

2010 Wisconsin Energy Independent Community Partnership

25 x 25 Plan for Energy Independence

Report completed by:

E3 Coalition &

Southwest Wisconsin Driftless Region Collaboration(SWDRC)

Energy Independence Collaboration:

Crawford County

Vernon County

City of Fennimore

City of Prairie Du Chien

City of Viroqua

Village of Ferryville

Village of Gays Mills

Village of La Farge

Village of Soldiers Grove

Village of Viola

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Overview

In 2007 Governor Doyle created the Wisconsin Office of Energy Independence to further his 25X25 energy independence goals. In January 2010 the Southwest Wisconsin Driftless Region Collaborative (SWDRC) joined 10 other communities statewide in the second annual round of Energy Independent Pilot Communities awarded grants to develop plans to achieve the Governor's planning objectives which are:

Objectives:

- Generate 25 percent of our municipal energy and transportation fuels from renewable sources by 2025
- Capture 10 percent of the market share for the production of renewable energy sources by 2030, bringing \$13.5 billion annually to Wisconsin's economy
- Become a national leader in groundbreaking research that will make alternative energies more affordable and available to all - and to turn those discoveries into new, high-paying Wisconsin jobs
- 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

This 25 x25 plan reflects the collaborative effort of the 10 SWDRC communities toward a regional energy plan. Because SWDRC is a collaboration between 10 communities without the power of unilateral decision-making, the following plan elements do not always reflect specific end-use projects or adopted policy. As a part of this planning effort each individual community will be left with their own individual baseline energy usage and many of the components of a complete local energy plan. SWDRC will continue to collaborate in order to finish each local plan within the following year.

The plan contains aggregated usage data and plan elements for all our communities which are required by the EIC Partnership dealing solely with municipal usage. In addition we have included elements of

narrative and planning referring to some commercial and private initiatives (including PACE financing of residential energy efficient retrofits) which were important reoccurring subjects during the planning year but not a formal part of the plan.

The plan is divided into the 10 elements in the table of contents and a number of these elements are divided into 4 main areas of consideration. These are:

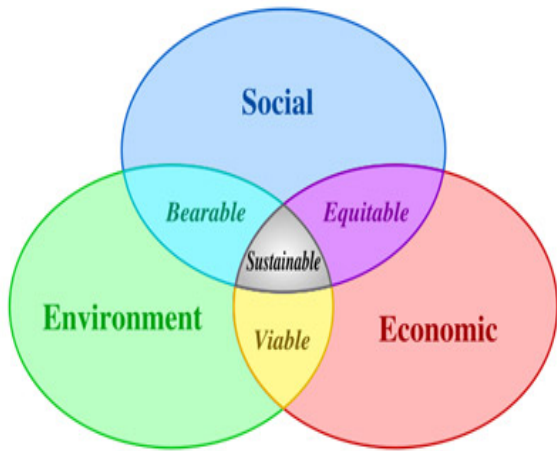
- **REDUCTION** - Reduction of baseline energy use through conservation and energy efficiency implementation measures.
- **PRODUCTION** - Production of energy for heating, electricity, and liquid fleet fuels through various available renewable sources.
- **ADMINISTRATION** - Translation of the goals and objectives of this 25X25 Plan into policy (Comprehensive Plans, procurement and operations and maintenance policies) at the local level. The establishment of the local Energy Independence Teams as advisory bodies within units of local government where they can inform and support decision making around issues of energy efficiency, conservation, sustainability, and renewable energy.
- **OUTREACH AND EDUCATION** - Current and continuing effort to inform and educate the public, educational, and business communities as well as units of government to the benefits of energy efficiency, conservation, and renewable energy.

SUSTAINABILITY and the TRIPLE BOTTOM LINE

Concepts of sustainability and the triple bottom line (environmental, economic, and social considerations) provide the context and guiding principles for all of our Energy Independence planning

efforts. The notion that there are more than simple economic considerations that should inform our energy policy and that they include the environmental and social consequences of our actions as well as the economic bottom line. As we continue to understand more about the limits of natural systems to

tolerate human action and its by products (i.e. the relationship of CO₂, methane, and other greenhouse gases with climate change), we realize we must be guided by concerns for the well being of future generations as well as our own. Simple energy efficiency, conservation, and renewable energy alone will not make a holistic and sustainable plan without consistent thought to integrate social and environmental values.



The Triple Bottom Line (TBL) focuses not just on economic value, but also on environmental and social values.

What was measured? Why?

Three years of municipal energy use data from ten municipalities participating in our regional energy independence planning process was collected for the following energy types:

- electric and natural gas usage for facilities (all buildings with significant usage; excluded many sheds and shelters)
- liquid fuel use for fleets (diesel and unleaded)

The Table below shows individual and regional baseline totals:

	Population	# buildings	Approx Sq. ft.	Electric Kwh Usage	Natural Gas/Therm Usage	# fleet units	Unleaded Fleet usage (gallons)	Diesel Fleet Usage (gallons)
Crawford County	16,885	63	250,300	938,291	54,766	100	29,970	119,319
Fennimore	2,334	11	43,900	1,102,879	20,011	28	10,159	8,560
Ferryville	174	6	5,800	80,889	N/A	8	N/A	982
Gays Mills	611	20	21,939	336,351	7,418	10	1,967	1,357
La Farge	788	18	38,433	410,434	6,454	13	671	2,524
Prairie Du Chien	6,018	29	219,763	1,824,997	33,156	55	11,714	7,696
Soldiers Grove	617	7	16,940	151,909	19,821	11	11,714	7,696
Vernon County	28,056	40	260,000	1,532,625	122,024	115	60,581	101,417
Viola	698	23	55,234	480,949	10,846	23	3,802	2373
Viroqua	4,430	30	120,000	912,226	12,369	38	4,387	12,618
Total	47,275*	247	1,032,309	7,754,132	271,997	401		

* indicates sum of only county data plus Fennimore

Sources of Data

Some data was collected from municipal clerks and other staff who kept up-to-date records while others were hard-pressed to track down data, especially when it came to liquid fuel usage . Other data was collected from utility companies. The municipal utilities provided hard-copy data which was entered manually. Large utilities (Xcel, Alliant, and MG&E) provided data in Excel spreadsheet format which is ideal for multiple meter/multiple year entry. This is also the format for the energy management tool we were required to place data into, Energy star Portfolio Manager.

2010 energy usage baseline is	105,173	million (MM) Btus.*
That baseline is comprised of	7,754,132	kWh,
	271,997	therms,
	128,036	gallons of unleaded,
and	254,628	gallons of diesel.
By assuming an annual growth rate of	2.00%	,
2025 energy use baseline will be	144,380	MMBtu.
Your 25% renewable energy goal	36,095	MMBtu,
or	34%	of your baseline consumption.
This translates into	10,578,873	kWh or
	360,951	therms or
	291,090	gallons gas or
	259,677	gallons diesel

* This baseline is an average of 3 years of energy use data. Because of the limitations of Portfolio Manager, for 76 of the 142 buildings and water facilities in your portfolio, the 2009 year used to create this average runs from Dec08-Nov09. In other words, for these facilities Dec08 was counted twice [the 2008 year and the 2009 year] and Dec09 was not counted.

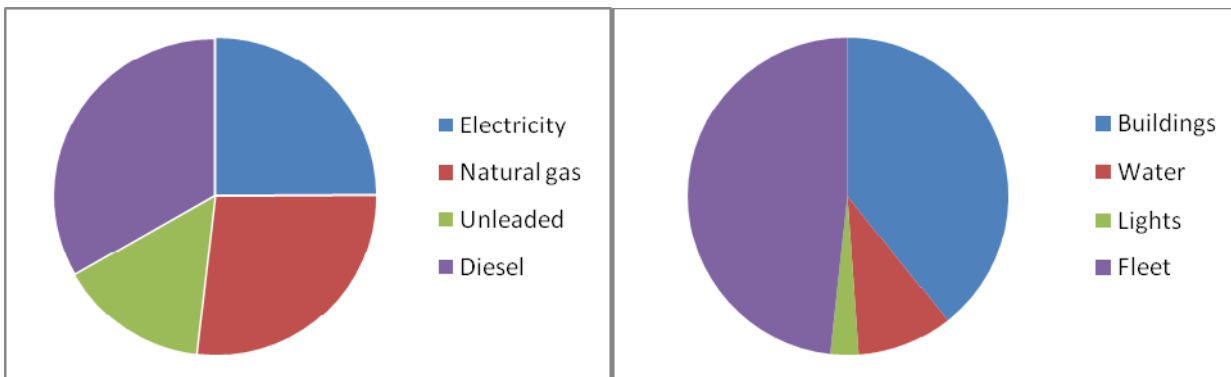
The ECW baseline tool calculates both a regional baseline (an aggregate of all the municipalities) as well as individual baselines per municipality. A 2% annual population growth rate was used for projecting a baseline to 2025. Below is a table showing a projected baseline for the year 2025:

Total Consumption by Energy Type

<i>Energy type</i>	<i>Percent of total Btus</i>
Electricity	24%
Natural gas	27%
Unleaded	15%
Diesel	34%

Total Consumption by End Use

<i>Energy end use</i>	<i>Percent of total Btus</i>
Buildings	38%
Water	10%
Lights	3%
Fleet	49%



Why do we measure energy usage?

Below is a list of a few key reasons discovered in the energy independence planning process:

- 1) Recording municipal energy use is the responsible thing to do. It is part of the accountability standard we hold government to.

- 2) When it comes to energy efficiency, “you can’t manage what you don’t measure.”
- 3) Baseline data is needed for setting an energy independence goal and creating a plan to achieve it.
Each facility has its own baseline as does the municipality as a whole.
- 4) Accurate energy usage information is key to effective budgeting and making informed decisions about operations and maintenance of facilities

Discoveries/Surprises

- An unexpected level of support for Energy Independence planning and interest in shaping our energy future became from local public and private leaders and informed citizens became evident through the energy independence planning year.
- Municipalities that have a consistent record of usage are furthest along in planning process
- A widespread lack of energy literacy from the general public to governmental decision-makers is one of the biggest hurdles of energy independence planning.
- Few municipalities record and review energy usage at all, much less on a regular basis.
- Two low-cost yet highly effective analysis tools -Life-cycle cost analysis and energy modeling- are virtually unused by municipal organizations for decision-making and planning processes.
- Municipal utilities have shown outstanding leadership in energy independence planning efforts seemingly due to their local ownership and high level of accountability.
- Liquid fuel from municipal fleets accounted for nearly 50% of our regional energy usage
- Energy consumed for water and wastewater treatment and distribution accounted for a more significant percent of energy usage than expected regionally(10% of regional energy usage) and individually (i.e. 22% of Viroqua energy use)

Total Projects Considered

The first projects considered in any energy planning effort should naturally include the practical and low-hanging fruit of energy efficiency and conservation projects which reduce the baseline in the most cost effective way. This reduces the amount of more expensive renewable energy required to achieve our 25X25 goals. In late 2009 during the Planning Grant application process, six of the ten SWDR Planning Communities (Vernon County, Viroqua, Viola, LaFarge, Ferryville, and Fennimore) enlisted the services of E3 Coalition, an energy efficiency consulting and design firm and Community Development Alternatives, a non-profit community development organization to write an Energy Efficiency Conservation Block Grant (EECBG). Based on field assessment performed by E3 Coalition, 135 projects were considered in the area of energy efficiency. These were the first projects considered for our energy independence plan.

Reduction

Energy Efficiency

During the 2010 planning year and concurrent with the EECBG project implementation in six of the communities, Focus on Energy sent an engineer to each municipality to do a walk-through of buildings with significant energy usage and subsequently create a report with general guidelines of potential energy efficiency and renewable energy projects. A few of our municipalities used these reports to create a “skeleton” list of potential projects while others expressed confusion and the need for more guidance to obtain the level of detail needed to select viable projects to include in the ECW baseline reduction tool. A total of 65 additional projects were considered, primarily in the four non EECBG communities of Soldier's Grove, Gays Mills, Prairie du Chien, and Crawford County to bring the total projects considered to 200. The projects considered fell into the following four categories:

- **HVAC**- high performance furnace replacement and infrared radiant heating installation
- **Lighting** – LED street lighting, linear fluorescents, compact fluorescents
- **Insulation and air-sealing** – Interior and exterior wall retrofits and attic and foundation insulation
- **Window replacement**

These were the first energy efficiency projects to be considered for our energy independence plan. At the beginning of the energy independence planning process an aggressive 30% reduction of municipal facility energy usage was identified as a target using energy efficiency and conservation measures.

Energy Conservation

Energy conservation is the low-cost method of energy reduction. A number conservation programs were discussed during the 2010 planning year including:

- Diesel fleet idle reduction and conservation driving training
- Compressed natural gas vehicle replacement
- Municipal staff training in energy conserving practices for office and other facilities

Production

The first renewable energy projects considered included the following two projects already in development:

Cashton Green Wind Facility - This is regional collaboration between municipal utilities, private business, a cooperative, and an educational institution to create a two turbine 5MW project.

Fennimore Biomass - This is another regional collaboration a municipal utility, an educational institution, and private business, this time to create a 8-15MW mixed use biomass, Combined Heat and Power (CHP) plant.

Other projects considered:

Liquid Biofuels: With fleet fuels representing 49% of our Baseline Energy Consumption we considered the following options for fleet fuels:

- Biodiesel
- Ethanol
- Compressed Natural Gas (CNG)
- Electric

Each fuel/technology has its pros and cons which we continue to study. We consulted with many local experts and researched many models/case studies such as our local model of Organic Valley's 100% Biodiesel fleet and then the national scale model of Brazilian sugar cane ethanol.

Crawford County Wind – The Crawford County Energy Independence team meeting with E3 Coalition at their highway department headquarters in Seneca realized the excellent wind potential their 20 acre site afforded, and a medium-scale wind project is under consideration.

Vernon Manor Solar hot water - As part of the EECBG projects we are able to install a large solar hot water project which will displace about 3500 therms/year. The uses will be split between domestic hot water and laundry.

Administration

Administration of energy independence planning requires establishment of local government policies that further defined goals. SWDRC considered the establishment of local energy team as energy independence advocates at the local government level and completion of local energy independence plans important first steps. The plans would be written and adopted into local government policy such as comprehensive plans, procurement, and operations and maintenance policies.

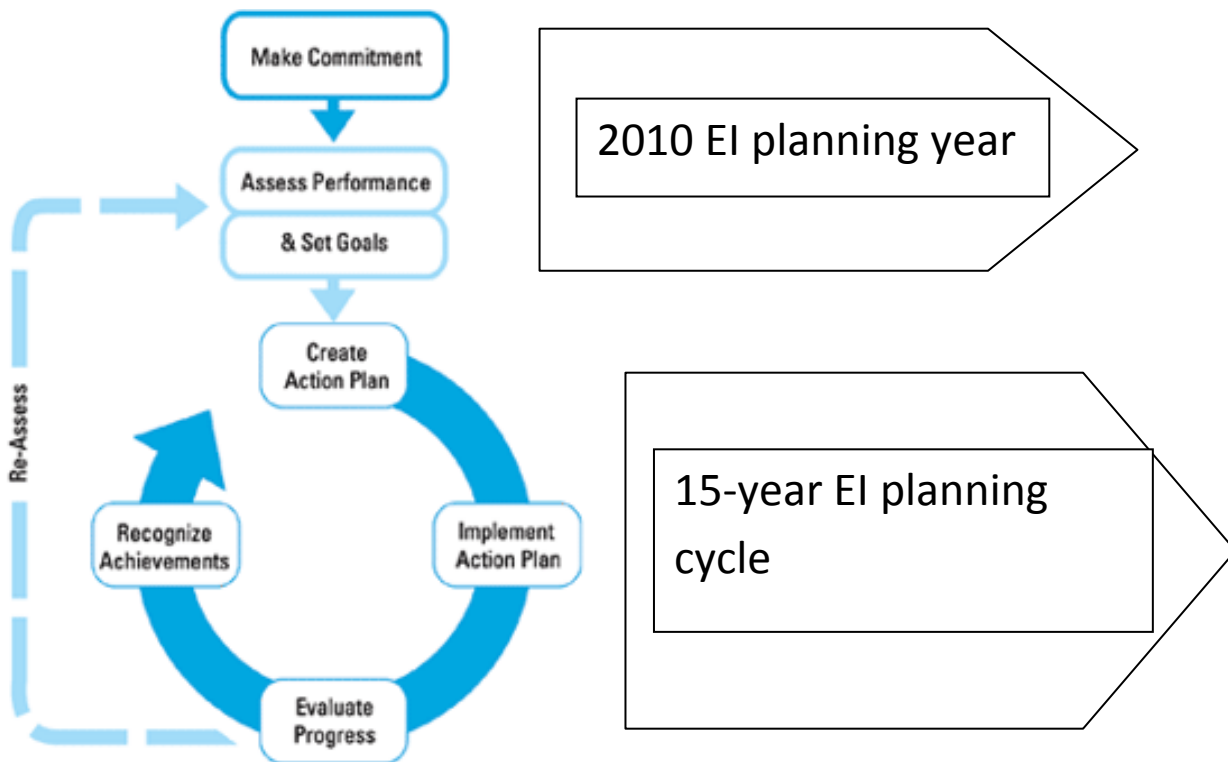
Education/Outreach

Education and outreach are essential for energy independence planning processes. In order to address the 25 x 25 goal, the SWDR collaboration considered its 2010 education and outreach efforts best spent exploring potential renewable energy projects. Presentations and workshops lead by experts in various renewable energy technologies seemed best suited to educate municipal energy teams and the interested public.

Another vehicle for promoting education and outreach on energy and sustainability issues we considered is a **Regional Resource Center**. The resource center would offer education, training, and support for energy efficiency and conservation, renewable energy, and sustainability efforts on an on-going basis. It could start with a web presence and develop to a physical site with material resources active demonstration projects

Pathways to 25 x 25

Critical to the achievement of the 25X25 SWDR goals during our 15 year planning and implementation process is the concept of a “living plan” that will need to be reviewed and altered as needed. Local action, a necessary part of a regional pathway, can be informed and supported by the resource and information sharing of the SWDR. The synergy of local action and regional collaboration is a key part to the SWDR pathways to 25 x 25. The Energy star planning chart below offers a simple representation of a 15-year process:



The pathways to 25 x 25 can be organized into four main areas:

1. **Reduction** of energy usage - The reduction target for the SWDRC energy independence plan is 20% energy usage reduction by 2020 through energy **conservation** (behavioral changes) and energy **efficiency** (technological changes). To address energy conservation SWDRC will share knowledge about ways to conserve energy. Initially, we will focus on our own member municipalities by outlining ways municipal staff can reduce usage through their actions. Local energy efficiency project identification will require time, expertise, and funding to complete. The SWDR collaboration will act as support and facilitator of this process.

2. **Production** of renewable energy -

Partnerships and collaborations are essential for development of renewable energy projects on a larger community scale. The Cashton Green Wind Facility which is slated to begin construction in 2012 is a shining example of a successful partnership among the following:

- Organic Valley (a large cooperative of organic farmers)
- Gunderson Lutheran (a regional healthcare organization)
- Western Wisconsin Technical College
- Upper Midwest Municipal Power Association (an organization of 17 municipal utilities in Minnesota and Wisconsin)

It is clear that municipal utilities play a pivotal role in renewable energy development of this scale. The Fennimore biomass project and the Westby wind and solar projects are other examples of this type of regional collaboration. It is through partnerships that SWDRC plans to develop a regional biodiesel cooperative and hopes to see additional solar, biogas, biomass, and/or other renewable energy projects be developed in the coming years.

For developing renewable energy projects we will use a valuable decision-making tool that was developed through North Central Sustainable Agriculture Research and Education (NC-SARE) in our outreach events. (Dane) The tool uses the “Triple Bottom Line” (social, environmental, and economic) approach to guide discussion around community-scale biomass, wind, and biogas production projects.

3. Administration –

The Integration of energy independence planning and policies into local government functions is especially important for achieving energy efficiency and conservation goals and preparing for renewable energy possibilities. The SWDRC plays a key role in this process through information sharing (i.e. case studies, educational resources, research, and experience) and resource sharing (i.e. energy analysis tools, group purchasing, and funding partnerships). Local energy teams act as energy independence advocates for their municipalities who oversee that energy independence plans are completed and adopted while they also can use SWDRC as support for their mission.

4. Education and Outreach-

The SWDRC is an ideal vehicle for developing energy conservation and efficiency, and renewable energy education and outreach programs such as were created in the 2010 planning year in partnership with other organizations. For example, UW Extension Crawford County, and the Environmental Resource Center of UW Madison partnered with SWDRC to create two outreach events geared to gathering public input on potential renewable energy projects for our region. Other events were in collaboration with Focus on Energy , Full Spectrum Solar, Organic Valley , and the Green Diesel Wisconsin Foundation. The SWDRC plans to partner with these and other organizations in the region to offer future education and outreach programs to public and private community members throughout the drift less area. By doing this, we will secure greater support for energy independence efforts.

Sustainability is the supporting principle that underpins the need for 25 x25 planning. The common definition of sustainable practices that is accepted by SWDRC *and* many others is “Using resources in ways that meet our needs without compromising the ability of future generations to meet their own needs”- U.N. Brundtland Commission Report, 1987. The Natural Step for communities is a popular framework for guiding local sustainable policy and has been the basis for a number of study groups in the area. The “Triple Bottom Line” offers a practical approach to attaining sustainability principles by considering the social, environmental, and economic aspects of policies. Though our regional energy independence efforts emerged with a strong emphasis on economic benefits, there are environmental, and social benefits we discussed as well. The 2010 Climate Change Roundtable held in

Viroqua and organized by Clean Wisconsin was an event that spoke directly to environmental benefits of energy conservation, efficiency, and renewable energy. Carbon emissions are reduced through energy conservation and renewable energy and carbon is sequestered through dedicated fuel crops

Social benefits, though harder to quantify, are no less significant. According to one study energy efficiency improvements resulted in 16% increase in productivity of workers. (Browning) A happy (warm, well-lit) worker is a productive worker!

Below is a list of organizations that SWDRC recognizes as Regional partners in sustainability:

Valley Stewardship Network

Organic Valley

Vernon Economic Development Association

Kickapoo Green Builders Guild

Vernon Trails

Clean Wisconsin

Southwest Badger RC & D

Kickapoo Woods Coop

UW Extension

Kickapoo Valley Regional Economic Development Initiative

Projects Selected – Explanation

Reduction –

Energy Efficiency

135 EECBG projects will result in approximately **7%** reduction in regional baseline energy use.

Energy Efficiency and conservation projects are the foundation of our energy independence plan. Six of our ten municipalities were recipients of the Energy Efficiency Community Block Grants; therefore these became the first projects identified for reduction of baseline usage.

Through the EECBG process a total of 135 projects were selected in the following areas (see appendix for complete list):

- **HVAC:** Including high performance furnace replacements, infrared radiant heating, and heat recovery ventilation systems.
- **Lighting:** Including LED street lighting and exterior lighting in 3 communities, replacement of T12 fluorescent lighting with high efficiency T8's in dozens of facilities, as well as installation of occupational sensors and compact fluorescent lights in many locations.
- **Insulation and Air-sealing:** Installation of exterior extruded polystyrene insulation systems on a number of large municipal concrete block buildings and foundations, installation of various interior blown-cellulose and foam wall and attic insulation systems with thorough air-sealing throughout.
- **Windows:** Installation of several high performance window replacement projects.
- **Solar Thermal hot water:** Design and installation of a large hot water system in a county nursing home

The projects were selected based on field assessments and individual energy saving calculations per project performed by E3 Coalition, a professional energy consultant group. For the EECBG projects a Focus on Energy PEM worksheet was created for each potential project that included projected energy

savings by kwh, therms, and dollars as well as total project cost and payback period. This provided the critical information required to evaluate and prioritize projects. According to these calculations and the ECW baseline numbers it is estimated that these 135 projects will result in approximately 7% reduction in regional baseline energy use.

Originally the communities' intentions were to use Focus on Energy reports to identify additional projects. While the reports did provide a general indication of what projects might be feasible, they needed to be informed by a significant amount building-specific information (i.e. what fixtures to delamp? which lamps to upgrade? first floor?, in all offices? etc.) before municipalities could decide which projects were viable and when. Municipalities were not equipped to perform this level of building analysis on their own. Sometimes municipal staff could provide some of the basic information needed information such as how many light fixtures each building had, what make, model, and year the furnace was, how much insulation, what R-value, etc. The municipalities that actively involved their building management and maintenance staff were much better able to create a "skeleton" list of projects. However, much of the information needed to project potential savings and project costs requires broad knowledge of energy efficiency and specific expertise with solving energy inefficiencies. While some local contractors in HVAC, electric, and other trades had varying levels of relevant knowledge, a professional energy efficiency audit would be most expedient and effective. Many communities in the SWDRC wish to have energy efficiency audits in the future.

In the mean time the SWDRC has attempted to set realistic goals to reduce energy usage incrementally until the year 2020 by which time 20% energy reduction will be achieved. The projected savings and project costs are based on the EECBG project figures adjusted to reflect decreased return on investment as the "low hanging fruit" projects are completed first. The 20% goal also reflects current Energy star standard recommended average of energy efficiency for commercial buildings.

Energy Conservation

Also included in the 20% reduction goal is the potential energy savings from energy conservation programs. This includes behavioral changes that can be achieved through energy education and training programs such as:

- Thermostat adjustment (setbacks)

- Turning off plug loads (computers, refrigerators, etc)
- Turning off lights
- Fleet driver fuel conservation training

Production-

At this point our regional projection is for 35% renewable energy by 2025. Three large-scale projects in the areas of wind, biomass, and biodiesel are in various stages of development in our region. One medium-scale solar hot water project will also go forward in Vernon County in 2011. It's clear that renewable energy projects depend on partnerships for their success. Also, with their involvement in the large-scale renewable energy projects, the 3 SWDR communities with municipal utilities: La Farge, Viola, and Fennimore demonstrated how instrumental the role municipal utilities play in the development of renewable energy in our region. The SWDRC will build on these communities' efforts to expand our renewable energy future through additional partnerships between all interested communities in our region. Below are details of SWDRC renewable energy projects:

1. Cashton Wind project is a collaborative effort between a cooperative organization (Organic Valley) , a healthcare organization (Gunderson Lutheran) , Western Wisconsin Technical College, Upper Midwest Municipal Power Association (municipal utility organization including three SWDR members: La Farge, Viola, and Fennimore). Production from this project will account for 14 % of our 25 x 25 goal as follows:

- 2011 two 2.5 MW turbines offset 25% of La Farge and Viola municipal usage (227, 301 kwh) annually.
- 2015 one additional 2.5 MW turbine offsets 100% of La Farge and Viola kwh usage

2. Fennimore is developing a 8-15 MW mixed-use, Combined Heat and Power (CHP) biomass plant , in a partnership between Fennimore, Southwest Technical College, and private businesses. Feasibility studies are

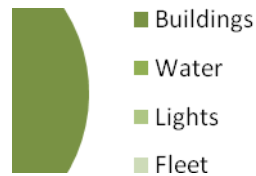
being completed and if the plant is on-line by 2012 it will supply 100% of Fennimore’s kwh usage, accounting for another 14% of our 25 x 25 goal. This number does not include energy production contribution from the heat-producing component of the CHP.

3. Converting Crawford and Vernon County municipal diesel fleets to biodiesel is our largest renewable energy project accounting for 72% of our 25 x 25 goal. The plan is that 20% of the county fleet fuel is biodiesel by 2020 and 50% by 2025. This is to be achieved in an incremental approach to gradually resolve technical and supply issues and fleet conversion.

With Petroleum prices continually very volatile along with the fact that liquid fuel represents ~49% of our baseline energy consumption it became obvious that we need to address this stirring giant.

Total Consumption by End Use

<i>Energy end use</i>	<i>Percent of total Btus</i>
Buildings	38%
Water	10%
Lights	3%
Fleet	49%



Because of historically low fuel costs and limited availability of biodiesel and ethanol the concept of moving our fleets this direction is daunting and abstract. With this huge challenge comes huge potential.

Over the course of the planning period we consulted with many industry professionals such as:

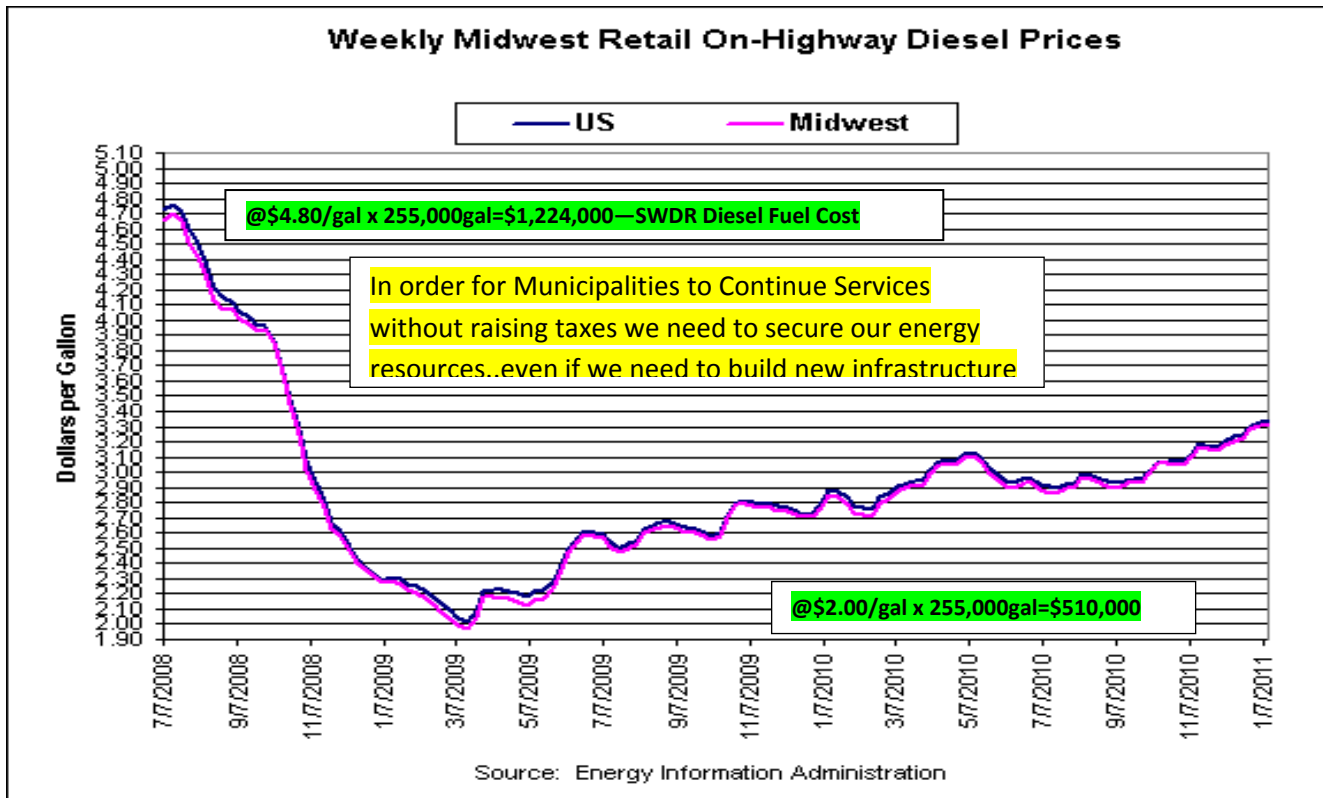
- Private agriculture producers (Organic Valley)
- Badger RC&D (funded by USDA)
- Kickapoo Woods Coop
- US Forest Service
- Department of Trade & Consumer Protection (DATCP)
- USDA

We now feel very confident that transitioning to biofuels will:

- Enhance our local economy
- Stabilize our operating budgets

- Improve the environment
- Help develop a stronger social network where a local farmer might grow the fuel for the county trucks that plow his roads

Volatile Diesel Prices: In 1 year Diesel Prices fluctuated by over 150%!



We are planning on a phased in approach, for example:

- Spring 2012 begin introducing B-5 to all diesel fleets
- Spring 2012 all gasoline fleets converted to flex-fuel
- Spring 2013 introduce B-20 in the Summer and B-10 in the winter
- Spring 2014 introduce B-50 in the Summer and B-20 in the winter
- Spring 2015 Continue with B-50 in the summer and Winter (as practical)

As regional demand increases we need to work with private industry to provide the supply. Outside fuel sources can temporarily meet the demand until local production catches up.

4. A solar hotwater project is also planned and EECBG-funded for Vernon Manor nursing home in Vernon County in 2011. This \$150,000 project will produce 3500 therms per year.

Administration -

The following steps are among the most important aspects of energy independence policy :

- Local energy independence plan completion and adoption
- consistent and accurate energy usage tracking per facility or function
- Regular reporting to local government
- Energy independence plan adoption in local policy and comprehensive plan
- Sustainable operations, maintenance, and procurement policies
- High performance and sustainability standards for all retrofit and new buildings
- Energy efficiency and renewable energy loan funds from EE savings

Education/Outreach -

Our education and outreach efforts during the 2010 planning year consisted of three workshops and two public outreach events. See details below:

Technical Assistance workshop

FOE presented an overview of the services and tools they offer regarding energy efficiency and conservation and renewable energy consultation and assessment programs

Biodiesel

This workshop and demonstration - The biodiesel workshop was held at the Organic Valley headquarters in La Farge, WI. There, the public viewed equipment used to create biodiesel from seed crops and inexpensive conversion systems used on a number of diesel trucks to allow the engines to run on pure vegetable oil. A leading expert in alternative fuels also informed discussion of other alternative fuel options.

Solar thermal and PV presentation

An excellent solar presentation was offered to the public by Full Spectrum Solar of Madison to help the public identify where solar could be best utilized.

Public Outreach

Two outreach public discussion events were created to gather public input regarding biomass, wind, and biogas potentials as sources of community-scale energy production (see photo). Experts in biomass, biogas, and wind technologies facilitated discussion and public input was gathered about which of these renewable energy types are of greatest interest for community-scale production. The 80+ participants expressed interest in continued discussion and efforts regarding other renewable energy sources as well as energy conservation and efficiency.

Narrative – Potential Renewable Feedstocks

Our region has a number of renewable feedstock options including:

- Woody and non woody biomass
- Solar thermal and PV
- Biogas from anaerobic digestion
- Biodiesel
- Wind

SWDRC exists in a rural area of Wisconsin therefore wood and agricultural land are relatively abundant making biomass a viable option. Ensuring a sustainable approach to production of both woody and non-woody biomass feedstock is priority. Southwest Badger RC & D researched biomass technology and production using sustainable practices and recently published a report. (see reference page)

Solar thermal and PV are viable options for our region as well as being the most proven and least risky option for on-site energy production. Biogas from landfills, wastewater treatment plants, farms, and food waste hold a lot of promise for our area as well if the related technology becomes scalable to smaller operations. The development of a dedicated fuel crop system from field to fuel tank already exists in this region but would need to be strategically developed to meet future biodiesel demand. Wind is a variable resource in our region with substantial presence on ridge top areas where both the Cashton Wind project is being developed and Crawford County Highway department has considered installing a wind farm.

Existing Unknowns – Necessary Information for Future

- Alternative fuel supply /source is a big unknown (future of ethanol, flex fuel designed vehicles future, compressed natural gas infrastructure a possibility, etc)
- Reliability/ quality of alternative fuels (i.e. the effects of biodiesel and ethanol on current engine design) is still in research stage.
- The level of support for ongoing energy conservation, efficiency, and renewable efforts from municipal staff and elected officials is still unclear. The advocates will reveal themselves as projects and programs are proposed to committees and boards.
- State and federal policy changes with each administration. This makes the future of policy that could hinder or help municipalities implement energy efficiency and renewable energy programs uncertain. We encourage municipalities to set the example for energy policy by adopting their own energy independence plan which would be reviewed yearly, thoroughly tracking their ongoing energy usage, and installing their energy team as advisor to their public property committee as a good start.
- The level of improvement, e.g., renewable energy generated, using wind and solar is still unknown on a large municipal scale.

Action Steps – Immediate & Long - Term

Because SWDRC is a collaboration amongst 10 communities without the power of unilateral decision making, the following steps do not represent specific end-use projects.

Immediate

Reduction -

- Throughout the following year: Facilitate energy efficiency and renewable energy project identification, funding, and implementation, with a goal of achieving professional audits on all major and priority facilities
- On a quarterly basis: Research funding opportunities that include multi-source grants, incentives, and funding mechanisms such as Property Assessed Clean Energy (PACE) models and present and discuss findings.

Production -

- Develop a biodiesel production/distribution collaboration and a then a regional implementation plan, with public and private stakeholders with an emphasis on serving local county, municipal, and rural (farm) consumers.
- Monitor and work to expand regional renewable generation projects from larger scale efforts such as the Cashton Green Wind Facility and the Fennimore Biomass to smaller distributed generation projects.

Administration

- Work with each municipality to create their own energy independence plan that they can propose to their local government for approval to be reviewed annually.
- Facilitate each municipality's adoption of procedures for updating Portfolio Manager data on a monthly (at minimum annual) basis.
- Organize at a community level to incorporate the local Energy Teams into local government structure.
- Identify potential grants, incentives, funding opportunities and research creative partnerships for the achievement of our planning goals.

Education/Outreach

- Build a database starting with our contacts from our public outreach events that we can build on for future outreach efforts such as a monthly e-newsletter or event announcement.
- Work with existing programs such as Focus on Energy, Energy Center of Wisconsin, Wisconsin Energy Conservation Corp (WECC), and the UW Extension to develop education programs to promote energy conservation, efficiency, and renewable energy.
- Expand these efforts to include Sustainability/Triple Bottom Line
- Develop the framework and plan for a Regional Sustainability Resource Center as a hub for energy conservation, efficiency, and renewable energy. This will begin as a virtual center with the E3 Coalition website, monthly educational events, columns in local papers, and use of listserv of all the contacts gathered during this year. Ultimately, the resource center will have a physical location where resources coalesce and activities originate. The center will have actual demonstrations of lighting, insulation, windows, mechanical equipment, and other related items which an educated employee will be able to provide non-biased answer to questions.

Long term

Reduction

- Continue the identification, funding, and implementation of energy efficiency projects to achieve our stated plan goal of incremental reduction of baseline consumption to a total of 20% by 2020.
- Provide case studies of 'Net Zero Ready' where the building energy usage will be as low as feasibly possible.

Production

- Develop and implement local and regional community renewable energy projects and creative financing mechanisms that make these possible as we incrementally meet and exceed our plan projections of 35% renewable sources by 2025.
- Work with the private sector to create transparency of regional goals so they can help develop the solution

Administration

- Continue the creation and maintenance of local government policy and committee structure that further and achieve our 25x25 goals as well as increase regional sustainability through following the principles of the Triple Bottom Line, possibly including the adoption of The Natural Step for Communities.

Education/Outreach

- Continue and expand our ongoing educational efforts beyond efficiency and renewable energy to the underlying principles of sustainability contained in the Triple Bottom Line and The Natural Step for Communities.
- Develop and implement a replicable model of a Regional Sustainability Resource Center which will be integrated into the State and Federal Programs and efforts.

Energy Independence Team Members

Crawford County-

UW Extension, Laura Brown

County Chair, Pete Flesch

County Supervisor, John Wallin

County Supervisor, Duane Rogers

Hwy Dept. Patrol Supt., Todd Myers

Chief Deputy Treasurer, Deanne Lutz

County Building Maintenance, John Poots

Vernon County-

Kathy Crittenden

Kelvin Rodolfo

County Supervisor, Dennis Brault

County Supervisor, Anita Zibton

Jess Leinberger

City of Fennimore-

City Clerk, Margaret Sprague

DPW, John Murphy

Street Supt., Barry Belstra

Utility Foreman, Al Zoromski

Wastewater Foreman, Denise Dabson

Police Chief, Rick Kreul

City of Prairie Du Chien- DPW, Terry Meyer

City of Viroqua

Citizen- David Banner

Citizen- Jim Olson

City Administrator, Matt Giese

Citizen- Tom Wilson

Ferryville

Village Board President, Larry Quamme

Village Board Rep., Al Kirchner

Gays Mills

Flood Relocation Committee Chair, Julie Henley

Citizen- Lila Marmel

Citizen-Ritch Stevenson

Citizen- Todd Osman

Village Clerk, Maura Otis

Village of La Farge

DPW, Wayne Carpenter

Citizen -Kim Kafka

Citizen - Pam Saunders

Village of Soldiers Grove

Village Administrator, Tammy Kepler

Village President, Laurel Hestitune

Citizen- Lila Marmel

Village of Viola

Village Administrator, Beth Campbell

Village board, Donna Simonson

Village Board, La Verne Phillips

Street Lights	Lighting	150W HPS to 43W LED
Memorial Building	Lighting	400W MH to 4LT5
Memorial Building	HVAC	PMB Motors
Memorial Building	Insulation A	Attic Add R-24
Memorial Building	Insulation G	Replace 960 sf Windows w/walls
Memorial Building	Lighting	Disconnect Vending Lights

Appendix:

Baseline

Energy

Consumption Data – Spreadsheets

FENNIMORE

Ferryville	Lighting	150W HPS to 43W LED W-Pak
Ferryville	Lighting	4-4 T12 to 4-4 T8
Ferryville	HVAC	Infrared Heater
Ferryville	HVAC	Replace Existing Furnace
Ferryville	Insulation D	Roof & Wall Insulation -19
Ferryville	Lighting	Occ Sensors
Ferryville	Lighting	Rep. Inc w/ CF
Ferryville	Lighting	

FERRYVILLE

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LAFARGE

Street Lights	Lighting	150 HPS to 43W LED
Public Works	HVAC	Infrared Heater
Village Hall	HVAC	Replace Furnace
Village Hall	Insulation B	Basement Insul. Add R-10
Village Hall	Insulation C	Walls to R10 w/metal
City Garage	Insulation D	Metal Building insul 8" R-19
Community Bldg Roof	Insulation E	Roof Insulation R20 and reroof

VERNON COUNTY

County Garage	Lighting	400 watt MH to HO T8
Erlandson Bldg	Lighting	4-2 T12 to 4-2 T8
Courthouse-Banta	Lighting	4-4 T12 to 4-4 T8
Erlandson Bldg	Lighting	4-4 T12 to 4-4 T8
Courthouse-Banta	HVAC	Controls Setbacks/Setup
Erlandson Bldg	HVAC	Controls Cooling Setup
Erlandson Bldg	HVAC	Controls Heating Setback
Courthouse-Banta	HVAC	PMB Motors
County Garage	HVAC	Replace Existing Furnace
Vernon Manor	HVAC	Solar Thermal
County Garage	Lighting	8-2 T12 to 4-4T8
Courthouse-Banta	Lighting	8-2 T12 to 4-4T8
County Garage(Grader)	Insulation A	Attic Add R-10
County Garage (Tire)	Insulation A	Attic Add R-10
Courthouse-Banta	Insulation A	Attic Add R-24
Courthouse-Banta	Insulation A	Attic Add R-28
Erlandson Bldg	Insulation A	Attic Add R-36
County Garage (Tire)	Insulation C	Walls to R10 w/metal
County Garage(Grader)	Insulation C	Walls to R10 w/metal
County Garage	Lighting	Rep. Inc w/ CF

VIOLA

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Street Lights	Lighting	150 W hps to 43 W LED
Street Lights	Lighting	250 W hps to 60 W LED
Village Hall	Lighting	400 watt MH to HO T8
Village Hall	HVAC	93% Hanging unit heater- c/o to 95% furnace
City Blue Garage	HVAC	Infrared Heater
Village Hall	Insulation A	Add R42 Ceiling Insul. Kit. and Bath
Pumphouse 4	Insulation A	Attic Add R-38
Pumphouse 3	Insulation A	Attic Add R-38
Village Hall	Insulation A	Attic and duct insul. Add R-24
City Blue Garage	Lighting	4-4 T12 to 4-4 T8
Village Hall	Lighting	4-4 T12 to 4-4 T8
Village Hall	Insulation B	Insulate walls to R10(Int.)
Pumphouse 3	Insulation C	Walls to R10 w/metal
Pumphouse 4	Insulation C	Walls to R10 w/metal
Village Hall	Insulation D	Insulate Ceiling R-50
City Blue Garage	Insulation D	Metal Building insul 8" R-16
City Blue Garage	Lighting	8-2 T12 to 4-4T8
Village Hall	Lighting	8-2 T12 to 4-4T8
Gym Building	Windows	535 sqft of U 1 to U .30

VIROQUA

Police and Fire	HVAC	AC
Police and Fire	HVAC	Controls Setback
Police and Fire	HVAC	Controls Setback
City Garage	HVAC	Infrared Heater
Pump House 3	HVAC	Infrared Heater
Pump House 4	HVAC	Infrared Heater
Park Bowl	Lighting	150W HPS to 43W LED
Bus Garage	Lighting	150W HPS to 43W LED W-Pak
City Garage	HVAC	PMB Motors
Park Bowl	HVAC	PMB Motors
Police and Fire	HVAC	PMB Motors
City Hall	HVAC	Replace Existing Boilers
City Hall	HVAC	Replace Existing Boilers
Police and Fire	HVAC	Replace Furnace
Park Bowl	HVAC	Replace Furnace - Shop
Park Bowl	Insulation A	Attic Add R-21 Office & Bldg

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City Hall	Lighting	4-2 T12 to 4-2 T8
Pump House 3	Insulation A	Attic Add R-38
Pump House 4	Insulation A	Attic Add R-38
City Garage	Insulation A	Attic Add- R-42
City Hall	Insulation A	Insulate Ceiling R-35(1st Floor)
City Hall	Insulation B	Basement Insul. Add R-10
City Garage	Insulation C	Walls to R10 w/metal
Park Bowl	Insulation C	Walls to R10 w/metal
Park Bowl	Lighting	4-2 T12 to 4-2 T8
Park Bowl	Insulation C	Walls to R10 w/metal
Pump House 3	Insulation C	Walls to R10 w/metal
Pump House 4	Insulation C	Walls to R10 w/metal
Bus Garage	Insulation D	Metal Building insul 8" R-19
Park Bowl	Insulation F	Floor R-10 Office & Bldg
Police and Fire	Lighting	4-4 T12 to 4-4 T8
Bus Garage	Lighting	8-2 T12 to 4-4T8
City Garage	Lighting	8-2 T12 to 4-4T8
Park Bowl	Lighting	8-2 T12 to 4-4T8
Police and Fire	Lighting	8-2 T12 to 4-4T8
Bus Garage	Lighting	Occ Sensors
City Garage	Lighting	Occ Sensors
City Hall	Lighting	Occ Sensors
Park Bowl	Lighting	Occ Sensors
Police and Fire	Lighting	Occ Sensors
Police and Fire	Lighting	Occ Sensors
Bus Garage	Lighting	Rep Exits w/ LEDs
City Garage	Lighting	Rep Exits w/ LEDs
City Hall	Lighting	Rep Exits w/ LEDs
Police and Fire	Lighting	Rep Exits w/ LEDs
Police and Fire	Lighting	Rep Exits w/ LEDs
City Garage	Lighting	Rep. Inc w/ CF
Bus Garage	Lighting	Rep. Inc w/ CF
Park Bowl	Lighting	Rep. Inc w/ CF
Police and Fire	Lighting	Rep. Inc w/ CF - office/bath
Park Bowl	Lighting	Rep. Inc w/ CF - Shop

References

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