

2010

Wisconsin Energy Independent Community Partnership

25 x 25 Plan for Energy Independence

**Report completed by:
Chippewa Valley Partnership**



Issue Date:

January 31, 2011

Wisconsin Office of Energy Independence

This page intentionally left blank

Table of Contents

Overview.....	3
What was measured? Why?.....	4
Discoveries/Surprises.....	8
Total Projects Considered.....	10
Pathways to 25 x 25.....	15
Projects Selected – Explanation.....	20
Narrative – Potential Renewable Feedstocks.....	24
Existing Unknowns – Necessary Information for Future.....	26
Action Steps – Immediate & Long – Term.....	28
Energy Independence Team Members.....	34
Appendix A – Baseline Energy Consumption Data.....	35
Appendix B – Carbon Dioxide Data.....	39
Appendix C – Renewable Energy Projects Considered.....	40

Overview

The Chippewa Valley Partnership is made up of the City of Eau Claire, the City of Altoona and Eau Claire County. The partnership provides local government services to a population over 100,000. Each government has committed to being an Energy Independent Community (EIC) – a community that has set a goal of 25 percent renewable energy use by the year 2025, to increase energy independence, and promote a sustainable energy policy in the State of Wisconsin.

The Wisconsin Energy Independent Community Partnership is a program administered by the Wisconsin Office of Energy Independence (OEI). The office helps to effectively assist and increase energy efficiency and renewable energy development for Wisconsin communities. Currently, there are over 125 Energy Independent Communities, with most passing official resolutions, pledging to meet the 25 percent goal. The main objectives of the Wisconsin Energy Independent Community Partnership are to:

- Increase the use of renewable energy and renewable fuels by 25 percent by 2025 across the State of Wisconsin.
- Increase and promote public awareness regarding the benefits of increased energy conservation, energy efficiency, and renewable energy use by counties and municipalities around the state. These benefits include and are not exclusive to: clean air and water, intelligent land management, rural and urban economic development, as well as state and national energy independence.

In February of 2010, the Chippewa Valley Partnership received an Energy Independent Pilot Community grant from OEI to create a plan towards 25 percent renewable energy. Funding originally came from the 2009 American Recovery and Reinvestment Act's Energy Efficiency and Conservation Block Grant Program. The partnership spent the year establishing their own energy baselines, working on individual and joint projects, and creating a plan to lay out how each local government will achieve 25 percent by implementing various measures.

This report represents the culmination of the partnership's efforts. Its purpose is to be used as a plan for future capital energy improvements- when projects should be evaluated and brought on line- to ultimately achieve the goal of 25 percent renewable energy by the year 2025. For ease of use, each local government's plan is broken up in the various sections. Structure, content and style may vary depending on how each entity prepared their sections.

What was measured? Why?

The Chippewa Valley Partnership measured energy consumption for buildings, water and sewer infrastructure, fleet and lighting. In order to categorize what was measured, the Energy Center of Wisconsin had us lump all items into four similar categories called: "Buildings", "Water", "Fleet" and "Lighting". The energy types measured were: kilowatts per hour (kWh), therms, liquid propane, unleaded gasoline, diesel and fuel oil.

Figure 1. Electric Meter



The partnership used the Environmental Protection Agency's Energy Star Portfolio Manager to enter energy quantities consumed at buildings, water and sewer infrastructure and other miscellaneous structures. This tool provides the ability to track energy performance and achieve Energy Star recognition for certain buildings. For the fleet and lighting, the Energy Center of Wisconsin provided a spreadsheet to capture associated data.

In both cases, five years of data, from 2005 to 2009, were entered. However, the baseline the Energy Center of Wisconsin (ECW) compiled for us, only used data from 2007, 2008 and 2009 as these data sets were more complete and reflective of current trends. The ECW then took an average of these three years to create our collective and individual energy usage baselines. They converted all energy types into one million British Thermal Units or MMBtus. Appendix A gives a precise breakdown of what was measured for each community.

Table 1.

Baseline	
Chippewa Valley Partnership	Average yearly MMBtus
City of Eau Claire	164,109
City of Altoona	11,862
Eau Claire County	83,227
Total	259,198

City of Eau Claire

The City of Eau Claire measured everything in our operations that consumed energy to arrive at an accurate baseline. Most of these items are owned by the City, but in some instances they are leased, and the utility bills were paid by us. In the case of our closed landfill, half the cost is paid for by outside parties.

Buildings & Water

Combined, this includes 97 items of infrastructure. An exhaustive list includes: Public Work buildings, Park and Forestry buildings, Fire stations, Police buildings and communication towers, City Hall, Library, Landfill pumps, water and sewer buildings/infrastructure (well houses, booster stations, reservoirs, water towers, aerators, stormwater pumps, and lift stations). Eau Claire Housing Authority buildings were not included as they operate financially independent of the City.

Fleet

Fleet includes all 192 licensed vehicles, plus other un-licensed motorized vehicles and equipment such as loaders, utility carts, riding-mowers, trimmers, edgers, etc.

Lighting

Lighting includes white way lighting on highways or streets, residential neighborhood street lighting, decorative lighting, traffic signals, park lighting, athletic field lighting, cemetery lighting, pedestrian lighting, footbridge lighting, security lights, emergency sirens, parking ramp lighting, and building lighting on separate meters.

Because of the amount of items, and how some used multiple energy types, we decided to group what was measured based on energy type (electric, gas, liquid). In each table, we listed which of the four categories applied. Year 2005 was omitted due to lack of data.

Table 2.

Electric Energy Consumed (buildings, lighting & water infrastructure)				
Year	2006	2007	2008	2009
Electricity (kWh)	21,736,390	23,044,163	22,853,133	22,481,354
Total in MMBtus	74,165	78,627	77,975	76,706

Table 3.

Gas Energy Consumed (buildings & water infrastructure)				
Year	2006	2007	2008	2009
Natural Gas (Therms)	287,193	292,006	345,916	349,672
Totals in MMBtus	28,719	29,201	34,592	34,967

Table 4.

Liquid Energy Consumed (fleet, buildings, water infrastructure)				
Year	2006	2007	2008	2009
Unleaded (Gallons)	147,457	152,054	143,741	132,997
Diesel (Gallons)	237,102	243,265	265,267	253,502
Heating Oil (Gallons)	754	554	1,616	274
Propane (Gallons)	3,027	3,042	2,460	3,369
Totals in MMBtus	51,629	53,028	55,156	52,077

City of Altoona

In order to meet the Chippewa Valley Partnership's 25 by 25 energy independence goals, it was necessary to measure the existing energy usage at City of Altoona facilities. In addition to City facilities, we also chose to measure the Hobbs Ice Arena, which is owned by the City of Altoona, but is leased by the Altoona Youth Hockey Association. Hobbs Ice Arena is a large user of energy, and even though the AYHA is responsible for payment of utilities, it was felt that inclusion was beneficial.

The City was also required to measure fuel usage by City vehicles. Since the City has a range of categories of vehicles and equipment that use different amounts of fuel for many purposes, we chose to simplify the types of vehicles and equipment that would be tracked. It was established that the vehicles or equipment to be measured would be classified as either gasoline or diesel-powered propelled equipment. This eliminated special purpose vehicles that were only used a few times a year, walk-behind equipment such as mowers and snow blowers, stationary equipment such as wood chippers, and hand held equipment that included leaf blowers and chainsaws. Quantifying the fuel consumption of these smaller pieces of equipment is impractical, and in addition, they may not be compatible with alternative fuels.

Buildings

The City of Altoona's building inventory includes the City Hall/Library building, the Emergency Services Building, Hobbs Ice Arena, and three buildings constituting the Public Works Shops. The buildings are generally modern, with the exception of Hobbs Ice Arena and the Public Works Shops. City Hall is several decades old; however, it was expanded and renovated to include the Library in 2000. The Emergency Services Building was originally composed of the Fire Department Garage, but it was expanded and renovated in 2001. The Parks & Recreation Maintenance Building was built approximately in 2004. The Altoona Youth Hockey Association leases the Hobbs Ice Arena from the City. The AYHA has a Capital Improvements Plan, and has implemented energy efficiency measures. One notable measure that was implemented was replacement of existing high-wattage incandescent fixtures with high-efficiency linear fluorescent.

Water

The facilities included in this section consist of two elevated water reservoirs, a water booster station, five of the six municipal wells, and three sewer lift stations. These facilities, with the exception of the two elevated reservoirs, consume a considerable amount of electricity.

Vehicles

The City of Altoona established an annual baseline of 14,912 gallons of gasoline used in 27 gasoline vehicles and 5,352 gallons of diesel fuel used in 16 diesel vehicles throughout the City.

Lighting

Street lighting within the City of Altoona was divided into two categories; City owned and maintained streetlights (decorative), and private utility owned and maintained streetlights. The two private utility companies that operate within City limits are Xcel Energy and Eau Claire Electric Cooperative. The number of existing decorative streetlights owned and maintained by the City is small, and the potential energy savings realized by converting them to inductance or light emitting diodes (LEDs) would be minimal. Xcel Energy has begun a pilot project on the use of LED lights. As the results of the pilot project are known, further analysis will be performed to determine the potential benefit to the City of converting from high-pressure sodium to LED.

Eau Claire County

Eau Claire County broke the energy usage into two basic categories, Buildings and Fleet.

Buildings

We chose to measure only the facilities that were owned by Eau Claire County, and occupied by Eau Claire County Departments. This excluded the Beaver Creek Reserve where utilities and operational costs are not provided by the County. Our baseline includes existing buildings only, so the new Jail, which is under construction, is not included. Using Portfolio Manager, we tracked building size, use, and energy used. The total energy usage for all of our facilities is 5,567,814 kWh, and 287,816 therms per year. The breakdown of the buildings is shown in the following table.

Table 5.

Department	# of Buildings	Sq Ft
Airport	16	169,655
Facilities Maintenance	3	268,533
Highway	12	66,672
Parks & Forests	25	79,692
Total	56	584,552

Fleet

Eau Claire County's fleet vehicles were broken into 5 departmental categories – Airport, Purchasing, Highway, Parks & Forests, and Sheriff's Department. Total fuel usage by the County was broken into two categories – Unleaded, and Diesel. In total Eau Claire County uses 79,997 gallons of unleaded, and 179,568 gallons of diesel per year. The breakdown by department is shown in the table below.

Table 6.

Department	Unleaded Gallons	Diesel Gallons
Airport	5074	4613
Purchasing	3858	N/A
Highway	13308	171923
Parks & Forests	4715	3032
Sheriffs	53042	N/A
Total	79,997	179,568

Discoveries/Surprises

In general, the Chippewa Valley Partnership found some common things worth noting in this plan.

1. Payback periods were extremely long for our considered renewable energy projects. Even after using life-cycle analysis, paybacks were still long enough to be somewhat discouraging.
2. We were surprised that the State of Wisconsin does not see geo-thermal technology as a renewable energy source. A few of these projects were some of the most attractive in terms of payback and initial cost to us. We hope the Wisconsin Public Service Commission redefines geo-thermal as a renewable energy.
3. After hiring a consultant to research the feasibility for a joint bio-fueling station, we learned of some significant disadvantages associated with ethanol and bio-diesel. First, fuel prices are highly volatile and depend on external market and political conditions. Second, E85 ethanol's fuel economy is 25 percent to 30 percent lower than unleaded gasoline. Though the price of E85 was around \$0.40 cheaper, and it burns cleaner, the lower fuel economy makes it hard to justify. Third, bio-diesel B100 was found to be \$0.80 more expensive than No. 2 diesel. The fuel economy is similar, but current price point proves it difficult to implement.
4. We learned how to work better with our utility providers to share/obtain energy usage data. Both Xcel Energy and Eau Claire Energy Cooperative were very helpful in providing us data. We are now working with them to get data automatically so it reduces manual entry burden.

City of Eau Claire

The City discovered that a holistic account of all our energy use had never been attempted before. For a City of our size, we found it extremely time consuming to gather all this information, although it was well worth the effort. From here, the City can now build upon what we know about our energy usage and make smarter decisions investing in energy efficiency and renewable energy improvements.

Using the online Environmental Protection Agency's Energy Star Portfolio Manager proved to be difficult. The tool does not yet offer many Energy Star recognition ratings for municipal type buildings. Furthermore, the Energy Center of Wisconsin directed pilot communities to put infrastructure in the system that were not actually buildings (i.e. life stations, water pumps, communication towers, etc.). However, it does serve as a good way to see energy use over time for buildings the City wants to track. In the future, we may continue to use the system in various capacities or use other services.

City of Altoona

One discovery, and surprise, for the City of Altoona was that its existing buildings were fairly energy-efficient. During renovation of the City Hall/Library building a number of measures such as occupancy sensors, T8 fluorescent lighting, daylight sensors, and higher efficiency HVAC equipment were incorporated into the renovation. Many of the same measures were incorporated into the Emergency Services Building as well, including an ultra-high-efficiency water heater. The Parks & Recreation Maintenance Building was reviewed previously by Focus on Energy and found to be very efficient. The building is well insulated and has newer HVAC equipment. As a result, potential renewable energy projects that would be suitable for low-efficiency, older buildings were less attractive due to the long payback period.

The City, in the end, grouped fuel use by department rather than by vehicle. It was found that quantifying use by vehicle was unrealistic. The City obtains fuel from Eau Claire County at their Highway Department located within Altoona. Employees use a coded key which records the volume of fuel obtained. Each employee may fuel multiple vehicles per day with the same key

Eau Claire County

One of the biggest discoveries for the Eau Claire County 25 by 25 team was that everything was being managed at a departmental level instead of a County-wide level. This includes energy efficiency upgrades, new projects, and fleet operations.

Another discovery was how long the paybacks were on all of the renewable energy projects. The paybacks for Eau Claire County's renewable projects ranged from 16 years to 142 years payback, with the majority falling between the 30 year to 50 year range. In many cases the payback period was longer than the life span of the equipment.

The total amount of energy Eau Claire County uses as a whole. Energy usage/cost is managed at a departmental level, and this is the first time that it was all brought together. This gives Eau Claire County an opportunity to change how it manages energy usage.

Total Projects Considered

Working with Focus on Energy and our renewable energy consultant team, the Chippewa Valley Partnership identified 422 total projects (380 efficiency and 42 renewable). Focus on Energy's Schools and Government Program provided us with building site assessments which found numerous potential energy efficiency projects. They also identified renewable energy projects, but on a cursory level. To follow up, we hired a consultant team, to perform more detailed renewable energy site assessments. Their 261 page report analyzed all projects the partnership wanted studied. Renewable site assessments occurred at twenty buildings. Appendix C lists all considered renewable energy projects and their life cycle paybacks. Life cycle payback is the year in which the first cost of the investment minus probable incentives is equal to the inflated energy cost savings, subtracting inflated maintenance costs.

In 2009, the twenty buildings studied consumed almost 16 million kWh of electricity and almost 550,000 therms of natural gas. The site assessments identified a total of ~431,000 kWh of electricity and ~25,000 therms that could be generated at an installed cost of roughly \$6.5 million dollars. Around \$930,000 of incentives from Focus on Energy was identified to help reduce the cost to implement these projects. Table 7 summarizes assessment results.

Table 7.

Consultant Site Assessment Summary						
	Energy Use		Renewables Identified		Cost	Incentive
	Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)		
City of Eau Claire	10,252,475	278,044	151,552	21,674	\$3,170,335	\$458,595
Eau Claire County	4,654,992	237,248	238,783	29,21	\$2,465,700	\$375,773
City of Altoona	721,828	33,139	40,664	134	\$836,600	\$97,280
Total	15,629,295	548,431	430,999	24,729	\$6,472,635	\$931,647

Joint Biofuels Fueling Station Project

The Chippewa Valley Partnership selected a joint project as part of the grant. The existing County owned fueling station in Altoona was considered because Altoona refuels city vehicles there, and the site is on Eau Claire County's Highway Department property. The County also uses the filling tanks for their fleet. The City of Eau Claire has its own fueling station located in the center of the city at the Central Maintenance Facility, but was interested in exploring a joint biofueling station with Altoona and the County.

The existing County fueling station has previous experience with biofuels. Currently, the station uses roughly 260 gallons of 100% canola oil per year as a release agent for the trucks that haul asphalt. The Station buys the fuel from a company in Cumberland, Wisconsin and stores the biofuels in a 325 gallon tote. They purchase the oil at a cost that is generally \$1/gallon over the price of diesel. They have used canola oil for this purpose in

the past several years as it is more environmentally friendly than using standard petroleum based oil.

Figure 2. County Highway Garage Diesel Tanks



Figure 3. County Unleaded Tank



The Chippewa Valley Partnership hired a consultant to study alternative fuel scenarios. Both ethanol E85 and bio-diesel blends were considered. Although the results of the study indicated that the use of alternative fuels at this time is not fiscally attractive (see Table 8), the group will continue to convert their fleet to flex-fuel capable vehicles through attrition. If alternative fuel costs are lower in the future, the group would be in a position to take advantage of the savings. We may also consider contracting with retail stations that offer bio-fuels.

Table 8.

Bio-Diesel Extra Cost Estimates - 2015		
Location	Projected Diesel Usage (gallons) - 2015	Additional cost for B20 blend (\$0.16/gallon)
City of Eau Claire	269,097	\$43,056
City of Altoona	5,243	\$839
Eau Claire County	191,666	\$30,667
Totals	466,006	\$74,561

City of Eau Claire

The City of Eau Claire considered 221 related energy projects. We identified a number of sites that could use energy efficiency or renewable energy technologies. On the next page, Table 9 shows a breakdown for the number and type of project considered at all sites.

Figure 4. Library Solar Electric



2010 Wisconsin Energy Independent Community Partnership

Table 9.

City of Eau Claire Total Projects Considered			
Site	Type	Number	Notes
City of Eau Claire Buildings			
City Hall / Fire Station #2	Energy Efficiency	16	
	Renewable Energy	2	Solar H ₂ O & photovoltaic
Library	Energy Efficiency	14	Geothermal included
	Renewable Energy	2	Solar H ₂ O & photovoltaic
Fire Station #5	Energy Efficiency	12	
	Renewable Energy	2	Solar H ₂ O & photovoltaic
Fire Station #6	Energy Efficiency	11	
	Renewable Energy	2	Solar H ₂ O & photovoltaic
Fire Station #8	Energy Efficiency	17	
	Renewable Energy	2	Solar H ₂ O & photovoltaic
Fire Station #9	Energy Efficiency	16	
	Renewable Energy	2	Solar H ₂ O & photovoltaic
Fire Station #10	Energy Efficiency	14	
	Renewable Energy	2	Solar H ₂ O & photovoltaic
Central Maintenance Facility	Energy Efficiency	19	Geothermals included
	Renewable Energy	2	Solar H ₂ O & photovoltaic
Downtown Bus Station	Energy Efficiency	6	
	Renewable Energy	0	
Waste Water Treatment Plant	Energy Efficiency	15	
	Renewable Energy	1	Anaerobic Digester Upgrade
Water Treatment Plant	Energy Efficiency	13	Photovoltaic (PV)
	Renewable Energy	1	
Park & Forestry	Energy Efficiency	24	Geothermal included
	Renewable Energy	3	Biomass, Solar H ₂ O & PV
Fairfax Pool	Energy Efficiency	7	
	Renewable Energy	2	Two solar H ₂ O
Hobbs Ice Arena	Energy Efficiency	5	
	Renewable Energy	2	Two solar H ₂ O
Park Flag Pole Lighting	Renewable Energy	2	PV @ Carson & Owen
City of Eau Claire Fleet			
Hybrid 40' Buses	Energy Efficiency	3	One purchased already
Diesel vehicles	Renewable Energy	1	Biodiesel blend & E85 joint fueling station with Altoona and E.C. County
Unleaded vehicles	Renewable Energy	1	
Totals	Energy Efficiency	192	
	Renewable Energy	29	

City of Altoona

The City of Altoona considered the recommended projects listed in the Focus on Energy Advisor Report and those addressed by the renewable energy consultant team. A general summary of the types of measures for buildings and fleet is listed on the next page in Table 10.

Table 10.

Site	Total Projects Considered		Notes
	Type	Number	
Altoona - Buildings			
City Hall	Energy Efficiency	15	Geothermal included
	Renewable Energy	1	Photovoltaic
Emergency Services Bldg.	Energy Efficiency	16	Furnace replacement with high-efficiency units or geothermal
	Renewable Energy	3	Solar H ₂ O, photovoltaic
City Shops	Energy Efficiency	14	Overhead door replacement
	Renewable Energy	0	
Hobbs Ice Arena	Energy Efficiency	8	Heat recovery (compressors)
	Renewable Energy	0	
Altoona - Fleet			
Diesel vehicles	Renewable Energy	1	Biodiesel blend
Unleaded vehicles	Renewable Energy	1	E85 joint fueling station with E.C. County and City of E.C.
Totals	Energy Efficiency	53	
	Renewable Energy	6	

Figure 5. City Hall/Library Geothermal Bore Field Layout



Eau Claire County

Eau Claire County considered both energy efficiency and renewable energy projects to reach our 25 by 25 goal. We are also looking at policy changes including creating a County wide sustainability plan, and changes on how energy usage is managed within our facilities, and fleets. We considered geo-thermal projects at the Airport, Expo Center, and Altoona Highway Shop. Wind generation projects were looked at for the Expo Center, and the Foster Highway Shop. We considered solar hot water at the Courthouse. We looked at solar photovoltaic for the Courthouse, Airport, and the Expo Center. An E-85 joint fueling station was investigated for the Altoona Highway Shop. Renewable projects were investigated with the help of consultant team's report that was funded by the 25 by 25 grant. Energy efficiency projects were looked at with the help of the County-wide Focus on Energy audits.

2010 Wisconsin Energy Independent Community Partnership

Table 11.

Site	Total Projects Considered		Notes
	Type	Number	
Eau Claire County Buildings			
Agricultural Center	Energy Efficiency	12	
	Renewable Energy	0	
Airport Buildings	Energy Efficiency	33	Geothermal included
	Renewable Energy	1	Photovoltaic
Courthouse	Energy Efficiency	26	
	Renewable Energy	2	Solar H2O & Photovoltaic
Expo Center	Energy Efficiency	8	
	Renewable Energy	2	Wind Power & Photovoltaic
Highway-Altoona	Energy Efficiency	18	Geothermal included
	Renewable Energy	0	
Highway-Augusta	Energy Efficiency	6	
	Renewable Energy	0	
Highway-Foster	Energy Efficiency	6	
	Renewable Energy	1	Wind Power
Lake Altoona Clubhouse	Energy Efficiency	3	
	Renewable Energy	0	
Lake Eau Claire Clubhouse	Energy Efficiency	4	
	Renewable Energy	0	
Lake Eau Claire Maintenance Building	Energy Efficiency	11	
	Renewable Energy	0	
Maintenance Building	Energy Efficiency	8	
	Renewable Energy	0	
Eau Claire County Fleet			
Joint Fueling Station (E85)	Energy Efficiency	0	
	Renewable Energy	1	E85 Fuel
Totals	Energy Efficiency	135	
	Renewable Energy	7	

Figure 6. Expo Center Turbine Locations



Pathways to 25 x 25

The Energy Center of Wisconsin helped the partnership evaluate solutions by developing a spreadsheet tool that took baselines and future project measures into account. Once each entity reached 100%, the goal was met. Result spreadsheets are available by request. Actual values are noted in the following tables. As stated, the purpose of the Chippewa Valley Partnership is to obtain 25 percent renewable energy by the year 2025. In order to reach this, the local governments will need to employ a combination of strategies.

1. RPS Strategy

The State of Wisconsin's Renewable Portfolio Standard (RPS) mandates power companies provide 10 percent to customers by 2010. However, Xcel Energy provides 15 percent to Western Wisconsin customers like the Chippewa Valley partnership. This is due to Minnesota's more aggressive 30 percent by 2020 RPS.

2. Renewable Energy Purchase Strategy

Both Xcel Energy (Windsorce) and Eau Claire Energy Cooperative (Evergreen) have volunteer programs to purchase renewable energy in 100 kWh blocks. Block purchasing comes at a premium, but it can be more cost-effective compared to developing a major generator like a wind or solar farm.

3. Selling RECs Strategy

Selling Renewable Energy Certificates to companies, who want to use renewable power but cannot generate it themselves, is an option currently available to the City of Eau Claire. If trade revenue is present, funds could go back into developing more renewable energy improvements.

4. Conservation Strategy

The most cost effective option is to reduce the amount of energy wasted. Various policies like fleet anti-idling, automatic computer shut-offs, turning off lights, can all add up to make a difference.

5. Energy Efficiency Strategy

There are many technological approaches to use energy in smarter ways. Programmable thermostats, energy management software, Energy Star rated products, motion sensor lights, higher efficiency light bulbs, variable frequency drives, can all help to reduce energy use. Larger expenditure items such as commissioned heating, ventilation and air condition (HVAC) systems, geo-thermal systems, and flex-fueled or hybrid vehicles are other options that could be pursued.

6. Renewable Energy Generation Strategy

The partnership found several projects that could create grid-independent renewable energy. Not only does this serve to supply on-site energy, but it provides energy security in case of grid outages.

City of Eau Claire Pathways to 25 x 25

There are three likely scenarios the City could pursue when considering an action plan. All options have a base of policy changes, conservation/efficiencies, and generating renewables. The base will contain variations, but essentially here are the three scenarios:

1. "Purchase" *Policies→Effeciencies→Renewables→Windsorce*
2. "Biofuels" *Policies→Effeciencies→Renewables→Biofuels*
3. "Mixed" *Policies→Effeciencies→Renewables→Windsorce→Biofuels*

Combinations of strategies are not shown for simplicity sake. The following table is a breakdown of the City of Eau Claire's pathway to 25 percent renewable energy. Overshooting the goal gives us the ability to adjust towards a preferred scenario.

Table 12.

City of Eau Claire	
Baseline usage (avg. of 2007-'09)	164,109 (MMBtu)
Projected 2025 usage (w/0.08% growth rate)	186,424 (MMBtu)
Revised 2025 usage (w/ Efficiency measures)	137,528 (MMBtu)
Revised 25% 2025 Renewables goal	34,382 (MMBtu)
Sum of Renewable measures	61,459 (MMBtu)
Percent of goal achieved	179%

Administrative Policies and Procedures

In 2008, the City of Eau Claire created a staff Green Team to carry out projects related to operational sustainability. An internal baseline audit report was completed in 2009 and it contained a five-year plan action plan. A major focus was related to energy efficiencies and work towards the 25% renewable energy goal. This groundwork aided our City Council to adopt the 25 by 25 resolution and ultimately to receive this pilot community grant. The Green Team has already created a Green Purchasing Policy that focuses on buying items that are more energy efficient (i.e. Energy Star rated). The Green Team and other key staff will lead the way to implement the following policies:

- Municipal Green Building Policy
- Anti-Idling Fleet Policy
- Consider renewable energy purchases
- Policy to monitor 25% renewable energy goal
- Use of a Geographic Positioning System to track fleet fuel consumption
- Policy to use energy dollar savings / incentives for future energy projects
- "Building a culture of sustainability" educational campaign

In order to ensure we meet our 25 by 25 goal, staff needs to make sure we follow up on how we are doing at least annually. This will provide the information we need to make decisions near and long term. As someone once said, "You can't manage what you don't know", rings true with this goal. Therefore, the City of Eau Claire will create a focus group to work with staff and our utility providers. The tasks identified below will need to take place so we can monitor our progress towards the goal.

- Work with utility providers to automatically obtain monthly energy data for all accounts.
- Appoint an energy coordinator for monitoring and updating energy consumption baseline.

- Project Sharing: project data such as cost, measure life, energy savings, renewable energy savings, life cycle return on investment, etc.) shall be shared with the appointed energy coordinator.

Windsorce

The City could purchase a number of kWh blocks of renewable energy offered by Xcel Energy. Windsorce comes at a price premium. Yet, purchasing renewable power might be a more cost-effective option compared to building expensive renewable energy installations that generate a significant amount of energy. The trade off is however, the City would have no control over premiums and would not generate its own power.

Buildings

The City will continue to aggressively pursue conservation and energy efficiency projects in our various buildings to lower our yearly baseline consumption. Efficiency projects will be identified, studied and placed into the Capital Improvement Plan.

A number of renewable energy projects will be studied closer to determine the feasibility of installation, and inclusion in the Capital Improvement Plan. Initial cost, incentives, simple payback, life-cycle payback, and generation output will be looked at. These projects include anaerobic digestion, solar hot water and photovoltaics.

The Green Building Policy will ensure new buildings and existing building remodels are built to equivalent Leadership in Energy and Environmental Design (LEED) standards. Presently, the Eau Claire Hobbs Ice Arena could be LEED Certified. The City Planning Department will also consider a construction site waste recovery ordinance later in 2011.

Water

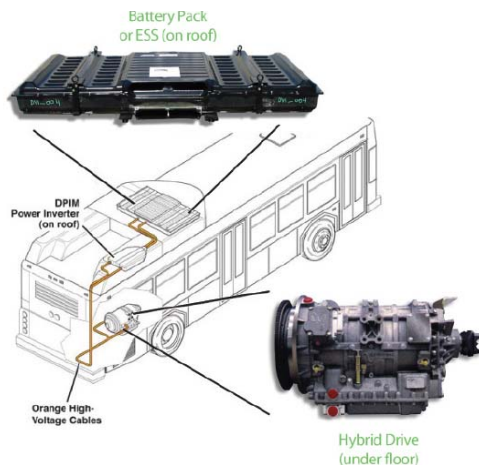
We will be upgrading our Waste Water Treatment Plant in 2011-2012. As part of this major project, we predict a 35 percent increase in methane use from the installation of a new digester cover and engines. Existing generation is 288,000 kWh and 144,000 therms per year. A variable frequency drive (VFD) is being installed at Damon Street Reservoir and more VDFs may be added in the future.

Fleet

Hybrid vehicles will be looked at every opportunity. The City has one hybrid sports utility vehicle (SUV). Eau Claire Transit has committed to purchase a 40-foot hybrid bus and they hope to obtain grant funds for two more. The GILLIG Allison Hybrid bus claims to reduce emissions by 95 percent and would save the City 3,000 gallons of diesel fuel annually (or a 20% decrease).

The City will purchase flex or dual-fueled vehicles whenever possible. If manufacturers offer dual fuel, it will be purchased. Currently, the fleet is at over 15 percent. The Police fleet will be the only true dual fueled/flex fuel fleet. When the fleet

Figure 7. GILLIG Allison Hybrid Bus Diagram



tips past the 60 percent mark, the City might dedicate a tank fueling system to E85. Or, use a joint fueling system with the County and Altoona. Details would need to be worked out as to how to bill the fuel out.

Lighting

The City will continue to use the most energy efficient lighting technologies where it makes sense. We have installed light emitting diodes (LEDs) above one traffic signal intersection and plan to install a block-run of LED street lamps on Golf Road.

City of Altoona Pathways to 25 x 25

The following table is a breakdown of the City of Altoona’s pathway to 25 percent. A combination of strategies will be used to obtain the goal.

Table 13.

City of Altoona	
Baseline usage (avg. of 2007-'09)	11,862 (MMBtu)
Projected 2025 usage (w/0.08% growth rate)	13,475 (MMBtu)
Revised 2025 usage (w/ Efficiency measures)	11,988 (MMBtu)
Revised 25% 2025 Renewables goal	2,997 (MMBtu)
Sum of Renewable measures	2,997 (MMBtu)
Percent of goal achieved	100%

Administrative Policies and Procedures

1. Continue with Energy Efficiency Projects to maximize savings.
 - The City will implement no-cost measures immediately, and will budget measures with a reasonable payback period into successive budgets.
2. Periodically reevaluate renewable energy technology to determine if payback periods become reasonable.
 - As costs for renewable energy technologies decrease, and/or costs for traditional sources of energy increase, the payback period for various measures may become attractive.
3. Purchase of renewable energy blocks (Windsorce).
 - In order to reach the 25 percent goal, the City would need to purchase 1,017 kWh blocks of Windsorce energy from Xcel Energy. The 25 percent goal is unattainable with energy efficiency measures and renewable energy projects alone.

Buildings

Energy efficiency measures will be incorporated into City buildings as budget permits. No-cost measures will be implemented immediately.

Water

The City currently has three municipal wells that lack variable-frequency drives. These wells will be upgraded to include the variable frequency drives (VFDs).

Fleet

The City’s fleet will be replaced with flex-fuel capable vehicles through attrition.

Eau Claire County Pathways to 25 x 25

Table 14.

City of Altoona	
Baseline usage (avg. of 2007-'09)	83,227 (MMBtu)
Projected 2025 usage (w/0.08% growth rate)	94,544 (MMBtu)
Revised 2025 usage (w/ Efficiency measures)	88,598 (MMBtu)
Revised 25% 2025 Renewables goal	22,149 (MMBtu)
Sum of Renewable measures	22,149 (MMBtu)
Percent of goal achieved	100%

Administrative Policies and Procedures

Eau Claire County has created a Sustainability team to expand on current green policies, as well as create new policies. This includes, but not limited to Green Cleaning, Green Purchasing, water use, landscaping, fleet operations, and land use.

Windsorce

In order for Eau Claire County to reach its 25 by 25 goal, we would need to purchase 33,370 blocks of 100kwh Windsorce power from Xcel Energy. Our goal cannot be met without purchasing these blocks, but comes at a price premium of \$38,375.50 per year in 2010 prices.

Buildings

The County will continue to pursue energy efficiency projects in the various buildings to lower our baseline consumption. These projects will be identified and placed into a number of successive budgets.

A number of renewable energy projects will be looked at closer to determine the feasibility of completion. Initial cost, payback, and output will be looked at and brought in front of the County Board. These projects include wind and solar.

New buildings that are built will be LEED certifiable. The Eau Claire County Justice Center is currently under construction, and this building will be LEED certifiable.

Table 15.

Energy	2009 BTU Base	BTU Renewables	BTU Savings
Kilowatt Hours (5,567,814)	18,997,000,000		
Therms (287,816)	29,350,000,000	Converted wrongly	
Total	48,347,000,000		
Energy Efficiency			5,946,000,000
Renewables			13,198,000,000

Fleet

We will look at replacing the fleet with flex-fuel capable vehicles through the normal replacement schedule. We will also look at an E-85 fueling station for these vehicles.

Table 16.

Fuel	2009 BTU Base	BTU Renewables
Gasoline	9,920,000,000	8,848,000,000
Diesel	24,960,000,000	
Total	34,880,000,000	

Projects Selected – Explanation

The Chippewa Valley Partnership

Projects selected to reach the 25 percent goal by 2025 were based on the average energy use for 2007-2009 (the baseline) and then multiplied by an estimated annual population growth rate of 0.8 percent. This estimated rate told us how we might expect municipal energy usage to grow. The growth rate was based on the October 2008 report, "Wisconsin Population 2035," by the Wisconsin Department of Administration's Division of Intergovernmental Relations.

Analysis of the 2007 to 2009 baseline showed the City of Eau Claire's municipal energy usage grew at 0.9 percent. Altoona's municipal energy usage decreased by 9.7 percent and Eau Claire County's decreased by 2.0 percent.

The Energy Center of Wisconsin also researched how the population growth rate could be discounted by percent of energy attributable to buildings. They supposed that building energy consumption will be essentially flat as municipalities grow. They found the energy use of new buildings is mostly offset by energy reductions from modernizing existing stock and building closings (although modernizing building stock can also occasionally increase energy consumption as new uses are added). However, the energy consumed by infrastructure and, to a lesser extent, fleet can reasonably be modeled as proportional to population growth. The population growth rate discounted by percent of energy attributable to buildings was 0.6 percent for the City of Eau Claire, 0.4 for Altoona, and 0.3 for the County.

The following is a list for each local government and why they chose the projects that are on their short and long term action plans. Many of the project measures identified will need exploratory bids from several installers to reduce uncertainty in pricing.

City of Eau Claire

Administrative Policies and Procedures

1. Green Team

The City of Eau Claire chose our various projects in this category based off the Green Team's 2009 internal baseline audit and the work performed by our Energy Independence Team (see Page 34). Each of these administrative policies and procedures will be important to reduce our energy use and promote incorporation of renewables.

- Municipal Green Building Policy
- Anti-Idling Fleet Policy
- Consider renewable energy purchases
- Policy to monitor 25 percent renewable energy goal
- Use of a Geographic Positioning System to track fleet fuel consumption
- Policy to use energy dollar savings / incentives for future energy projects
- "Building a culture of sustainability" educational campaign

2. Energy Data Management

Tracking energy information is paramount to realizing our goal. The City will create a focus group to oversee that progress towards the 25 percent goal and energy reduction is occurring.

- Work with utility providers to automatically obtain monthly energy data for all accounts (metered and non-metered).
- Appoint an energy coordinator for monitoring and updating energy consumption baseline.
- Project Sharing: project data such as cost, measure life, energy savings, renewable energy savings, life cycle return on investment, etc.) shall be shared with the appointed energy coordinator.

3. Purchase Renewable Power

City decision-makers will need to consider purchasing additional kilowatt per hour blocks of power in order to make up for any shortfall towards the 25 percent goal.

Buildings & Water

1. Energy Efficiency Measures

- The City will complete its remaining Energy Efficiency and Conversation Block Grant projects at City Hall.
- As noted in the action plan on Page 28, many efficiency projects were worthy of implementation.
- Geothermal upgrades had better payback periods than the renewable measures. Geothermal projects at the Central Maintenance and the Parks and Forestry Building were strong contenders.

2. Renewable Energy Measures

- Many Photovoltaic and Solar Hot Water (SHW) projects will be considered once energy efficiency is addressed at various facilities.
- City Fire stations are seen as a great application for SHW. Economies of scale may be realized by having an installer put several of these systems on fire stations at the same time.
- Likewise, larger photovoltaic systems generally have economies of scale and could potentially receive special/pilot incentives from Focus on Energy. The Water Treatment Plant could be targeted for a potential special grant or pilot incentive program.
- The City's anaerobic digester will receive improvements in the 2011-2012 Waste Water Treatment Plant overhaul.

Fleet

1. The City would be using more bio-diesel if cost was no question. There is minimal on the mechanical side in order to make the switch. If price becomes more competitive with diesel and/or City decision-makers decide to use this fuel, we can foresee making a shift away from diesel. In this plan, we conservatively see using this fuel by the year 2020. By 2017, we anticipate using E85 to reduce unleaded.

Lighting

1. The City chose the Golf Road LED project as a test for 2011, and will use the results to inform future project decisions.

City of Altoona

Administrative Policies and Procedures

1. Policies and procedures to implement include the following:
 - Green design of any future building projects.
 - Building energy schedules.
 - Windsource energy purchasing.

Buildings

1. Energy Efficiency and Conservation

The City will implement energy efficiency and conservation measures identified in the Focus Advisor reports.

2. Building Site Energy

No cost-effective measures were identified at this time; however, potential measures will be periodically examined.

Water

1. Addition of Variable Frequency Drives to Remaining Well Pumps

The City has added VFDs to a number of City well pumps. The VFDs, in addition to increasing the useful life of the equipment, will lower the energy consumption of each well.

Fleet

1. Gradual Conversion of the City's Fleet to E-85 Capable Vehicles

The use of biofuel, at this time, is the only renewable measure that is marginally attractive cost-wise to the City of Altoona. The City will consider a gradual conversion of the fleet to flex-fuel capable vehicles through attrition. There is no anticipated additional cost for this type of vehicle. Currently, the City would experience additional costs for using biofuels. If fuel prices change in a manner that makes the routine use of biofuel cost-effective, the City will be in a position to take advantage of the measure.

2. Begin Using a Biodiesel Blend

The City will explore the use of biodiesel blends immediately.

Eau Claire County

Administration Policies and Procedures

1. Green Cleaning – The County currently uses green cleaning products
2. Green Purchasing – The County follows this as a rule, but policy should be put in place
3. Green Design – All new County buildings will follow LEED designs
4. Personal Appliances – Create policy addressing employee personal appliance use in County facilities.

5. Windsorce Energy Purchasing
6. Workplace Environment
7. Energy Efficiency Policy
8. Efficient Driving Training/Policy

Buildings

1. Energy Efficiency and Conservation

The County will begin implementing energy audit measures identified on the Focus on Energy tour of the facilities. The geo-thermal projects identified at the Expo Center, Airport, and Altoona Highway Shop will be examined more in depth for possible execution. The County will also continue to look at new technology to increase the energy efficiency in various buildings.

2. Building Site Energy

Eau Claire County will look into the cost effectiveness of the renewable energy projects that were selected in our measures sheet which include wind power at the Expo Center and Foster Highway Shop, solar hot water at the Courthouse, and solar photovoltaic at the Airport.

Fleet

1. Ethanol

Eau Claire County will consider gradually converting all unleaded fuel vehicles to E85 capable through normal replacement schedule. Along with this, we will consider an E85 joint fueling station with the City of Eau Claire, and City of Altoona. There will be a cost increase using E85 factoring in price of fuel and fuel economy.

2. Bio-Diesel

The County may look further into using blended bio-diesel fuel in the future, but more research is needed.

Narrative – Potential Renewable Feedstocks

Biogas

Biogas is currently being generated at a number of area human, agricultural and landfill waste resource sites.

The four megawatt, Veolia Seven Mile Creek Landfill gas-to-energy (LGE) generating facility, can power 3,325 homes. Dairyland Power Cooperative owns and operates the generating plant, which is located in the nearby Town of Seymour. The LGE plant came online in 2004 and was expanded in 2008. The natural by-product of waste in landfills, methane gas, is the fuel used to generate the renewable energy. In 2004, Dairyland received the U.S. Environmental Protection Agency's Landfill Methane Outreach Program's Energy Partner of the Year award for their work on this plant.

Dairyland Power Cooperative also purchases renewable power through an interconnection at Five Star Dairy LLC nearby in Elk Mound, Wisconsin. The 900-head dairy farm has a 750 gallon digester tank producing methane gas. The gas is unitized in engine generators to send power to the grid.

Over the last 30 years, the City of Eau Claire has captured methane gas from an anaerobic digester to help co-power the Waste Water Treatment Plant. Approximately \$200,000 is saved annually. As part of a major 2011-2012 upgrade, the City is considering increasing methane gas availability to create more power. It is predicted a 35 percent increase may result from the improvements.

Biomass

Two fuel options to pursue are densified biomass fuel (pellets) or chipped wood. The City of Eau Claire prunes and cut trees within its jurisdiction. The waste is then chipped. Much of City's wood chips are used for parks and play grounds, while the remainder low grade chips are sold to an outside firm. It is estimated that the city produces 5,400 cubic yards (126 tons) of wood chips per year. It is projected that all of the chipped wood could be used for a biomass system at the Parks and Forestry Building. However, chipped wood systems have higher upfront costs as they require more fuel handling equipment and contain more sophisticated controls. The extra system cost negates the benefits of using locally harvested low grade timber. Given the low quantity of natural gas used on site coupled with the low cost of natural gas, our consultant report concluded that a commercial biomass pellet system would be best at the Parks and Forestry Building. Biomass pellets can be purchased in bulk from most any pellet manufacturer in Wisconsin and beyond. Quotes were obtained from two pellet firms, Indeck Energy Services Inc. and Marth Woods, for the Parks and Forestry Building biomass study.

Figure 8. Biomass System



Bio fuels

The partnership has a number of possibilities when it comes to utilizing bio-fuels for fossil fuel replacement.

Chippewa Valley Technical College has been working with biofuels, and more specifically biofuel crop plots, for the past couple of years. They lease 80 acres of fields south of Eau Claire. CVTC has been growing camelina, canola, soy beans and sunflowers for the past two years in order to produce oil for biodiesel. The volume of production is unknown at this time. In addition to the oil they are pressing, they are examining the residual value of the solids taken from the press. In the near future they are looking at using the fuels for on-campus vehicles and in their semi-truck training program.

Bio-diesel blends can be purchase from Sunpower. Their Premium Cold Flow Biodiesel is 100% renewable and 100% free of foreign oil. The fuel is produced from canola oil seeds grown in the upper Midwest and is manufactured in Cumberland, Wisconsin.

Ethanol can be purchased from the Ace Ethanol Plant in Stanley, Wisconsin. Ace was the first large scale ethanol plant in Wisconsin. Ace is a dry mill facility. In 2004 the plant went from milling 8 million bushels to milling 15 million bushels of corn and produces 43.0 million gallons of ethanol per year. Ace is also researching non-foodstuff second-generation ethanol from woody plant materials. The partnership has contacted Ace in order to seek discounted shipping rates. If other local municipalities join a consortium of purchasers, Ace will offer discounts to make implementation more attractive.

Ethanol E85 and 10 percent ethanol can be purchased at local retailers. We could look at contracting with gas stations such as Kwik Trip or others in the area that offers the fuel.

Figure 9.



Existing Unknowns – Necessary Information for Future

Funding

The challenging economy and budgetary constraints that many face at this time places an extreme emphasis on the need to make sound financial decisions. The tolerance level for experimental or risky solutions to energy problems is also reduced when there are so many demands for the limited dollars that are available.

The City of Altoona was not a recipient of an Energy Efficiency Conservation Block Grant (EECBG), but the City of Eau Claire and the Eau Claire County were both recipients. Federal funding for the EECBG program was included in the federal economic stimulus program under the American Recovery and Reinvestment Act (ARRA) of 2009. At this time the Federal Energy Program Budget does not include continued funding for the EECBG program. Uncertainties regarding future funding of the EECBG program make it difficult to sustain the necessary financial commitment to reducing our dependence on non-renewable energy sources.

Renewable Energy Technologies

Likely the biggest area of existing unknowns revolves around advancements in renewable energy technologies. Limited budgets make it essential that investments of public tax dollars into renewable energy projects provide an adequate return on the investment. The rapid development of new renewable energy technologies makes it difficult to stay on top of the latest and greatest improvements. Renewable energy technologies oftentimes demand significant investments which include risk for the decision makers. Examples of these evolving technologies include solar photovoltaic, anaerobic digesters, pyrolysis and gasification, as well as advancements in wind turbines.

Non-Renewable Energy Prices

A major determinant in the cost-effectiveness of renewable energy investment is a comparison to the cost of traditional non-renewable energy. Energy market prices vary significantly based on the overall global economy and market demand. For example, inexpensive petroleum prices can reduce the public demand for more efficient hybrid automobiles. Short term economic shifts can often reduce governmental emphasis on long-term sustainable solutions to energy needs.

Political and Public Support

Public concerns regarding global warming, conflicts associated with energy markets, as well as the economic impact of fuel prices is at an all time high. However, maintaining a high level of public support on any issue is always difficult especially when so many challenges face our nation. It is important that public awareness of the many energy challenges continues and that evidence of success in regards to the development of renewable energy is publicized.

At this time of political leaders pledging to cut government spending, and shrinking budgets, it will be difficult to gain support on renewable energy projects. It will be difficult for these leaders to justify the cost of these projects based on the return that will be realized. Additionally, none of the three communities have experienced a push by the general public to invest in renewable energy sources.

Future Legislation

One of the unknowns is the future legislation that may or may not come out of the State or Federal level regarding renewable energy. Will there be a move to require energy providers to supply a greater percentage of renewable energy? Will there be stable and significant funding/incentives available to complete renewable projects?

Action Steps – Immediate & Long Term

The following tables/information represent how each jurisdiction will more specifically reach the 25 percent goal by the year 2025. Short and long term projects are noted.

City of Eau Claire Action Steps – Immediate & Long Term

Table 17.

City of Eau Claire Action Plan - Immediate and Long Term			
Measure Description		Responsibility	Install
Administrative Policy and Procedure			
	City Council consideration of 25 by 25 Plan	Green Team	2011
	Green Building Policy	Green Team	2011
	Anti-idling Fleet Policy	Green Team	2011
	Renewable Power Purchase consideration	Green Team	2011
	Track and Monitor Energy Use and 25% Goal	Green Team	2011
	GPS Fleet Tracking software	Public Works	2011
	Reuse of Energy Dollars Saved Fund	Green Team	2011
	Program Energy Efficiencies / Renewable into successive CIPs	Green Team	2011
	Staff Educational Awareness Campaign	Green Team	2011
	Construction Site Waste Recovery Ordinance	Planning	2011
	Computer Shutdown Policy	Green Team	2012
	Green Purchasing & Cleaning Policy	Green Team	Done
Buildings			
Central Maintenance			
E	Plug Loads/Office Equipment - Computer/Monitor Sleep Mode	Public Works	2011
E	HVAC - Keep All Windows/Doors Closed During Winter	Public Works	2011
E	HVAC - Air Conditioning Tune-up	Public Works	2011
E	Lighting - LED Exit Lighting	Public Works	2013
E	Lighting - Delamping	Public Works	2012
E	Lighting - Occupancy Sensor for Lighting	Public Works	2015
E	Pipe Insulation on Domestic Hot Water Lines	Public Works	2014
E	Plug Loads/Office Equip. Vending Machine, ENERGY STAR	Public Works	2011
E	Low Wattage Fluorescent Replacement of T-8 Lamps	Public Works	2012
E	HVAC - Door Replacement - High Efficiency Units	Public Works	2020
E	Geothermal Upgrade - Office and Shops	Public Works	2016
E	Geothermal Upgrade - Garage	Public Works	2016
R	Solar Hot Water System - 20 sq. ft. of collectors w/1150 gal. storage, Roof / curb-mounted	Public Works	2017
City Hall Complex			
E	HVAC - Overhead Door Seals - Replacement	Public Works	2013
E	HVAC - Weather Stripping/Caulking Around Doors	Public Works	2014
E	Lighting - LED Exit Lighting	Public Works	2010
E	Lighting - High Performance Linear Fluorescent	Public Works	2011
E	HVAC - Energy Management System	Public Works	2013
E	Lighting - Delamping	Public Works	2011
E	Plug Loads/Office Equip. - PC Network Energy Mang. System	Public Works	2011
E	HVAC - Variable Frequency Drive	Public Works	2012
E	HVAC - Ventilation Controls	Public Works	2013
E	Lighting - Occupancy Sensor for Lighting	Public Works	2011

2010 Wisconsin Energy Independent Community Partnership

City of Eau Claire Action Plan - Immediate and Long Term (cont...)			
Measure Description		Responsibility	Install
Buildings (Cont...)			
City Hall Complex (Cont...)			
E	HVAC - Boiler Replacement- High Performance	Public Works	2015
E	Plug Loads/Office Equipment - Replace Refrigerator with High Efficiency Energy Star Refrigerator	Public Works	2011
R	Solar Hot Water System - 96 sq. ft. of collectors w/120 gal. storage, Roof / curb-mounted	Public Works	2016
Fairfax Pool			
E	Lighting - Compact Fluorescent Lamps Replacement	Parks & Public Works	2011
E	Lighting - High Performance Linear Fluorescent	Parks & Public Works	2011
E	Pool - Pool Heater Replacement	Parks & Public Works	2011
E	Lighting - Replace Existing with LED Lighting	Parks & Public Works	2011
R	Solar Hot Water System for Pool heating (300'x40' asphalt mat)	Parks & Public Works	2011
Fire House No. 5			
E	HVAC - Setback Thermostat Installation	Fire & Public Works	2011
E	HVAC - Air Conditioning Tune-up	Fire & Public Works	2011
E	Lighting - Compact Fluorescent Lamps Replacement	Fire & Public Works	2011
E	Lighting - LED Exit Lighting	Fire & Public Works	2013
E	Domestic Hot Water - On Demand Water Heater	Fire & Public Works	2011
E	Low Wattage Fluorescent Replacement of T-8 Lamps	Fire & Public Works	2011
E	Plug Loads/Office Equipment - LCD Monitor Replaces CRT	Fire & Public Works	2011
R	Solar Hot Water System - 96 sq. ft. of collectors w/120 gal. storage, Roof / Tilt-up-mounted	Fire & Public Works	2011
Fire House No. 6			
E	HVAC - Furnace Tune-up	Fire & Public Works	2011
E	HVAC - Air Conditioning Tune-up	Fire & Public Works	2011
E	HVAC - Insulation for Piping - Cooling	Fire & Public Works	2013
E	Lighting - LED Exit Lighting	Fire & Public Works	2014
E	Low Wattage Fluorescent Replacement of T-8 Lamps	Fire & Public Works	2012
R	3.5 kW array, Ground/fixed pole-mounted PV Array	Fire & Public Works	2015
R	Solar Hot Water System - 64 sq. ft. of collectors w/80 gal. storage, Roof / Tilt-up-mounted	Fire & Public Works	2015
Fire House No. 8			
E	HVAC - Furnace Tune-up	Fire & Public Works	2011
E	HVAC - Air Conditioning Tune-up	Fire & Public Works	2011
E	HVAC - Overhead Door Seals - Replacement	Fire & Public Works	2014
E	HVAC - Weather Stripping/Caulking Around Doors	Fire & Public Works	2015
E	Domestic Hot Water - Pipe Insulation on Lines	Fire & Public Works	2013
E	Lighting - Occupancy Sensor for Lighting	Fire & Public Works	2011
E	Low Wattage Fluorescent Replacement of T-8 Lamps	Fire & Public Works	2011
E	HVAC - Door Replacement - High Efficiency Units	Fire & Public Works	2011
R	6.6 kW Ground-mounted Photovoltaic Array	Fire & Public Works	2011
R	Solar Hot Water System - 64 sq. ft. of collectors w/80 gal. storage, Roof / Tilt-up-mounted	Fire & Public Works	2011
Fire House No. 9			
E	HVAC - Min. Temp. Setting in Unoccupied Spaces	Fire & Public Works	2014
E	HVAC - Setback Thermostat Installation	Fire & Public Works	2014
E	HVAC - Furnace Tune-up	Fire & Public Works	2011
E	HVAC - Air Conditioning Tune-up	Fire & Public Works	2011
E	HVAC - Windows/Doors - Keep All Closed During Winter	Fire & Public Works	2013

2010 Wisconsin Energy Independent Community Partnership

City of Eau Claire Action Plan - Immediate and Long Term (cont...)			
Measure Description		Responsibility	Install
Buildings (Cont...)			
Fire House No. 9 (Cont...)			
E	HVAC - Insulation for Piping - Cooling	Fire & Public Works	2014
E	HVAC - Ventilation Controls	Fire & Public Works	2011
E	HVAC - Door Replacement - High Efficiency Units	Fire & Public Works	2011
E	Plug Loads/Office Equip - Vending Machine - ENERGY STAR	Fire & Public Works	2011
E	Low Wattage Fluorescent Replacement of T-8 Lamps	Fire & Public Works	2011
R	Solar Hot Water System - 200 sq. ft. of collectors w/250 gal. storage, Roof / curb-mounted	Fire & Public Works	2018
Hobbs Ice Arena			
E	Lighting - Compact Fluorescent Lamps Replacement	Parks & Public Works	2011
E	HVAC - Weather Stripping/Caulking Around Doors	Parks & Public Works	2011
E	Lighting - High Performance Linear Fluorescent	Parks & Public Works	2011
E	Domestic Hot Water - Water Heater - Upgrade High Efficient	Parks & Public Works	2011
L.E. Phillips Memorial Library			
E	Lighting - Delamping	Public Works	2011
E	HVAC - Bldg Scheduling - Adjust Occupied/Unoccupied Schedule	Public Works	2011
E	HVAC - Thermostat Calibration	Public Works	2011
E	HVAC - Variable Frequency Drive	Public Works	2011
E	Lighting - Occupancy Sensor for Lighting	Public Works	2016
E	Low Wattage Fluorescent Replacement of T-8 Lamps	Public Works	2011
E	Lighting - T-8 or T-5 - Replaces HID	Public Works	2013
E	HVAC - Energy Management System	Public Works	2011
E	HVAC - Chiller System - Replace with High Efficiency Unit	Public Works	2011
E	Geothermal Upgrade	Public Works	2035
R	19 kW Roof-mounted Photovoltaic Array	Public Works	2017
R	Solar Hot Water System - 360 sq. ft. of collectors w/450 gal. storage, Roof / curb-mounted	Public Works	2017
Parks and Forestry Building			
E	HVAC - Minimum Temperature Setting in Unoccupied Spaces	Parks & Public Works	2011
E	Plug Loads/Office Equipment - Computer/Monitor Sleep Mode	Parks & Public Works	2011
E	HVAC - Thermostat Calibration	Parks & Public Works	2011
E	HVAC - Windows/Doors - Keep Closed During Winter	Parks & Public Works	2011
E	HVAC - Overhead Door Seals - Replacement	Parks & Public Works	2013
E	HVAC - Weather Stripping/Caulking Around Doors	Parks & Public Works	2013
E	HVAC - Linkageless Boiler Control	Parks & Public Works	2016
E	HVAC - Setback Thermostat Installation	Parks & Public Works	2010
E	Plug Loads/Office Equipment - Vending Machine - Install Vending Miser or Disconnect Lamps and Ballasts	Parks & Public Works	2011
E	HVAC - Ventilation Controls	Parks & Public Works	2020
E	HVAC - Boiler Oxygen Trim Control	Parks & Public Works	2013
E	Lighting - Occupancy Sensor for Lighting	Parks & Public Works	2010
E	Plug Loads/Office Equipment - Vending Machine - ENERGY STAR	Parks & Public Works	2011
E	Low Wattage Fluorescent Replacement of T-8 Lamps	Parks & Public Works	2010
E	HVAC - Door Replacement - High Efficiency Units	Parks & Public Works	2020
E	Plug Loads/Office Equip. - Replace frigerator w/ Energy Star one	Parks & Public Works	2011
E	Lighting - Replace Existing with LED Lighting	Parks & Public Works	2020
E	HVAC - Insulation - Roof	Parks & Public Works	2012
E	HVAC - Window Replacement - High Efficiency Units	Parks & Public Works	2015
E	Geothermal Upgrade - Office	Parks & Public Works	2016
R	Biomass system	Parks & Public Works	2011
R	Roof-mounted Solar Hot Water- 64 sq. ft. w/64 - 80 gal. storage	Parks & Public Works	2011

2010 Wisconsin Energy Independent Community Partnership

City of Eau Claire Action Plan - Immediate and Long Term (cont...)			
Measure Description		Responsibility	Install
Water			
Wastewater Treatment Plant			
E	HVAC - Minimum Temp. Setting Unoccupied Spaces	Public Works	2012
E	Lighting - Compact Fluorescent Lamps Replacement	Public Works	2012
E	HVAC - Weather Stripping/Caulking Around Doors	Public Works	2012
E	HVAC - Overhead Door Seals - Replacement	Public Works	2012
E	Lighting - LED Exit Lighting	Public Works	2012
E	Lighting - Occupancy Sensor for Lighting	Public Works	2012
E	Lighting - High Performance Linear Fluorescent	Public Works	2012
E	Lighting - T-8 or T-5 - Replaces HID	Public Works	2012
E	HVAC - VFD for Boiler Hot Water Distribution Pump	Public Works	2012
E	Motors - Non HVAC - Apply VFD to Motor	Public Works	2011
E	HVAC - Boiler Replacement- High Performance	Public Works	2012
E	Plug Loads/Office Equip. - LCD Monitor Replaces CRT Monitor	Public Works	2012
E	HVAC - Door Replacement - High Efficiency Units	Public Works	2012
E	HVAC - Overhead Door - Replacement	Public Works	2012
R	Digester Covers, boilers and engines replacements.	Public Works	2013
Water Treatment Plant			
E	HVAC - Min. Temp. Setting in Unoccupied Spaces	Public Works	2012
E	Lighting - Delamping	Public Works	2011
E	HVAC - Door Sweeps Installation	Public Works	2012
E	HVAC - Weather Stripping/Caulking Around Doors	Public Works	2012
E	HVAC - Overhead Door Seals - Replacement	Public Works	2012
E	Lighting - T-8 or T-5 - Replaces HID	Public Works	2011
E	Low Wattage Fluorescent Replacement of T-8 Lamps	Public Works	2011
E	HVAC - Door Replacement - High Efficiency Units	Public Works	2012
Damon Street Reservoir			
E	VFD on Damon Street Reservoir	Public Works	2011
Fleet			
E	GILLIG 40' Hybrid Bus with regenerative braking	Public Works	2013
E	Two GILLIG 40' Hybrid Buses with regenerative braking	Public Works	2015
R	Joint Bio-diesel station with County and Altoona	Public Works	2020
R	E85 Fueling Station (at City or in partnership)	Public Works	2017
Lighting			
E	LED Street Lights Golf Road Project	Public Works	2011
R	Carson & Owen Parks, Photovoltaic Flagpole Lighting fixtures (Two (2) 10-watt PV panels w/ 45-LED lights)	Parks	2011

City of Altoona Action Steps – Immediate & Long Term

Table 18.

City of Altoona Action Plan - Immediate and Long Term		
Actions	Responsibility	Schedule
Administration		
<u>Policy and Procedure</u>		
<u>Immediate</u>		
Bring final 25 X '25 plan in front of the City Council for consideration		2011
Continue to track energy use with Portfolio Manager		Ongoing
Coordinate with AYHA on their CIP		Ongoing
Green Cleaning		2011
Green Purchasing		2011
Utilities Use at Work		2011
Appliance Use		2011
Workplace Environment		2011
Fuel-efficient Purchasing		2011
<u>Long -Term</u>		
Program energy efficiency into successive budgets		Ongoing
Buildings		
<u>Energy Efficiency and Conservation</u>		
<u>Immediate</u>		
Delamp overlit areas		2011
Replace EXIT lights with LED bulbs		2011
<u>Long -Term</u>		
Replace HVAC with geothermal at the Emergency Services Building		2020
Water		
<u>Long -Term</u>		
Add variable-frequency drive motors to remaining municipal wells		2011-2013
Fleet		
<u>Gasoline Plan</u>		
<u>Immediate</u>		
<u>Long -Term</u>		
Begin replacing vehicles with flex-fuel capable vehicles as necessary		2011-2025
<u>Diesel Plan</u>		
<u>Immediate</u>		
Conduct B2 Tests		2011
<u>Long -Term</u>		
Conduct Tests (B5, B10, B20)		2011
Implement B20 Plan		

Eau Claire County Steps – Immediate & Long Term

Administration

Policy and Procedure

Immediate

- Bring final plan and consultants report in front of the Committee on Administration and County Board
- Complete the County's Sustainability Plan
- Continue to track energy use through Portfolio Manager
- Green Cleaning
- Green Purchasing
- Personal Appliance Policy

Long Term

- Provide energy efficiency/renewable projects in long term capital improvement plans

Buildings

Immediate

- Complete all energy efficiency measures that are part of the EECBG, and were identified on our baseline results page.
- Research new technology for energy efficiency in buildings

Long Term

- Further research on renewable projects that were selected in the report for feasibility
- Begin replacement of air handlers with more efficient models when equipment is at the end of its useful life
- Implement geo-thermal projects

Fleet

Immediate

- Purchase E-85 capable vehicles through normal replacement schedule
- Efficient driver training

Long Term

- Implement E-85 fueling station project

Energy Independence Team Members

The following are lists of each energy independent team. The teams were responsible to see this project through over the past year.

Chippewa Valley Partnership

Energy Independence Team Members

- Ned Noel – Project Coordinator, City of Eau Claire
- Matt Theisen – Eau Claire County Facilities Manager
- Dave Walter – Altoona City Engineer
- Steve Craker & Todd Wanous – Focus on Energy
- Jean Derfus & Oscar Brandser – Xcel Energy
- Dave Graves – Eau Claire Energy Cooperative
- Aliesha Crowe – Chippewa Valley Technical College
- Erin LaFaive – Eau Claire County University of Wisconsin Extension
- Eric Anderson – West Central WI Regional Plan Commission
- Meg Marshall – Sustainable Eau Claire

Consultant Team Members

- Jon Evans – Sustainable Engineering Group LLC
- Dave Drapac & Myron Tanner – Seventh Generation Energy Systems
- Barb Basaj – SunSpec LLC, Solar Energy Consulting
- Josh Kaurich – GDS Associates

City of Eau Claire

Energy Independence Team Members

- Ned Noel – City Planner and Project Coordinator
- Steve Hayden – Utilities Engineer
- Rodney Bonesteel – Building Supervisor
- Bob Boecher – Fleet Supervisor
- Darryl Tufte – Community Development Director
- Laura Leland – Senior Accountant
- Eric Hopfensberger – Chippewa Valley Tech College Intern

City of Altoona

Energy Independence Team Members

- Mike Golat – City Administrator
- Dave Walter – City Engineer
- Ann Lein – Administrative Assistant
- Matt Olson – Chippewa Valley Tech College Intern

Eau Claire County

Energy Independence Team Members

- Matt Theisen – Eau Claire County Facilities Manager
- John Staszczuk – Eau Claire County Parks & Forests Director
- Todd Andrews – Eau Claire County Senior Planner
- Tim McMillan – Eau Claire County Highway Shop Superintendent
- Becky Gunderson – Eau Claire County Budget Analyst

Appendix A: Baseline Energy Consumption Data

Chippewa Valley Partnership

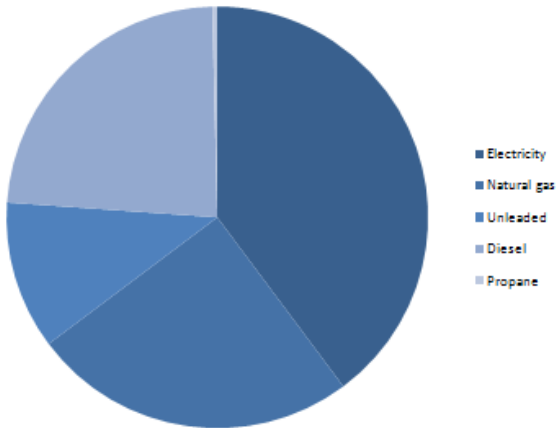
Your energy usage baseline is **259,223** million (MM) Btus.*
 That baseline is comprised of 30,239,330 kWh,
 646,811 therms,
 237,840 gallons of unleaded,
 438,153 gallons of diesel,
 and 10,593 gallons of propane and fuel oil.

By assuming an annual growth rate of **0.80%** ,
 in 2025 your energy use baseline will be **294,471** MMBtu.

Your 25% renewable energy goal
 for 2025 is therefore **73,618** MMBtu,
 or 28% of your baseline consumption.
 This translates into 21,576,140 kWh or
 736,178 therms or
 593,692 gallons gas or
 529,624 gallons diesel, or
 some combination
 of those fuels.

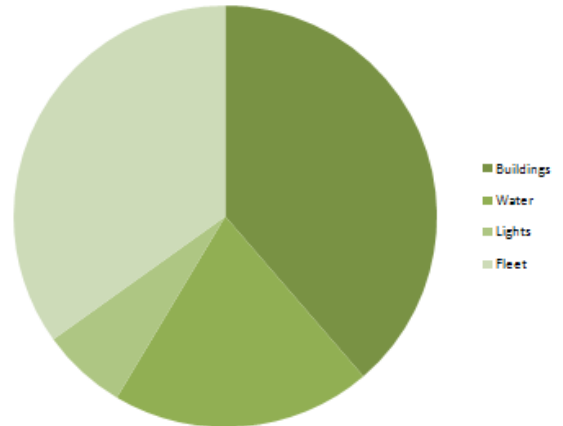
Total Consumption by Energy Type

Energy type	Percent of total Btus
Electricity	40%
Natural gas	25%
Unleaded	11%
Diesel	23%
Propane	0.4%



Total Consumption by End Use

Energy end use	Percent of total Btus
Buildings	39%
Water	20%
Lights	7%
Fleet	35%



City of Eau Claire

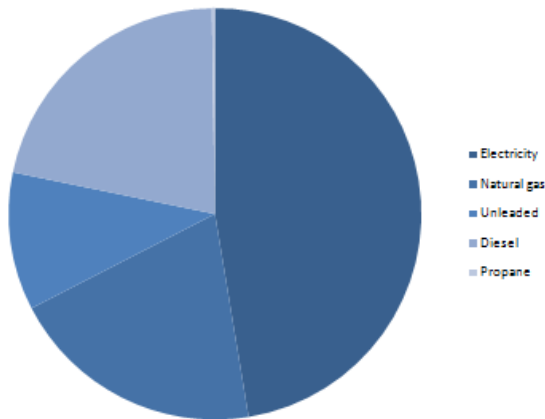
Your energy usage baseline is **164,109** million (MM) Btus.*
 That baseline is comprised of 22,792,883 kWh,
 329,198 therms,
 142,931 gallons of unleaded,
 254,011 gallons of diesel,
 and 4,249 gallons of propane and fuel oil

By assuming an annual growth rate of **0.80%** ,
 in 2025 your energy use baseline will be **186,424** MMBtu.

Your 25% renewable energy goal
 for 2025 is therefore **46,606** MMBtu,
 or 28% of your baseline consumption.
 This translates into 13,659,432 kWh or
 466,060 therms or
 375,855 gallons gas or
 335,295 gallons diesel, or
 some combination
 of those fuels.

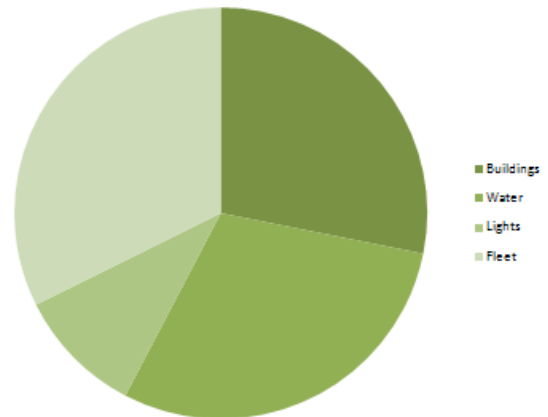
Total Consumption by Energy Type

Energy type	Percent of total Btus
Electricity	47%
Natural gas	20%
Unleaded	11%
Diesel	22%
Propane	0%



Total Consumption by End Use

Energy end use	Percent of total Btus
Buildings	28%
Water	30%
Lights	10%
Fleet	32%



City of Altoona

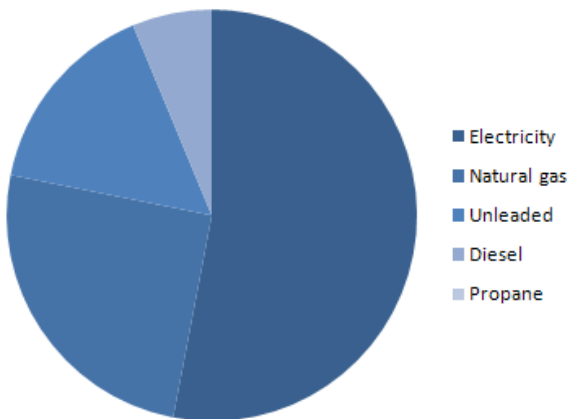
Your energy usage baseline is **11,862** million (MM) Btus.*
 That baseline is comprised of 1,843,247 kWh,
 29,798 therms,
 14,912 gallons of unleaded,
 5,352 gallons of diesel,
 and (0) gallons of propane.

By assuming an annual growth rate of **0.80%** ,
 in 2025 your energy use baseline will be **13,475** MMBtu.

Your 25% renewable energy goal
 for 2025 is therefore **3,369** MMBtu,
 or 28% of your baseline consumption.
 This translates into 987,312 kWh or
 33,687 therms or
 27,167 gallons gas or
 24,235 gallons diesel, or
 some combination
 of those fuels.

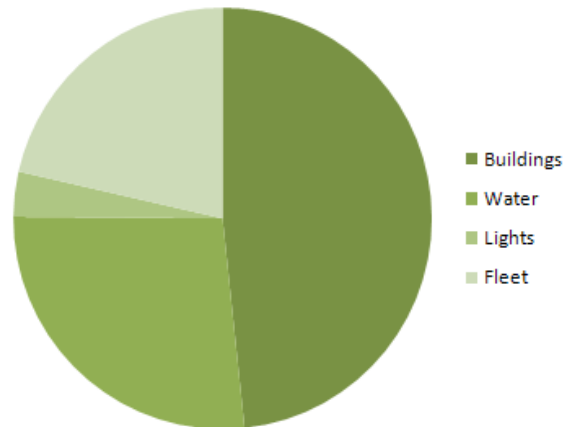
Total Consumption by Energy Type

Energy type	Percent of total Btus
Electricity	53%
Natural gas	25%
Unleaded	16%
Diesel	6%
Propane	0%



Total Consumption by End Use

Energy end use	Percent of total Btus
Buildings	48%
Water	27%
Lights	3%
Fleet	21%



Eau Claire County

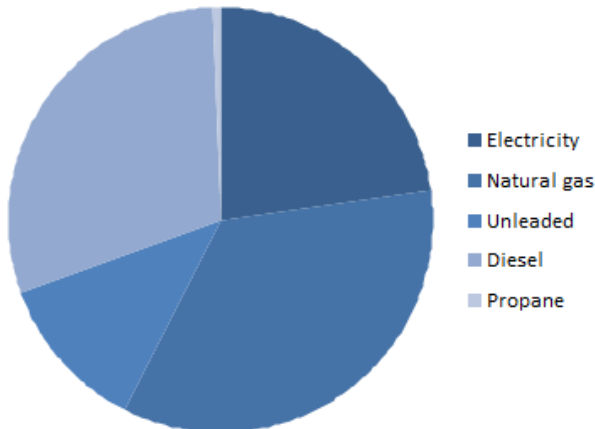
Your energy usage baseline is **83,227** million (MM) Btus.*
 That baseline is comprised of 5,567,814 kWh,
 287,816 therms,
 79,997 gallons of unleaded,
 179,568 gallons of diesel,
 and 568 gallons of propane.

By assuming an annual growth rate of **0.80%** ,
 in 2025 your energy use baseline will be **94,544** MMBtu.

Your 25% renewable energy goal
 for 2025 is therefore **23,636** MMBtu,
 or 28% of your baseline consumption.
 This translates into 6,927,297 kWh or
 236,359 therms or
 190,612 gallons gas or
 170,043 gallons diesel, or
 some combination
 of those fuels.

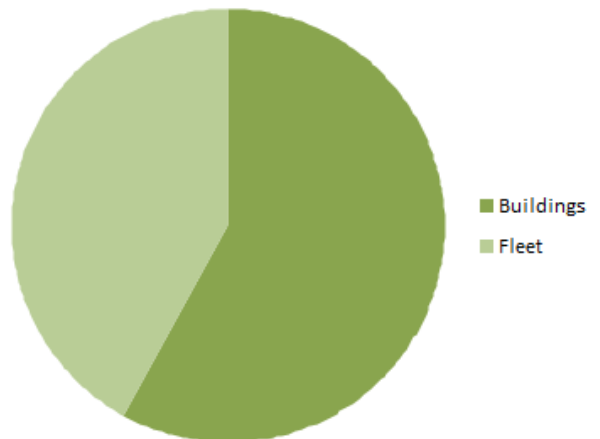
Total Consumption by Energy Type

Energy type	Percent of total Btus
Electricity	23%
Natural gas	35%
Unleaded	12%
Diesel	30%
Propane	1%



Total Consumption by End Use

Energy end use	Percent of total Btus
Buildings	58%
Fleet	42%



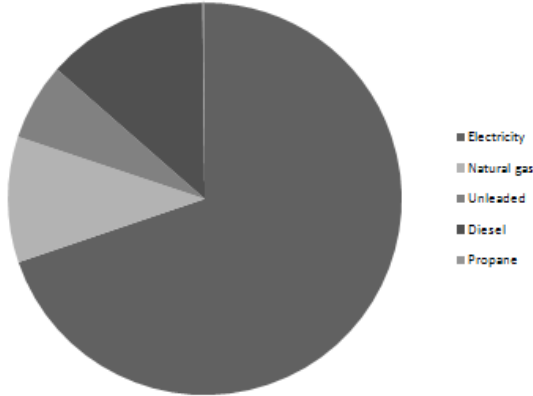
Appendix B: Carbon Dioxide Data

Chippewa Valley Partnership Baseline

Total CO2 Emissions by Energy Type

Energy type	Percent of total CO2
Electricity	70%
Natural gas	10%
Unleaded	6%
Diesel	13%
Propane	0%

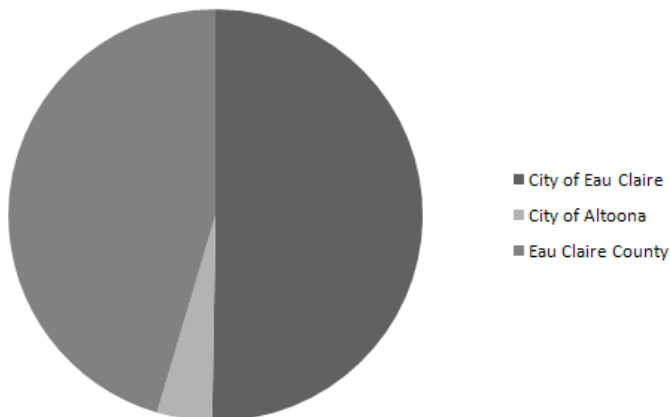
Total: 73 million lbs CO2



Chippewa Valley Partnership Reductions

Pounds of CO₂ Avoided from Fossil Emissions

Local Government	Pounds of CO ₂	Percent
City of Eau Claire	8,131,720	0.50
City of Altoona	697,848	0.04
Eau Claire County	7,346,275	0.45
Total	16,175,843	



Appendix C: Renewable Energy Projects Considered

Chippewa Valley Partnership

Chippewa Valley Partnership					Renewable Energy Generated	
Measure Name	Total Installed Cost	Annual Electric Saved (kWh)	Annual Gas Saved (therms)	Annualized Maintenance Costs	Annual kWh	Annual Therms
Grand Totals	\$6,472,635	697,840	193,368	-\$31,538	430,999	24,729

City of Eau Claire

City of Eau Claire							Renewable Energy Generated	
Measure Name	Total Installed Cost	Life Years	Annual Electric Saved (kWh)	Annual Gas Saved (therms)	Annualized Maintenance Costs	Life Cycle Payback	Annual kWh	Annual Therms
Biomass- Parks and Forestry Building	185,000	20	0	21,000	(\$12,602.50)	15.5	0	17,063
Geothermal - Central Shops (office/shops)	243,500	25	16,162	24,842	\$0.00	9.0		
Geothermal Central Shops (garage)	458,000	25	-3,232	49,685	\$0.00	9.0		
Geothermal Parks and Forestry	121,400	25	1,674	6,915	\$0.00	15.0		
Geothermal L.E. Phillips Memorial Library	704,500	25	66,189	24,224	\$0.00	18.0		
PV Central Maintenance Facility	133,000	50	23,095	0	(\$1,046.67)	33.0	23,095	0
PV LE Philips Memorial Library	133,000	50	23,047	0	(\$1,046.67)	33.0	23,047	0
PV Eau Claire city Hall Complex / Fire Station #2	37,500	50	5,690	0	(\$213.33)	35.0	5,690	0
PV Fire Station #5	73,625	50	10,298	0	(\$680.00)	34.0	10,298	0
PV Fire Station #6	27,475	50	4,039	0	(\$133.33)	30.0	4,039	0
PV Fire Station #8	51,150	50	7,768	0	(\$266.67)	28.0	7,768	0
PV Fire Station #9	141,000	50	22,128	0	(\$1,046.67)	31.0	22,128	0
PV Fire Station #10	56,250	50	9,128	0	(\$266.67)	28.0	9,128	0
PV Parks & Forestry Building	133,000	50	23,028	0	(\$1,046.67)	33.0	23,028	0
PV Carson & Owen Parks Photovoltaic Flagpole Lighting	735	10	570	0	(\$25.00)	18.0	570	0

2010 Wisconsin Energy Independent Community Partnership

City of Eau Claire <i>(continued)</i>							Renewable Energy Generated	
Measure Name	Total Installed Cost	Life Years	Annual Electric Saved (kWh)	Annual Gas Saved (therms)	Annualized Maintenance Costs	Life Cycle Payback	Annual kWh	Annual Therms
PV Eau Claire Water Treatment Plant	266,000	50	22,762	0	(\$1,046.67)	48.0	22,762	0
SHW Central Maintenance Facility	92,000	40	0	1,982	(\$294.44)	24.0	0	1,625
SHW LE Philips Memorial Library	54,000	40	18,672	0	(\$161.43)	21.0	0	630
SHW City Hall Complex / Fire Station #2	19,200	40	4,952	0	(\$73.88)	26.0	0	167
SHW Fire Station #5	19,200	40	0	261	(\$72.51)	34.0	0	151
SHW Fire Station #6	12,800	40	0	151	(\$71.85)	35.0	0	94
SHW Fire Station #8	12,800	40	0	176	(\$71.85)	29.0	0	101
SHW Fire Station #9	30,000	40	0	361	(\$90.93)	35.0	0	346
SHW Fire Station #10	6,400	40	0	89	(\$71.81)	39.0	0	51
SHW Parks & Forestry Facility	12,800	40	0	159	(\$71.55)	37.0	0	96
SHW Eau Claire Hobbs Ice Arena South	36,000	40	0	315	(\$85.62)	43.0	0	302
SHW Eau Claire Hobbs Ice Arena North	70,000	40	0	1,207	(\$206.80)	31.0	0	724
SHW Fairfax Pool	40,000	40	0	540	(\$130.00)	36.0	0	324
Totals	\$3,170,335		255,968	131,906	(\$20,823.49)		151,552	21,674

City of Altoona

City of Altoona							Renewable Energy Generated	
Measure Name	Total Installed Cost	Life Years	Annual Electric Saved (kWh)	Annual Gas Saved (therms)	Annualized Maintenance Costs	Life Cycle Payback	Annual kWh	Annual Therms
Geothermal Altoona Emergency Services	116,600	25	16,821	6,674	\$0.00	13.0		
Geothermal Altoona City Hall / Library	150,000	25	10,749	3,567	\$0.00	20.0		
Heat Recovery Chiller Retrofit - Hobbs Altoona	75,000	25	37,900		\$0.00	11.0		
PV Altoona City Hall & Library	213,000	50	17,940	0	(\$1,046.67)	42.0	17,940	0
PV Altoona Emergency Services Facility	266,000	50	22,724	0	(\$1,046.67)	46.0	22,724	0
SHW Emergency Services	16,000	40	0	140	(\$72.79)	43.0	0	134
Totals	\$836,600		106,134	10,381	(\$2,166.12)		40,664	134

2010 Wisconsin Energy Independent Community Partnership

Eau Claire County

Eau Claire County							Renewable Energy Generated	
Measure Name	Total Installed Cost	Life Years	Annual Electric Saved (kWh)	Annual Gas Saved (therms)	Annualized Maintenance Costs	Life Cycle Payback	Annual kWh	Annual Therms
Geothermal County Expo Center (entire building)	208,500	25	15,458	8,740	\$0.00	15.0		
Geothermal County Expo Center (1/3 building)	86,500	25	5,153	2,913	\$0.00	18.0		
Geothermal County Expo Center (2/3 building)	122,000	25	10,306	5,826	\$0.00	14.0		
Geothermal Altoona Highway Garage	50,700	25	6,386	7,219	\$0.00	7.0		
Geothermal CVRA Terminal	373,000	25	59,652	21,514	\$0.00	13.0		
PV CVRA Terminal	266,000	50	22,724	0	(\$1,046.67)	46.0	22,724	0
PV County Courthouse	266,000	50	23,066	0	(\$1,046.67)	45.0	23,066	0
PV County Expo Center	266,000	50	22,287	0	(\$1,046.67)	40.0	22,287	0
SHW County Courthouse	172,000	40	0	4,868	(\$383.27)	23.0	0	2,921
Wind - Expo Center (Endurance E-3120, 3 ph, Free Lattice)	350,000	25	79,803		(\$1,750.00)	21.0	79,803	
Wind - Expo Center (Enertech 44a, 3 ph, Free Lattice)	127,000	25	47,487		(\$635.00)	15.0	47,487	
Wind - Foster Garage (Xzeres ARE 442 on 140' freestanding)	92,000	25	19,629		(\$920.00)	22.0	19,629	
Wind - Foster Garage (Jacobs 31-20 on 140' freestanding)	86,000	25	23,787		(\$1,720.00)	23.0	23,787	
Totals	\$2,465,700		335,738	51,081	(\$8,548.27)		238,783	2,921

2010 Wisconsin Energy Independent Community Partnership

Please direct any questions electronically to:

Brian Driscoll
Community Relations Director
State of Wisconsin
Office of Energy Independence
17 West Main St. Room #429
Madison, WI 53702
brian.driscoll@wisconsin.gov

