



MEMO
City of Fitchburg
Department of Public Works

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To:	Mayor Shawn Pfaff; Tony Roach, City Administrator; Paul Woodard, Director of Public Works; Rick Eilertson, Environmental Engineer; City of Fitchburg Green Team Staff;
From:	Kristofer Canto, Sustainability Specialist
Date:	April 7, 2014
Subject:	Update on Resolution R-50-09 – A Resolution in Support of the State of Wisconsin’s Energy Independence Goals for 2025 (25x25)

Purpose

On August 11, 2009, the City of Fitchburg adopted Resolution R-50-09 – A Resolution in Support of the State of Wisconsin’s Energy independence Goals for 2025 – also known as 25x25. The purpose of this staff memo is to briefly summarize goals defined by 25x25 and provide an update regarding what has been accomplished by the City of Fitchburg in support of this resolution.

Goals Established by former Governor Doyle’s Office of Energy Independence include:

1. Generating 25% of electricity and transportation fuels from renewable resources by 2025 (25x25),
2. Capturing 10% of the emerging bio-industry and renewable energy market by 2030, and
3. Becoming a national leader in groundbreaking energy research.

Fitchburg committed to participating in 25x25 as a “three-star” Energy Independent Community. A summary of Energy Independent Community characteristics and Fitchburg’s progress to date are provided below:

One Star:

1. **25x25 Goals:** Pass resolution adopting the 25x25 goals
Status: Completed (Resolution adopted August 11, 2009)
2. **Communication and Education:**
 - a. Post community Efforts toward Energy Independence on a website and link to the OEI,
Status: Completed
 - b. Promote three Energy Independence Community Events
Status: Completed through Fitchburg Green Thursday Events

Two Star – Enact at the local level resolutions based on the Governor’s Executive Orders:

1. **Energy Efficiency and Renewable Sources (Act 141):** Adopt energy standards for all energy-consuming equipment purchased by government agencies and departments; commit to renewable energy purchases for municipal buildings (20 percent by 2011).
Status: **Incomplete**

2. **Increase Utilization of Renewable Fuels in Vehicles** owned and operated by the local government by 20% by 2010 and by 50% by 2015.
Status: Incomplete
3. **Creation of High Performance Green Building Standards and Energy Conservation for Municipal Facilities and Operations**
Status: In-Progress - Currently developing City of Fitchburg Municipal Green Building Guidelines

Three Star:

1. **Agree to evaluate their current energy use and sources; determine an energy efficiency and savings strategy; and, using a checklist, determine the community potential for energy independence. The five-step process follows:**
 - a. **Define community boundaries;**
Status: Completed
 - b. **Inventory energy uses;**
Status: Ongoing
 - Draft 2012 Energy Consumption and GHG Emissions Report³ completed
 - Beginning 2013 Energy Consumption data collection and analysis
 - c. **Design an energy efficiency and savings strategy;**
Status: Completed
 - 2013 Retro-commissioning Project² identified energy efficiency and saving strategies for the City Campus buildings
 - GHG Emissions and Recommendations Report Updated¹ (2013)
 - d. **Evaluate potential energy technologies;**
Status: Completed
 - 2013 Retro-commissioning Project² identified energy efficiency and saving strategies for the City Campus buildings
 - e. **Match energy needs to capacity.**
Status: Incomplete
2. **Prepare energy independent plan with projected savings and costs to implement;**
Status: Completed - See attached GHG Emissions and Recommendations Report Update¹ (2013)
3. **Help shape state policy for the future on funding and legislation to help further the energy independence goals of the state.**
Status: Incomplete
4. **Designate Energy Independence Coordinator.**
Status: Completed – Sustainability Specialist position created January 6, 2014

Attached:

1. GHG Emissions and Recommendations Report Update (November 11, 2013)
2. Making Good Buildings Even Better (September 24, 2013)
3. Draft 2012 Energy Consumption and GHG Emissions Report (July 11, 2013)

USMCPA RCC Recommendations
GHG Emission Reduction Measures Already Completed or In-Progress

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Status
1	Assign a City staff member to: <ul style="list-style-type: none"> – Oversee the implementation of accepted recommendations. – Perform specific recommendations – Evaluate GHG inventory software updates. – Re-inventory GHG emissions to gage progress. – Re-inventory GHG emissions in 2012. 	(1)	Open On going ✓ done ✓ done Open
2-1	Rewrite Fitchburg's zoning code to permit and encourage compact, diverse, mixed-use neighborhoods.	(2)	✓ done
2-2	Develop a City-wide build out plan to specify the order of neighborhood development, prioritizing infill.	(2)	Done?
2-3	Encourage LEED ND or similar standard.	(2)	
2-4	Encourage Transit-Oriented Developments.	(2)	✓ done
2-11	Use extra-territorial jurisdiction to positively influence planning in adjacent jurisdictions.	(2)	On going
3-1	Implement the following transportation education related items: <ul style="list-style-type: none"> – Create and maintain a ride-sharing online message board. (Comment: using www.rideshareetc.org/) – Educate City employees, residents and businesses on transportation options through FACTv, events, website postings, neighborhood associations, Fitchburg Updates and incentive programs, etc. – Promote and encourage City participation in the area's annual Car-Free Challenge and consider starting a Bike-to-Work Challenge. 	9,300 MMBtu ⁽³⁾	✓ done On going ✓ done
3-4	Promote fuel efficient vehicle purchases by Fitchburg residents and businesses.	18,600 MMBtu ⁽⁴⁾	2011 RCC Expo
3-5	Establish and promote a policy regarding the use of neighborhood electric vehicles (NEV) on local streets (<45 mph).	5,600 MMBtu ⁽⁵⁾	✓ done
3-6	Pursue Madison Metro transit improvements to promote transit usage and increase ridership.	(6)	On going
3-7	Investigate the feasibility of commuter rail.	(6)	
4-1	Proceed with the installation of the budgeted City renewable energy systems during 2009.	15,000 kWh	✓ done
4-2	Proceed with the installation of the budgeted City renewable energy system in 2010.	7,500 kWh	✓ done
5-1	Increase energy conservation awareness of City staff, residents and businesses. (Comment: 2010 RCC Expo, Green Team, RCC presentations.)	225 MMBtu ⁽⁷⁾	On going

USMCPA RCC Recommendations
GHG Emission Reduction Measures Already Completed or In-Progress
(cont.)

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Status
5-2	Amend the City's Purchasing Policy to include GHG emission reductions/energy-efficiency as a purchasing criterion and emphasize that the Policy allows for purchase orders and contracts to be awarded based on life-cycle costs.	(8)	In-progress
5-5	Replace all incandescent "Exit" signs in City buildings with LED "Exit" signs.	23,700 kWh ⁽⁹⁾	?
5-7	Replace any remaining incandescent light bulbs with compact fluorescent light bulbs.	225 MMBtu ⁽⁷⁾	✓ done
6-2	Follow-up on implementation of the City's computer "power off" policy.	3,900 kWh ⁽¹⁰⁾	In-progress
6-3	Evaluate additional winterizing measures at McKee Park Shelter during winter months.	2,000 kWh ⁽¹¹⁾	✓ done
6-4	Implement a Green IT Program.	1,240 kWh + 1,400 gal. gas ⁽¹²⁾	In-progress
7-4	Evaluate the use of LEED NC standard for all future City buildings. Evaluate applying LEED EB standard to existing City buildings.	550 MMBtu per bldg ⁽¹³⁾	In-progress
8-2	Conduct an Idling Reduction Awareness Campaign.	75,000 gal ⁽¹⁴⁾	In-progress
8-3	Engage a consultant to review vehicle idling in the Police and Fire Departments. (Comment: Report prepared by Intern. City Idling policy added to Personnel Manual. Fire Dept's newer engines minimize idling.)	(15)	In-progress
8-4	Encourage vehicle-sharing between departments and/or reimburse employees for the use of their personal vehicle. Encourage teleconferencing.	(16)	In-progress
8-5	Formalize the City's policy for car-pooling to meetings, seminars, training sessions, etc.	(16)	In-progress (Green Team)
8-7	Continue to evaluate the potential for no-mow zones. (Comment: RCC met w/ maintenance staff in 2010.)	(17)	On-going
9-1 & 9-2	Water Conservation - Be proactive regarding critical summer water conservation. - Evaluate and propose additional watering restrictions.	50,000 kWh ⁽¹⁸⁾	✓ done
9-3	Address Well No. 9 issues.	84,000 kWh	✓ done
9-4	Evaluate and review the preventative maintenance procedures for water utility pumps and mechanical equipment.	0 – 8,000 kWh	✓ done
9-6	Evaluate additional water utility facilities for Variable Frequency Drives.	0- 19,500 kWh	In-progress

USMCPA RCC Recommendations
GHG Emission Reduction Measures Already Completed or In-Progress
(cont.)

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Status
9-7	Provide information to residents, businesses and children/teachers about water conservation.	(16)	In-progress
10-1	Re-inventory the waste stream.	0 ⁽¹⁹⁾	✓ done
10-2	Reinforce “reduce” ethic.	50 tonnes CO ₂ ⁽²³⁾	In-progress (Green Team)
10-3	Promote composting by residents.	5 tonnes CO ₂ ⁽²⁰⁾	In-progress
10-6	Reduce frequency of brush pickups (from 16 to 8/year).	1T eCO ₂ per pick-up	Pick-ups reduced to 12 in 2010; 2 pick-ups were added for a total of 14 in 2011
10-7	Enhance recycling in City operations.	5 tonnes CO ₂	In-progress (Green Team)
11-2	Update Tree Inventory; identify planting sites.	0 ⁽²¹⁾	In-progress
11-6	Draft “Forest Management Plans” for all public woodlots.	1 tonnes CO ₂	In-progress
12-1	Conduct a Fitchburg Resource Conservation Commission Forum on the USMCPA (2009).	(22)	✓ done
12-4	Recommend sustainability speakers to Fitchburg’s Chamber of Commerce.	(22)	In-progress
12-6	Promote EnACT and Sustain Dane programs to Fitchburg residents and businesses.	(22)	In-progress
12-8	Promote USMCPA-related topics on FACTv and in Fitchburg Update.	(22)	On-going. 7 articles written in 2010.

USMCPA RCC Recommendations
Cost Saving GHG Reduction Measures
 Priority I

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Estimated Out-of-Pocket Cost
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All of the Priority I Cost Saving Recommendations are now either Completed or In-Progress.

USMCPA RCC Recommendations
Cost Saving GHG Reduction Measure
 Priority II

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Estimated Out-of-Pocket Cost	Status
8-6	Raise the height of City mowers during the summer.	520 gal ⁽²⁴⁾	Cost saving recommendation ⁽²⁵⁾	

USMCPA RCC Recommendations
Zero Cost GHG Reduction Measures
Priority I

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Estimated Out-of-Pocket Cost	Status
2-5	Site new community facilities to minimize auto VMT.	(2)	\$0	
2-6	Avoid financial incentives for developments not promoting high density and energy efficiency.	(2)	\$0	
3-8	Adopt and implement street construction standards that promote bikes and pedestrians.	(3)	\$0	
6-1	Implement a City purchasing/leasing policy that new equipment and appliances are Energy Star certified or equally energy efficient.	40,800 kWh ⁽²⁶⁾	\$0	
2-10	Consider establishing a Parking Utility to operate City-owned parking structure, lots and street parking.	(3)	\$0 ⁽²⁷⁾	
8-1	Encourage the purchase of hybrids to replace retiring vehicles. Amend the City's Purchasing Policy to include GHG emissions as a purchasing criterion.	(28)	\$0	
7-2	Develop a plan to phase-in either the Fitchburg version of LEED NC standard or the USGBC's LEED NC standard for new commercial buildings.	550MMBtu per bldg ⁽¹³⁾	\$0	
5-4 Green Team	Set up an Environment-friendly Suggestion Box for City staff suggestions.	(29)	\$0	
12-3	Identify and promote businesses providing services or products that reduce greenhouse gases.	(22)	\$0	
3-2	Introduce and pass a resolution for the Dane County area to establish a group to guide and promote regional transit options.	(16)	\$0	

USMCPA RCC Recommendations
Zero Cost GHG Reduction Measures
Priority II

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Estimated Out-of-Pocket Cost	Status
2-8	Encourage Fitchburg's park dedication requirements be met with small parks and contributions to regional parks.	(2)	\$0	
2-9	Revise Fitchburg's parking requirements to encourage compact development and transportation modes other than private autos and to discourage surface parking.	(2)	\$0	
8-11	Encourage residents to minimize their use of small engines. Evaluate ways to reduce the City's small engine usage.	(16) (17)	\$0	
7-5	Evaluate the "LEED for Homes," Energy Star and "GreenBuilt Homes" building standards for either incorporation into an incentive-based program or phased-in as a part of residential new construction standards.	56 MMBtu ⁽³⁰⁾ per bldg	\$0	
8-9 Green Team	Use monthly Fuel Consumption Reports to manage fuel use and to monitor significant decreases in efficiency.	(31)	\$0	
11-4	Establish a Tree Board.	0 ⁽²¹⁾	\$0	✓ done
11-7	Develop a commemorative tree-planting program.	0 ⁽²¹⁾	\$0	

USMCPA RCC Recommendations
Zero Cost GHG Reduction Measures (cont.)
Priority III

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Estimated Out-of-Pocket Cost	Status
2-12	Consider TDR program to encourage compact building and reduce consumption of undeveloped land.	(2)	\$0 ⁽³²⁾	
3-3	Urge State legislators and the governor to adopt CA Vehicle Emission Standards.	(16)	\$0	
2-13	Evaluate the feasibility of adopting an urban-friendly fire code (street widths, building heights, roof slopes, etc.).	(2)	\$0	
8-10	Continue to evaluate the use of Low Carbon Fuel Standard (LCFS) vehicle fuels for City fleet use.	(33)	\$0	
2-7	Encourage new subdivisions to align streets in cardinal directions to maximize opportunities for solar energy.	(2)	\$0	
11-1	Examine Forestry operations for ways to cut emissions.	5 tonnes CO ₂ ⁽³⁴⁾	\$0 ⁽³⁵⁾	
12-5	Develop a networking website for Fitchburg residents to share ideas on reducing their carbon footprint.	(22)	\$0	

USMCPA RCC Recommendations
GHG Reduction Measures Involving Cost (cont.)
Priority I (cont.)

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Estimated Out-of-Pocket Cost	Payback Period (Years)	Status
4-4	Implement a renewable energy plan.	(36)	\$3,000 ⁽³⁷⁾	--	
5-3	Implement real-time monitoring of the electricity and natural gas usage in individual City buildings and use this information to improve energy efficiency.	560 MMBtu ⁽³⁸⁾	\$4,800	0.8	
5-8	Work with Focus on Energy, MG&E and Alliant Energy to develop and implement a plan to assist businesses and residents with implementation of energy efficient methods and equipment.	(39)	\$10,000	--	
4-3	Evaluate subscribing Fitchburg to MG&E's Green Power Tomorrow (GPT).	(40)	.025/kWh ⁽⁴¹⁾	--	
7-3	Develop and implement programs tailored to Fitchburg to encourage existing commercial and residential buildings to become more energy efficient.	415 MMBtu (com. bldg) 40 MMBtu (res. bldg) ⁽⁴²⁾	\$15,000 ⁽⁴³⁾	(44)	
4-6	Consider providing additional incentives to residents and businesses for the installation of renewable energy systems.	(45)	(46)	--	
5-6 Green Team	Implement energy conservation policies for City buildings (e.g. motion sensors for interior and exterior lights; solar lights for park trails and shelters, see GHG and Recommendations Report for detail.)	560 MMBtu ⁽³⁸⁾	\$36,500	5.8	

USMCPA RCC Recommendations
GHG Reduction Measures Involving Cost (cont.)
Priority II

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Estimated Out-of-Pocket Cost	Payback Period (Years)	Status
12-2	Solicit additional input from residents, businesses, City staff and others regarding how Fitchburg could best implement the USMCPA recommendations and how best to educate and motivate those willing to make changes.	(22)	\$500	--	
12-7	Organize presentations at schools of Fitchburg residents.	(22)	\$500	--	
10-5	Increase recycling at businesses.	22 tonnes CO ₂ ⁽⁴⁷⁾	\$1,000	2.2	
10-4	Increase recycling in multi-family dwellings.	220 tonnes CO ₂ ⁽⁴⁸⁾	\$5,000	2.2	
9-5	Energy audit of the water utility.	(49)	\$1,500	--	
7-1	Evaluate and implement Fitchburg's modified version of the LEED NC sustainable building standard being developed for buildings in the Green Tech Village.	550 MMBtu per bldg ⁽¹³⁾	\$5,000	0.8 (one average commercial building)	
11-3	Develop a cost-sharing tree-planting program.	0 ⁽²¹⁾	\$14,250 ⁽⁵⁰⁾	--	
6-5	Reduce physical servers 50% by 2012 and replace with more virtual servers.	5,000 kWh ⁽⁵¹⁾	~\$20,000 ⁽⁵²⁾	(52)	

USMCPA RCC Recommendations
GHG Reduction Measures Involving Cost (cont.)
Priority III

Action Item Reference	RCC Recommendations	Est. Annual Energy Savings by 2012	Estimated Out-of-Pocket Cost	Payback Period (Years)	Status
11-5	Purchase CITYgreen software.	0 ⁽²¹⁾	\$895 ⁽⁵³⁾	--	
4-5	Evaluate the installation of less traditional renewable energy systems, including: waste-to-energy technologies (anaerobic digester for animal waste and other biomass materials), extraction of heat from wastewater flowing through Fitchburg, landfill gas recovery, etc.	(54)	\$3,000 ⁽⁵⁵⁾	--	
8-8	Study EMS location to determine if it is located centrally enough to minimize response time and thereby decrease fuel consumption.	(33)	\$5,000	--	
9-8	Install the additional water pipes necessary to connect the Greenfield Neighborhood domestic water system to the City.	3,000 kWh ⁽⁵⁶⁾	\$100,000	297.6	

**USMCPA RCC Recommendations
GHG Emission Reduction Measures
Footnotes**

Rates used for Payback Calculations:

- \$2.00 per gallon of gasoline
- \$25 per ton of landfilled municipal solid waste
- \$11.20 per MMBTU
- \$0.112 per kWh (The residential rate may be higher and therefore yield a shorter payback period.)

- (1) This is critical to the ongoing success of Fitchburg's efforts to address and reduce GHG emissions and may eventually involve cost depending on the implementation plan.
- (2) While these recommendations will reduce GHG emissions, they will have their greatest impact after 2012.
- (3) Assumes a 0.5% reduction in "Community" and "Government" transportation energy usage from improved transportation habits (from 2012 projected transportation energy usage).
- (4) Assumes a 1% reduction in "Community" transportation usage (from 2012 projected transportation energy usage).
- (5) Assumes a 0.3% reduction in "Community" transportation energy usage (from 2012 projected transportation energy usage).
- (6) Studies have shown that these types of improvements decrease VMT.
- (7) Assumes a 2% decrease in the projected 2012 government building energy usage.
- (8) This recommendation will likely save money and reduce GHG emissions.
- (9) Assumes 100 "Exit" signs are replaced. Incandescent "Exit" signs changed to LED will decrease electricity usage by 237 kWh/sign/year x 100 signs = 23,700 kWh/year. LED "Exit" signs are \$32 each, plus labor.
- (10) Assumes current 90% computer shutdown rate among City of Fitchburg employees could be improved to 95% through this policy.
- (11) Assumes 400 kWh savings per month over the 5-month winter period.
- (12) Assumes annual increases of 5% in telecommuting by City of Fitchburg employees, 10% in additional IT savings per year through various measures.
- (13) A 30% to 50% reduction in energy usage translates into an annual energy savings of an estimated 2,100 to 3,500 therms and 60,000 to 100,000 kWh per average commercial building, when compared with current standard construction methods. Using the average energy savings of 40% results in an average annual natural gas savings of 2,800 therms (280 MMBtu) and an average annual electric energy savings of 80,000 kWh (272 MMBtu). That results in a total average annual energy savings of 550 MMBtu per average commercial building.
- (14) An average of 15 gal of gasoline/year/vehicle can be saved by eliminating 5 minutes of idling per day. Assuming an Anti-Idling Campaign reduces the idling of half of Fitchburg's estimated 10,000 vehicles, the savings would be 75,000 gal/year.
- (15) Fire and Police Department vehicles are often idled for long periods of time. Eliminating the need to keep vehicles running to power emergency equipment will significantly increase fuel efficiency and reduce GHG emissions. The fuel savings may more than offset the cost of the consultant.
- (16) This recommendation will reduce GHG emissions, but the amount is difficult to predict.
- (17) One riding lawn mower emits as much pollution each hour as 34 cars (Environmental Defense Fund). As no-mow and reduced-mow zones are expanded, GHG emissions from mowers will decrease.
- (18) Based on a review of previous monthly energy usage data and comparing the energy usage prior to and after a water warning designation was announced.
- (19) Re-inventorying the waste stream is carbon-neutral but is the foundation for the other Action Item 10 (USMCPA) recommendations to increase recycling rates.
- (20) The assumption was made that fuel savings would not exceed 1% of the City's fuel usage.
- (21) Use of land for urban forestry is known to sequester carbon through photosynthesis (CO₂ is converted to cellulose). By maintaining the "carbon storage" in existing trees, GHG emissions are avoided. In addition, carbon storage can be increased by planting additional trees (and through changing from conventional to conservation tillage practices on agricultural lands). The carbon sequestration rates for trees vary by tree species, regional climate, topography and management practice. It is estimated that Wisconsin trees have a 26% canopy yet store \$42 million worth of carbon and sequester an additional \$2.4 million worth of carbon annually. In addition, trees reduce heating and cooling expenses by \$24 million annually (e.g., providing summer shade and blocking winter winds), resulting in an additional \$1 million worth of carbon production being avoided because of reduced energy demand (Sources: U.S. EPA and WDNR websites).
- (22) Education and awareness are both critical to the adoption of GHG emission reduction measures in a community and City government operation. However, action is needed along with education. The education recommendations presented are the precursors to the implementation of the actions listed in previous USMCPA Action Items 2 through 11. Therefore, no energy savings or GHG emission reductions have been credited to education alone, despite its vital importance.
- (23) The carbon savings from reinforcing the "reduce" ethic is assumed to be roughly ten times the savings from promoting recycling in City operations.
- (24) At least 2,600 gallons of gas are used annually by City mowers. Raising the height of the mower is assumed to reduce the need for mowing by 20%, saving both lawnmower gas and transportation gas. One riding lawn mower emits as much pollution each hour as 34 cars (Environmental Defense Fund).

**USMCPA RCC Recommendations
GHG Emission Reduction Measures
Footnotes**

- (25) Savings will be realized from reduced labor costs and reduced fuel consumption.
- (26) Assumes the current purchasing/leasing program pace for the City of Fitchburg is not accelerated. Annual anticipated energy savings based on the following estimates: 20 new computers (non-Energy Star converted to Energy Star), 4 laser printers, 1 copier, 1 refrigerator, 20 smaller equipment appliance items not including lighting items covered under USMCPA Action Items 5-5 and 5-7.
- (27) Cost would be involved if adopted; the amount depends on the nature of the plan adopted.
- (28) This will definitely reduce GHG emissions; the amount depends on the vehicles replaced and the vehicles purchased.
- (29) This recommendation will likely reduce GHG emissions, but the amount is difficult to predict.
- (30) Based on Home Energy Rating System (HERS) tests performed on homes certified through the LEED for Homes program during 2008, the average home approved at the LEED for Homes "Certified" level is predicted to have potential energy savings of up to 30% over homes built to the International Energy Conservation Code, a widely used standard. The average LEED for Homes "Platinum" level home could have as much as 60% or more energy savings than an IECC-built home. (LEED information obtained from the USGBC's website - 2008). See footnote (13) for 2008 average usage information.
- (31) Monthly monitoring may reveal other areas where fuel consumption can be reduced.
- (32) Cost would be involved if adopted; the amount depends on the nature of the plan adopted.
- (33) Fuel savings and related emissions reduction depend on the results of the study/evaluation.
- (34) Assumes the energy savings equals the product of forestry emissions times a savings factor (0.3). Forestry emissions is estimated as the product of 2007 Vehicle Fleet eCO₂ times 0.02 (i.e. the carbon emissions from Forestry operations amount to 2% of emissions from Fitchburg's fleet of vehicles).
- (35) Assumes this would be done by an intern.
- (36) This has the potential for significant GHG emissions reduction; the amount depends on the systems chosen.
- (37) Estimated cost of \$3,000 assumes City staff works with renewable energy contractors/suppliers to produce the draft report and a paid consultant reviews it for accuracy.
- (38) Assumes a 5% decrease in the projected 2012 government building energy usage.
- (39) While this recommendation will reduce GHG emissions, the amount depends on the methods implemented and the equipment replaced.
- (40) Amount of GHG emissions reduction depends on percent of subscription.
- (41) Cost per kWh has increased from the \$.01 kWh reported in the original USMCPA recommendations.
- (42) Based on the assumption that the annual energy consumption of an average single family residence equals 940 therms and 8,700 kWh. According to Energy Star, "U.S. households typically use up to 30 percent more energy than necessary to achieve the desired level of performance and comfort." The commercial building assumption is based on a 30% reduction in a 10,000 sq ft commercial building using an annual average of 7,000 therms and 200,000 kWh. (see footnote (a) above.) The 30% reduction in annual energy usage results in a 415 MMBtu savings per average commercial building and 40 MMBtu savings per average single family home.
- (43) Based on subsidizing the inspection of 200 commercial or residential buildings in one year at \$75/building.
- (44) Payback period was not calculated since the investment is by City, but the energy savings is realized by the business/resident.
- (45) This has the potential for significant GHG emissions reduction.
- (46) Cost depends on the incentives offered.
- (47) Cost and carbon savings were estimated on the basis of the multi-family dwelling calculation: one-fifth of the cost and one-tenth of the savings.
- (48) The emission savings for greater recycling at apartment complexes were estimated using the EPA Personal Emissions Calculator. This calculation was compared with estimates of the energy used to smelt aluminum and reprocess glass. (The two numbers agreed to within 25%.)
- (49) Energy savings depend on what is found.
- (50) \$190/tree x 50% resident cost-sharing x 150 trees. Annual capital budget for Parks and Street Tree Replacement of \$15,200 could be considered for this project. DNR Grants may be available to reduce cost.
- (51) Assumes 4 physical servers replaced by virtual servers at \$5,000 each and average of 5,000 kWh saved annually.
- (52) Represents the cost of the virtual servers. When offset against the cost of physical servers, the payback period is usually 2 - 3 years.
- (53) Cost includes training; per the City Forester the cost has been reduced from the \$3,000 included in the original USMPCA recommendations.
- (54) GHG emissions reduction depends on the systems chosen.
- (55) Estimated cost of \$3,000 assumes City staff works with renewable energy contractors/suppliers to produce the draft report and a paid consultant reviews it for accuracy.
- (56) Based on a comparison of 4.5 kWh/1,000 gal of water energy usage for the Greenfield Neighborhood wells compared with 2 kWh/1,000 gal of water at Well No. 4. Energy savings comes from the fact that the larger pumps associated with the main water utility are more energy efficient than the smaller pumps being used in the Greenfield wells.



Make Good Buildings Even Better - RCx

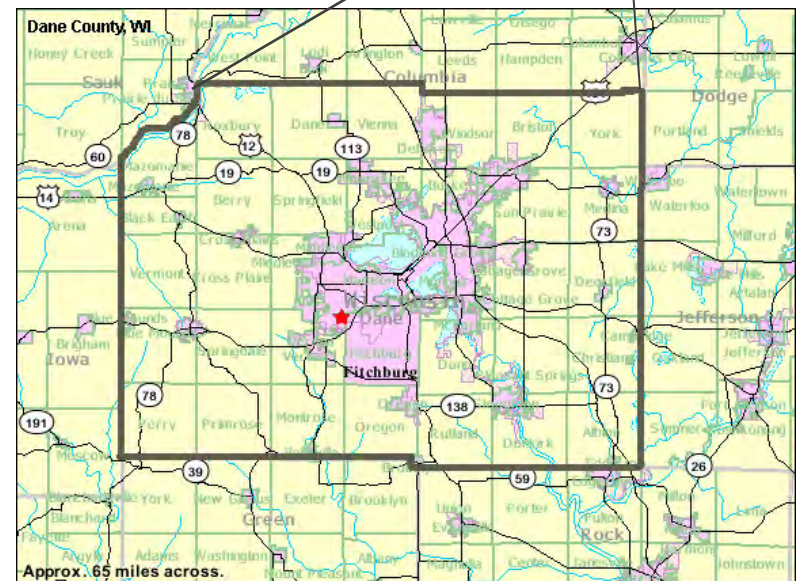
GSCC - September 24, 2013

Sam Cooke, PE, CEM

John Crook, Manager Facilities/BI

City of Fitchburg

- Population (2012): 25,895
- Tree City (Arbor Day)
- Cool City (Sierra Club)
- Bike Friendly Community Award
- USMCPA



City of Fitchburg Campus

City Hall



Library



Community Center

City of Fitchburg Campus



City of Fitchburg Campus

CITY HALL

- Built in 1999
- 56,300 square feet
- 4 floors
- Uses: City Staff Offices, Meeting Rooms, Police Department, FACTv Studio, Storage



City of Fitchburg Campus

COMMUNITY CENTER

- Built in 1988
- 20,200 square feet
- 2 floors
- Uses: Senior Center, Meeting Rooms, Food Prep, SC Staff Offices, FACTv, Gym Space



City of Fitchburg Campus

LIBRARY

- Built in 2010
- 56,400 square feet
- 3 floors
- LEED Gold (60 – 79 LEED points)
- Uses: Book/Media Access, Meeting/Study Rooms, Children Areas, Staff Offices, Underground Parking



Make Good Buildings Even Better - RCx

Retro-commissioning (RCx) is:

- Following a systematic process
- Optimizing buildings and systems
- Changing systems to perform interactively
- Meeting the current operational needs



Adapted from ASHRAE Guideline 0-2005

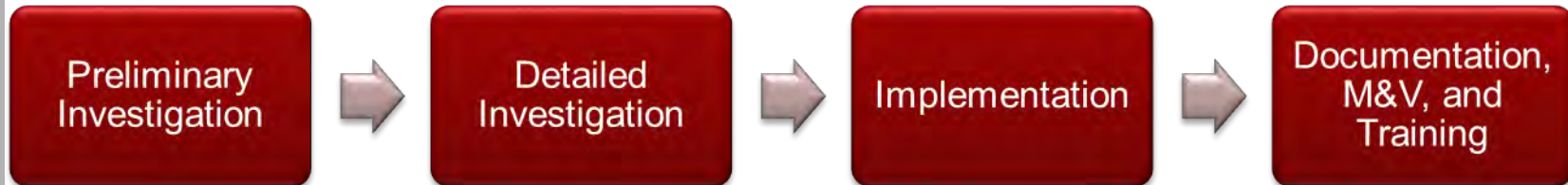
Proven Benefits of RCx

- Reduced energy consumption
- Improved indoor air quality
- Improved worker productivity
- Lower environmental impact
- Retention of staff
- Good PR



RCx Scope of Work

- Preliminary Investigation
- Detailed Investigation
- Implementation
- Measurement and Verification
- WI Utility Incentive (Focus on Energy - RCx Incentives: \$0.08/kWh and \$0.50/therm)



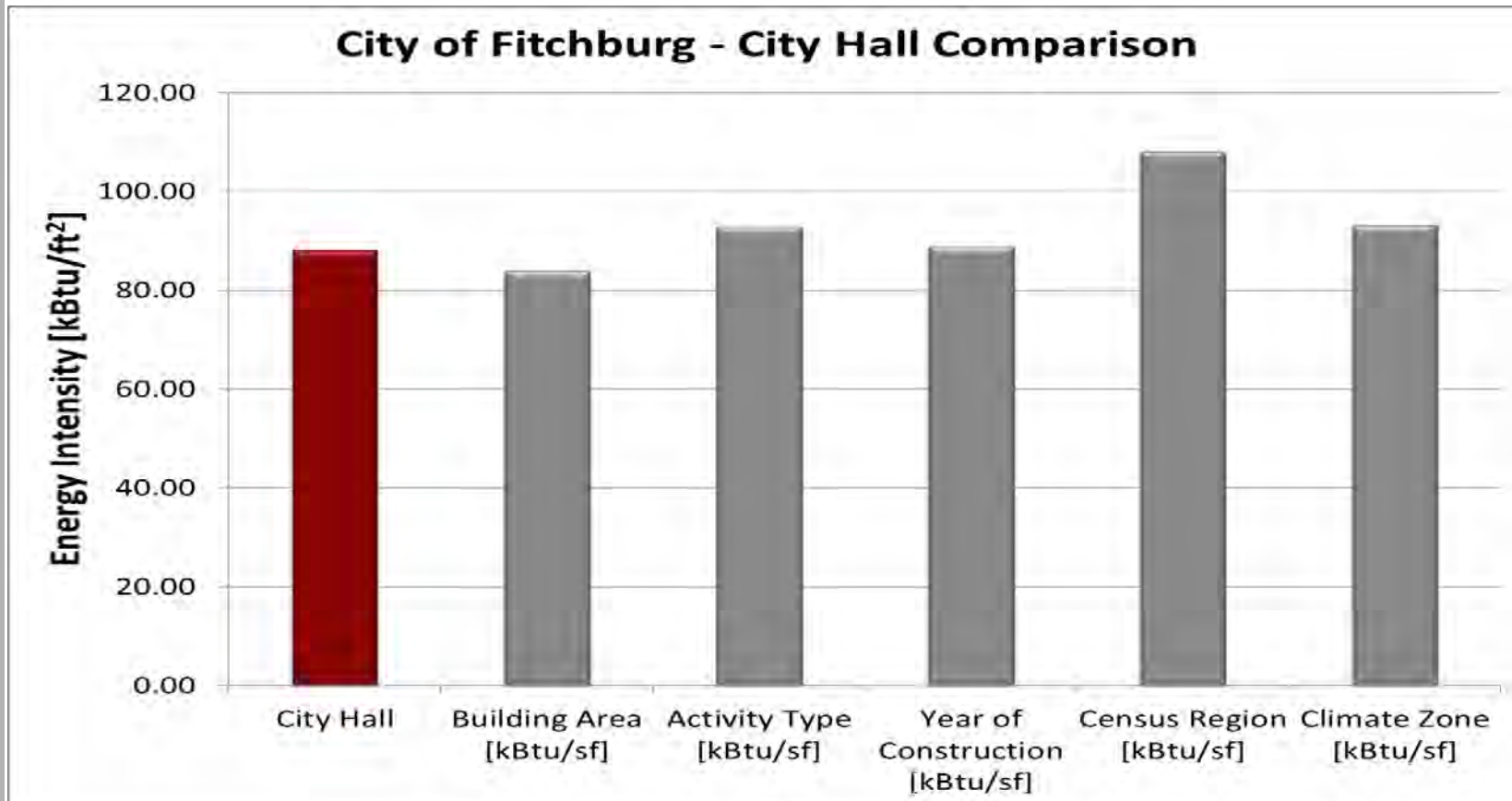
RCx – City Hall



Solar photovoltaic and solar thermal panels on City Hall roof top

RCx – City Hall

- Energy Use Intensity
 - 88,000 BTU/ft²/year
 - Energy Star PM Score: 71
- Mechanical Systems:
 - (3) VAV AHUs
 - HW Nat Gas Boilers
 - Water-cooled Chillers



RCx – City Hall

Energy Conservation Measures (examples):

- **Change 24-hour operation of AHUs**
- **Separate FACTv IT from AHU system**
- **Lower HVAC static pressure set point**
- Reduce simultaneous heating and cooling (leaking AHU hot water valve)
- Lower heating outside air lockout temperature
- Implement standby CFM setpoints in less frequently used areas
- Install VFD controls on cooling tower fans

RCx – City Hall

ECM – Change 24-hour Operation of AHUs

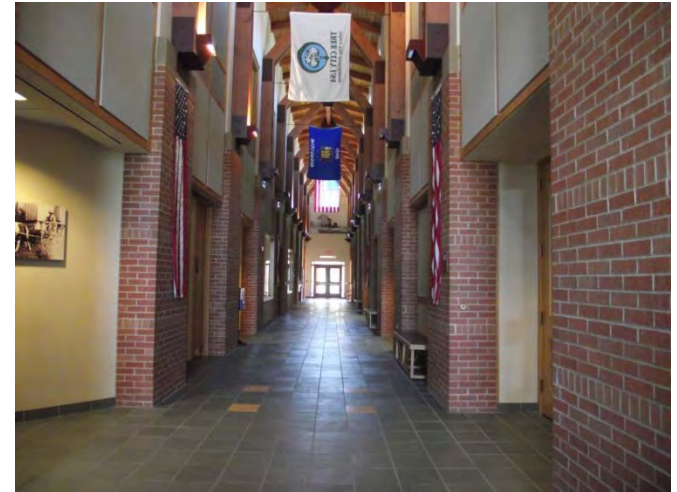
Police Department operation is 24/7, but not all areas served by the AHU are occupied during second and third shift. Areas with reduced, short term, or no occupancy include: prefunction hall (pictured), multipurpose room, conference rooms, fitness center/ locker rooms, and briefing room.

ECM would be combination of CO₂ sensors in intermittent use rooms and scheduled OA reduction for others.

OA savings: \$3,990/year

CO₂ sensors install and programming cost: \$3,150

Simple Payback: < 1 year



RCx – City Hall

ECM – Separate FACTv IT from AHU system

Currently one of the three large AHUs serving the City Hall Building is left on 24/7 to condition the office space housing the FACTv servers.

ECM examines installing a split system AC unit for servers after hours and running the AHU on a schedule.

AHU savings: \$2,760/yr

Split system cost to run: ~\$1,000/yr

Split system install cost: \$2,800

Simple Payback: 1.6 years



RCx – City Hall

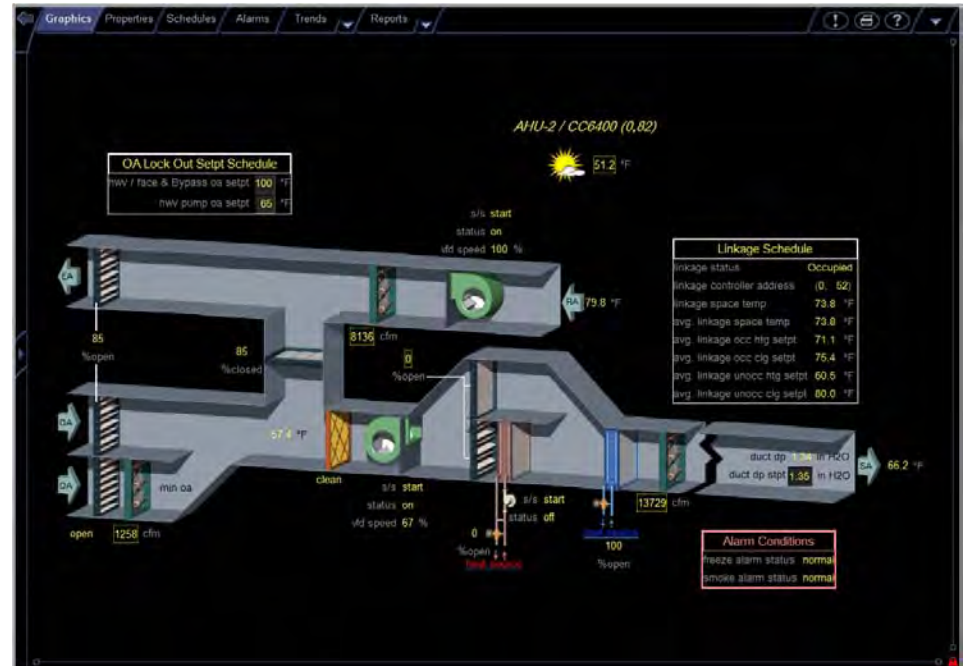
ECM – Lower HVAC static pressure set point

Trending was performed on both the AHU supply fan speed and the VAV box damper positions. With the exception of known 'trouble' areas such as the FACTv server room, VAV dampers averaged just 56-70% open, indicating supply static could be reset down.

Fan Savings (All AHUs):
\$480/year

Setpoint Programming
cost: \$1,440

Simple Payback: 3 years



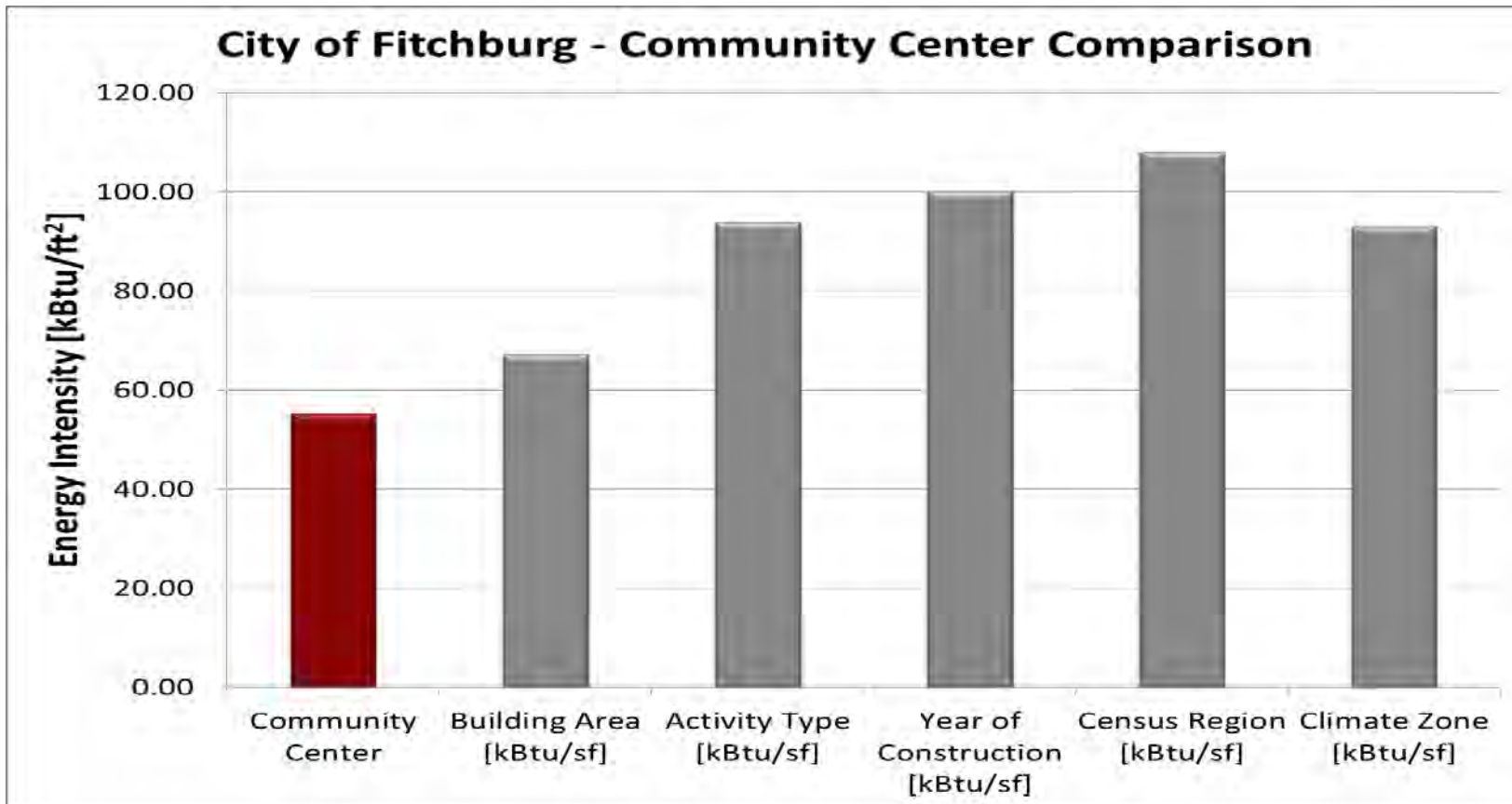
RCx – Community Center



Senior Center dining/meeting area

RCx – Community Center

- Energy Use Intensity
 - 55,000 BTU/ft²/year
- Energy Star PM Score
 - N/A
- Mechanical Systems
 - (5) MZU CV AHUs
 - HW Nat Gas Boilers
 - DX Cooling



RCx – Community Center

Energy Conservation Measures (examples):

- **Upgrade multi-zone unit to VAV system**
- Fix leaking outside air damper on FCU
- **Upgrade three existing low EER condensers**
- Separate IT servers from AHU load
- **Fix hot/cold deck zone damper leaks**
- Make Lighting sensors adjust for daylight
- Replace hot/cold deck discharge T-sensors
- Repair torn MZU isolation boot

RCx – Community Center

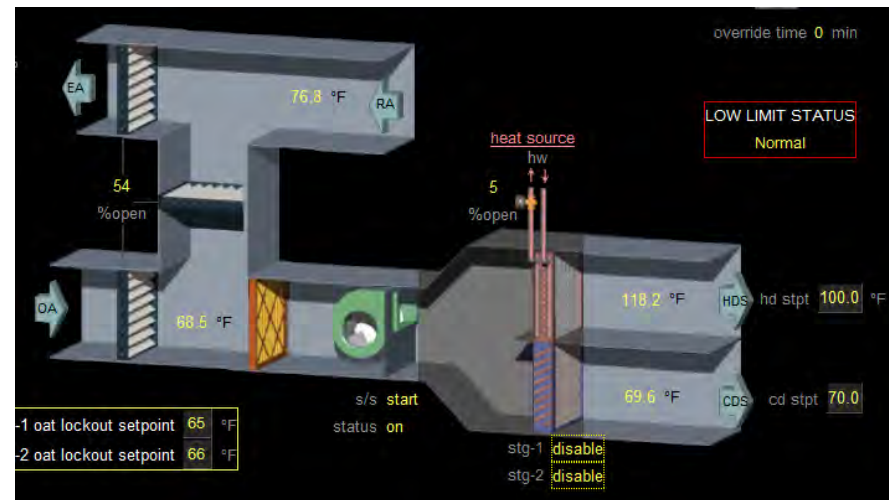
ECM – Upgrade multi-zone unit to a VAV system

This ECM includes adding a retrofit variable volume terminal unit with an airflow monitoring station and associated volume damper to each zone discharge ductwork associated with the MZU. The airflow will be measured and the volume adjusted based on space conditions.

Fan and OA Savings:
\$2,940/year

VAV installation and
programming costs:
\$12,000

Simple Payback:
3.5 years



RCx – Community Center

ECM – Replace existing condenser unit(s)

Some of the existing condenser units are past or near their life expectancy. When replacing existing equipment, equipment Energy Efficiency Rating (EER) should be considered to balance upfront cost with annual operating costs (existing units EER = 8).

Base Case EER: 13

Premium Efficiency EER: 16

AHU-1,2,3 CU Replacement

Base costs: \$17,250

Premium: \$22,970

Annual Electric Savings: 12,960 kWh

Annual \$ Savings: \$1,940

Simple Payback: 11.8 years



RCx – Community Center

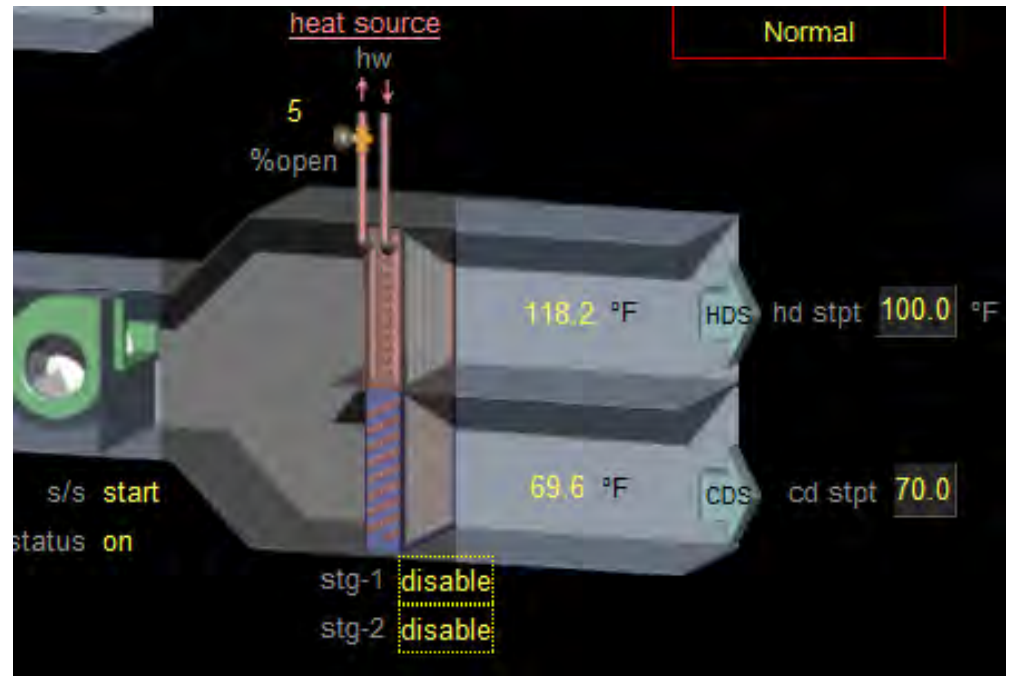
ECM - Fix hot/cold deck zone damper leaks

During functional performance testing (FPT) the zones were commanded 100% open to the cold deck and temperature measurements taken at the zone discharge. Zones 4 and 5 discharge temperatures were found to be ~5 degrees F warmer than the cold deck temperature.

Fan and OA Savings:
\$1,050/year

Damper Replacement
costs: \$ 925

Simple Payback:
< 1 year



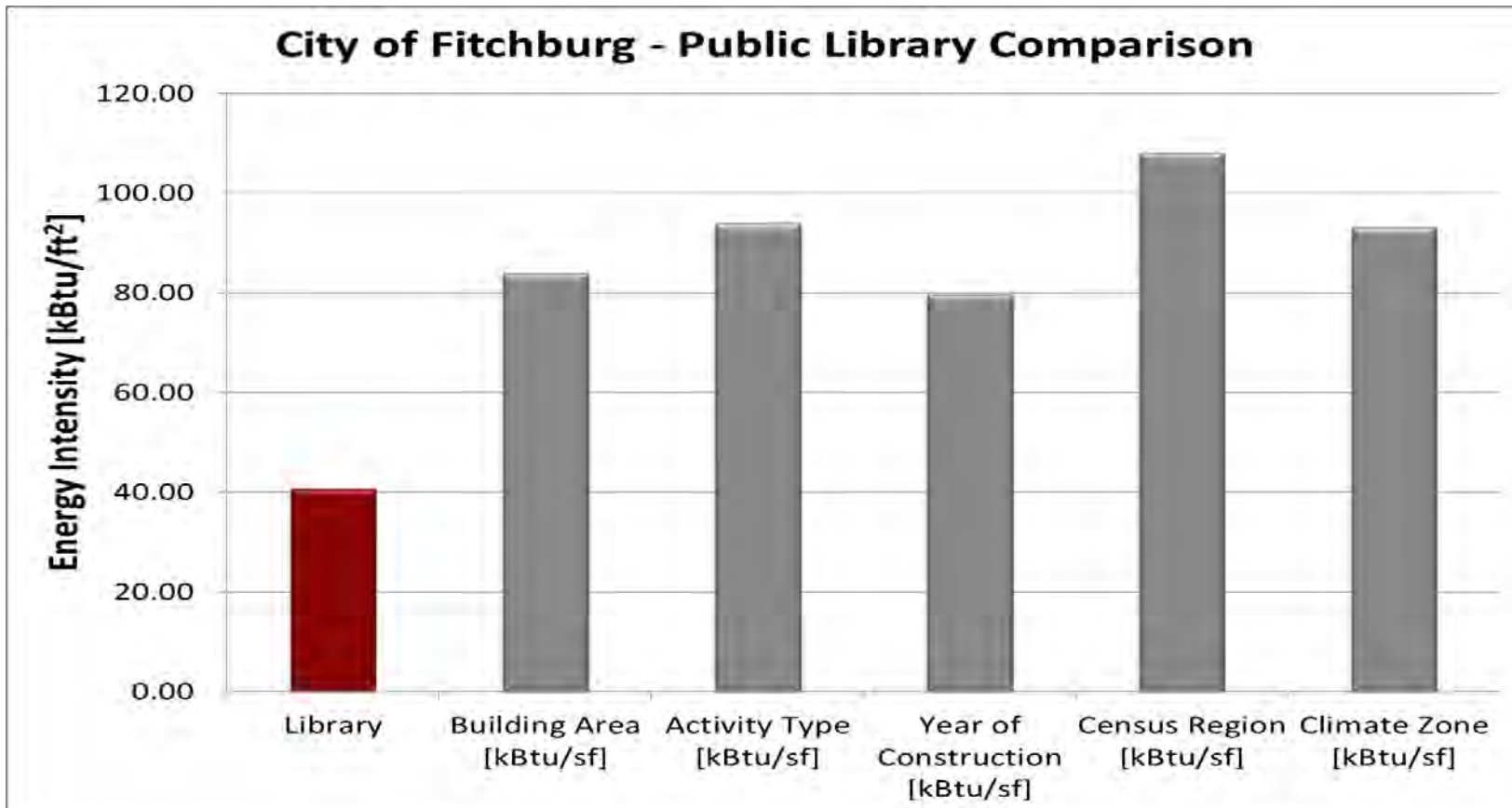
RCx – Library



Entrance lobby and Children's Library area

RCx – Library

- Energy Use Intensity
 - 41,000 BTU/ft²/year
- Energy Star PM Score
 - N/A
- Mechanical Systems:
 - (1) VAV AHU + other AHUs
 - Centralized Geo Heat/Cool Heat Pumps



RCx – Library

Energy Conservation Measures (examples):

- Purchase and install Honeywell interface
- **Use Lighting controls (use daylight)**
- **Stop radiant floor heat, while cooling**
- **Address ground source heat pump issues**
- **Program advanced VAV controls**
- Add temperature reset to AHU
- Reduce VFD minimum setting
- Repair entryway snow melt indicator

RCx – Library

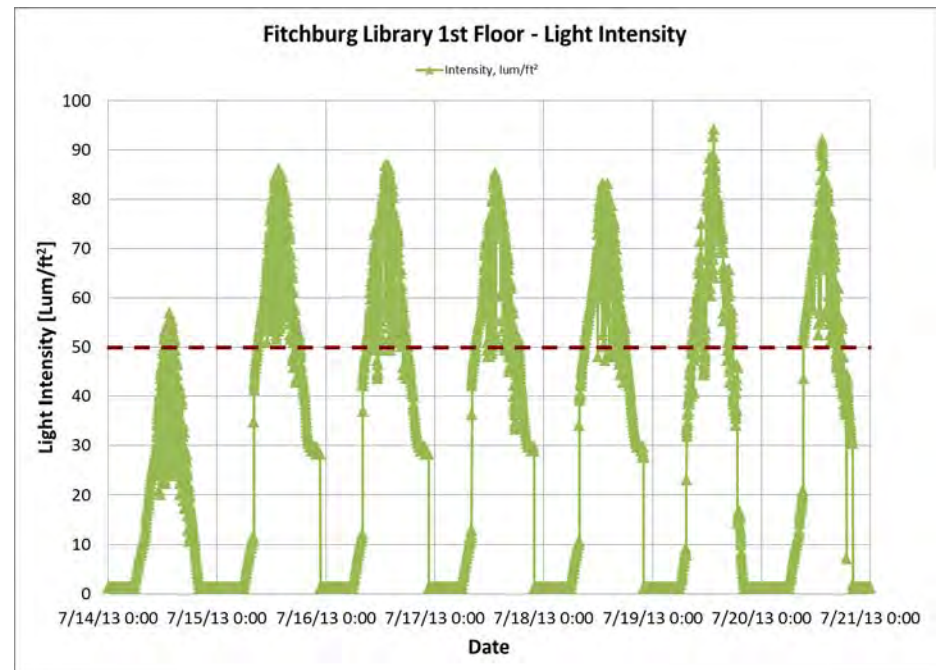
ECM – Use Lighting Controls

The library is equipped with day lighting controls which appear to be operating incorrectly. The chart shows the light intensity for a single zone over the course of a week. When the intensity is above 50 Lum/ft² the fixtures on the day lighting circuits can be turned off.

Electrical Savings:
\$1,160/year

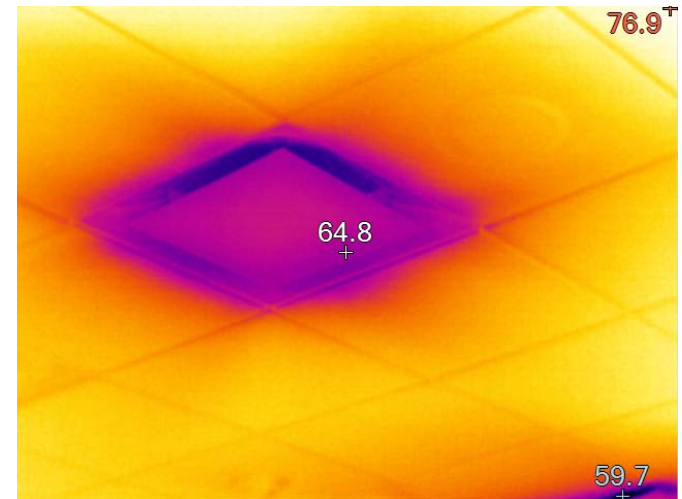
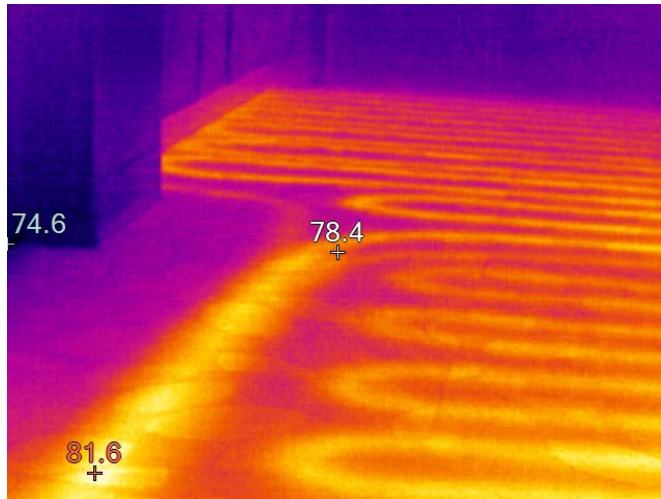
Programming cost: \$400

Simple Payback:< 1 year



RCx – Library

ECM – Radiant floor heat, while cooling space



RCx – Library

ECM – Radiant floor heat, while cooling space

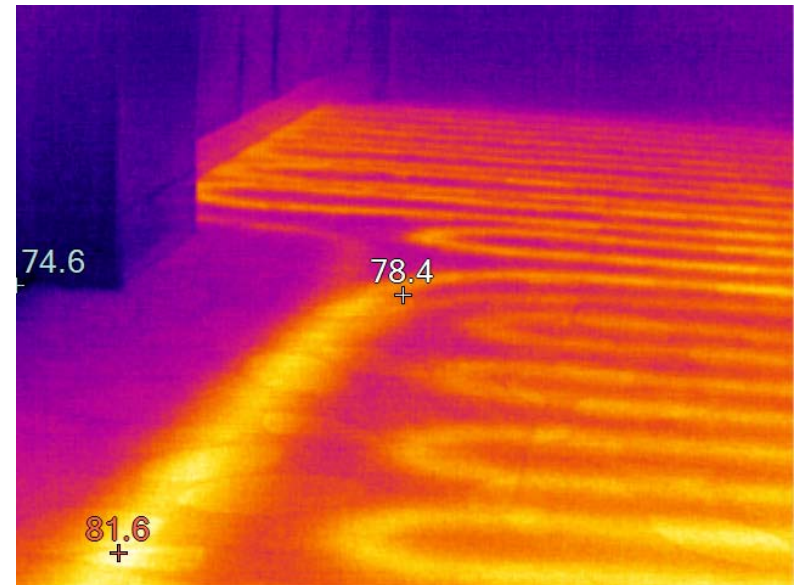
When the radiant floor is running simultaneously, energy is being used both by the hot water system to warm the floor and the chilled water system through the air handling unit (AHU).

With both systems already on the BAS, interlocks can be added to disable the radiant heat when the space is calling for cooling.

Electrical Savings from
heat pump and AHU:
\$2,820/year

Programming cost: \$400

Simple Payback: < 1 year



RCx – Library

ECM – Program advanced VAV controls

Newer VAV control strategies include “Dual Maximum” CFM setpoints which reset the airflow for both heating and cooling strategies. Typical VAV control has a single heating CFM setpoint and modulate the hot water reheat valve. Savings result from lower fan energy as well as lower reheat energy use.

Electrical Savings
from heat pump and
AHU: \$6,760/year

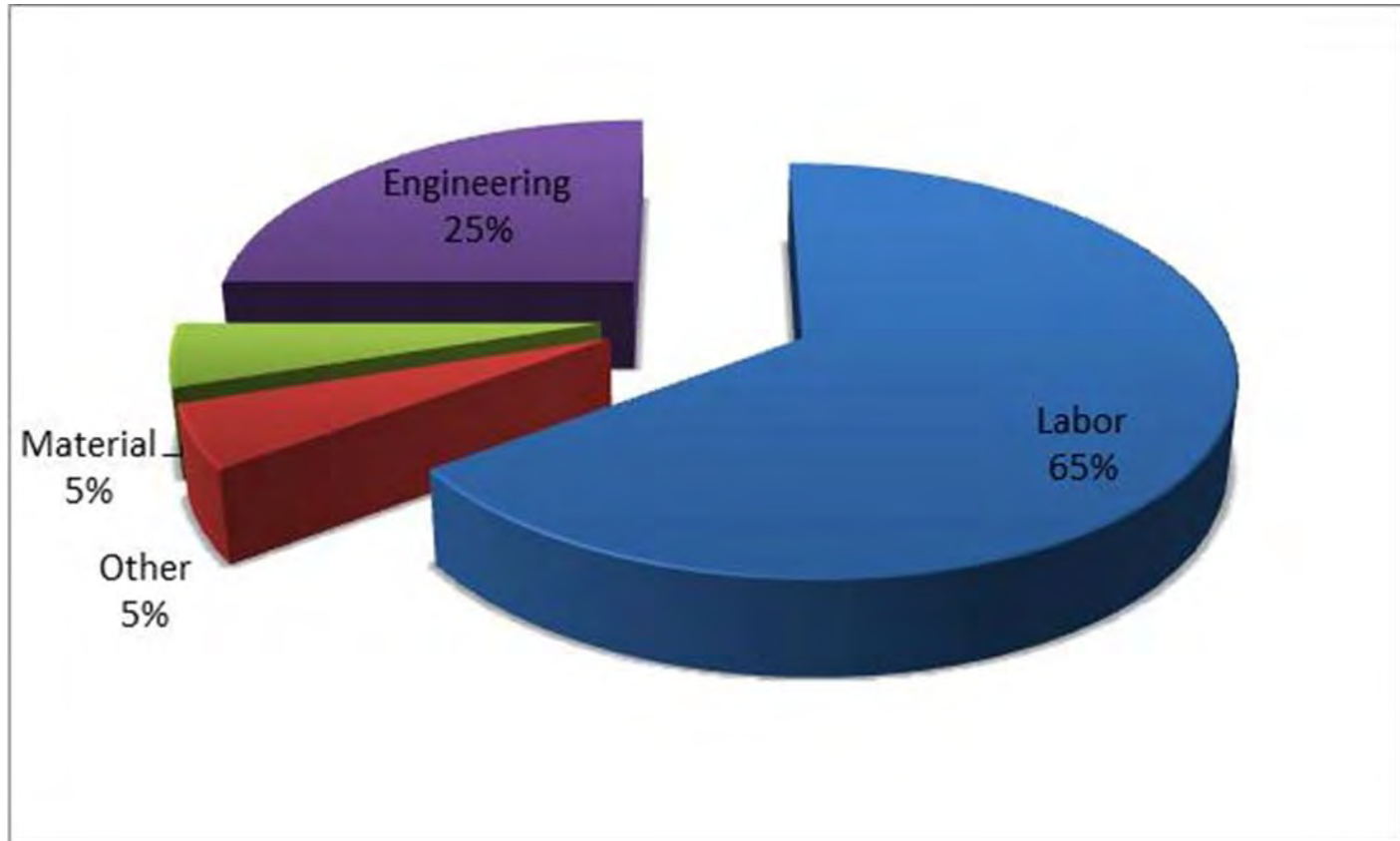
Programming cost:
\$400

Simple Payback:
< 1 year



RCx Costs

Cost ranges between \$0.20/SF and \$3.00/SF



Source: NEMI Retro-commissioning Existing System Inventory

SCS ENGINEERS



Sam Cooke: scooke@scsengineers.com

John Crook: john.crook@fitchburg.wi.us

Thank You!

DRAFT

2012 Energy
Consumption &
Greenhouse Gas
Emissions Report

City of Fitchburg

Kristofer Canto (2013) / Sustainability Intern
Department of Public Works
Last Revised: July 11, 2013



Acknowledgments

The City of Fitchburg would like to recognize the following individuals for providing information, guidance and assistance throughout the production of this report:

Resource Conservation Commission

- Diane Streck (Chair)
- Samuel Cooke
- Jan Kucher
- Steve Arnold
- Tony Hartman
- Kay Schindel
- Rick Eilertson (Staff Representative)
- Kristofer Canto (Staff Intern)

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- Rick Eilertson, P.E., Environmental Engineer
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- Jan Uselmann
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- Jesse Shields
- Bob Connor

Alliant Energy

- Raya Nachreiner
- Sharie Greif

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Fitchburg, Wisconsin 53711**

**For more information contact Rick Eilertson, Fitchburg Environmental Engineer
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608-270-4264**

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Executive Summary

To better understand the City of Fitchburg's energy consumption, the City has committed its resources to collecting, analyzing and communicating energy data. The purpose of this report is to present the most current and complete data regarding the City of Fitchburg's energy consumption and greenhouse gas emissions. The 2012 Energy and Greenhouse Gas (GHG) emission inventory shows the City of Fitchburg producing 425,340 tonnes of CO₂ equivalent, with the commercial sector electric kWh energy usage contributing most significantly.

History

The City of Fitchburg Resource Conservation Commission (RCC) recommends policy, enforcement, and informational programs to promote the preservation and improvement of the environment. The RCC has made recommendations for meeting the Kyoto Protocol, and has suggestions for how individuals can reduce their carbon footprint.

In February 2007, the (RCC) began discussing the opportunity to join the U.S. Mayors Climate Protection Agreement (USMCPA), an agreement signed by 1,053 mayors nationwide to reduce GHG emissions 7% from 1990 levels by 2012. This resulted in Resolution R-73-07 being passed in October 2007, supporting a study of the USMCPA. In August 2008, Resolution R-55-08 was passed to endorse the USMCPA and in February 2009 a preliminary GHG Inventory was presented to the City of Fitchburg Common Council.

Following this presentation, the RCC also presented USMCPA recommendations to mitigate the City of Fitchburg's contribution to global climate change. To support this effort, the City of Fitchburg Common Council passed Resolution R-50-09, or Resolution 25x25, a commitment to generating 25% of the City's electricity and transportation fuels from renewable resources by 2025. More than 140 communities in Wisconsin have adopted the 25x25 goals.

In October 2009, the City of Fitchburg formed the Fitchburg Green Team, an interdepartmental group of City staff that meets bi-monthly to discuss, plan and implement sustainability initiatives that can be incorporated into the City's daily operating procedures. In September of 2010, the Common Council passed the Green Tier Charter Resolution R-82-10. Under the Green Tier Legacy Communities Charter, municipalities agree to adopt policies, practices and development patterns that minimize energy consumption, reduce all forms of pollution and waste to create a better place to live.

The RCC and Fitchburg Green Team presented a Progress Report May 25, 2011 on Fitchburg's Climate Protection Initiatives to the Fitchburg Committee of the Whole. The presentation included a report on the status of greenhouse gas emissions and recommendations, vehicle idling reduction strategies, and suggested greenhouse gas emission reduction measures to target next.

On Sept. 27, 2011, the Fitchburg Common Council adopted Resolution R-60-11, a resolution in support of idling reduction strategies for the City of Fitchburg.

Methodology

Energy consumption data was retrieved from multiple sources and compiled together to create a comprehensive energy inventory. Data sources included local utility providers Madison Gas & Electric, Alliant Energy and the City of Fitchburg.

Data received from Madison Gas and Electric provided gas therms and electric kilowatt hours (kWh) energy information for commercial, industrial, residential and street lighting sectors. Also included was gas and electric data billed to the City of Fitchburg.

Alliant energy data received included electric kWh for residential, farm, commercial, industrial and street/highway lighting sectors. Gas therms data was only provided for the residential sector. Alliant Energy also provided electric kWh billed to 10 City of Fitchburg properties.

Non-metered street lights billed by Alliant Energy to the City of Fitchburg were provided by City of Fitchburg staff. Also, gasoline consumption by City of Fitchburg Fleet vehicles was provided by City of Fitchburg staff.

The MG&E and Alliant Energy data was used to analyze current energy consumption sources (electric kWh and gas therms) and their associated sectors.

The City of Fitchburg also uses the 2009 ICLEI – Local Governments for Sustainability Clean Air & Climate Protection (CACP) Software. This software allows for an analysis of GHG emissions resulting from electricity, fuel use and waste disposal. Data retrieved from this software was then analyzed further in Microsoft Excel to better understand the relationship between GHG emissions and population data. Final results are presented only in tonnes of CO₂ equivalent, a measure that describes for any mixture of gasses, the equivalent CO₂ global warming potential over time.

The CACP Software organizes its data entry into two scopes, Government and Community. Government data entry reflects energy consumption and GHG emissions resulting from City of Fitchburg Government associated activities only. The Government scope is divided into building, vehicle fleet, street light and water delivery sectors. The Community scope area is divided into residential, commercial, transportation and waste sectors. Transportation data entered for 2012 is only an estimate and will be updated when 2012 traffic counts are available from the City of Fitchburg and WI DOT.

Greenhouse gas emission analysis per capita was calculated using information collected from the U.S. Census Bureau and the U.S. Environmental Protection Agency.

For more information and to access this data please refer to:

- U.S. Census Bureau: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. EPA State Energy CO₂ Emission: http://www.epa.gov/statelocalclimate/resources/state_energyco2inv.html

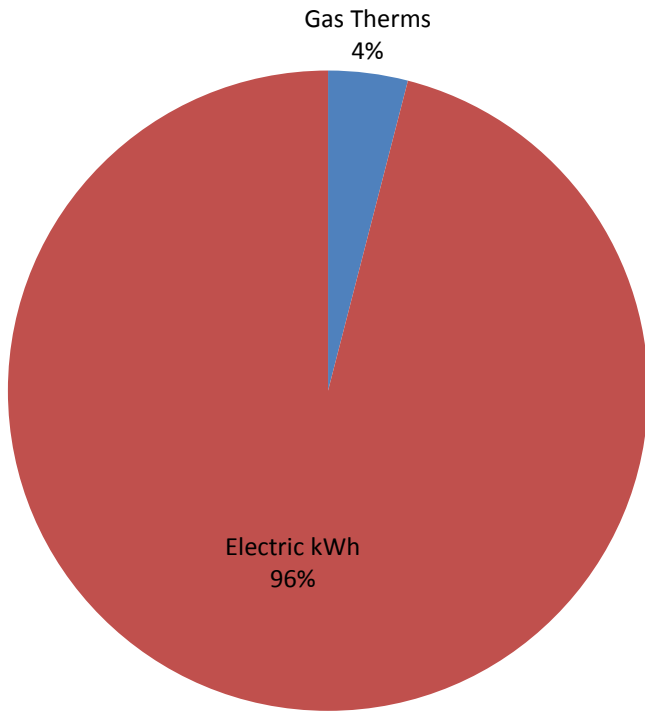
Note of Assumptions/Externalities: Some information has been assumed or omitted due to a lack of sufficient data as well as the complex nature of collecting data. This report acknowledges that not all data is precise and that not all outside influences upon the environment have been accounted for. This report attempts to accurately describe existing energy/GHG conditions to the extent that reasonable trends and conclusions might be drawn from the presented data.

Table 1. 2012 City of Fitchburg Energy Utility Data

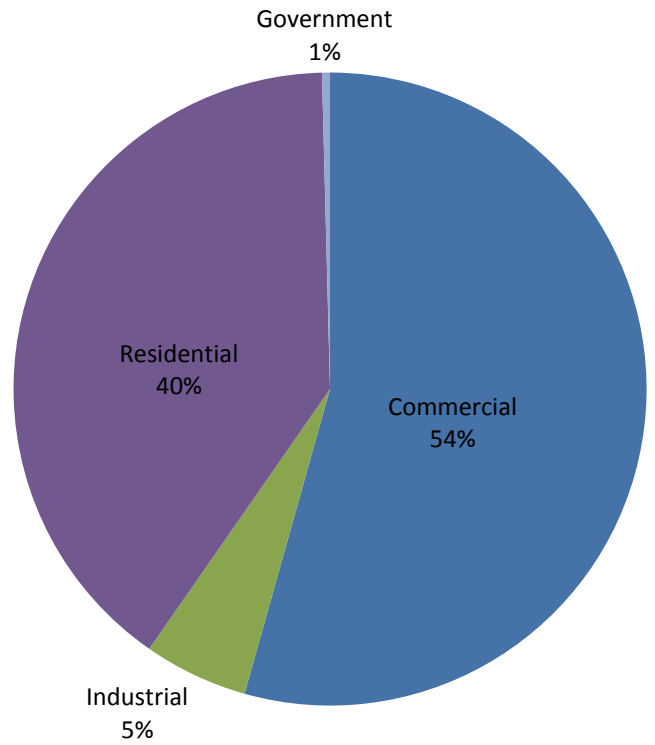
MG&E	Gas Therms	Electric kWh
Commercial	5,827,640	175,447,112
Less Green Power Tomorrow	-	-195,967
Industrial	570,503	482,245
Residential	4,280,034	79,472,223
Less Green Power Tomorrow	-	-4,089,363
Street Lighting	-	770,135
Government	43,540	4,581,832
*Total Green Power Tomorrow	-	4,285,330
Total	10,721,717	256,468,217
<hr/>		
Alliant Energy	Gas Therms	Electric kWh
Residential	2,047	1,821
Farm	-	210,609
Commercial	-	10,853,701
Industrial	-	12,742,800
Street/HWY Lighting	-	81,754
Government	-	181,632
Total	2,047	24,072,317
<hr/>		
Combined Totals	Gas Therms	Electric kWh
MG&E	10,721,717	256,468,217
Alliant Energy	2,047	24,072,317
Total	10,723,764	280,540,534

*Green Power Tomorrow is a program ran by MG&E that allows users to purchase energy from renewable sources (wind, solar) for an additional charge on their utility bill.

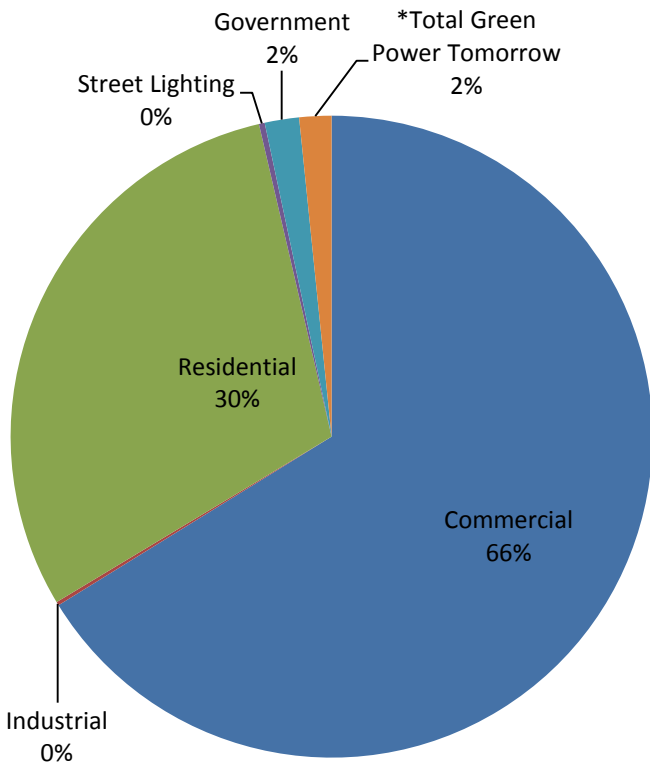
Chart 1. 2012 City of Fitchburg Energy Utility Data



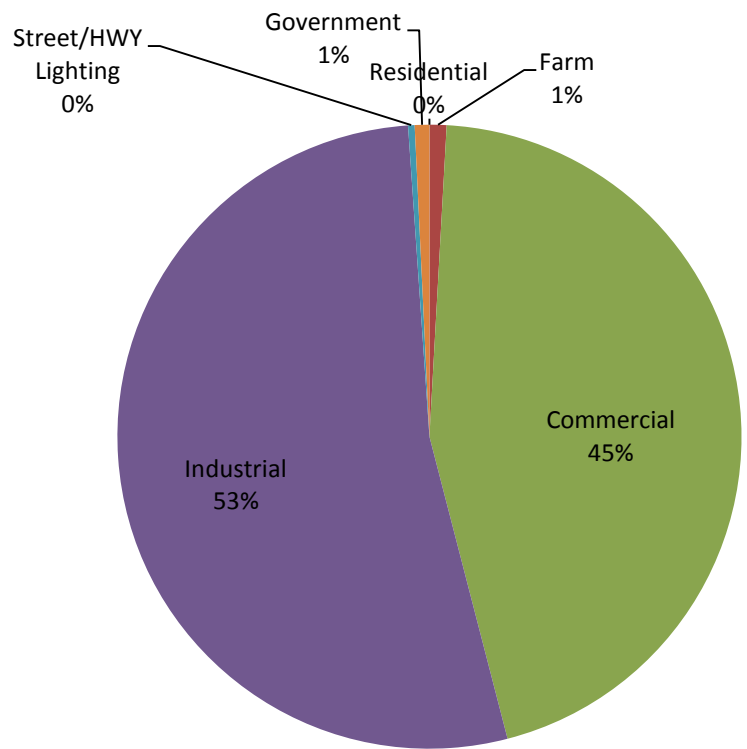
MG&E Gas Therms v. Electric kWh



MG&E Gas Therms



MG&E Electric kWh

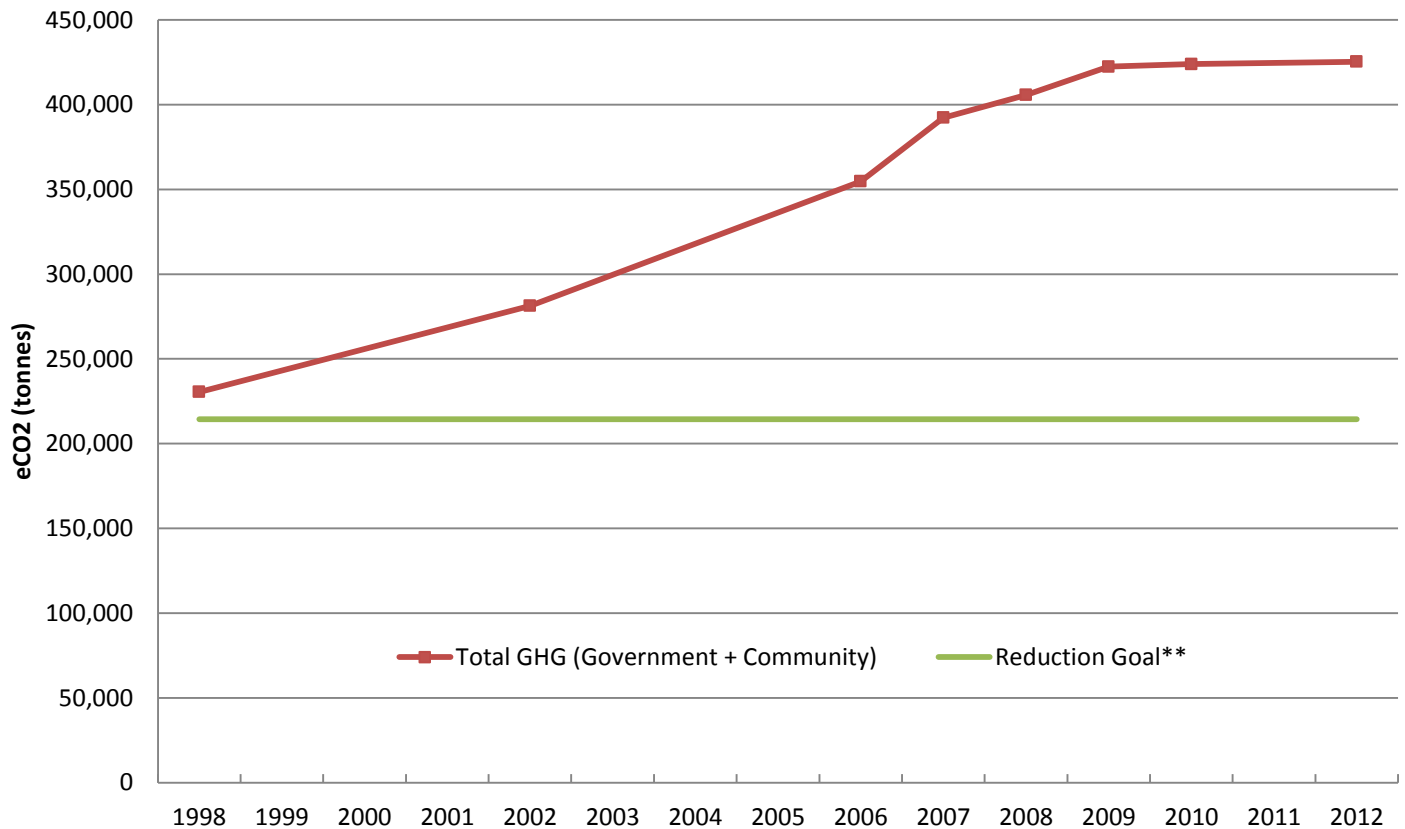


Alliant Energy Electric kWh

Table 2. Total City of Fitchburg Greenhouse Gas Emissions

Years*	1998	2002	2006	2007	2008	2009	2010	2012
Total GHG (Government + Community)	230,475	281,272	354,690	392,309	405,665	422,384	423,938	425,340
Reduction Goal**	214,341	214,341	214,341	214,341	214,341	214,341	214,341	214,341
Total GHG/capita***	12.60	13.20	15.50	16.90	17.30	18.00	16.80	16.40

Chart 2. Total City of Fitchburg Greenhouse Gas Emissions



*Years in graph extended to include missing data.

**Reduction goal calculated as a 7% reduction of the total 1998 baseline GHG values.

***GHG/capita calculated using population data from the 2010 U.S. Census Bureau.

Table 3. 2012 Government Greenhouse Gas Emissions by Sector

Sector	eCO2 (tonnes)
Buildings	2,030
Vehicle Fleet	769
Streetlights	786
Water Delivery	1,436
Total	5,021

Chart 3. 2012 Government Greenhouse Gas Emissions by Sector

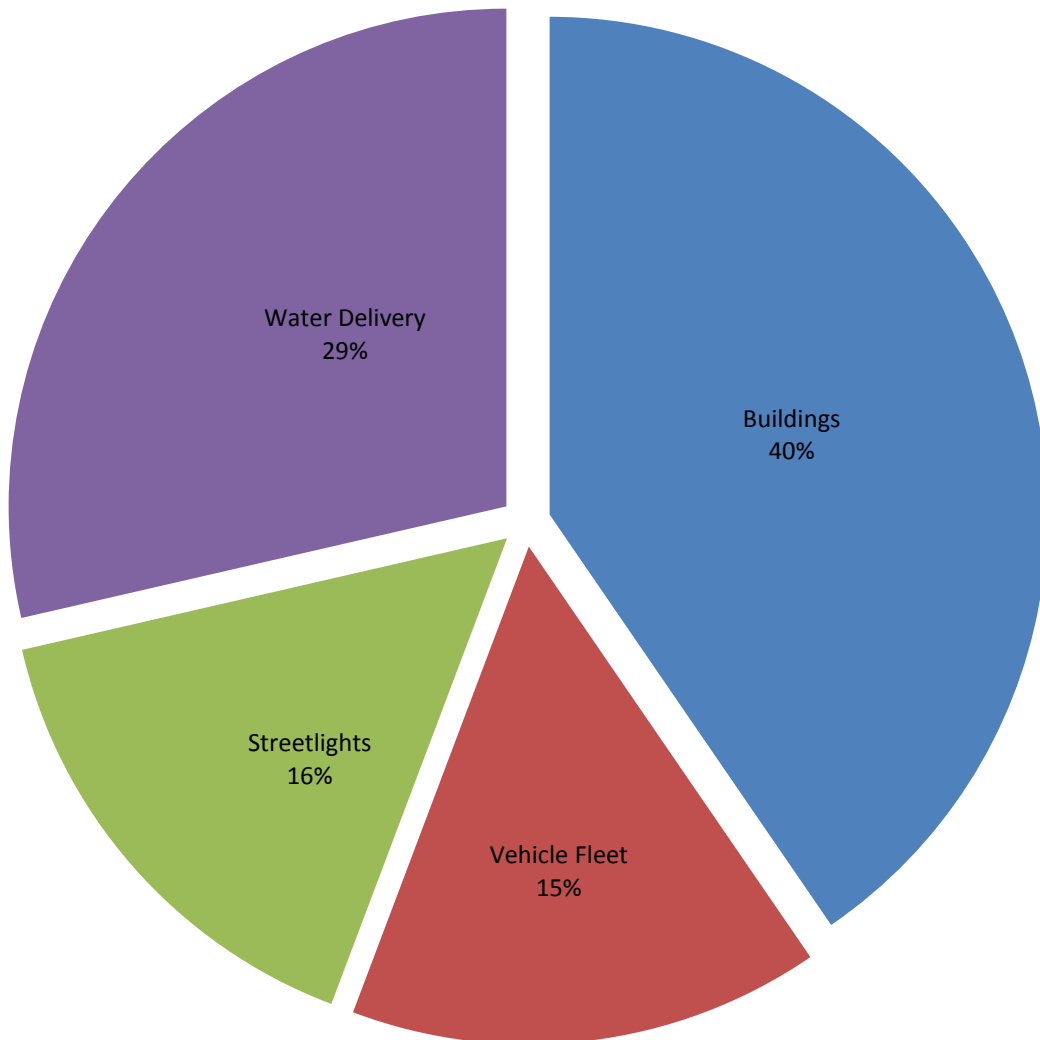
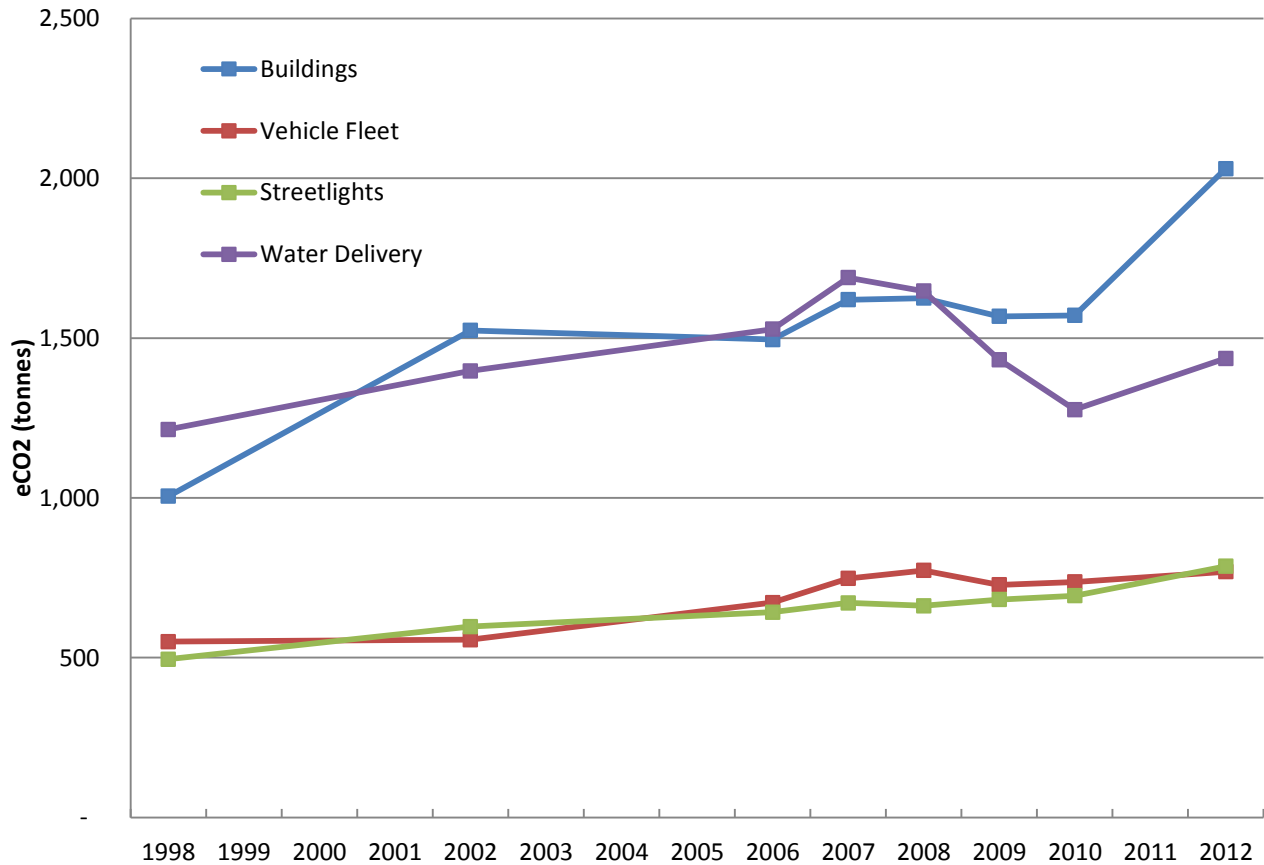


Table 4. Government Greenhouse Gas Emissions by Sector (1998-2012)

Sector	1998	2002	2006	2007	2008	2009	2010	2012
Buildings	1,005	1,524	1,495	1,620	1,625	1,568	1,571	2,030 ^a
Vehicle Fleet	550	556	672	748	773	728	737	769
Streetlights	495	597	642	671	662	682	694	786
Water Delivery	1,214	1,397	1,528	1,689	1,647	1,432	1,276 ^b	1,436
Total	3,264	4,074	4,337	4,728	4,707	4,410	4,278	5,021

Chart 4. Government Greenhouse Gas Emissions by Sector (1998-2012)



^a The increase in GHG emissions for government buildings from 2010-2012 can largely be attributed to the construction and operation of the new City of Fitchburg Public Library.

^b The decrease in GHG emissions for government water delivery in 2010 was a result of the large amounts of precipitation received in 2010.

Table 5. 2012 Community Greenhouse Gas Emissions by Sector

Sector	eCO2 (tonnes)
Residential	90,802
Commercial	201,164
Transportation*	127,306
Waste	1,047
Total	420,319

*Transportation data estimated using historical vehicle miles traveled data as well as alternative transportation and idling reduction measures.

Chart 5. 2012 Community Greenhouse Gas Emissions by Sector

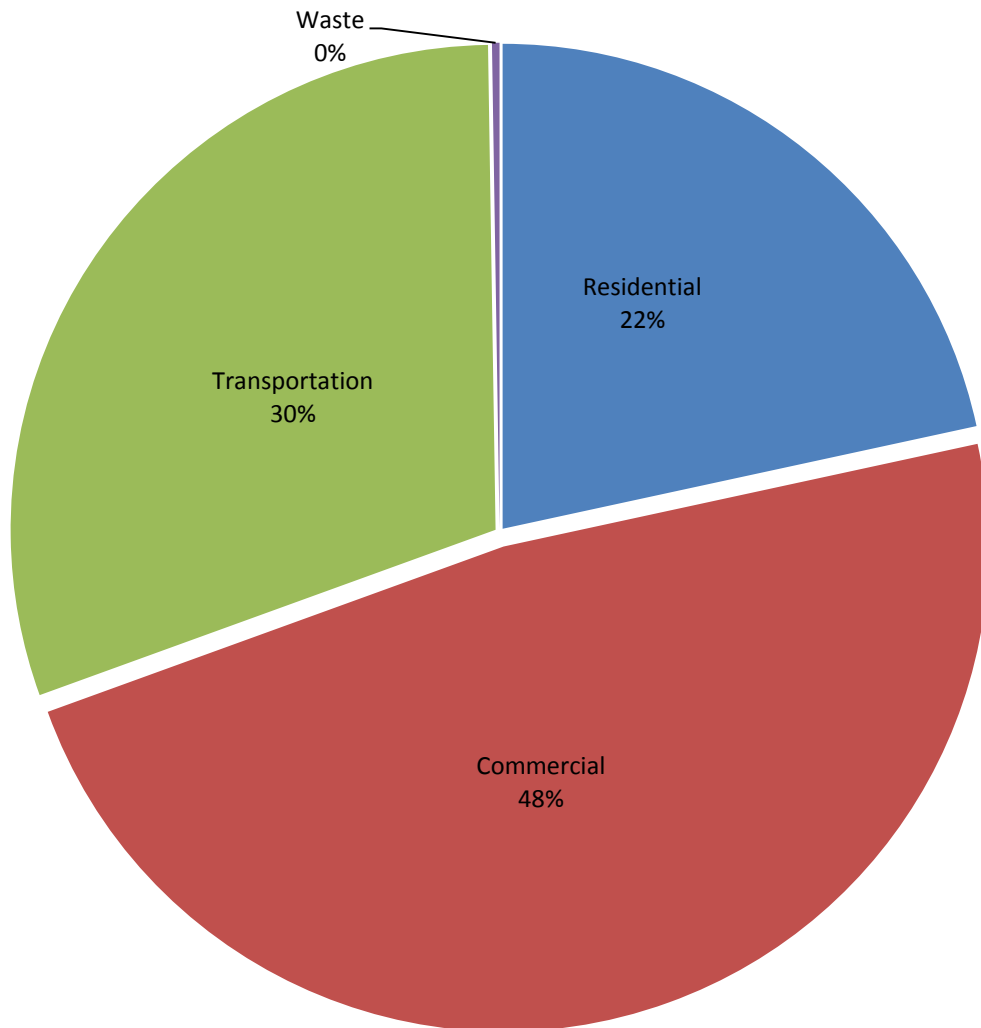
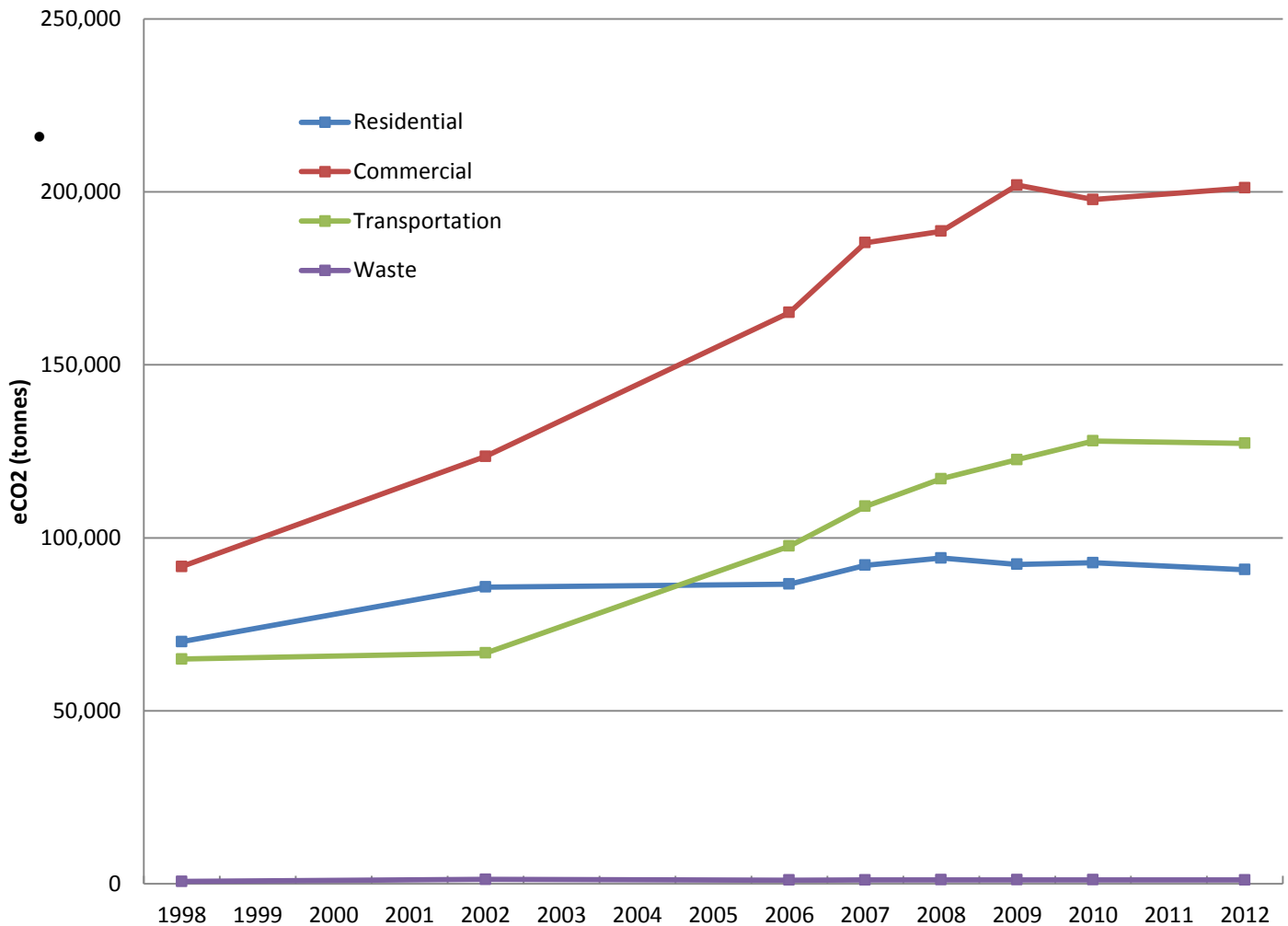


Table 6. Community Greenhouse Gas Emissions by Sector (1998-2012)

Sector	1998	2002	2006	2007	2008	2009	2010	2012
Residential	69,960	85,779	86,612	92,064	94,154	92,299	92,777	90,802
Commercial	91,701	123,523	165,134	185,326	188,663	201,992	197,791	201,164
Transportation*	64,929	66,677	97,607	109,116	117,055	122,580	128,000	127,306
Waste	621	1,219	1,000	1,075	1,086	1,103	1,092	1,047
Total	227,211	277,198	350,353	387,581	400,958	417,974	419,660	420,319

*Transportation data estimated using historical vehicle miles traveled data as well as alternative transportation and idling reduction measures.

Chart 6. Community Greenhouse Gas Emissions by Sector (1998-2012)





MEMO
City of Fitchburg
Department of Public Works

5520 Lacy Road
Fitchburg, WI 53711
Phone (608) 270-4260
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To:	Mayor Shawn Pfaff; Tony Roach, City Administrator; Paul Woodard, Director of Public Works; Ahnaray Bizjak, Transportation Project Engineer & Interim Director of Public Works; Rick Eilertson, Environmental Engineer; City of Fitchburg Green Team Staff
From:	Kristofer Canto, Sustainability Specialist; Diane Streck, RCC Chair
Date:	May 22, 2014
Subject:	Update #2 on Resolution R-50-09 – A Resolution in Support of the State of Wisconsin’s Energy Independence Goals for 2025 (25x25)

Goals Established by former Governor Doyle’s Office of Energy Independence include:

1. Generating 25% of electricity and transportation fuels from renewable resources by 2025 (25x25),
2. Capturing 10% of the emerging bio-industry and renewable energy market by 2030, and
3. Becoming a national leader in groundbreaking energy research.

On August 11, 2009 Fitchburg committed to participating in 25x25 as a “three-star” Energy Independent Community by adopting Resolution R-50-09. A summary of Energy Independent Community characteristics and Fitchburg’s progress to date are provided in Table 1 and Table 2 this document.

Progress Summary

- **Fitchburg generates less than 1% of total electricity consumption from renewable resources.** To date, the total electricity generated from renewable solar arrays equates to roughly 2% of the targeted 25x25 goal.
- Fitchburg does not own or operate any vehicles powered by alternative fuels.

Opportunities

- Existing retro-commissioning and building efficiency standards in Fitchburg are raising the bar for municipal construction.
- The cost of solar technology has drastically declined, making solar a competitive option for renewable energy – even challenging the price of coal and natural gas.
- Programs such as MGEs Green Power Tomorrow allow for energy customers to purchase renewable energy from the utility provider, offsetting non-renewable consumption.
- Emerging bio-digester in Madison has the opportunity to provide Fitchburg with a reliable and cost-effective approach to transforming source-separated organic food waste into power.
- The recently created Sustainability Specialist position is able to target specific project goals and objectives.

Table 1: Summary of 25x25 Progress (Fitchburg committed to three-star level)

	Status
One Star	
1. Pass Resolution adopting 25x25 goal	Completed (resolution adopted August 11, 2009)
2. Post community efforts toward energy independence on a website and link to the OEI; promote three energy independence community events	Completed (RCC website, Fitchburg Green E-News Blasts, Fitchburg Green Thursdays)
Two Star	
1. Adopt energy standards for all energy-consuming equipment purchased by government agencies and departments; commit to renewable energy purchases for municipals buildings (20% by 2011)	No Progress
2. Increase utilization of renewable fuels in vehicles owned and operated by the local government 20% by 2010 and 50% by 2015.	No Progress - Fitchburg does not own or operate any vehicles powered by alternative fuels
3. Creation of high performance green building standards and energy conservation for municipal facilities and operations.	In-Progress - RCC Proposed Municipal Construction Guidelines
Three Star	
1. Agree to evaluate their current energy use and sources; determine an energy efficiency and savings strategy; and, using a checklist, determine the community potential for energy independence.	In Progress (Draft 2012 Energy Consumption and GHG Emissions Report, 2013 GHG Emissions and Recommendations Report Update, 2013 Retro-commissioning Project)
2. Prepare an energy independent plan with projected savings and costs to implement.	In Progress (2013 GHG Emissions and Recommendations Report Update)
3. Help shape state policy for the future on funding and legislation to help further the energy independence goals of the state.	Incomplete
4. Designate Energy Independence Coordinator.	Completed (Sustainability Specialist position created January 6 th , 2014).

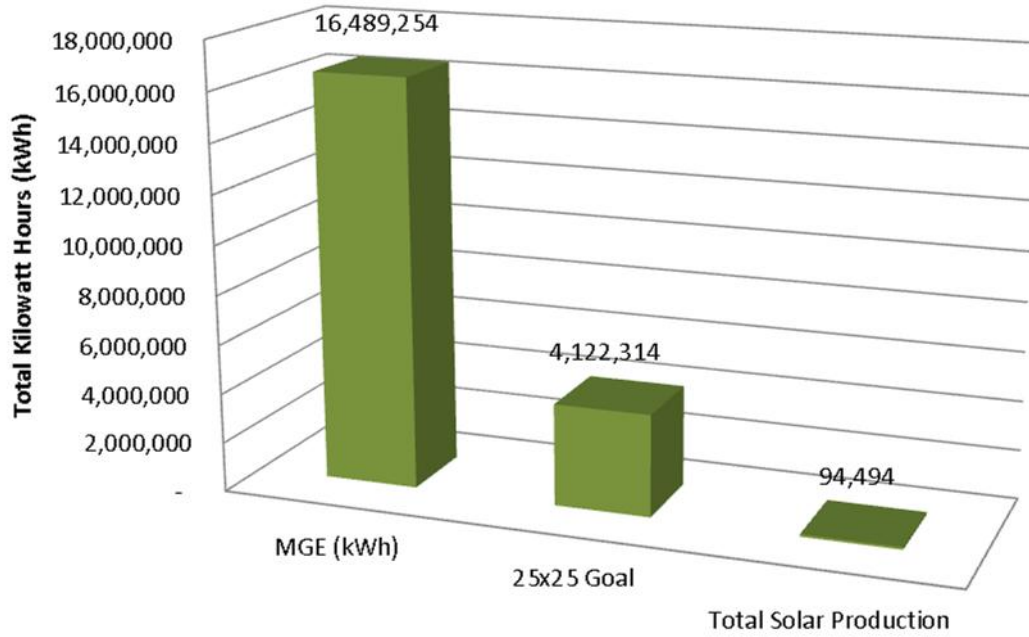
Table 2. Comparison of MGE Electric (kWh) Energy Consumption vs. Solar Production Since 2009

	2009	2010	2011	2012	2013	2014	Total
MGE (kWh)¹	3,831,994	3,694,249	4,381,179	4,581,832	-	-	16,489,254
25x25 Goal²	957,999	923,562	1,095,295	1,145,458	-	-	4,122,314
Solar (kWh):							
<i>City Hall³</i>	11,975	11,975	11,975	11,975	11,975	11,975	71,850
<i>PW Maintenance Facility⁴</i>			5,661	5,661	5,661	5,661	22,644
Total Solar Production							94,494
<i>% of Total MGE Energy Consumption</i>							0.57%
<i>% of 25x25 Goal</i>							2%

Notes:

1. Data for 2013 and 2014 is currently not available. Data also excludes Alliant electrical information as the majority of the electrical energy consumed by the City of Fitchburg is provided by MGE.
2. The 25x25 Goal is defined as generating 25% of electricity and transportation fuels from renewable resources by 2025.
3. City Hall solar arrays were installed in 2009. The annual totals are estimates generated from life-time electrical production data available to date.
4. PW Maintenance Facility solar arrays were installed in 2011. Similarly annual totals are estimates generated from the life-time electrical production data available to date.

Figure 1: Comparison of Total MGE Electric (kWh) Energy Consumption vs. Total Solar Production Since 2009





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To:	Mayor Shawn Pfaff; Tony Roach, City Administrator; Ahnaray Bizjak, Interim Director of Public Works/City Engineer; Rick Eilertson, Environmental Engineer; Fitchburg Green Team Staff
From:	Kristofer Canto, Sustainability Specialist
Date:	June 9, 2014
Subject:	Update #3 on Resolution R-50-09 – A Resolution in Support of the State of Wisconsin’s Energy Independence Goals for 2025 (25x25)

As requested by Mayor Pfaff, this update provides information regarding the City of Fitchburg’s participation in MG&E’s Green Power Tomorrow Program (GPT) as well as MG&E’s Clean Power Partner programs.

Bottom Line: Between the Green Power Tomorrow and Clean Power Partner programs, Fitchburg purchases or produces an average 1.5% renewable energy annually.

Green Power Tomorrow (GPT): This MGE program provides MGE electric customers the option to purchase more of their energy from renewable sources. Power is sold to MGE costumers for \$0.04 more per kilowatt-hour (kWh) than the standard electricity rate.

Clean Power Partner: This program allows customers who invest in solar photovoltaic (PV) systems to sell the energy produced back to MGE for \$.25 per kWh. The energy sold is used as a credit towards monthly MGE utility bills.

Fitchburg is participating in both the Green Power Tomorrow and Clean Power Partner programs through the City Hall and Public Works Maintenance buildings.

Green Power Tomorrow

- City Hall purchases two percent (2%) of it’s energy through Green Power Tomorrow
- The Public Works Maintenance Facility purchases ten percent (10%) of it’s energy through Green Power Tomorrow
- Since the adoption of Resolution R-50-09 on August 11, 2009, Fitchburg has purchased on average 19,436 kWh of GPT electricity annually, or roughly .9% of annual MGE electricity energy consumption.

Clean Power Partner

- City Hall and the Public Works Maintenance Facility both participate in the Clean Power Partner program by selling solar generation back to MGE for \$.25 per kWh.
- Since the adoption of Resolution R-50-09 on August 11, 2009, Fitchburg has sold on average 15,241 kWh annually, equaling an annual credit average of \$3,810.

Table 1: Electricity Consumption, Green Power Tomorrow Purchases & Clean Power Partner Credits in Fitchburg August 2009 - May 2014

Year	Date	Electric Energy		Green Power Tomorrow				Clean Power Partner Credits (Solar Parallel Energy Generation)			
		Electric Energy Consumption (kWh)	Total Charges for Electric Energy (\$)	Green Power Tomorrow Energy Purchased (kWh)	Percent of Total Electric Energy Consumption	Green Power Tomorrow Energy Purchased (\$)	Percent of Total Charges for Electric Energy	Solar Energy Production (kWh)	Percent of Total Electric Energy Consumption	Solar Energy Rebates (\$)	Percent of Total Charges for Electric Energy
2009	8/5/2009 - 12/3/2009	837,647	\$ 111,991.99	6,822	0.8%	\$ 68	0.1%	2,798	0.3%	\$ 700	1%
2010	1/6/2010 - 12/3/2010	2,164,502	\$ 283,523.54	16,543	0.8%	\$ 201	0.1%	12,628	0.6%	\$ 3,157	1%
2011	1/3/2011 - 12/5/2011	2,835,575	\$ 364,295.17	22,329	0.8%	\$ 527	0.1%	17,854	0.6%	\$ 4,464	1%
2012	1/3/2012 - 12/5/2012	2,884,738	\$ 374,525.54	29,194	1.0%	\$ 730	0.2%	28,112	1.0%	\$ 7,028	2%
2013	1/4/2013 - 12/4/2013	2,881,091	\$ 389,292.84	27,346	0.9%	\$ 1,025	0.3%	25,716	0.9%	\$ 6,429	2%
2014	1/6/2014 - 5/5/2014	1,353,265	\$ 169,574.91	15,450	1.1%	\$ 618	0.4%	8,460	0.6%	\$ 2,115	1%
Total		14,650,022	\$ 1,693,204	117,684	0.8%	\$ 3,169	0.2%	95,568	0.7%	\$ 23,892	1%
Median		2,500,039	\$ 323,909	19,436	0.88%	\$ 573	0.2%	15,241	0.63%	\$ 3,810	1%

Average Annual Percentage of Green Power Tomorrow + Clean Power Partner Credits = 1.5%

Notes:

1. Dataset starting August 8, 2009 to reflect adoption date of 25x25 resolution
2. Public Works Maintenance Facility Purchases 10% Green Power Tomorrow Energy at .04 cents per/kWh
3. City Hall Purchases 2% Green Power Tomorrow Energy at .04 cents per/kWh
4. Clean Power Partner Credits are given at .25 cents/kWh of solar parallel energy generation
5. Electricity Consumption Data downloaded from MGE.com and used in this analysis is less than data provided by MG&E directly.

