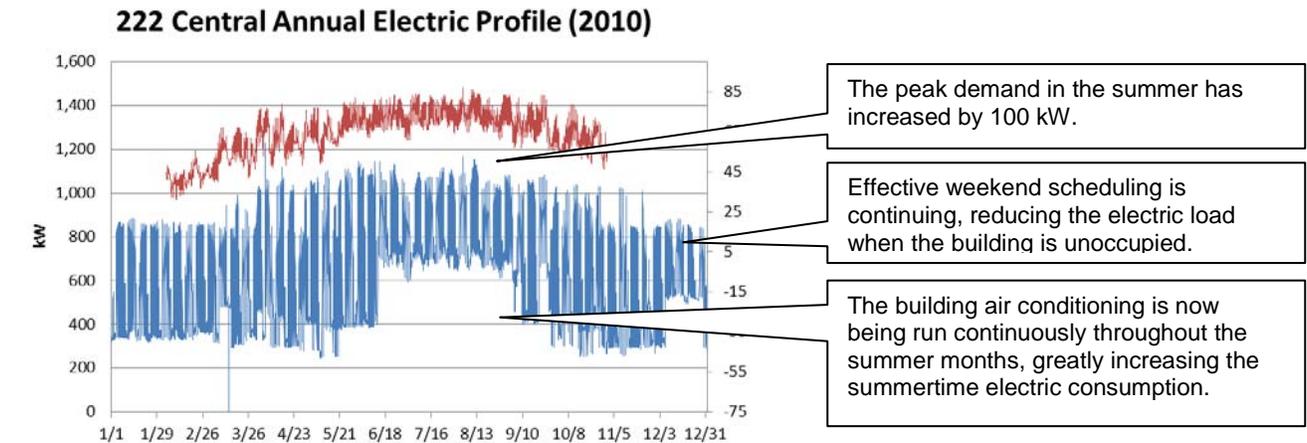
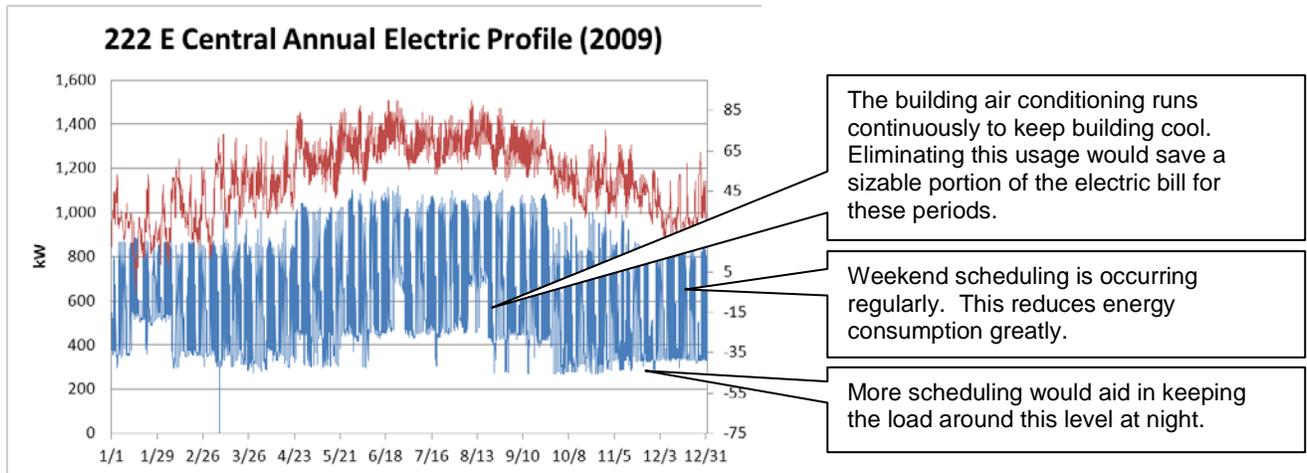
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2009	CCF	18,524	15,471	8,729	6,247	582	139	119	119	3,841	4,887	13,360	72,128
	Cost	\$ 21,987	\$ 18,962	\$ 12,313	\$ 4,436	\$ 477	\$ 153	\$ 134	\$ 131	\$ 130	\$ 2,515	\$ 3,797	\$ 10,341
2010	CCF	17,164	15,262	7,788	1,902	846	126	113	163	250	1,930	5,972	68,134
	Cost	\$ 14,310	\$ 12,742	\$ 6,564	\$ 1,694	\$ 906	\$ 389	\$ 376	\$ 415	\$ 480	\$ 1,649	\$ 4,574	\$ 12,682
2011	CCF	22,928	17,379	9,642	7,078	2,531	201	73	15	379	2,013	3,010	75,778
	Cost	\$ 17,917	\$ 13,672	\$ 7,553	\$ 5,145	\$ 2,111	\$ 2,572	\$ 86	\$ 428	\$ 584	\$ 1,727	\$ 4,340	\$ 7,495

222 East Central Taft Water Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2009	CCF	197	226	263	212	315	497	481	599	568	324	235	4,184
	Cost	\$ 1,508	\$ 1,742	\$ 2,108	\$ 1,658	\$ 2,138	\$ 3,064	\$ 2,854	\$ 3,462	\$ 3,388	\$ 2,155	\$ 1,771	\$ 2,066
2010	CCF	298	254	284	293	347	552	667	696	717	386	286	5,019
	Cost	\$ 2,077	\$ 2,164	\$ 2,250	\$ 2,158	\$ 2,484	\$ 3,604	\$ 3,883	\$ 3,783	\$ 4,241	\$ 2,552	\$ 2,125	\$ 1,976
2011	CCF	231	203	275	220	300	500	508	723	599	367	258	4,443
	Cost	\$ 2,039	\$ 1,840	\$ 2,428	\$ 1,870	\$ 2,373	\$ 3,439	\$ 3,302	\$ 4,321	\$ 3,911	\$ 2,607	\$ 2,135	\$ 2,307

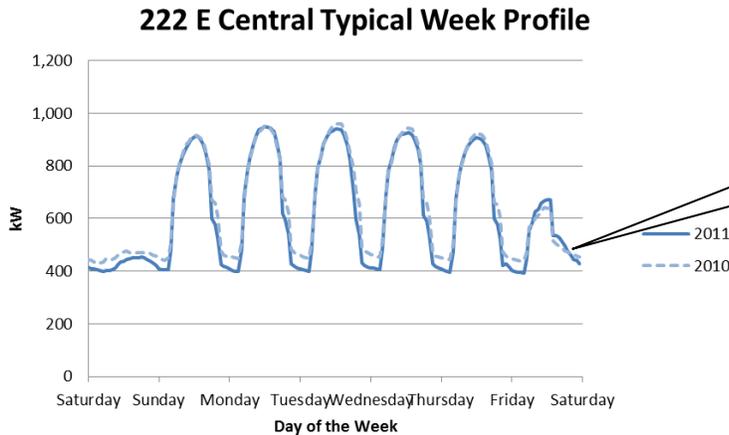
Minimum of month for past 3 years

222-Three Year Electrical Review

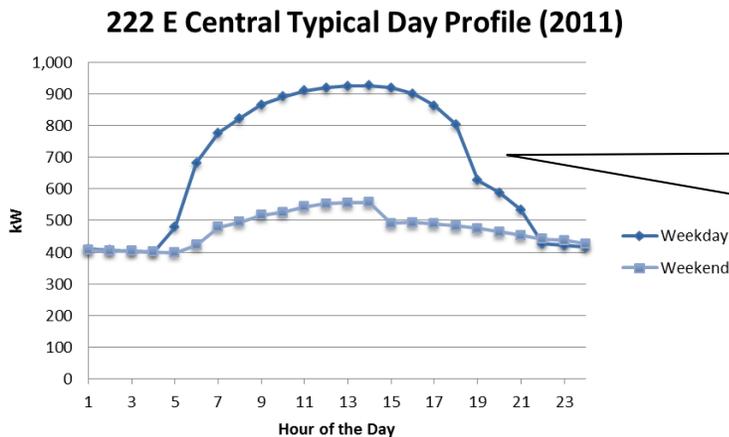


222-Electric Profile Review

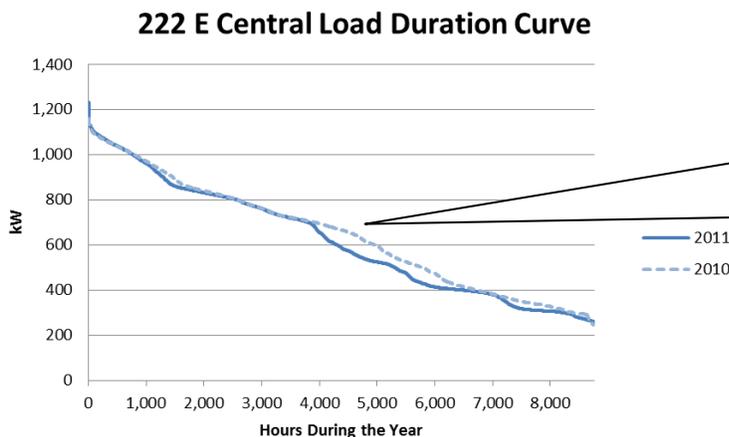
The graphs below illustrate the power requirements of the facility throughout a typical week, typical day and the year. The typical week and typical day profiles are averaged throughout the year in order to view how the electric demand varies during the day and across the week. The load duration curve represents the demand as a function of cumulative time for the year.



The average electric demand slightly decreased compared to the previous year, particularly at night and on weekends.



The setback schedules are clearly visible here. During the week, the power requirement ramps up to nearly double the requirement at night. The demand staggers after 5 pm on the weekdays and 1 pm on the weekends.



The reduction in number of hours at the higher base load in the summer is visible on this load duration curve. Unfortunately, the peak summer demand that increased from the previous year set a high ratchet, so the overall decrease in electric demand is only recovered in some of the electric bills.

222-Energy Star Review

General Information Edit	
Address: 222 East Central Parkway , Cincinnati, OH 45202	
Year Built: 1878	
Property Type: Single Facility	
Baseline Rating: 43	Current Rating: 44
<input type="checkbox"/> View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	Energy Period Ending Dates Current: November 2011 Baseline: December 2007
Eligibility for the ENERGY STAR	
Not Eligible: Rating must be 75 or above	

This building's current Energy Star score is 44, typical of past ratings.

222 East Central Energy Conservation Measures and Recommendations

Electric – The electricity consumption increased by 4% compared to 2009, but still remained lower than that of 2008. The peak demand in the summer increased as well.

Gas – Natural gas consumption for the facility decreased by 6% the past year, reaching the lowest level tracked for the facility.

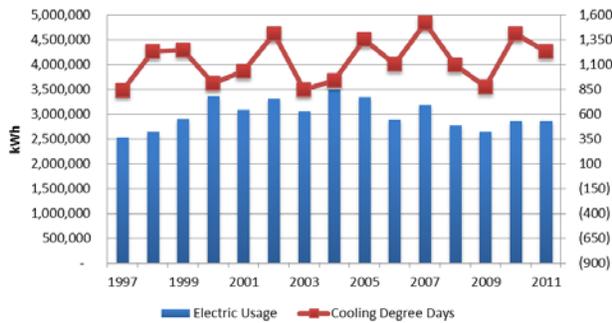
Proposed ECM's

- Continue to use night setback on chillers as much as possible. There are numerous times throughout the summer where the chillers run 24/7 in this building. Implement an aggressive chiller schedule so that chiller do not run overnight even during summer months.
- Implement energy savings strategies that decrease electric usage overnight and on weekends. This includes lights off, computers off, and elevators on standby when not in use. Exterior lighting should be minimized during after midnight hours.
- Conduct an Ameresco ECM audit for energy conservation measures.
 - Retrofit lighting
 - Replace domestic water heaters
 - Install heat pump in elevator room
 - Perform water conservation work
 - Upgrade and recommission controls.

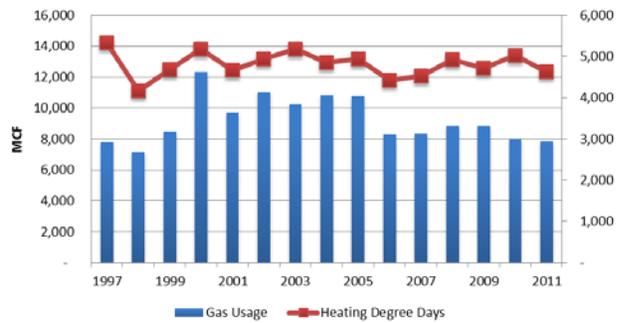
230 East 9th

0230 - William Howard Taft Center				ARCHIBUS/FM Bldg Data				
				Bldg Code:	0230			
				Bldg Name :	William Howard Taft Center			
				Address :	230 East Ninth Street			
				City :	CINCINNATI			
				State :	OH			
				Postal Code:	45202			
				Site Code :	COUNTYCAMPUS			
				Agency :	BOCC			
				Use :	Office			
				Const Type:	BrickStone			
				Date Built :	1925			
				Ext Gross Area:	193,524.83 sf			
				Int Gross Area:	184,574.10 sf			
				Rentable Area:	172,180.32 sf			
				Estimated Area:	0.00 sf			
Total Roof Area:	15,111.27 sf							
Leased/Owned :	Owned							
Floor Count :	16							
Sprinklered? :	Yes							
Property :								
Fl Code	Int Gross	Ext Gross	Vert Pen	Service	Rentable	Usable	Room Area	
01	13,655 sf	14,439 sf	1,395 sf	3,001 sf	12,260 sf	9,259 sf	13,655 sf	
02	13,838 sf	14,482 sf	946 sf	2,164 sf	12,892 sf	10,728 sf	13,781 sf	
03	13,778 sf	14,503 sf	886 sf	2,182 sf	12,892 sf	10,710 sf	13,770 sf	
04	13,737 sf	14,502 sf	842 sf	2,092 sf	12,895 sf	10,804 sf	13,703 sf	
05	13,848 sf	14,503 sf	880 sf	1,843 sf	12,967 sf	11,124 sf	13,848 sf	
06	13,895 sf	14,503 sf	903 sf	1,612 sf	12,992 sf	11,380 sf	13,885 sf	
07	13,775 sf	14,498 sf	897 sf	1,530 sf	12,878 sf	11,348 sf	13,775 sf	
08	13,895 sf	14,503 sf	850 sf	1,654 sf	13,045 sf	11,392 sf	13,895 sf	
09	13,890 sf	14,503 sf	883 sf	2,262 sf	13,007 sf	10,745 sf	13,888 sf	
0B	14,480 sf	15,049 sf	785 sf	7,484 sf	13,696 sf	6,211 sf	14,480 sf	
0P	2,488 sf	2,647 sf	242 sf	2,246 sf	2,246 sf	-0 sf	2,488 sf	
0R	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	
10	13,880 sf	14,503 sf	915 sf	2,070 sf	12,965 sf	10,895 sf	13,878 sf	
11	13,883 sf	14,503 sf	914 sf	1,492 sf	12,969 sf	11,477 sf	13,269 sf	
12	13,825 sf	14,503 sf	912 sf	2,220 sf	12,913 sf	10,694 sf	13,825 sf	
OUT	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	
SB	1,706 sf	1,886 sf	144 sf	1,562 sf	1,562 sf	0 sf	1,706 sf	

230 East Ninth Annual Electric Usage



230 East Ninth Annual Gas Usage



The 230 East 9th Building is one of the newer buildings on the County Campus having full DDC control and VAV boxes. It was renovated in the 1990's and includes "Varicone" VAV Air Central Station Air-Handlers, a full DDC building control system and intelligent lighting panels. The building uses night setback on all mechanical equipment and lighting systems to promote low energy use when the building is not occupied.

The electrical graph shows that after the grand opening the usage increased through the years as more tenants were added to the building. Electric consumption then decreased as the building manager gained more control of a steady workforce. In 2010 the usage increased compared to 2009, primarily due to a higher number of cooling degree days.

The gas history shows a downward trend, with 10% reduction in natural gas consumption in 2010. Overall, this trend indicates greatly improved fuel management over the last several years.

Hamilton County Department of County Facilities

230-Historical Monthly Electric and Gas Data

The following data is a representation of electrical and gas usage by month. The green cells show the minimum usage for the month. In 2010, the electric consumption and peak demand remained nearly constant to that of the previous year. The natural gas consumption decreased slightly compared to 2010 due to the elimination of natural gas consumption in July and August; however, this was nearly offset by an increase in usage the last few months of the year. Water consumption increased by 17%.

230 East Ninth Electric Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	kWh	188,260	171,939	203,115	215,775	236,399	268,055	269,652	272,937	246,234	200,599	182,509	189,370	2,644,846
	kWa	521	626	787	826	801	922	864	986	878	734	667	605	986
	kWb	838	838	838	838	838	922	864	986	878	838	838	838	986
	Cost	\$ 22,621	\$ 21,758	\$ 23,405	\$ 24,074	\$ 25,164	\$ 28,092	\$ 27,150	\$ 29,328	\$ 26,287	\$ 23,272	\$ 22,317	\$ 22,679	\$ 296,146
2010	kWh	220,721	180,217	186,338	207,253	213,643	280,325	301,240	365,381	286,156	227,087	190,695	204,657	2,863,713
	kWa	520	518	678	864	909	969	953	975	925	853	779	711	975
	kWb	843	843	843	864	909	969	953	975	925	853	829	829	975
	Cost	\$ 30,252	\$ 18,072	\$ 18,530	\$ 20,231	\$ 20,951	\$ 26,270	\$ 27,731	\$ 32,181	\$ 26,544	\$ 21,928	\$ 19,054	\$ 20,091	\$ 281,835
2011	kWh	210,477	184,913	190,391	210,860	223,566	266,002	305,253	310,627	283,575	241,368	223,595	200,884	2,851,511
	kWa	516	704	687	785	884	972	970	960	898	826	717	745	972
	kWb	829	829	829	829	884	972	970	960	898	826	826	826	972
	Cost	\$ 18,172	\$ 16,499	\$ 16,858	\$ 18,540	\$ 19,705	\$ 22,996	\$ 25,385	\$ 25,679	\$ 23,569	\$ 20,300	\$ 19,151	\$ 17,666	\$ 244,520

230 East Ninth Gas Data

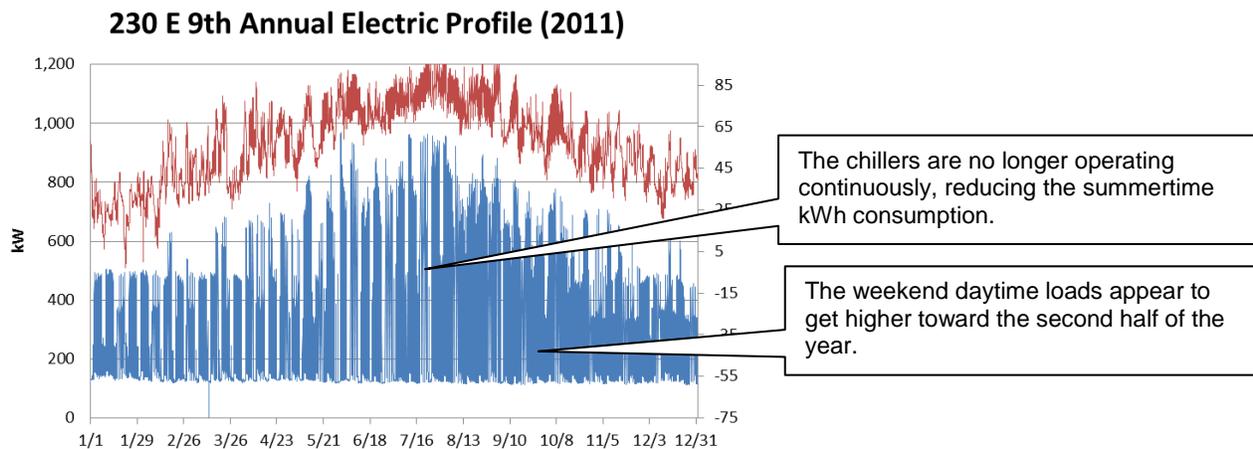
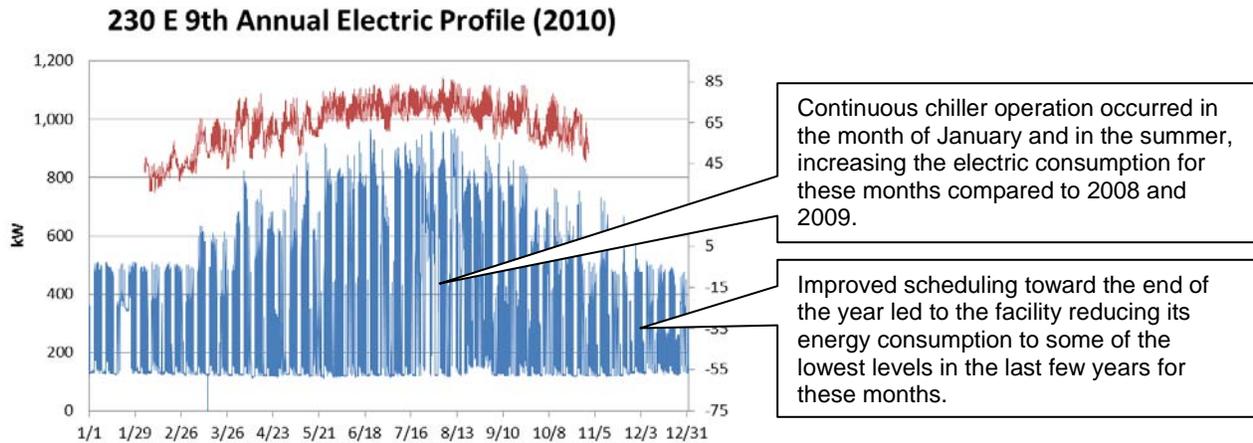
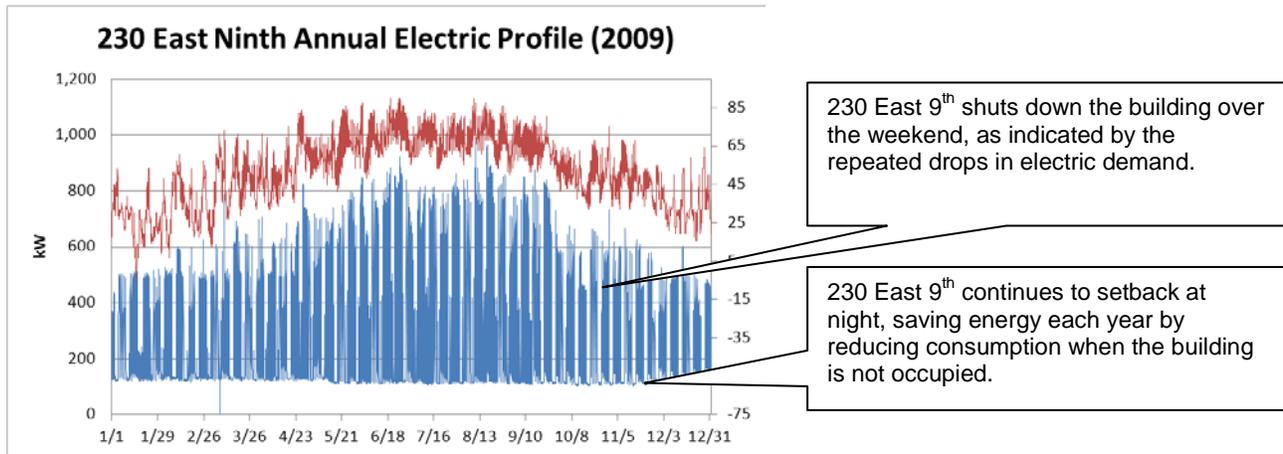
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	14,840	13,512	9,354	7,345	4,550	5,439	3,655	3,492	3,914	4,825	5,627	11,818	88,371
	Cost	\$ 17,634	\$ 16,573	\$ 13,187	\$ 5,199	\$ 3,198	\$ 3,966	\$ 2,559	\$ 2,566	\$ 2,616	\$ 3,143	\$ 4,360	\$ 9,157	\$ 84,157
2010	CCF	16,448	13,009	9,608	5,084	4,066	3,579	3,596	4,254	3,667	4,014	4,937	7,640	79,902
	Cost	\$ 13,655	\$ 10,833	\$ 7,959	\$ 3,971	\$ 3,122	\$ 2,807	\$ 2,702	\$ 3,276	\$ 2,882	\$ 3,022	\$ 3,757	\$ 5,917	\$ 63,903
2011	CCF	18,021	11,857	8,366	8,140	5,047	2,424	0	0	3,320	5,004	6,914	9,300	78,393
	Cost	\$ 14,081	\$ 9,347	\$ 6,516	\$ 5,793	\$ 3,801	\$ 1,973	\$ 228	\$ 228	\$ 2,566	\$ 3,730	\$ 4,859	\$ 6,571	\$ 59,693

230 East Ninth Water Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	226	247	308	261	333	403	375	442	476	322	467	387	4,248
	Cost	\$ 1,370	\$ 1,724	\$ 1,931	\$ 1,870	\$ 1,810	\$ 1,954	\$ 1,686	\$ 1,973	\$ 2,156	\$ 1,685	\$ 1,569	\$ 2,360	\$ 22,087
2010	CCF	280	345	296	305	519	518	524	622	701	420	359	315	5,204
	Cost	\$ 1,813	\$ 2,375	\$ 2,021	\$ 2,130	\$ 2,902	\$ 2,517	\$ 2,369	\$ 2,517	\$ 3,111	\$ 2,188	\$ 2,188	\$ 2,176	\$ 28,306
2011	CCF	324	283	475	341	479	590	600	725	773	499	492	528	6,109
	Cost	\$ 2,309	\$ 2,083	\$ 3,241	\$ 2,246	\$ 2,984	\$ 3,190	\$ 3,023	\$ 3,352	\$ 3,746	\$ 2,824	\$ 3,006	\$ 3,430	\$ 35,434

Green cells = minimum of month for past 3 years

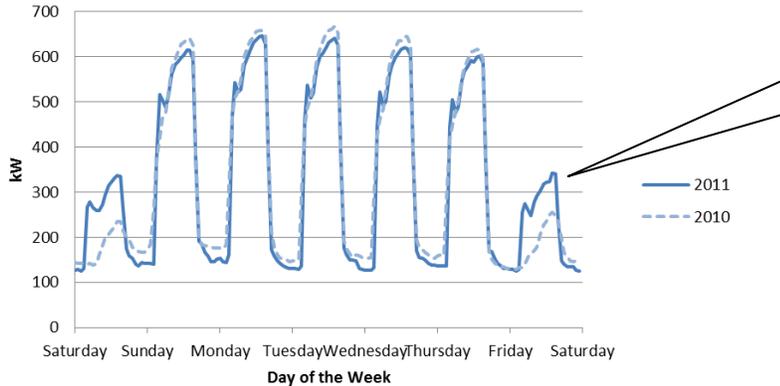
230-Three Year Electrical Review



230-Electric Profile Review

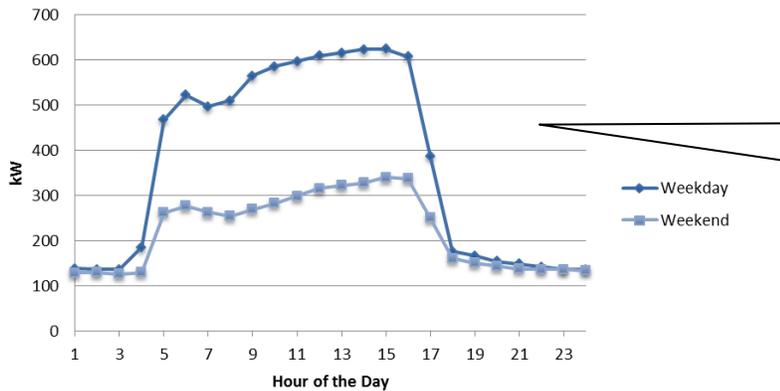
The graphs below illustrate the power requirements of the facility throughout a typical week, typical day and the year. The typical week and typical day profiles are averaged throughout the year in order to view how the electric demand varies during the day and across the week. The load duration curve represents the demand as a function of cumulative time for the year.

230 E 9th Typical Week Profile



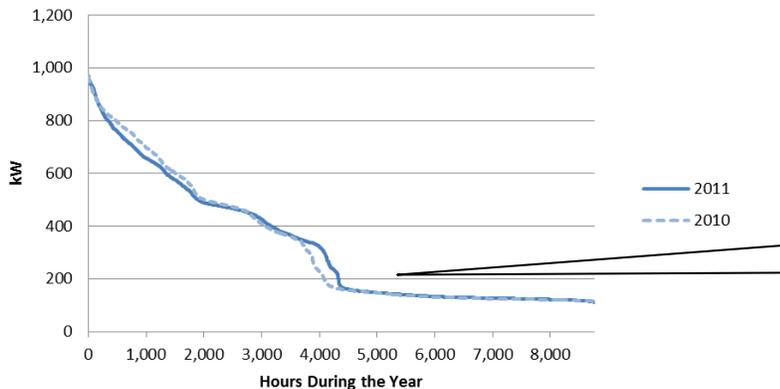
The electric demand on weekends increased greatly in the past year. Weekends and nights seemed to have improved slightly.

230 E 9th Typical Day Profile (2011)



The setback schedules are clearly visible here as well. During the week, the power requirement ramps up to nearly double the requirement at night. The demand drops greatly after 5 pm.

230 E 9th Load Duration Curve



The increase in weekend load is visible here as an increase in the number of hours spent around 300 kW.

230-Energy Star Review

General Information Edit	
Address: 230 East 9th Street , Cincinnati, OH 45202	
Year Built: 1925	
Property Type: (not set)	
Baseline Rating: 72	Current Rating: 73
<input type="checkbox"/> View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	Energy Period Ending Dates Current: November 2011 Baseline: January 2007
Eligibility for the ENERGY STAR	
Not Eligible: Less than one year since the period ending date of the last ENERGY STAR application. Eligible again on 09/30/2012	

This building received an Energy Star Award in 2011. The facility will be eligible to apply for another award in September of 2012.

230 East 9th Energy Conservation Measures and Recommendations

Electric – The electric consumption of the facility increased by 8% compared to 2009, while the electric demand decreased slightly. The chillers were operated continuously for a period, but scheduling improved toward the end of the year.

Gas – Natural gas consumption was reduced to the lowest levels in a decade, reduced by 10% compared to 2009.

Previous ECM's

- Night setback for equipment.
- Increase boiler efficiency.
- Programmed lighting schedule for unoccupied periods.

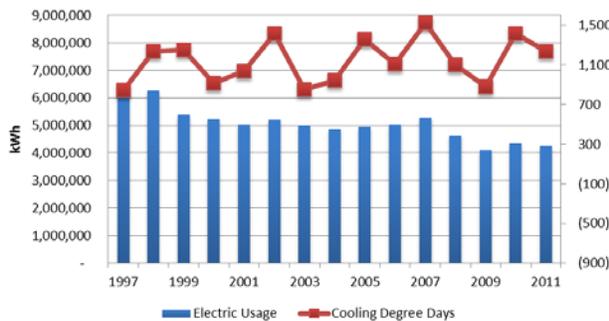
Proposed ECM's

- Conduct an Ameresco ECM audit for energy conservation measures.
 - Retrofit lighting
 - Replace summer boiler with condensing hot water boiler
 - Perform water conservation survey and associated work
 - Upgrade and recommission controls.
 - Replace cooling towers
 - Reclaim AHU condensate for make-up water (bldg staff ECM)

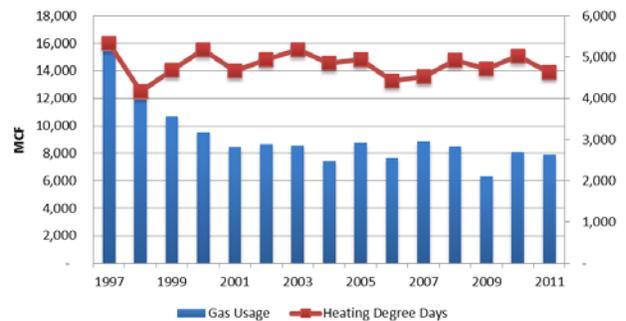
800 Broadway

0800 - 800 Broadway Building				ARCHIBUS/FM Bldg Data					
				Bldg Code:	0800				
				Bldg Name :	800 Broadway Building				
				Address :	800 Broadway Street				
				City :	CINCINNATI				
				State :	OH				
				Postal Code:	45202				
				Site Code :	COUNTYCAMPUS				
				Agency :	BOCC				
				Use :	Office				
				Const Type:	Stone				
Date Built :	1931								
Ext Gross Area:	372,420.59 sf								
Int Gross Area:	349,318.78 sf								
Rentable Area:	295,239.16 sf								
Estimated Area:	0.00 sf								
Total Roof Area:	41,856.63 sf								
Leased/Owned :	Owned								
Floor Count :	19								
Sprinklered? :	Yes								
Property :	079-0003-0146-00								
Fl Code	Int Gross	Ext Gross	Vert Pen	Service	Rentable	Usable	Room Area		
D1	35,947 sf	38,116 sf	2,107 sf	6,402 sf	33,839 sf	27,438 sf	35,937 sf		
D2	35,943 sf	38,208 sf	2,794 sf	4,193 sf	33,148 sf	28,955 sf	35,981 sf		
D3	36,159 sf	38,196 sf	6,056 sf	5,417 sf	30,103 sf	24,686 sf	36,159 sf		
D3M	35,962 sf	38,076 sf	19,499 sf	6,494 sf	16,463 sf	9,970 sf	35,962 sf		
D4	31,920 sf	33,764 sf	1,386 sf	3,088 sf	30,534 sf	27,466 sf	31,920 sf		
D5	21,001 sf	22,426 sf	4,848 sf	1,667 sf	16,153 sf	14,487 sf	20,988 sf		
D6	20,426 sf	21,652 sf	1,248 sf	4,474 sf	19,178 sf	14,705 sf	20,241 sf		
D7	5,609 sf	6,191 sf	758 sf	1,226 sf	4,851 sf	3,626 sf	5,609 sf		
D8	5,682 sf	6,191 sf	754 sf	1,220 sf	4,928 sf	3,707 sf	6,169 sf		
D9	5,749 sf	6,190 sf	750 sf	1,247 sf	4,999 sf	3,752 sf	5,749 sf		
D8	39,778 sf	41,884 sf	7,997 sf	10,776 sf	31,781 sf	21,004 sf	40,126 sf		
DR	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf		
D10	5,683 sf	6,191 sf	730 sf	1,275 sf	4,954 sf	3,678 sf	5,682 sf		
D11	5,703 sf	6,191 sf	771 sf	1,307 sf	4,933 sf	3,625 sf	5,704 sf		
D12	5,040 sf	5,541 sf	766 sf	1,146 sf	4,274 sf	3,128 sf	5,040 sf		
D14	5,133 sf	5,541 sf	764 sf	1,117 sf	4,369 sf	3,252 sf	5,133 sf		
D15	4,397 sf	4,851 sf	761 sf	856 sf	3,636 sf	2,780 sf	4,397 sf		
D16	3,751 sf	4,151 sf	748 sf	1,278 sf	3,003 sf	1,725 sf	3,753 sf		
D17	3,655 sf	4,193 sf	473 sf	3,182 sf	3,182 sf	0 sf	3,655 sf		
D18	2,980 sf	3,294 sf	91 sf	2,889 sf	2,889 sf	-0 sf	2,980 sf		
OUT	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf		
SB	38,800 sf	41,573 sf	779 sf	11,072 sf	38,022 sf	26,950 sf	38,803 sf		

800 Broadway Annual Electric Usage



800 Broadway Annual Gas Usage



The 800 Broadway Building was one of the least efficient buildings in 1997 when the ECM program started. Most of the original ECM projects were concentrated on this building. The results are visible in the above graphs. The building is the first to qualify for an Energy Star Award which is the crowning achievement for the Facility Department and the ECM project.

The electrical graph shows an ever-improving consumption nearly 30% lower than 1997. The electric consumption has slightly increased in 2010.

The natural gas history shows a strong and steady decrease since 1997. Consumption in 2010 was significantly higher than 2009, but was similar to that of the last several years.

Hamilton County Department of County Facilities

800-Historical Monthly Electric and Gas Data

The following data is a representation of electrical and gas usage by month. The green cells show the minimum usage for the month. The electric consumption remained similar to that of 2010, with a slight decrease overall. The natural gas consumption decreased slightly compared to 2010 as well, despite an increase in consumption most months. This is primarily due to the low natural gas usage in December of 2011.

800 Broadway Electric Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	kWh	314,415	303,478	297,573	303,985	327,763	385,978	401,510	396,213	411,999	327,101	302,625	332,140	4,104,780
	kWa	811	963	1,048	1,064	1,014	1,048	1,031	1,048	1,014	997	997	862	1,064
	kWb	919	963	1,048	1,064	1,014	1,048	1,031	1,048	1,014	997	997	890	1,064
	Cost	\$ 31,147	\$ 30,966	\$ 31,929	\$ 29,966	\$ 30,181	\$ 32,820	\$ 39,928	\$ 39,550	\$ 39,779	\$ 37,002	\$ 35,619	\$ 35,333	\$ 414,220
2010	kWh	325,519	280,955	280,660	330,092	371,100	424,743	439,339	447,398	425,646	369,993	340,648	325,770	4,361,863
	kWa	777	760	811	997	946	1,031	1,014	997	1,014	1,048	997	794	1,048
	kWb	891	891	891	997	946	1,031	1,014	1,007	1,014	1,048	997	876	1,048
	Cost	\$ 37,230	\$ 24,499	\$ 24,479	\$ 28,512	\$ 30,873	\$ 34,954	\$ 36,024	\$ 36,574	\$ 35,186	\$ 32,091	\$ 30,151	\$ 20,091	\$ 370,665
2011	kWh	318,339	284,884	286,489	304,746	316,228	399,658	450,181	434,167	403,081	338,199	412,468	298,668	4,247,108
	kWa	777	794	879	879	1,017	998	1,036	1,017	979	998	941	876	1,036
	kWb	875	876	879	879	1,017	998	1,036	1,017	979	998	941	794	1,036
	Cost	\$ 24,580	\$ 22,406	\$ 22,521	\$ 24,083	\$ 25,450	\$ 30,835	\$ 34,102	\$ 32,976	\$ 30,785	\$ 26,588	\$ 33,990	\$ 23,764	\$ 332,080

800 Broadway Gas Data

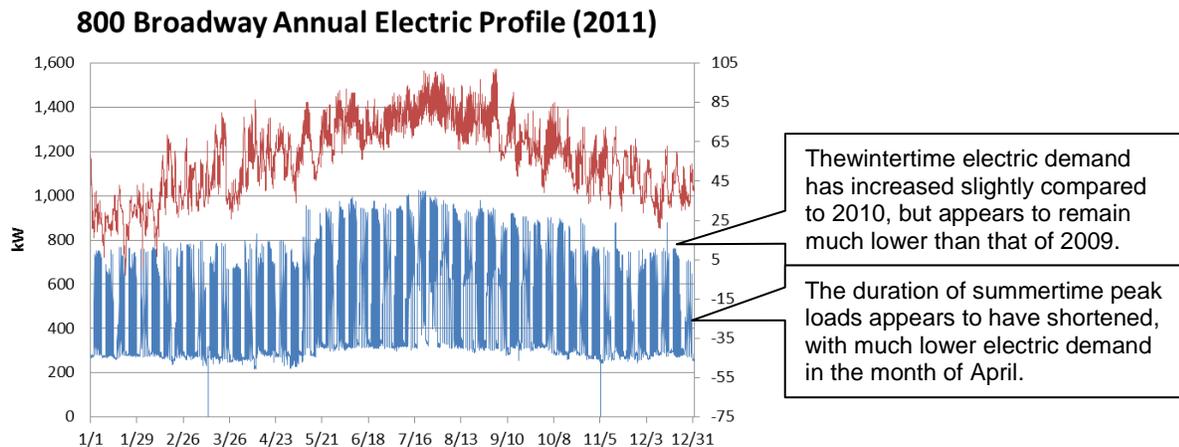
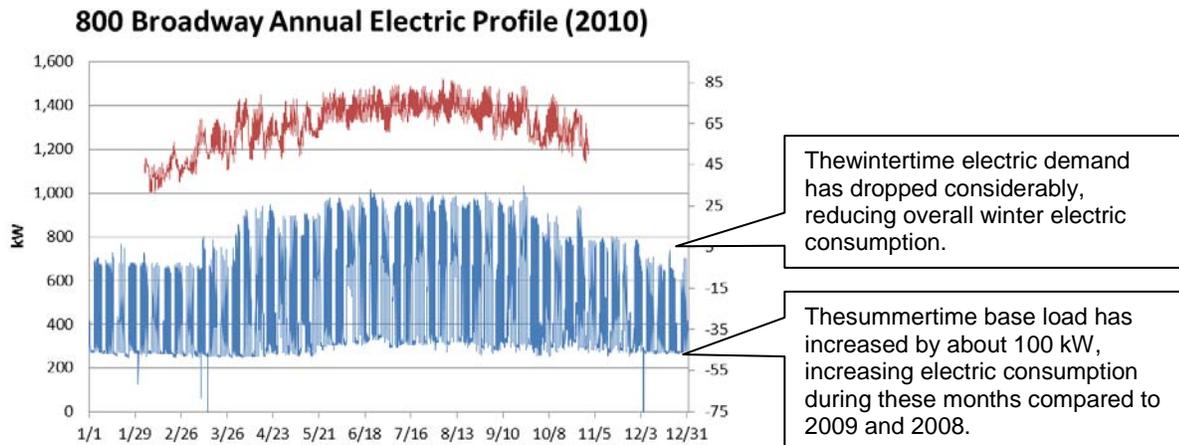
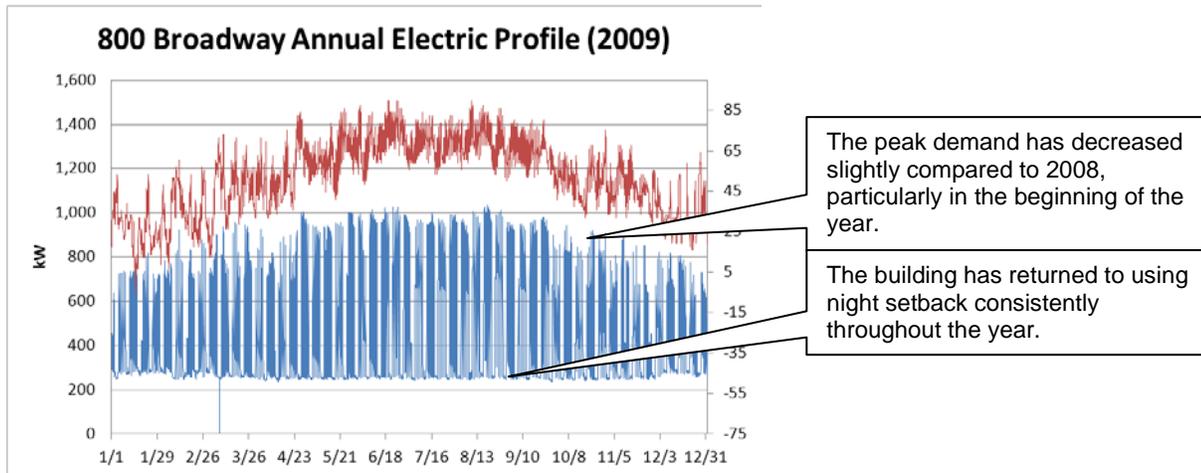
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2009	CCF	18,698	16,077	6,400	2,138	247	202	219	239	1,493	1,026	15,829	62,781
	Cost	\$ 22,200	\$ 19,763	\$ 9,078	\$ 1,583	\$ 244	\$ 430	\$ 204	\$ 207	\$ 211	\$ 1,023	\$ 852	\$ 12,293
2010	CCF	21,460	19,885	7,739	1,099	284	231	216	225	236	580	6,977	80,937
	Cost	\$ 17,742	\$ 16,442	\$ 6,454	\$ 1,031	\$ 424	\$ 388	\$ 370	\$ 382	\$ 392	\$ 628	\$ 5,216	\$ 16,606
2011	CCF	25,857	16,840	9,489	6,737	925	278	290	271	255	612	5,000	12,537
	Cost	\$ 20,077	\$ 13,180	\$ 7,361	\$ 4,834	\$ 889	\$ 430	\$ 441	\$ 423	\$ 409	\$ 660	\$ 3,578	\$ 8,776

800 Broadway Water Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	299	288	380	394	488	579	581	625	687	488	337	353	5,499
	Cost	\$ 3,322	\$ 3,509	\$ 4,512	\$ 3,883	\$ 4,249	\$ 4,788	\$ 4,116	\$ 4,356	\$ 5,017	\$ 3,752	\$ 3,712	\$ 4,086	\$ 49,302
2010	CCF	283	367	348	315	479	672	739	1,030	1,232	727	650	422	7,264
	Cost	\$ 3,619	\$ 4,599	\$ 4,432	\$ 3,691	\$ 4,388	\$ 5,360	\$ 4,956	\$ 6,203	\$ 7,287	\$ 4,923	\$ 4,841	\$ 4,414	\$ 58,713
2011	CCF	832	619	618	380	469	674	724	1,022	1,030	687	732	459	8,246
	Cost	\$ 5,817	\$ 5,179	\$ 5,974	\$ 4,055	\$ 4,790	\$ 5,612	\$ 5,219	\$ 6,053	\$ 6,809	\$ 5,037	\$ 5,150	\$ 5,382	\$ 65,077

Green cell = minimum of month for past 3 years

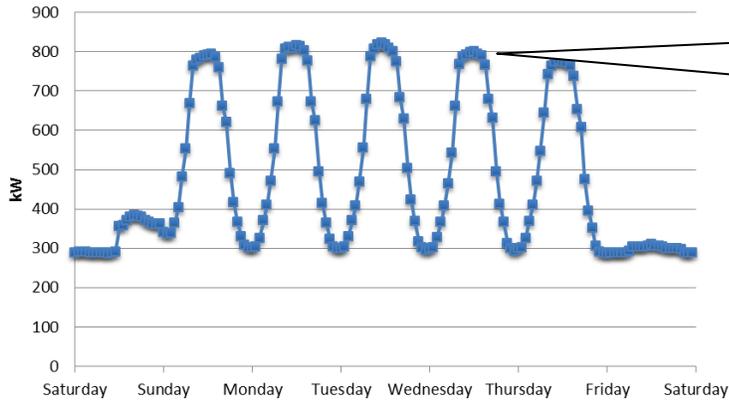
800-Three Year Electrical Review



800-Electric Profile Review

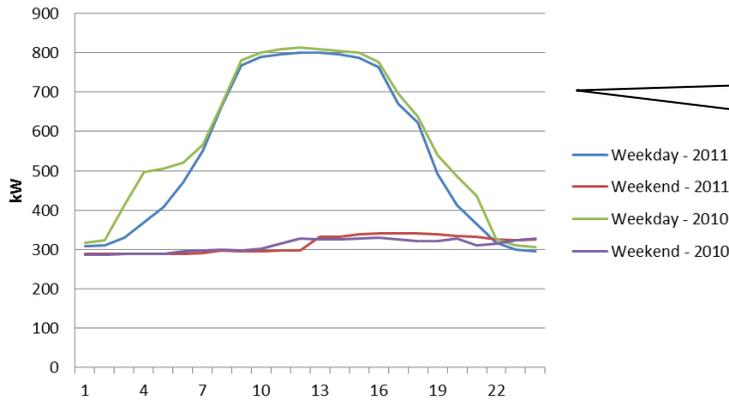
The graphs below illustrate the power requirements of the facility throughout a typical week, typical day and the year. The typical week and typical day profiles are averaged throughout the year in order to view how the electric demand varies during the day and across the week. The load duration curve represents the demand as a function of cumulative time for the year.

800 Broadway Typical Week Profile (2011)



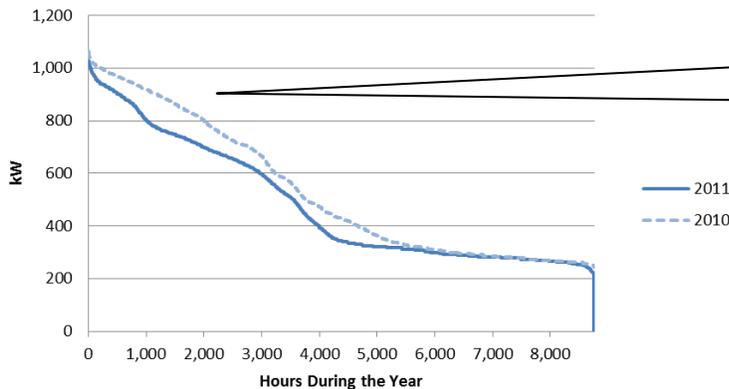
The facility has a weekly curve typical of a facility with a gradual start up and shut down schedule during weekdays, and setback during the weekends.

800 Broadway Typical Day Profile



Weekday occupancy controls have appeared to transition more quickly in 2011 compared to the previous year.

800 Broadway Load Duration Curve



While the summertime peak demand and weekend/nighttime demand remain very close to that of 2010, the electric load has decreased dramatically.

800-Energy Star Review

General Information Edit	
Address: 800 Broadway Street , Cincinnati, OH 45202	
Year Built: 1931	
Property Type: (not set)	
Baseline Rating: 81	Current Rating: 86
<input type="checkbox"/> View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	Energy Period Ending Dates Current: November 2011 Baseline: December 2006
Eligibility for the ENERGY STAR	
Not Eligible: Less than one year since the period ending date of the last ENERGY STAR application. Eligible again on 09/30/2012	

This building was received the Energy Star award in 2011 for the fourth straight year. The building should be able to receive another award in September of 2012.

800 Broadway Energy Conservation Measures and Recommendations

Electric - In recent years there has been a slight increase in usage but this building is still doing very well overall. We recommend the encouraging trying to keep as much equipment off during unoccupied times as possible to continue the low usage/sf that this building has had over the last six years. The electric consumption increased, with summer electric consumption higher than both 2008 and 2009. The rest of the year, the electric consumption remained steady. Despite the increase, the electric consumption is the second lowest tracked, behind 2009.

Gas – Natural gas consumption increased in 2010, particularly in the last few months of the year.

Previous ECM's

- Night setback for equipment.
- Time clocks and schedules for all lighting and equipment.
- New more efficient chiller.
- New more efficient boilers
- New high efficiency domestic water boilers.
- VFD's on pumps and air handlers.
- New high efficiency cooling towers with VFD's.
- Selective lighting replacements.

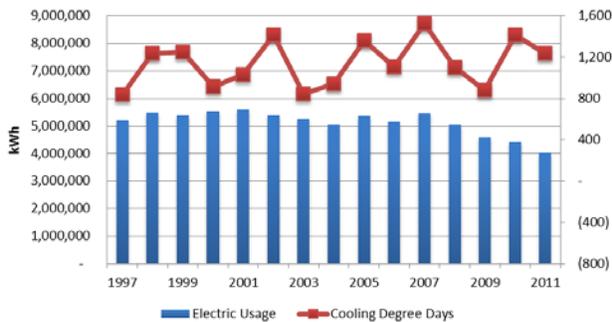
Proposed ECM's

- Additional lighting retrofits with Duke Energy incentives or ESCO.
- Additional programming and equipment off periods.
- Replacement of large low rise air handlers with more efficient equipment.
- Upgrade control system and retro-commission equipment and controls for schedules.

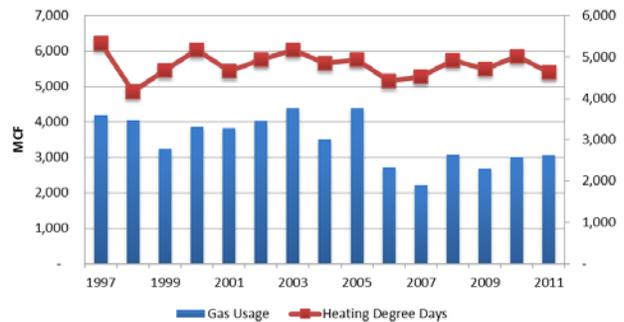
County Administration Building

0138 - Administration Building				ARCHIBUS/FM Bldg Data					
				Bldg Code:	0138				
				Bldg Name:	Administration Building				
				Address:	138 East Court Street				
				City:	CINCINNATI				
				State:	OH				
				Postal Code:	45202				
				Site Code:	COUNTYCAMPUS				
				Agency:	BOCC				
				Use:	Office				
				Const Type:	BrickStone				
Date Built:	1987								
Ext Gross Area:	209,063.30 sf								
Int Gross Area:	196,735.49 sf								
Rentable Area:	182,724.33 sf								
Estimated Area:	0.00 sf								
Total Roof Area:	20,488.00 sf								
Leased/Owned:	Owned								
Floor Count:	11								
Sprinklered? :	Yes								
Property:	079-0001-0128-90								
Fl Code	Int Gross	Ext Gross	Vert Pen	Service	Rentable	Usable	Room Area		
01	16,844 sf	17,852 sf	2,008 sf	4,981 sf	14,836 sf	9,854 sf	16,844 sf		
02	18,027 sf	19,162 sf	2,071 sf	2,679 sf	15,956 sf	13,277 sf	18,027 sf		
03	17,934 sf	19,039 sf	1,564 sf	2,980 sf	16,369 sf	13,389 sf	17,934 sf		
04	17,929 sf	19,030 sf	1,559 sf	2,972 sf	16,371 sf	13,398 sf	17,929 sf		
05	17,419 sf	18,552 sf	893 sf	2,709 sf	16,526 sf	13,817 sf	17,419 sf		
06	17,414 sf	18,553 sf	925 sf	3,174 sf	16,490 sf	13,315 sf	17,414 sf		
07	17,407 sf	18,549 sf	902 sf	2,680 sf	16,505 sf	13,825 sf	17,407 sf		
08	17,400 sf	18,553 sf	893 sf	3,102 sf	16,507 sf	13,405 sf	17,400 sf		
09	17,400 sf	18,553 sf	862 sf	2,136 sf	16,538 sf	14,403 sf	17,400 sf		
0B	21,521 sf	22,616 sf	1,432 sf	10,231 sf	20,089 sf	9,858 sf	21,521 sf		
0R	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf		
10	17,440 sf	18,606 sf	902 sf	3,615 sf	16,538 sf	12,923 sf	17,440 sf		
OUT	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf		

Administration Annual Electric Usage



Administration Annual Gas Usage



The County Administration Building was renovated in the 1980's and has recently been upgraded with a rooftop "swing" chiller, new electric service, DDC controls and two new rooftop chillers. The base Central Heating Plant (CHP) remains 1980 vintage as the boilers, chillers, cooling towers and air handlers are original equipment to that renovation.

The electrical graph shows relatively steady consumption pattern up until 2007, where it has continued to decrease each year. This building has the highest electrical cost per unit area cost due to the large computer center (RCC) residing on the 9th & 10th floor. The computer data center has its own rooftop cooling equipment and air handlers. The consumption decreased in 2009 as the RCC has moved out of the building.

The gas history chart demonstrates a 3% increase in gas usage overall, corresponding to a 7% increase in heating degree days.

Hamilton County Department of County Facilities

CAB-Historical Monthly Electric and Gas Data

The following data is a representation of electrical and gas usage by month. The green cells show the minimum usage for the month. The electric consumption was at an all-time low for all but 1 of the 12 months. Natural gas consumption increased slightly from the previous year, with a similar rise in consumption in January as other buildings, due to cold weather. The building returned to having very minimal to no gas consumption in the summer.

Administration Building Electric Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	kWh	353,105	343,028	329,112	345,861	383,518	480,234	447,605	442,294	441,078	360,343	332,886	325,613	4,584,677
	kWa	922	919	797	1,174	1,019	940	652	1,056	1,079	1,007	1,073	994	1,174
	kWb	774	770	820	1,066	1,356	1,225	1,215	1,309	1,115	1,043	944	829	1,356
	Cost	\$ 30,832	\$ 29,775	\$ 30,189	\$ 32,844	\$ 39,047	\$ 40,675	\$ 45,853	\$ 47,950	\$ 44,313	\$ 40,130	\$ 36,778	\$ 34,429	\$ 452,814
2010	kWh	324,343	285,488	301,961	385,433	405,924	462,495	461,786	450,370	390,898	339,288	301,949	320,665	4,430,600
	kWa	910	902	1,045	1,001	944	936	887	1,097	1,123	1,088	938	760	1,123
	kWb	819	813	812	1,033	971	1,037	1,028	1,097	1,151	1,103	915	851	1,151
	Cost	\$ 36,357	\$ 25,424	\$ 26,608	\$ 33,563	\$ 34,425	\$ 39,091	\$ 39,101	\$ 38,961	\$ 35,203	\$ 31,418	\$ 27,632	\$ 28,402	\$ 396,184
2011	kWh	317,782	276,831	290,155	327,115	325,618	388,027	418,364	389,935	370,075	314,729	303,946	277,726	4,000,303
	kWa	610	739	808	790	949	1,023	1,079	1,033	1,082	969	827	724	1,082
	kWb	852	838	837	836	1,017	1,218	1,134	1,134	1,084	893	787	778	1,218
	Cost	\$ 24,203	\$ 22,708	\$ 23,577	\$ 26,424	\$ 27,320	\$ 32,018	\$ 33,863	\$ 32,003	\$ 30,417	\$ 25,613	\$ 24,324	\$ 22,532	\$ 325,002

Administration Building Gas Data

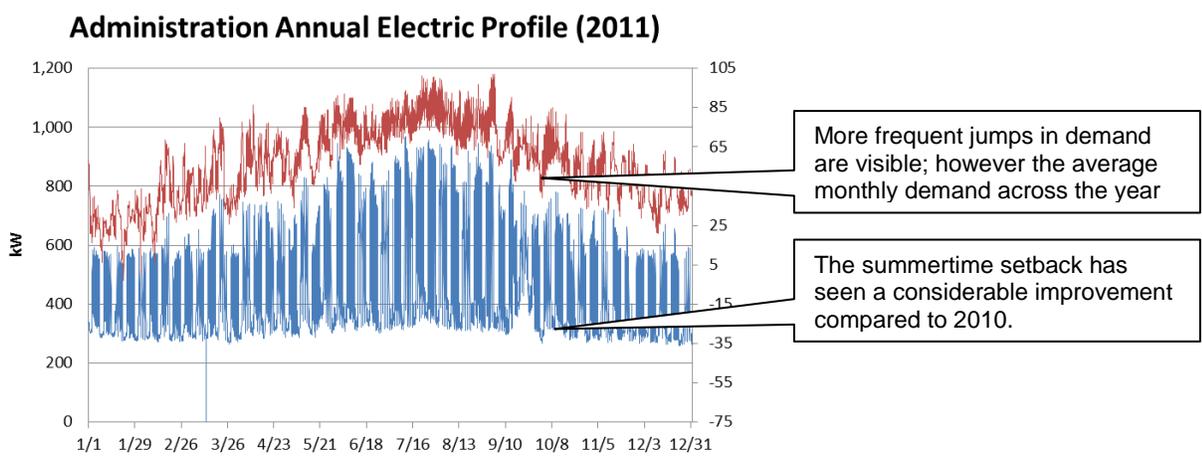
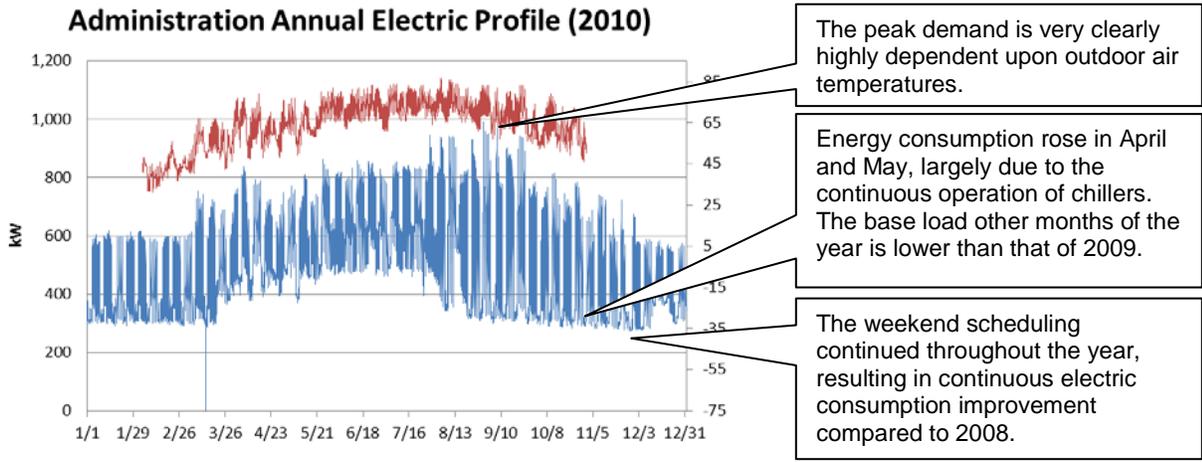
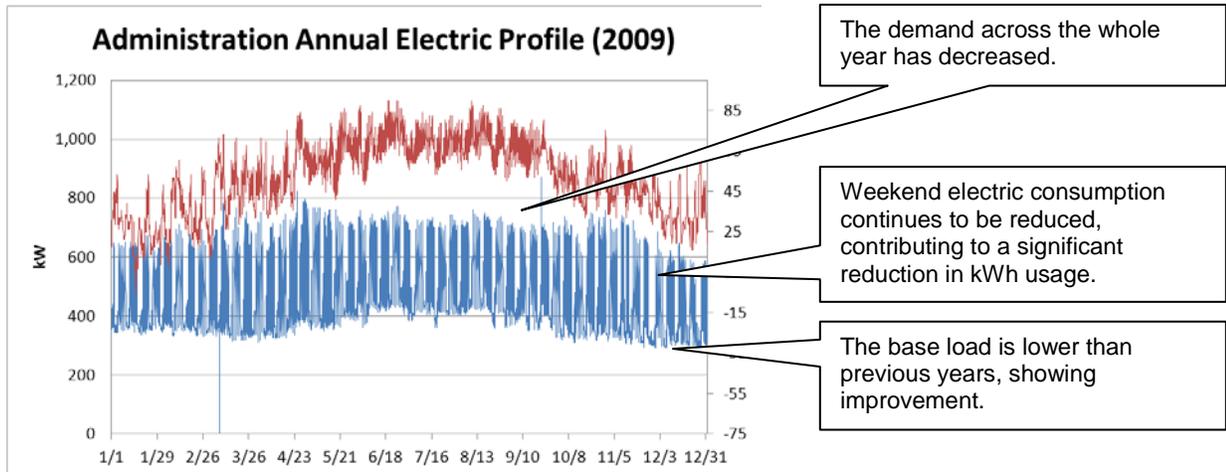
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	7,657	6,313	3,200	1,858	25	0	1	1	1	2,237	5,385	26,678	
	Cost	\$ 9,150	\$ 7,821	\$ 4,583	\$ 1,387	\$ 88	\$ 51	\$ 51	\$ 52	\$ 52	\$ 52	\$ 1,782	\$ 4,235	\$ 29,302
2010	CCF	7,364	6,873	3,879	1,399	1,055	828	295	143	160	177	2,663	5,195	30,031
	Cost	\$ 6,322	\$ 5,917	\$ 3,429	\$ 1,319	\$ 1,051	\$ 910	\$ 537	\$ 420	\$ 430	\$ 430	\$ 2,210	\$ 4,096	\$ 27,071
2011	CCF	10,815	5,899	3,562	2,480	580	1	2	0	0	319	498	6,500	30,656
	Cost	\$ 8,541	\$ 4,764	\$ 2,905	\$ 1,923	\$ 643	\$ 229	\$ 230	\$ 228	\$ 228	\$ 454	\$ 565	\$ 4,664	\$ 25,374

Administration Building Water Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	362	324	492	345	466	4,092	1,258	1,683	1,832	949	630	495	12,928
	Cost	\$ 2,687	\$ 2,472	\$ 3,555	\$ 2,529	\$ 3,267	\$ 6,567	\$ 7,255	\$ 9,407	\$ 10,316	\$ 5,757	\$ 4,667	\$ 3,623	\$ 62,102
2010	CCF	283	367	348	315	479	672	739	1,030	1,232	727	650	422	7,264
	Cost	\$ 3,619	\$ 4,599	\$ 4,432	\$ 3,691	\$ 4,388	\$ 5,360	\$ 4,956	\$ 6,203	\$ 7,287	\$ 4,923	\$ 4,841	\$ 4,414	\$ 58,713
2011	CCF	832	619	618	380	469	674	724	1,022	1,030	687	732	459	8,246
	Cost	\$ 5,817	\$ 5,179	\$ 5,974	\$ 4,055	\$ 4,790	\$ 5,612	\$ 5,219	\$ 6,053	\$ 6,809	\$ 5,037	\$ 5,150	\$ 5,382	\$ 65,077

Green cell = minimum of month for past 3 years

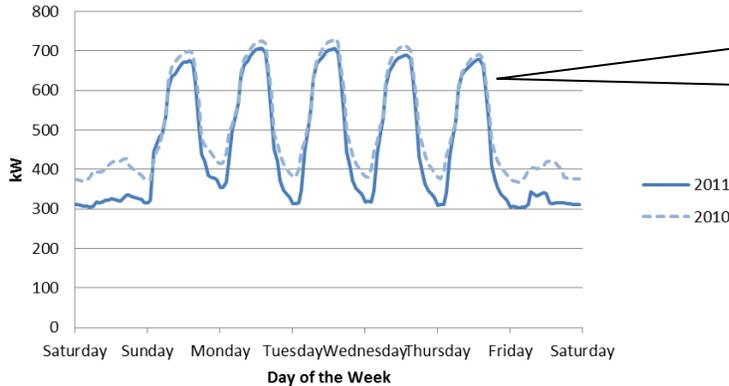
CAB-Three Year Electrical Review



CAB-Electric Profile Review

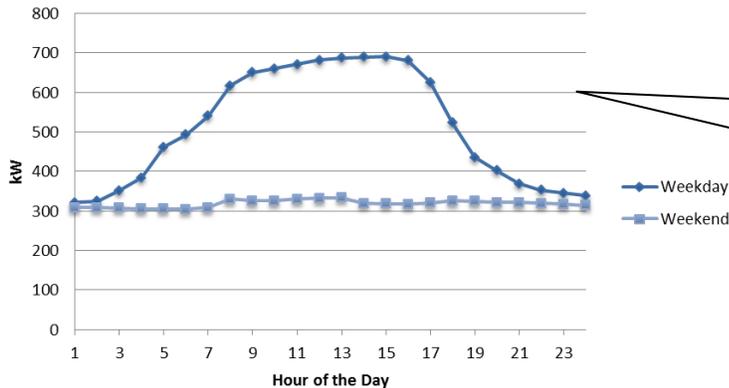
The graphs below illustrate the power requirements of the facility throughout a typical week, typical day and the year. The typical week and typical day profiles are averaged throughout the year in order to view how the electric demand varies during the day and across the week. The load duration curve represents the demand as a function of cumulative time for the year.

Administration Typical Week Profile



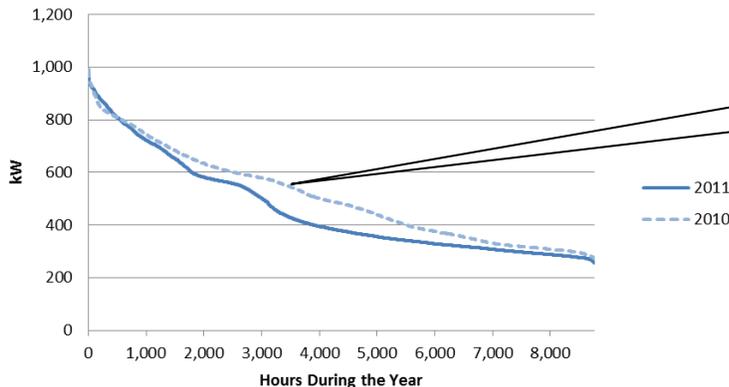
While the electric demand remained fairly constant during weekdays, the nighttime and weekend setbacks have greatly reduced the unoccupied electric load.

Administration Typical Day Profile (2011)



The facility has a weekday curve typical of facilities with space conditioning. The weekend load remains constant throughout the day.

Administration Load Duration Curve



The demand in the 400-600 kW range became much more infrequent due to improved setback in the summertime.

CAB-Energy Star Review

General Information Edit	
Address: 138 East Court Street , Cincinnati, OH 45202	
Year Built: 1987	
Property Type: (not set)	
Baseline Rating: 84	Current Rating: 93
<input type="checkbox"/> View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	Energy Period Ending Dates Current: November 2011 Baseline: December 2006
Eligibility for the ENERGY STAR	
Not Eligible: Less than one year since the period ending date of the last ENERGY STAR application. Eligible again on 08/31/2012	

This building received an Energy Star Award in 2011. The facility will be eligible again in August of 2012.

County Administration Building Energy Conservation Measures and Recommendations

Electric - The Administration building electric consumption decreased by 3% in 2010, reaching the lowest electric consumption for the facility tracked to-date. This was achieved partly due to improved scheduling toward the end of the year. The peak demand of the facility increased by about 100 kW (10%) in the summer.

Gas – The natural gas consumption of the facility increased by 3% this year, due to summer boiler operation for the first time in several years.

Previous ECM's

- Night setback for equipment.
- New rooftop chiller for "swing" seasons.
- New high efficient rooftop air handling units bought on Life Cycle Cost Methodology.
- Selective lighting replacements.

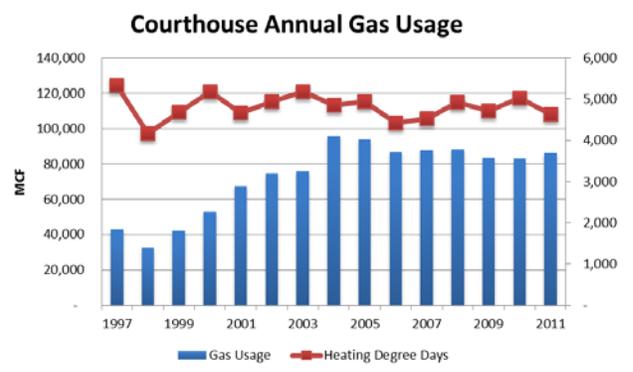
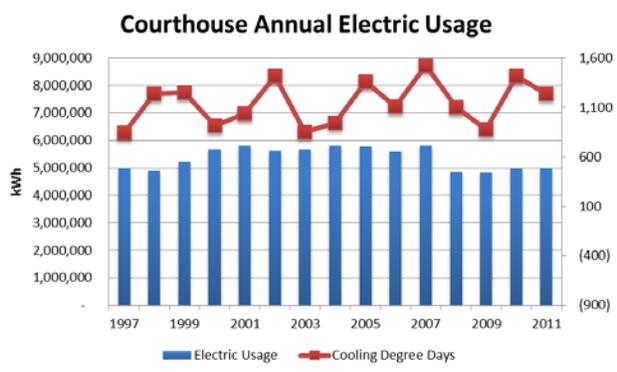
Proposed ECM's

- Conduct an Ameresco ECM audit for energy conservation measures.
 - Lighting retrofits using Duke Incentive program
 - Replace domestic water heaters
 - Replace inefficient steam boilers
 - Convert steam plan to heating hot water plant
 - Perform water conservation work
 - Upgrade and recommission controls.
 - VFD's for main air handlers

Hamilton County Courthouse

1000 - Courthouse	ARCHIBUS/IFM Bldg Data
	Bldg Code: 1000
	Bldg Name: Courthouse
	Address: 1000 Main Street
	City: CINCINNATI
	State: OH
	Postal Code: 45202
	Site Code: COUNTYCAMPUS
	Agency: BOCC
	Use: Office
	Const Type: Stone
	Date Built: 1915
	Ext Gross Area: 553,685.24 sf
	Int Gross Area: 516,480.17 sf
	Rentable Area: 400,528.35 sf
	Estimated Area: 0.00 sf
Total Roof Area: 77,077.67 sf	
Leased/Owned: Owned	
Floor Count: 9	
Sprinklered?: Yes	
Property: 079-0002-0017-90	

Fl Code	Int Gross	Ext Gross	Vert Pen	Service	Rentable	Usable	Room Area
01	69,885 sf	73,992 sf	12,388 sf	21,457 sf	57,497 sf	36,040 sf	69,937 sf
02	69,717 sf	74,373 sf	19,912 sf	18,337 sf	49,805 sf	31,468 sf	69,711 sf
03	68,305 sf	75,498 sf	12,721 sf	16,207 sf	55,583 sf	39,377 sf	68,303 sf
04	68,301 sf	73,426 sf	24,512 sf	18,556 sf	43,789 sf	25,232 sf	68,306 sf
05	68,236 sf	73,420 sf	13,199 sf	19,435 sf	55,036 sf	35,601 sf	68,300 sf
06	70,734 sf	73,464 sf	23,067 sf	12,595 sf	47,667 sf	35,072 sf	70,734 sf
07	24,384 sf	26,699 sf	7,335 sf	2,988 sf	17,049 sf	14,061 sf	24,384 sf
08	70,255 sf	75,493 sf	2,817 sf	27,221 sf	67,438 sf	40,217 sf	70,553 sf
DR	0 sf						
OUT	0 sf						
SB	6,665 sf	7,319 sf	0 sf	6,395 sf	6,665 sf	270 sf	6,665 sf



The County Courthouse has had many renovations in the 1990's as part of a large scale Public Works upgrade project. Future projects were never started due to lack of funding. Those original projects provided five new boilers and several large VAV air handlers. The building has modern electronic DDC controls and two new VFD driven cooling towers.

The electrical graph shows a large upward trend as the building was remodeled and tenants began using the new space in the 1990's. After 2001 the usage levels off and the building began consuming nearly the same amount of electricity year-to-year, until 2008. In 2008, the electric consumption dropped to a level nearly the same as that before the remodeling effort. 2009 remained at the same level, while 2010 increased slightly.

The natural gas history shows a steady increase since 2000 as the Courthouse began providing steam to the Justice Center for combined plant use. The natural gas consumption has leveled off in recent years, and slightly decreased in 2010.

Hamilton County Department of County Facilities

CH-Historical Monthly Electric and Gas Data

The following data is a representation of electrical and gas usage by month. The green cells show the minimum usage for the month. The electric consumption continued to increase nearly every month, with a slight increase in peak demand as well. A meter change skews the month of September 2011. The natural gas consumption increased as well.

Courthouse Electric Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	kWh	375,619	404,272	408,288	395,586	384,829	434,036	431,634	425,212	418,706	369,894	379,795	394,565	4,822,436
	kWa	988	1,280	1,182	1,240	1,274	1,448	1,372	1,489	1,268	1,166	1,133	1,049	1,489
	kWb	1,250	1,280	1,250	1,250	1,274	1,448	1,372	1,489	1,268	1,266	1,266	1,266	1,489
	Cost	\$ 40,746	\$ 41,986	\$ 41,605	\$ 37,711	\$ 37,778	\$ 42,527	\$ 47,457	\$ 49,841	\$ 45,749	\$ 44,895	\$ 45,571	\$ 46,381	\$ 522,247
2010	kWh	397,682	357,945	375,505	409,081	399,335	453,778	471,911	497,162	452,635	365,543	366,049	415,185	4,961,811
	kWa	1,037	1,041	1,128	1,156	1,253	1,406	1,386	1,399	1,336	1,250	1,161	1,111	1,406
	kWb	1,266	1,266	1,266	1,266	1,266	1,406	1,386	1,399	1,336	1,250	1,195	1,195	1,406
	Cost	\$ 49,417	\$ 33,589	\$ 34,904	\$ 37,185	\$ 36,546	\$ 41,239	\$ 42,451	\$ 44,290	\$ 40,845	\$ 34,559	\$ 34,220	\$ 37,466	\$ 466,712
2011	kWh	419,553	381,416	397,207	429,264	412,366	459,158	520,080	523,984	241,477	392,122	412,468	399,987	4,989,082
	kWa	1,172	1,172	1,209	1,249	1,172	1,331	1,481	1,426	1,172	1,117	1,284	1,081	1,481
	kWb	1,195	1,195	1,209	1,249	1,194	1,331	1,481	1,426	1,032	1,117	1,284	1,081	1,481
	Cost	\$ 33,724	\$ 31,244	\$ 32,347	\$ 35,252	\$ 33,844	\$ 37,676	\$ 42,382	\$ 42,308	\$ 22,351	\$ 31,747	\$ 34,010	\$ 32,056	\$ 408,941

Courthouse Gas Data

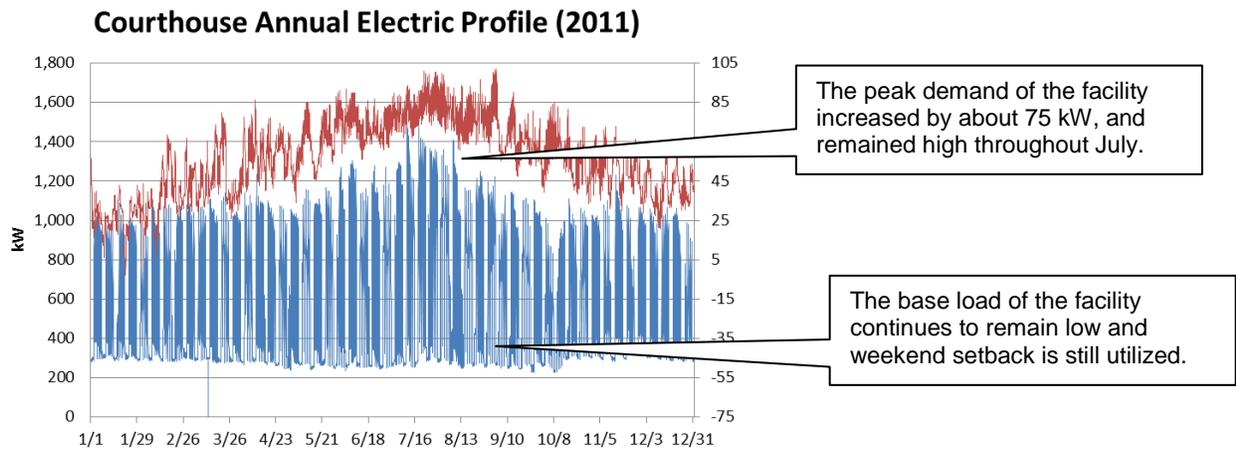
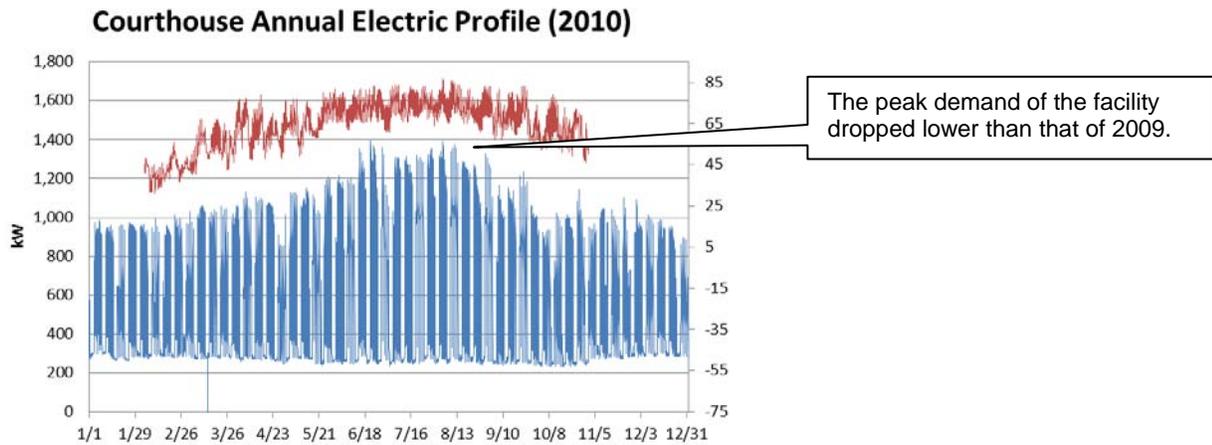
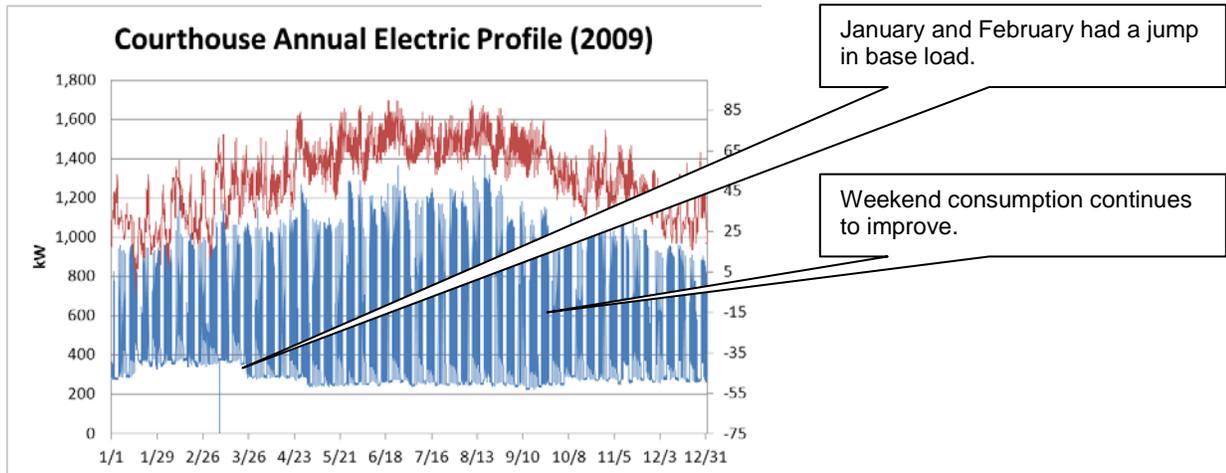
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	132,036	139,037	114,248	88,117	67,479	37,933	30,093	30,030	30,414	23,216	64,476	75,829	832,908
	Cost	\$ 136,631	\$ 149,562	\$ 143,556	\$ 48,752	\$ 36,588	\$ 22,152	\$ 16,644	\$ 17,625	\$ 15,957	\$ 12,001	\$ 40,383	\$ 47,950	\$ 687,801
2010	CCF	117,755	139,540	125,972	95,357	40,165	41,688	36,199	35,464	35,485	31,968	47,225	84,723	831,541
	Cost	\$ 78,351	\$ 104,788	\$ 91,077	\$ 71,512	\$ 24,854	\$ 25,995	\$ 22,812	\$ 22,835	\$ 22,849	\$ 17,100	\$ 26,232	\$ 40,540	\$ 548,944
2011	CCF	137,299	135,042	102,913	95,235	62,884	53,419	36,601	35,385	36,465	38,530	48,233	77,871	859,877
	Cost													\$ -

Courthouse Water Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	
2009	CCF	1,512	1,647	1,902	1,584	1,763	2,200	2,144	2,515	2,783	2,120	1,754	2,081	24,004
	Cost	\$ 7,473	\$ 8,790	\$ 10,472	\$ 8,810	\$ 9,453	\$ 12,085	\$ 10,434	\$ 12,520	\$ 13,668	\$ 10,327	\$ 9,088	\$ 11,085	\$ 124,206
2010	CCF	1,561	2,050	1,829	1,611	1,927	2,509	2,674	2,933	3,369	2,061	1,869	2,263	26,656
	Cost	\$ 8,605	\$ 11,701	\$ 10,317	\$ 9,518	\$ 10,974	\$ 13,304	\$ 13,560	\$ 14,198	\$ 16,880	\$ 11,145	\$ 10,373	\$ 11,522	\$ 142,095
2011	CCF	2,517	1,737	2,223	1,564	1,876			3,105	3,010	1,750	1,798	2,236	21,816
	Cost	\$ 12,564	\$ 10,349	\$ 13,345	\$ 9,527	\$ 11,137			\$ 14,750	\$ 15,712	\$ 10,293	\$ 10,856	\$ 13,220	\$ 121,753

Green cells = minimum of month for past 3 years

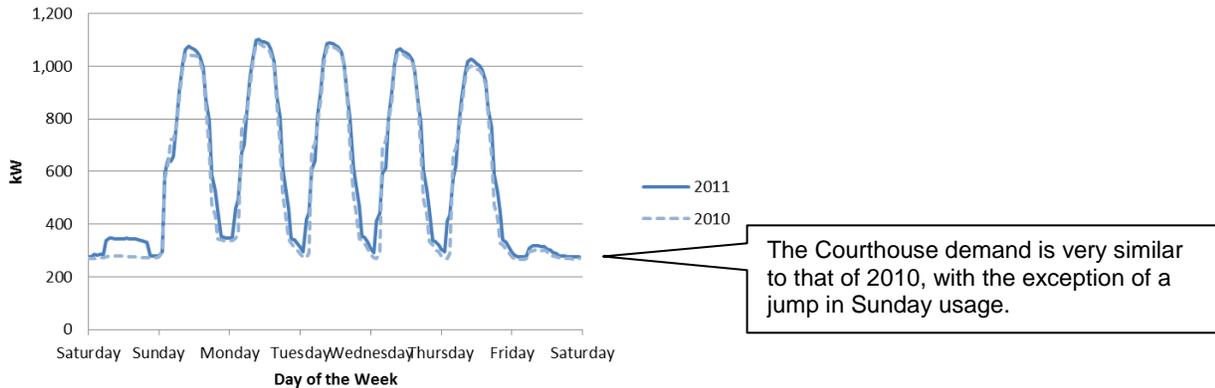
CH-Three Year Electrical Review



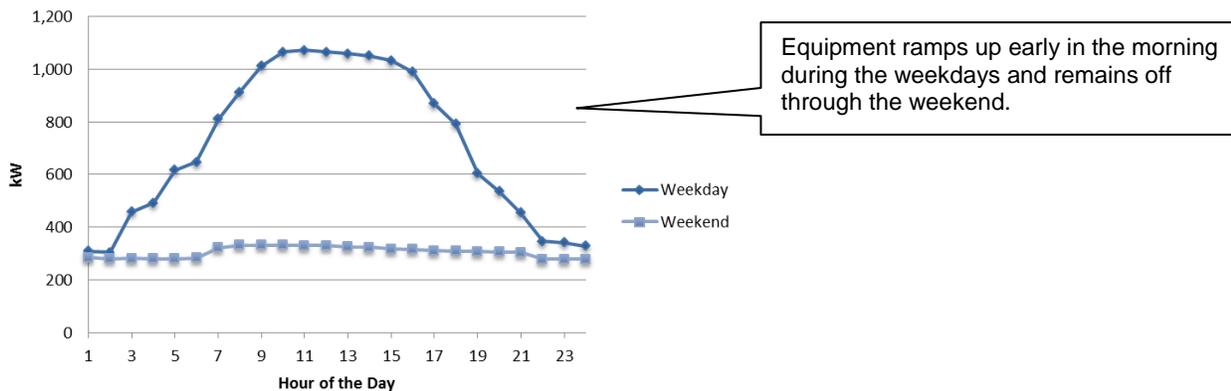
CH-Electric Profile Review

The graphs below illustrate the power requirements of the facility throughout a typical week, typical day and the year. The typical week and typical day profiles are averaged throughout the year in order to view how the electric demand varies during the day and across the week. The load duration curve represents the demand as a function of cumulative time for the year.

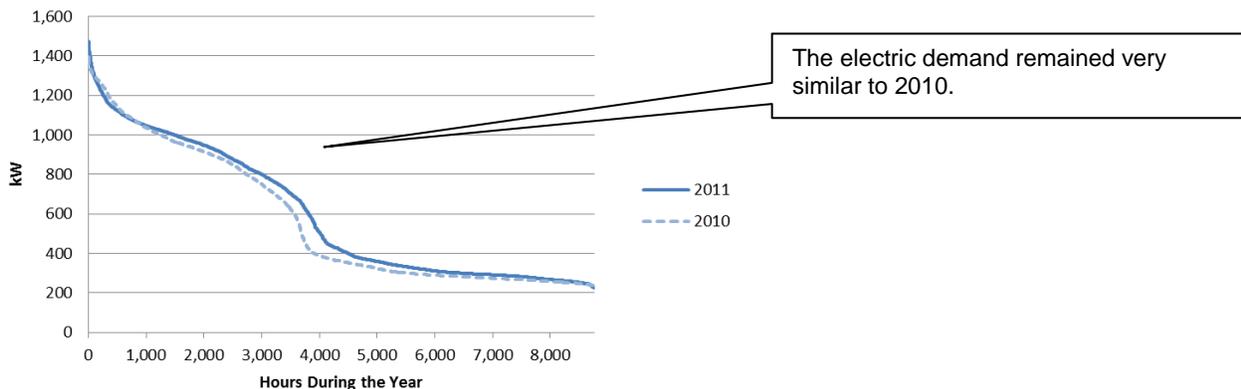
Courthouse Typical Week Profile



Courthouse Typical Day Profile (2011)



Courthouse Load Duration Curve



CH-Energy Star Review

General Information Edit	
Address: 1000 Main Street , Cincinnati, OH 45202	
Year Built: 1915	
Property Type: (not set)	
Baseline Rating: 35	Current Rating: 41
<input type="checkbox"/> View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	Energy Period Ending Dates Current: November 2011 Baseline: December 2006
Eligibility for the ENERGY STAR	
Not Eligible: Rating must be 75 or above	

This building does not qualify for an Energy Star because the EPA does not recognize the combined boiler plant as a method of obtaining an Energy Star rating. When combined with the Justice Center, both buildings could qualify. The Energy Star score is currently 46, a rating lower than 2009. The building will be reevaluated in 2012.

Hamilton County Courthouse Building Energy Conservation Measures and Recommendations

Electric - In the beginning the Courthouse was in a three phase major renovation. As the building came back on line with new equipment the electric usage went up with increased occupancy. Once the usage reached a plateau, the building uses about 5.7 million KWH per year. Some years have been better than others but the usage has remained consistent over the last five years. In 2010 the electric consumption increased 3%; however, the facility still remained 14% lower than in 1997.

Gas - In 2000 the Courthouse began providing steam for the Justice Center through a common steam header that connects the buildings. After the initial increase of running both buildings, this building responded with better control and better results over the last six years. The annual natural gas consumption remained about the same as that of 2009, with continued increases in usage in spring and summer, but decreases in fall and winter.

Previous ECM's

- Night Setback for equipment.
- VAV air handlers.
- Selective lighting replacements.

Proposed ECM's

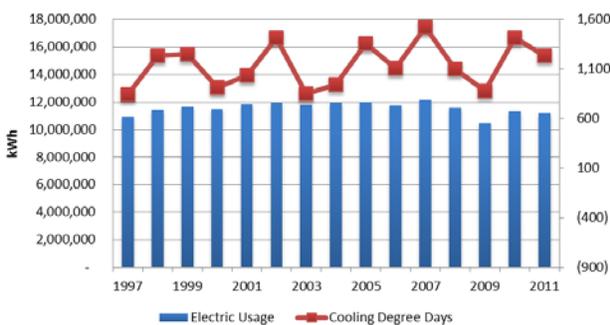
- Conduct an Ameresco ECM audit for energy conservation measures.
 - Lighting retrofits using Duke Incentive programs
 - Replace summer boiler with condensing hot water boiler
 - Perform water conservation survey and associated work
 - Install well water makeup system
 - Upgrade and recommission controls.
- Complete original construction plans and upgrade all air handlers and controls to newer standards.

Justice Center

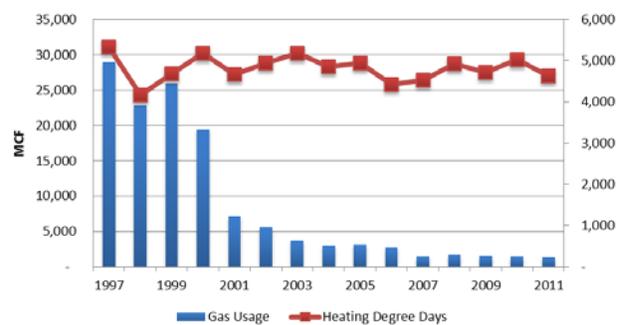
1100 - Justice Center		ARCHIBUS/FM Bldg Data	
	Bldg Code:	1100	
	Bldg Name:	Justice Center	
	Address:	1000 Sycamore Street	
	City:	CINCINNATI	
	State:	OH	
	Postal Code:	45202	
	Site Code:	COUNTYCAMPUS	
	Agency:	Sheriff	
	Use:	Jail	
	Const Type:	Masonry	
	Date Built:	1985	
	Ext Gross Area:	736,871.36 sf	
	Int Gross Area:	721,586.85 sf	
	Rentable Area:	489,538.49 sf	
	Estimated Area:	0.00 sf	
Total Roof Area:	95,778.18 sf		
Leased/Owned:	Owned		
Floor Count:	26		
Sprinklered? :	Yes		
Property:	075-0001-0147-90		

FI Code	Int Gross	Ext Gross	Vert Pen	Service	Rentable	Usable	Room Area
N01	33,634 sf	34,489 sf	1,916 sf	8,055 sf	31,719 sf	23,664 sf	33,614 sf
N01M	32,814 sf	35,007 sf	14,246 sf	7,811 sf	18,568 sf	10,757 sf	32,990 sf
N02	31,926 sf	32,831 sf	2,347 sf	3,887 sf	29,579 sf	25,692 sf	31,351 sf
N02M	31,901 sf	32,810 sf	25,698 sf	46 sf	6,202 sf	6,157 sf	31,890 sf
N03	32,256 sf	32,676 sf	2,678 sf	378 sf	29,578 sf	29,199 sf	31,841 sf
N03M	32,365 sf	32,673 sf	20,333 sf	43 sf	12,032 sf	11,989 sf	31,993 sf
N04	32,166 sf	32,606 sf	2,680 sf	367 sf	29,486 sf	29,119 sf	32,311 sf
N04M	32,302 sf	32,606 sf	14,472 sf	43 sf	17,829 sf	17,787 sf	32,376 sf
N05	32,070 sf	32,673 sf	2,317 sf	351 sf	29,752 sf	29,401 sf	32,071 sf
N05M	32,072 sf	32,673 sf	20,479 sf	43 sf	11,593 sf	11,550 sf	31,952 sf
N0B	21,707 sf	22,489 sf	994 sf	14,568 sf	20,713 sf	6,145 sf	21,707 sf
N0P	1,851 sf	2,112 sf	351 sf	1,354 sf	1,500 sf	146 sf	1,851 sf
N0R	0 sf						
N0S	0 sf						
N0T	0 sf						
S01	55,187 sf	56,216 sf	2,334 sf	12,264 sf	52,853 sf	40,589 sf	55,122 sf
S01M	53,671 sf	55,123 sf	26,257 sf	13,465 sf	27,414 sf	13,949 sf	53,642 sf
S02	33,024 sf	33,320 sf	2,809 sf	338 sf	30,215 sf	29,877 sf	33,047 sf
S02M	32,385 sf	32,794 sf	21,586 sf	42 sf	10,799 sf	10,757 sf	32,385 sf
S03	32,376 sf	32,676 sf	2,651 sf	410 sf	29,724 sf	29,315 sf	32,290 sf
S03M	32,243 sf	32,675 sf	20,626 sf	44 sf	11,617 sf	11,572 sf	32,243 sf
S04	32,167 sf	32,606 sf	2,543 sf	352 sf	29,624 sf	29,272 sf	32,172 sf
S04M	32,249 sf	32,673 sf	20,633 sf	44 sf	11,617 sf	11,572 sf	32,162 sf
S05	32,133 sf	32,673 sf	2,195 sf	351 sf	29,937 sf	29,586 sf	32,134 sf
S05M	32,072 sf	32,673 sf	20,395 sf	44 sf	11,677 sf	11,633 sf	31,204 sf
S0B	5,168 sf	5,684 sf	1,158 sf	1,564 sf	4,010 sf	2,447 sf	5,168 sf
S0P	1,851 sf	2,112 sf	351 sf	1,354 sf	1,500 sf	146 sf	1,851 sf
S0R	0 sf						

Justice Center Annual Electric Usage



Justice Center Annual Gas Usage



The Justice Center is the full time penal institution that houses inmates 24/7. The building is air-conditioned via (2) 455-ton chillers, cooling towers and large air handlers on the mezzanine levels. A recent heating upgrade provided a modern electronic DDC control system.

The electrical graph shows a general downward trend over the last few years. Electric consumption in 2010 was higher than that of 2009, due to the increase in cooling degree days. Federal and State requirements for both cooling and heating make it difficult to save energy in this building.

The natural gas history shows a drastic decrease in natural gas usage once the Courthouse began providing steam to this building. The building currently only uses natural gas for cooking and boiler testing.

Hamilton County Department of County Facilities

JC-Historical Monthly Electric and Gas Data

The following data is a representation of electrical and gas usage by month. The green cells show the minimum usage for the month. The electric consumption slightly decreased compared to 2010, while the peak demand slightly increased. Natural gas consumption decreased greatly in the summer, resulting in a lower annual consumption than the previous year. The improvement in the past couple years is evident in the table below. The natural gas consumption remained low throughout most of the year, peaking in October, likely due to boiler testing.

Justice Center Electric Data

Month		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2009	kWh	902,060	871,591	791,737	830,091	885,054	996,872	960,770	977,157	966,522	739,177	706,140	803,842	10,431,013
	kWa	1,369	1,361	1,361	1,538	1,629	1,767	1,767	1,793	1,719	1,693	1,447	1,223	1,793
	kWb	1,729	1,730	1,730	1,730	1,730	1,767	1,767	1,793	1,719	1,693	1,524	1,524	1,793
	Cost	\$ 72,542	\$ 69,782	\$ 66,415	\$ 61,094	\$ 62,914	\$ 67,338	\$ 80,169	\$ 82,503	\$ 80,644	\$ 72,940	\$ 68,094	\$ 73,455	\$ 857,891
2010	kWh	859,919	770,892	754,780	828,690	917,879	1,138,808	1,185,774	1,245,082	1,049,935	857,131	796,284	898,093	11,303,267
	kWa	1,300	1,326	1,309	1,568	1,875	1,927	1,953	1,979	1,892	1,884	1,616	1,352	1,979
	kWb	1,524	1,524	1,524	1,568	1,875	1,927	1,953	1,979	1,892	1,884	1,682	1,682	1,979
	Cost	\$ 81,713	\$ 62,972	\$ 61,914	\$ 67,168	\$ 75,386	\$ 90,071	\$ 93,589	\$ 97,820	\$ 84,475	\$ 72,391	\$ 66,710	\$ 73,363	\$ 927,573
2011	kWh	920,603	781,210	782,584	890,293	868,082	1,089,037	1,249,160	1,124,797	1,019,571	819,245	831,234	798,840	11,174,656
	kWa	1,339	1,335	1,594	1,564	1,793	1,918	1,992	1,961	1,914	1,572	1,591	1,334	1,992
	kWb	1,682	1,682	1,682	1,682	1,793	1,918	1,992	1,961	1,914	1,693	1,693	1,693	1,992
	Cost	\$ 68,777	\$ 59,801	\$ 59,891	\$ 67,898	\$ 67,073	\$ 82,064	\$ 92,431	\$ 84,284	\$ 77,262	\$ 62,765	\$ 63,545	\$ 61,436	\$ 847,227

Justice Center Gas Data

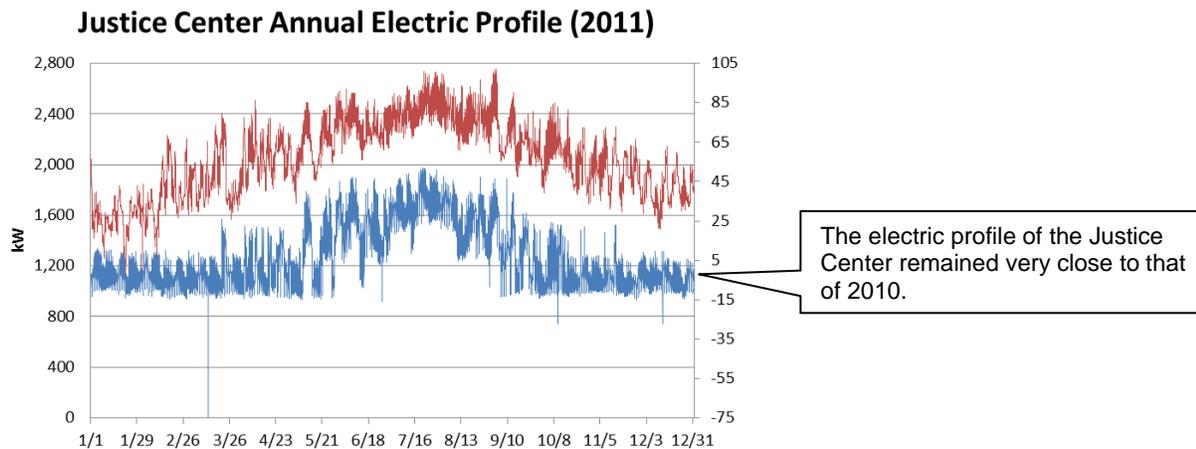
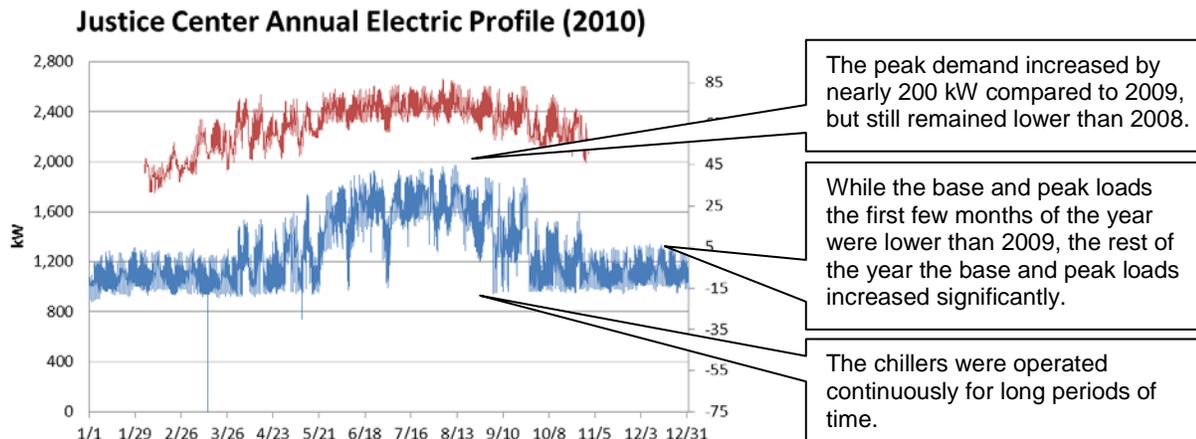
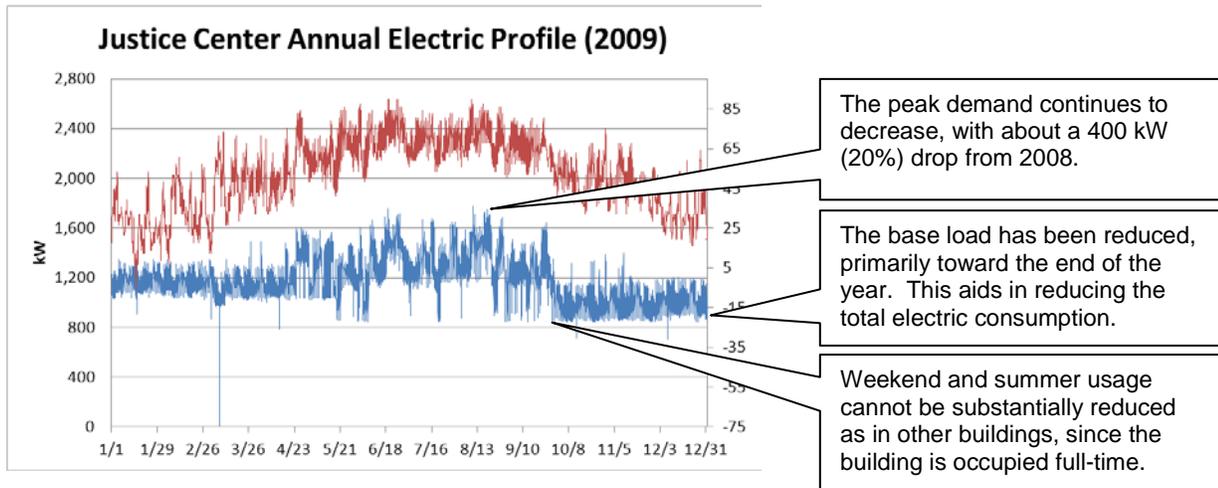
Month		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2009	CCF	1,991	1,755	1,001	673	292	820	640	620	4,680	915	650	745	14,782
	Cost	\$ 2,443	\$ 2,236	\$ 1,491	\$ 551	\$ 275	\$ 1,876	\$ 499	\$ 506	\$ 3,132	\$ 651	\$ 559	\$ 638	\$ 14,858
2010	CCF	815	629	377	1,389	4,550	639	653	658	656	882	982	2,056	14,286
	Cost	\$ 884	\$ 730	\$ 519	\$ 1,245	\$ 3,467	\$ 685	\$ 574	\$ 696	\$ 699	\$ 840	\$ 929	\$ 1,758	\$ 13,025
2011	CCF	1,264	759	598	682	623	442	530	485	588	4,915	995	1,502	13,383
	Cost	\$ 1,199	\$ 809	\$ 673	\$ 691	\$ 673	\$ 549	\$ 618	\$ 577	\$ 645	\$ 3,668	\$ 901	\$ 1,259	\$ 12,262

Justice Center Water Data

Month		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2009	CCF	3,429	3,646	4,168	3,286	3,678	4,434	3,843	4,259	4,698	3,219	623	769	40,050
	Cost	\$ 15,821	\$ 17,890	\$ 20,568	\$ 16,460	\$ 18,022	\$ 21,365	\$ 18,554	\$ 20,627	\$ 22,725	\$ 15,663	\$ 4,489	\$ 5,570	\$ 197,754
2010	CCF	588	743	607	585	645	799	4,439	4,550	5,020	3,693	3,487	3,647	28,803
	Cost	\$ 4,521	\$ 6,022	\$ 5,010	\$ 4,985	\$ 5,088	\$ 3,553	\$ 19,773	\$ 19,911	\$ 22,525	\$ 17,959	\$ 18,270	\$ 19,583	\$ 147,200
2011	CCF	4,016	3,287	4,091	3,084	3,695		4,473	4,241	5,051	4,133	3,305	4,159	43,535
	Cost	\$ 21,723	\$ 18,706	\$ 23,338	\$ 17,130	\$ 20,154		\$ 21,436	\$ 19,190	\$ 24,270	\$ 21,892	\$ 18,506	\$ 23,529	\$ 229,874

= minimum of month for past 3 years

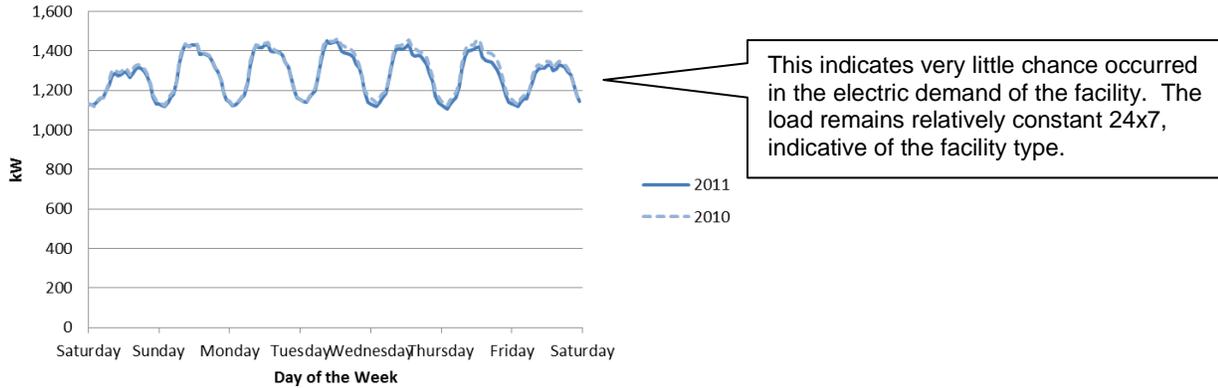
JC-Three Year Electrical Review



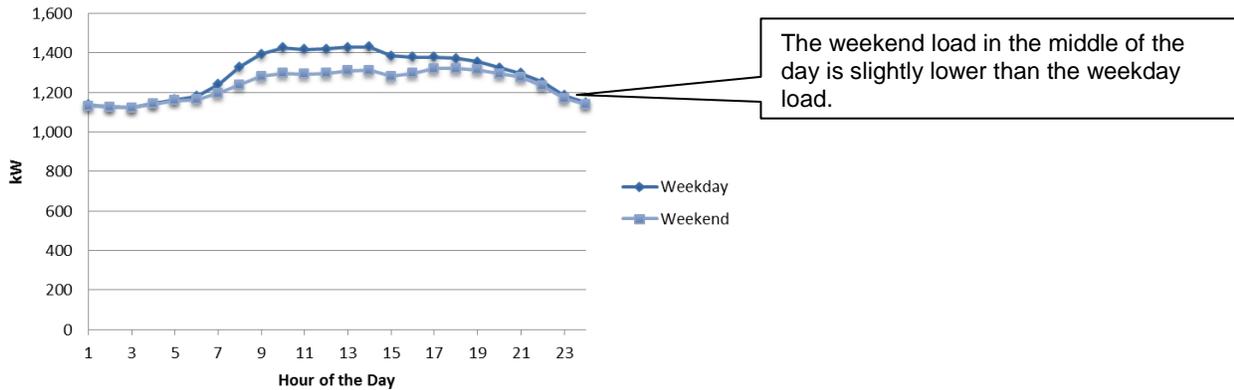
JC-Electric Profile Review

The graphs below illustrate the power requirements of the facility throughout a typical week, typical day and the year. The typical week and typical day profiles are averaged throughout the year in order to view how the electric demand varies during the day and across the week. The load duration curve represents the demand as a function of cumulative time for the year.

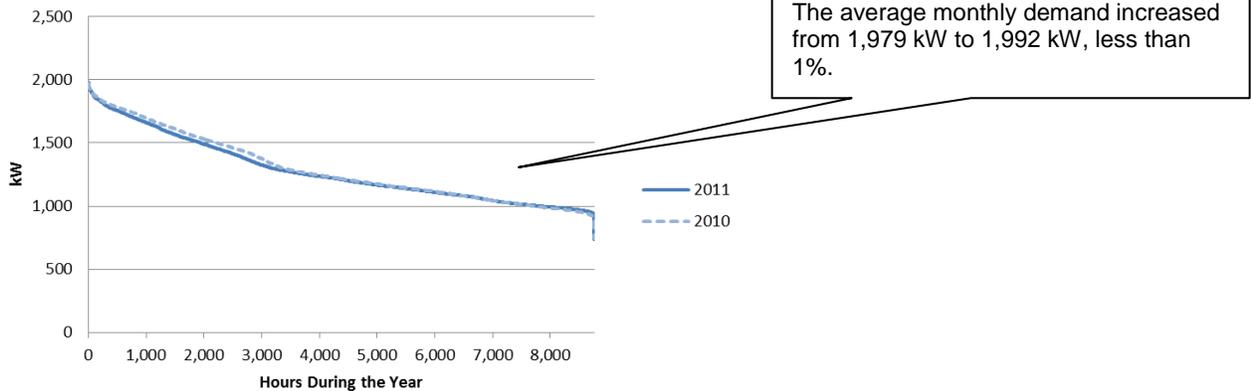
Justice Center Typical Week Profile



Justice Center Typical Day Profile (2011)



Justice Center Load Duration Curve



JC-Energy Star Review

General Information Edit	
Address: 100 Sycamore Street , Cincinnati, OH 45202	
Year Built: 1985	
Property Type: (not set)	
Baseline Rating: 63	Current Rating: 85
<input type="checkbox"/> View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	Energy Period Ending Dates Current: November 2011 Baseline: December 2006
Eligibility for the ENERGY STAR	
Eligible to Apply for the ENERGY STAR	

The Justice Center is not eligible to qualify for the Energy Star because the heating for this building is provided by the Courthouse Boiler Plant. Steam usage is being monitored hourly with the intent of allotting the steam consumption for the facility if the EPA allows this method of submetering in the future.

Justice Center Energy Conservation Measures and Recommendations

Electric - The electric usage on this building continues to be one of the highest in the County as this is a penal facility operating at its maximum load. There was an increase in electric consumption of 8%, likely due to the increase in heating degree days. The chillers were operated constantly throughout the summer, leading to a high summer electric consumption. The peak electric demand increased by 186 kW (10%) when compared to 2009. Despite this increase, the electric consumption is the second lowest in the last decade.

Gas - The gas usage for this building has dropped very low since the Courthouse took over steam production for both buildings. This consumption reached the lowest level tracked to date.

Previous ECM's

- New cooling towers with VFD's.
- DDC control system upgrade.
- Upgraded Domestic Water pumping system to new Grundfos with VFD control.

Proposed ECM's

- Conduct an Ameresco ECM audit for energy conservation measures.
 - Lighting retrofits using Duke Incentive programs with occupancy sensors
 - Perform water conservation survey and associated work
 - Upgrade and recommission controls, demand controlled ventilation.
 - Install single zone cooling in LCC center to allow for system wide setback on air temperatures.
 - Solar panels and hot water heat pumps for domestic heating
 - VFD's on nearly all motors.
 - Chiller Replacement with Green Chiller options based on LCC selections.
 - Ozone laundry cleaning.

Courthouse IT (Interruptible Tariff) Savings

This program was put in place in 2003 and was ready for 2004 usage. An agreement exists between the County and Duke Energy that stipulates that gas service to the Courthouse can be stopped with advance notice from Duke, and that the Courthouse must use at least 1,000 MCF during the summer months.

Table 3: Courthouse FT / IT Natural Gas Rate Comparison

	Gas Usage	FT Rate 1	FT Rate 2	FT Rate 3	FT Admin	IT Rate	IT Admin	Firm	Interruptible	Monthly
Month	CCF	\$ / CCF	\$ / CCF	\$ / CCF	Cost	\$ / CCF	Cost	Cost	Cost	Savings
1	137,299	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.07525	\$625.12	\$18,766	\$10,957	\$7,810
2	135,042	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.07526	\$625.12	\$18,463	\$10,789	\$7,675
3	102,913	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.07551	\$625.12	\$14,150	\$8,396	\$5,754
4	95,235	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.07559	\$625.12	\$13,119	\$7,824	\$5,295
5	62,884	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.07616	\$625.12	\$8,776	\$5,414	\$3,362
6	53,419	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.08170	\$626.04	\$7,505	\$4,990	\$2,515
7	36,601	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.08260	\$626.04	\$5,247	\$3,649	\$1,598
8	35,385	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.08270	\$626.04	\$5,084	\$3,552	\$1,532
9	36,465	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.08261	\$626.04	\$5,229	\$3,639	\$1,591
10	38,530	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.08246	\$626.04	\$5,506	\$3,803	\$1,703
11	48,233	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.08191	\$626.04	\$6,809	\$4,577	\$2,232
12	77,871	\$0.14665	\$0.13914	\$0.13425	\$ 228.45	\$0.08108	\$626.04	\$10,788	\$6,940	\$3,848
Total	859,877							\$119,445	\$74,529	\$44,916

This comparison shows an estimated savings of having the Courthouse on the Duke Energy Interruptible Gas Service Plan of the following for each year:

- \$94,000 (2004)
- \$87,000 (2005)
- \$84,000 (2006)
- \$85,000 (2007)
- \$95,000 (2008)
- \$85,000 (2009)
- \$50,000 (2010)
- \$45,000 (2011)

This savings is expected to continue annually, and has saved the taxpayers an estimated \$624,000 in avoided natural gas commodity cost versus the fixed firm rate tariff.

Hamilton County Natural Gas Broker Agreement

This program was put in place in 2000, with an agreement between the County and County Commissioners' Association of Ohio (CCAO). The CCAO manages a third party gas marketer who aggressively buys natural gas on the open market with strategies that are intended to provide the best gas prices possible to the group with a manageable risk. Monthly totals vary between savings and expenditures but overall the plan is saving money.

Year	Duke \$/ MCF	Exelon \$/ MCF	Duke All Year	Exelon All Year	Savings
2001	\$ 6.6982	\$ 5.0663	\$ 724,333	\$ 629,185	\$ 95,148
2002	\$ 3.8843	\$ 4.2994	\$ 456,254	\$ 491,285	\$ (35,031)
2003	\$ 7.0748	\$ 5.9751	\$ 684,903	\$ 679,907	\$ 4,996
2004	\$ 7.7913	\$ 7.0118	\$ 870,079	\$ 746,382	\$ 123,697
2005	\$ 9.4914	\$ 9.6725	\$1,174,869	\$1,204,177	\$ (29,309)
2006	\$ 9.3188	\$ 9.8878	\$1,104,029	\$1,173,280	\$ (69,252)
2007	\$ 9.4023	\$ 8.0682	\$1,116,246	\$ 958,818	\$ 157,428
2008	\$ 11.1699	\$ 10.2292	\$1,233,389	\$1,120,661	\$ 112,728
2009	\$ 7.0869	\$ 6.5561	\$ 849,018	\$ 845,947	\$ 3,072
2010	\$ 6.3207	\$ 5.1855	\$ 701,462	\$ 594,920	\$ 106,541
2011	\$ 5.7358	\$ 5.0717	\$ 608,793	\$ 538,309	\$ 70,483

Total Cumulative Savings => \$540,502

Table 4: Natural Gas Comparison, CCAO versus Duke Energy

As can be seen above in the spreadsheet the County has saved an approximate \$540,000 in the last eleven years by participating in deregulated natural gas commodity purchasing through the County Commissioners Association of Ohio (CCAO). As with any open market commodity purchase plan there is always risk. Over the last five years the purchase of gas through the CCAO has seen positive results.

Hamilton County Deregulated Electricity Agreement

This program was put in place January 1, 2010 and will continue through December 31, 2012. 2010 was the first year in this type of cost avoidance contract. The current electric provider is Duke Energy Retail Service (DERS), different than the regulated utility Duke Energy Ohio (DEO). As with any open market commodity purchase plan, there is always risk but this should be minimized by re-bidding prior to the current agreement ending in December 2012. This process will start in mid-2012 and will reflect the open market process that the PUCO will have in place at that time.

In summary, \$1,017,000 was saved in 2011 by switching to the shopper rate with purchased commodity, rather than remaining on the non-shopper rate. Through a public bid in 2009, Hamilton County Facilities locked into a three year electric commodity rate of \$0.057 per kWh. One of the main benefits in buying market electricity is that the County no longer pays a demand charge on the generation of the electricity, which results in a savings to the County.

The savings of \$1,017,000 is broken down as \$940,000 for the major accounts and an estimated amount of \$76,800 for the smaller accounts managed by the Facilities Department. The first year savings for the major accounts are listed in the table below:

Table 5: Electric Comparison, DERS vs. DEO

Building Name	Electric Usage	Shopper Rate \$/kWh	Shopper Comm Cost \$	Shopper Trans Cost \$	Shopper Total Cost \$	Utility Non Shopper Cost	Annual Savings
222 Alms & Doepke	5,441,731	\$ 0.05700	\$ 310,179	\$ 112,644	\$ 422,822	\$ 563,219	\$140,397
230 East Ninth	2,851,511	\$ 0.05700	\$ 162,536	\$ 75,280	\$ 237,816	\$ 359,576	\$121,760
237 WHT	-	\$ 0.05700	\$ -	\$ -	\$ -	\$ -	\$0
250 WHT *	813,278	\$ 0.05950	\$ 48,390	\$ 21,064	\$ 69,454	\$ 99,708	\$30,254
2020 Auburn	2,314,128	\$ 0.05700	\$ 131,905	\$ 46,051	\$ 177,956	\$ 231,644	\$53,688
800 Broadway	4,247,108	\$ 0.05700	\$ 242,085	\$ 83,668	\$ 325,753	\$ 454,016	\$128,263
Administration Bldg	4,000,303	\$ 0.05950	\$ 238,018	\$ 90,007	\$ 328,025	\$ 442,834	\$114,809
Courthouse	4,989,082	\$ 0.05700	\$ 284,378	\$ 120,237	\$ 404,615	\$ 580,230	\$175,616
Justice Center	11,174,656	\$ 0.05700	\$ 636,955	\$ 195,556	\$ 832,512	\$ 1,007,954	\$175,442
TOTALS:	35,831,797		\$ 2,054,446	\$ 744,507	\$ 2,798,953	\$ 3,739,180	\$940,227

Note: Savings calculation is based on Duke Energy Ohio (DEO) Rate Worksheet and Hamilton County Bid Prices through Duke Energy Retail Services (DERS)

* there are two meters in this building, savings is combination of both meters

Accumulated Savings \$1,715,660
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Facilities staff and the Energy Consultant included the facilities for several other County owned properties in the RFP. As a result the County Engineer, DDS (formerly MRDD), Communications, and PBS "piggyback" on the bid process and entered into their own separate agreements, netting a 25% reduction from the established rates for Duke Energy customers.

Appendix A - Glossary of Terms

BASELINE OR BASEYEAR - The reference to the year in which the County began its Energy Conservation Project, the calendar year 1997.

BROKER OR MARKETER - Natural gas marketers, or brokers, are independent companies that arrange alternate rates and terms of service for Primary Gas or Electric supply. Marketers offer the option of different terms of pricing than that offered by Duke Energy, such as a fixed rate for a fixed period of time. Marketers only arrange a customer's gas or electric supply—they do not deliver the natural gas or provide utility services.

BTU - A British thermal unit (BTU) is a standard unit of energy that is used in the United States. A 5-ton air conditioner that conditions a typical home is equivalent to 60,000 BTU/hour. A 100 watt light bulb dissipates 341 BTU/hour. The BTU is often used as a quantitative specification for the energy-producing or energy-transferring capability of heating and cooling systems such as furnaces, ovens, refrigerators, and air conditioners.

CCAO - County Commissioners' Association of Ohio. For the purposes of this report this refers to the organization in which Hamilton County Facilities is partnered with to provide all natural gas commodities for Hamilton County owned buildings. The CCAO manages the contract through Exelon Energy for all the Counties in the current buying block.

DDC - Direct Digital Control is a name given to computer systems used to monitor, trend, adjust and control building HVAC (Heating, Ventilating and Air Conditioning) Systems.

DEGREE-DAY - A rough measure used to estimate the amount of heating or cooling required in a given area, defined as the difference between the mean daily temperature and 65 degrees Fahrenheit. Cincinnati typically experiences about 4,500 heating degree-days per year.

DEO - Duke Energy Ohio is the regulated utility provider in Hamilton County.

DERS - Duke Energy Retail Service is the deregulated branch of Duke Energy in the Hamilton County area.

ECM - Energy Conservation Measure. Reference to any activity (project, scheduling, replacement, task) that is taken to save or use energy more wisely.

ESCO - Energy Service Company.

FT RATE - See IT Rate.

ENGINEERING ENERGY PARTNER - An energy service company or registered professionals, such as architectural and engineering firms, that provide the expertise, services, equipment, and financing without performance contracting guarantees (e.g. ThermalTech Engineering in this report).

GS RATE - See IT Rate

HVAC - Heating, Ventilating and Air Conditioning.

IGA - Investment Grade Audit.

IT RATE - Interruptible Rate Tariff. An optional rate schedule offered by Duke Energy that charges the customer lower transportation prices on natural gas in exchange for Duke Energy's ability to curtail the gas supply to building during high demand periods. The gas can be purchased on the open market from companies other than Duke Energy. GS stands for General Service (the default residential and commercial rate schedule) and FT stands for Firm Transportation (similar to IT but it cannot be curtailed).

KW - The kilowatt (symbolized kW) is a unit of power measurement. Used by the utility industry to measure the peak power consumption of buildings. A peak kW of usage costs about \$10-15/month.

KWH - The kilowatt-hour (symbolized kWh) is a unit of energy equivalent to one kilowatt (1 kW) of power expended for one hour (1 h) of time. It is commonly used in electrical measurement applications. A 100 watt light bulb operated for 10 hours consumes 1,000 watt-hours or 1 kWh. A kWh costs about \$0.03-0.05.

LEED® - Leadership in Energy and Environmental Design. A rating system created by the U.S. Green Building Council to allow the sustainability and energy efficiency of buildings to be compared. Points can be earned for energy and water savings strategies, indoor environmental quality, materials recycling. The rating system has reward levels of certified, bronze, silver and gold.

LIFE CYCLE COST (LCC) - A financial decision-making calculation for building owners and designers. It provides a means of comparing the net present value or rate-of-return of two or more design alternatives. For each alternative, first costs and annual maintenance and energy costs are combined with financial factors input to a LCC spreadsheet. The final result is a number that shows the total cost of ownership over an economic period (20 years typically for mechanical equipment) and allows the owner to select the piece of equipment that provides the best financial return.

MCF - A unit of measurement used for natural gas equal to 1,000 cubic feet of gas or about 1 mmBTU. An MCF costs about \$5-10.

NIGHT SETBACK - A terminology used when HVAC control systems are schedule off when the building is unoccupied. Normally these setbacks will allow the building to rise to 80 degrees in the summertime and drop to 65 degrees in the wintertime before bringing the building system back on to maintain the building temperature.

NORMALIZED - For the purposes of this report there are two cases of normalization. The first is the way in which Duke Energy bills its customers. Since meter read dates often occur in the middle of the month the bills often range from dates (i.e. the 21st of one month to the 21st the next month). When this happens the usage and cost is put in the month with the most days represented (i.e. if a bill arrives on March 1st for the dates of Jan 21 through Feb 21, that is considered the February bill). The second occurrence of normalization occurs in comparing successive calendar years to the baseline year of this report. To accurately decide if energy usage and cost have increased or decrease the rising or falling cost of gas and electric is factored out in addition to the effect of hotter summers and colder winters. This is accomplished by acquiring the degree-days for each year and building a ratio from each year to the base year. Lastly, the minimum utility usage of a building that is independent of external stimuli (e.g. computers, lights, elevators, etc) is determined. The "Normalized" Master Spreadsheet is then created.

PAYBACK PERIOD - The amount of time required for an asset to generate enough savings to offset the initial outlay for the asset.

PC - Performance Contractor or ESCO as in Energy Service Company.

PROJECTED SAVINGS (In a savings-based financing agreement) - Refers to the expected annual dollar value of the reduced energy consumption due to implementing conservation measures.

SAVINGS-BASED FORMULA - The formula (calculation of savings procedure) specified in the contract, which is used to determine savings. Usually involves four steps:

1. Determine actual historical usage and contributing operating conditions to form a base year
2. Adjust base year actual usage for variations (temperature, occupancy, etc.) to form a baseline
3. Subtract actual usage from adjusted baseline consumption and
4. Calculate savings by multiplying the units of energy saved by the current cost per unit.

Note: Calculations for electrical demand savings are considered part of the formula but are computed separately.

Appendix B - Accomplishments

Since the implementation of the Energy Conservation Master Plan in 1998, County Facilities has implemented the following ECM's and continues to look for similar improvements in the buildings:

- **All Buildings (1998):** Hamilton County Facilities uses an outside firm, ThermalTech Engineering, to assist in monitoring energy usage monthly. To date this alliance has discovered a \$50,000 billing error at the 800 Broadway building and a \$16,000 electric tariff billing error at an MRDD facility. The alliance also achieved over \$577,000 in IT (Interruptible Tariff) gas savings at the County Courthouse.
- **All Buildings (2000):** Life Cycle Cost and Total Cost of Ownership to purchase large mechanical equipment (boilers, chillers, air handlers and cooling towers).
- **All Buildings (2000):** Facilities began purchasing deregulated natural gas with the CCAO in October 2000.
- **All Buildings (2000):** Implement FT gas rate for all buildings (Duke Energy Resources won bid and later went defunct).
- **All Buildings (2009):** County Facilities has accepted deregulated electricity bids twice to try to beat Duke Energy prices (currently no bidders have ever been able to meet County bid requirements and Duke Energy prices). In 2010 the County entered into a contract with Duke Energy Retail Services for commodity electricity for three years.
- **230 East 9th (1994):** Completed building upgrade of all HVAC and electrical systems. Upgrade included new DDC building automation system complete with night setback and two hour overrides that turn off unscheduled starts of the heating and cooling system automatically after two hours of unoccupied use. Power Logic electrical panels also allow for two hour unscheduled use of lighting system before it automatically places the lights back into unoccupied mode. Complete variable-flow air handling system with similar zones for better space control. Varicone air handlers on roof to handle part load conditions within the building.

- **237 William Howard Taft (2001):** Bought two new boilers using the Life Cycle Cost procedure.
- **237 William Howard Taft (2006):** Bought new 400-ton Chiller using the Life Cycle Cost procedure. Interlocked with Building Automation System to provide optimal start/stop and night setback wherever possible in building. Added VFD to primary chilled water pump for better flow control through chiller. Controls contractor added additional programming for better backup control of building while in setback over weekends.
- **237 William Howard Taft (2007):** Upgraded DDC system with night setback programming.

- **800 Broadway (1999):** Turned off Waiting Room AHU fans with timeclocks during unoccupied periods.
- **800 Broadway (1999):** Used night setback to eliminate unnecessary space heating and cooling during unoccupied periods.
- **800 Broadway (1999):** Eliminated unnecessary space cooling during unoccupied periods in the cooling season.
- **800 Broadway (1999):** Used small compressors in the computer room cooling units in lieu of the large building chiller during the heating season.
- **800 Broadway (1999):** Added sewer deduction water meter for cooling tower and boiler make-up water.
- **800 Broadway (1999):** Insulated bare steam and condensate piping and related equipment in various parts of the building.

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- **800 Broadway (1999):** Installed fluorescent lighting fixtures in place of incandescent units.
 - **800 Broadway (1999):** Upgraded secondary CHW pump VFD controls to allow variable speed operation of pump; block all bypass ports of 3-way valves to promote variable flow.
 - **800 Broadway (1999):** Installed two high-efficiency power burner gas water heaters and shutdown large steam boilers all summer long.
 - **800 Broadway (1999):** Combined cooling tower operation to take advantage of low speed fan operation.
 - **800 Broadway (1999):** Replaced the 600-ton Trane chiller with a high efficiency chiller. Modified the cooling tower piping and fan controls to allow both towers to serve one chiller at lower fan speed.
 - **800 Broadway (1999):** Upgraded the building automation to full DDC system. Utilize scheduling and setbacks. IPAC Phase I. 2000.
 - **800 Broadway (1999):** Programmed "Near optimized control of Chiller Plants" into DDC system.
 - **800 Broadway (2001):** Upgraded the building automation to full DDC system. Utilize scheduling and setbacks. IPAC Phase II. 2001.
 - **800 Broadway (2002):** Upgraded the building automation to Full DDC system. Utilize scheduling and setbacks. IPAC Phase III. 2002.
 - **800 Broadway (2003):** Replaced outdated cooling towers utilized two speed motors with new counterflow cooling towers equipped with VFD's.
 - **800 Broadway (2004):** Replaced old boilers with new higher efficiency boilers.
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- **2020 Auburn (2010):** Installed new high-efficiency condensing boilers.
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- **Alms & Doepke Building (1994):** Low VOC materials - paint, furniture, carpet.
 - **Alms & Doepke Building (1994):** Met LEED criteria for daylighting/view access to staff.
 - **Alms & Doepke Building (1994):** Installed a high efficiency charcoal filtration system with 100% OA.
 - **Alms & Doepke Building (1994):** Mechanical system flushout ran one week at high temperatures to encourage early off-gassing
 - **Alms & Doepke Building (1994):** Mechanical system monitored offsite to see that the building systems continue to operate at best levels
 - **Alms & Doepke Building (1994):** Mechanical system computer controls defaults to appropriate setting when changed manually to inappropriate settings
 - **Alms & Doepke Building (1994):** High efficiency lighting - among the best available at the time.
 - **Alms & Doepke Building (1994):** Reused/recycled content materials - flooring (primarily carpeting), systems furniture, ceiling tile.
 - **Alms & Doepke Building (1999):** Insulated domestic hot water storage tank in penthouse.
 - **Alms & Doepke Building (1999):** Insulated bare steam and condensate piping and related equipment in various parts of the building.
 - **Alms & Doepke Building (1999):** Upgraded insulation values in building.
 - **Alms & Doepke Building (1999):** Insulated bare steam and condensate piping and related equipment in various parts of the building.
 - **Alms & Doepke Building (1999):** Insulated bare steam and condensate piping and related equipment in various parts of the building.
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- **County Administration Building (1999):** Insulated bare steam and condensate piping and related equipment in various parts of the building.
- **County Administration Building (2005):** Replaced old evaporative tenth floor chiller with a high efficiency air cooled chiller purchased through life cycle cost analysis.

- **County Courthouse (1999):** Replaced constant volume air handlers with energy efficient VAV units under DDC control.
- **County Courthouse (2003):** Upgraded boiler plant to utilize separate condensate receiver and deaerator so that boiler stack economizers can be utilized to preheat feedwater for better efficiency at steam production.
- **County Courthouse (2004):** Converted to IT Rate transport gas supply from Duke Energy (Commodity purchased through CCAO).
- **County Courthouse (2006):** Modified Boiler DDC system to fire boilers more efficiency and prevent moisture carryover during steam production.

- **Justice Center (2001):** Replaced cooling towers with new cooling towers equipped with VFD's.
- **Justice Center (2006):** Recommissioned the DDC system to eliminate many obsolete and broken control components. Take better control of schedules and outdoor air control. Repaired system back to original specifications.
- **Justice Center (2006):** Replaced dual duct boxes in Sheriff's Offices to improve comfort and energy usages.
- **Justice Center (2007):** Installed VFD drives on stairwell pressurization fans to reduce amount of conditioned air being exhausted from building.
- **Justice Center (2010):** Replaced Domestic Water Booster Pumping system with higher efficiency Grundfos VFD domestic water pumps.

- **Winton Road Records Center (2001):** Installed Air Handling Unit with no economizers to reduce the humidification costs for archive storage facilities. Calculations showed the use of outdoor air for free cooling would use more energy. Acquired variance from Building Department for installation

Appendix C - History

Since the large portion of utility usage is directly attributable to the six major downtown buildings and the 237 William Howard Taft building, the charts in this report reflect their usage. In actuality in 2010, the Facility Department manages or co-manages over 3.2 million square feet of building space and includes the following facilities within the County jurisdiction: 2020 Auburn, 230 East 9th, 237 William Howard Taft, 250 William Howard Taft, 264 William Howard Taft, 800 Broadway, Communication Center, County Courthouse, County Administration Building, Coroner's Office, Engineer's Garages, Hillcrest Training School, 222 East Central Parkway, Justice Center, Memorial Hall, Sheriff Patrol Headquarters, Parkhaus Garage, and Winton Road Records Center. County Facilities does not provide all services in all of these buildings as some of them have their own management, pay their own utility bills, or perform their own maintenance but for the most part County Facilities has something invested in each of these facilities.

Energy Conservation Master Plan (ECM)

In 1998 County Facilities began an Energy Conservation Master Plan (ECM) study with a local engineering firm called ThermalTech Engineering. The County selected ThermalTech Engineering because of their long-standing tradition of engineering energy management (they have performed over 100 Federal Title III energy audits, have a full understanding of Duke Energy's rate tariffs and engineering design experience to assist with installations).

The first phase of the ECM project identified 24 cost savings opportunities in six separate buildings including ECM's that cost nothing to implement up to a chiller replacement that cost over \$100,000 to install. At the end of the first year the County had invested approximately \$140,000 with a \$48,000 annual energy savings. In particular at the 800 Broadway Building the Cost per Square Foot dropped from \$1.64 to a \$1.43 in 2 years - an amazing accomplishment for the County.

Cinergy Resources

As the project continued, opportunities to acquire natural gas supplies through deregulation were identified. Facilities and ThermalTech prepared bid documents and secured a brokered supplied natural gas commodity from Duke Energy Resources in 1999 but shortly after the program started, Cinergy Resources went defunct and the County was forced back onto CG&E natural gas.

CCAO Service Corporation Natural Gas Programs

In 1999 the CCAO Service Corporation (CCAOSC) Board of Trustees authorized the establishment of a Natural Gas Program for CCAO members. The 30 counties that signed up for the program saved money in two ways: Pre-payment and Aggregation (buying as a group). Taxable bonds which totaled \$29,890,000 were issued by Hamilton County on October 31, 2000 to assist the CCAO Service Corporation and 30 CCAOSC Natural Gas Program member counties. The program began November 1, 2000 with Exelon Energy managing the gas portion of the program and ended in May 2009.

The County signed on to a new program with the CCAOSC in May 2009 with Palmer Energy acting as the Energy Broker for the CCAOSC Natural Gas Program member counties of which in 2010 there were over 50. Presently the Facilities Director, Ralph Linne, serves on the Natural Gas Executive Committee and is the representative for Hamilton County.

Procurement of Electricity form the Deregulated Market

County Facilities has also attempted to buy electricity on the deregulated market and has twice produced bid packages for this purpose. Jim Clarkson of Resource Management, Inc along with ThermalTech Engineering prepared the bid packets. Bids were opened on two occasions but in one case the prices were not low enough to project any savings to the County and ThermalTech recommended not accepting any bid. The second bid was not executable due to contract and pricing restrictions by the marketers - basically a contract could not be agreed upon fast enough to keep the bid prices on bid day intact (the market is very volatile). The third try in 2009 was successful with a three year contract with Duke Energy Retail lowering the cost of electric power by 20%.

Energy Manager

County Facilities has had two full time energy managers since 2001, but has not had this position filled for several years. In lieu of a having a full time employee, ThermalTech Engineering has provided monthly review and reconciliation of utility bills, prepared the RFPs for electric power, updated the ECM, and assisted in preparing the data presented in this report. Presently they analyzes trends and reports monthly on County utility usage.

List Energy Related Awards

Over the years in this program, County Facilities has applied for numerous awards and have won many significant awards that honor the efforts. Here is a list of accomplishments to date:

- 2011 EPA Energy Star Award for the 800 Broadway Building, County Administration Building and 230 East Ninth.
- 20112010 EPA Energy Star Award for the 800 Broadway Building
- Who's Who 2009: Leaders in Energy Management and Sustainability
- 2009 EPA Energy Star Award for the 800 Broadway Building
- 2008 EPA Energy Star Award for the 800 Broadway Building
- 2006 Governor's Award for Energy Excellence - Honorable Mention
- 2005 Governor's Award for Energy Excellence - Second Place Finisher
- 2005-2006 Local and Regional TOBY (The Office Building of the Year) for 800 Broadway
- 2004 Governor's Award of Energy Excellence - First Place Finisher
- 2004 Alliance to Save Energy - Participant
- 2002 Rebuild America Energy Grant Recipient - Winner
- 2001 NACO Award for Life Cycle Cost Purchasing - Winner
- 2001-2002 Regional TOBY (The Office Building of the Year) for the Hamilton County Courthouse
- 2000-2001 Local TOBY (The Office Building of the Year) for the Hamilton County Courthouse
- 2000-2001 Regional TOBY (The Office Building of the Year) for the 230 East Ninth Building
- 1999-2000 Local TOBY (The Office Building of the Year) for the 230 East Ninth Building

End of Report