

# ENVIRONMENT & ENERGY



Our ability to create a healthy community is dependent on our interaction with the environment around us.



The quality of our natural resources contributes directly to our economy, our health, and our quality of life.



Thoughtful and balanced use of our natural resources continues to support the vitality of our community.

## Environment and Energy Subcommittee

Rebecca Frisch, Chair	Marathon County Conservation, Planning, and Zoning
Dale Grosskurth	Marathon County Health Department
Meleesa Johnson	Marathon County Solid Waste Department
Joanne Leonard	Marathon County Solid Waste Board
Sandi Cihlar	Marathon County Environmental Resources Committee
Kelly Zagrzebski	Wisconsin Public Service Corporation
Jeff Pritchard	Marathon County Conservation, Planning, and Zoning

## Keep in mind....

The environment is more than the “sense of place” it provides us; it has an essential practical purpose as it provides our communities with the resources with which we create prosperity, energy, health, and safety.

# Section Summary

## Success and Progress

- Marathon County residents recognize the benefits of our ample and clean water resources. The 2015 LIFE Community Survey indicates a high public awareness of the importance of protecting our water quality.
- Marathon County residents remain committed to reducing their waste and improving the health of our local environment. According to the 2015 LIFE Community Survey, 94.3 % of Marathon County residents recycle.
- Schools and businesses have demonstrated their commitment to energy conservation. Marathon County has high participation rates in programs designed to educate students about and assist business with strategies to improve energy efficiency.

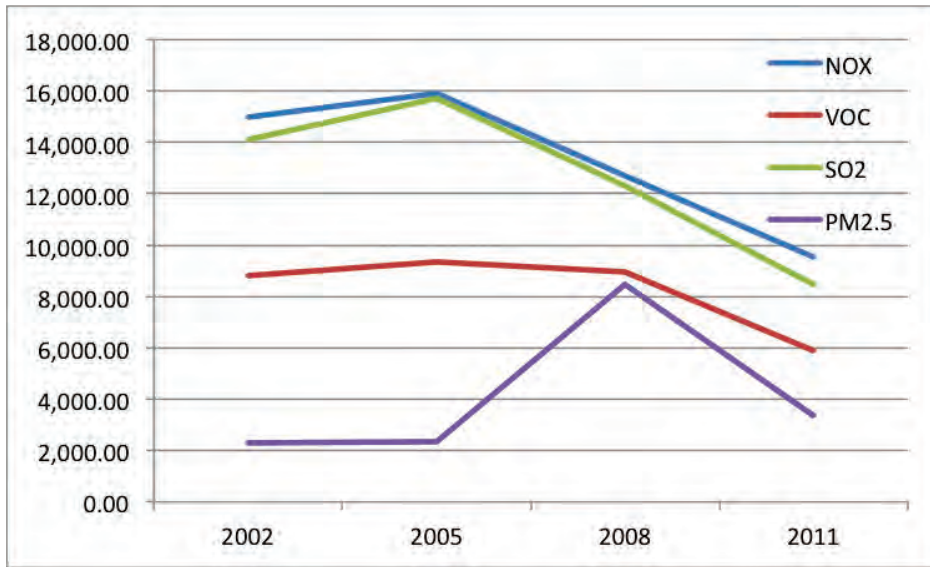
## Calls to Action

- Marathon County streams are contributing heavily to high levels of phosphorus in the Wisconsin River. We must educate county residents on the sources of the high phosphorus levels and successful mitigation strategies to bring these levels back with safe ranges.
- Too many residents with private wells in Marathon County are still unaware of the need to have their well tested annually to ensure the safety of their drinking water.
- To attract young professionals, Marathon County must consider ways to become more energy conscious and invest in programs—bike paths, recycling, conservation, renewables—that help individuals use energy more efficiently.

## Opportunities for Action

For Individuals	Learn about the impact of phosphorous of surface water. Test for unsafe levels of indoor radon. Take mass transit, carpool, bike or walk to reduce air pollution, traffic congestion, and save money. Test private wells annually. Make conscious efforts to avoid waste production.
For Organizations	Join in natural resource protection efforts in your community. Initiate or contribute to a project to enhance our natural resources. Help others understand the importance of waste avoidance. Implement “green” policies.
For the Community	Build community capacity of private and public partnerships to achieve greater natural resource protection. Influence legislation to enhance natural resource protection. Recognize the need and adopt wellhead protection ordinances. Adopt regulations involving outdoor wood boilers.

**Key Measure:** Air Pollutant Emissions (Tons) in Marathon County, 2002—2011



### COMMUNITY PERSPECTIVES

Air quality is based on trends in air emissions. Sources of emissions include stationary sources (facilities with significant emissions), mobile sources (vehicles), and area sources (households, wood burning). Air pollutant emissions for Nitrogen Oxides (NOX), Volatile Organic Compounds (VOC), and Sulfur Dioxide (SO<sub>2</sub>) decreased from 2008 to 2011, the most recent data available.

Particulate Matter 2.5 (PM 2.5), which are fine particles, increased from 2008 to 2011. It is difficult to explain why PM 2.5 indicated an increase because calculating these amounts is not precise, using indirect calculations to approximate the expected release amounts, and testing of PM 2.5 sources is limited. Additionally, PM<sub>2.5</sub> primarily forms in the atmosphere, so weather influences formation. PM 2.5 can also be emitted during combustion processes.

The Department of Natural Resources measures regional air quality and issues air quality advisories when air pollutants reach unhealthy levels. Based on ozone and fine particles, outdoor air quality in Marathon County is good. Local air quality can be affected by local air emissions from regulated and unregulated sources. For example, smoke from outdoor wood burners (OWB) contains ozone, carbon monoxide, nitrous oxides, particulate

matter, sulfur dioxide, and carcinogens. Since there are no federal or state regulations governing OWBs, it is up to the local government to implement regulations.

Radon is the primary indoor air quality concern in Marathon County. It is the leading cause of lung cancer in non-smokers. Radon is a naturally occurring, odorless radioactive gas. Because it is odorless, a test must be performed to determine the amount of radon in a home. Between five and ten percent of homes in Wisconsin have radon levels above the EPA guideline of 4 pCi/L for the year average on the main floor. Marathon County's geology contributes to the area having among the highest rates of elevated radon levels in the state. There is no method of removing the source of radon because it is found in the soil. Radon testing, however, is easy and inexpensive. Radon levels can generally be reduced with a radon mitigation system, which costs approximately \$1,000.

### DATA HIGHLIGHTS

- Air Quality ranked 3<sup>rd</sup> at 48% as a natural environment concern following Drinking water quality (63%) and Cleanliness of lakes and rivers (55)%.
- Nine of 62 Marathon County municipalities reported regulations on OWBs.
- It is estimated that about 25% of homes in Marathon County have radon levels that exceed EPA guidelines, compared with 5-10% statewide.
- In 2014, 63% of radon tests had elevated radon levels. This figure represents tests, which some homes completed multiple times.

### SOURCES

- **Wisconsin Department of Natural Resources**  
Historical Statewide Air Quality [dnr.wi.gov/topic/AirEmissions/Historical.html](http://dnr.wi.gov/topic/AirEmissions/Historical.html)  
Wisconsin Air Quality Trends April 2015 [dnr.wi.gov/files/PDF/pubs/am/AM526.pdf](http://dnr.wi.gov/files/PDF/pubs/am/AM526.pdf)
- **Wisconsin Department of Health Services**  
Radon in Wisconsin [www.dhs.wisconsin.gov/radiation/radon](http://www.dhs.wisconsin.gov/radiation/radon)

## DATA HIGHLIGHTS

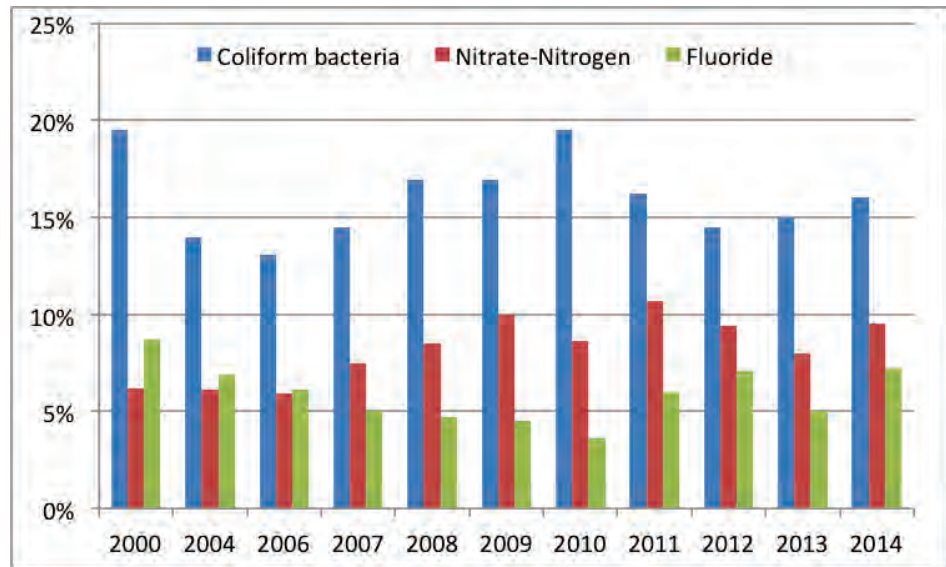
According to 2015 LIFE Community Survey respondents:

- 33% (355) rely on a private well for drinking water.
- Only 18.2% reported having this water tested annually, a drop from the 20.3% in 2013.
- Reasons why respondents do not test the well water annually:
  - \* No concerns with the water in terms of taste, odor, or appearance—134
  - \* Cost—33
  - \* Didn't know where to test—30
  - \* Didn't know they should—71
  - \* Other—53
- At 63%, drinking water quality was the most important natural environment concern among LIFE Community Survey respondents.
- Marathon County Health Laboratory data indicates private wells testing unsafe for bacteria, nitrate, or fluoride have stayed essentially the same over the last three years. State agencies estimate 20-25% of private wells are unsafe bacteriologically alone.

## SOURCES

- **Marathon County Health Department**  
Water Testing Lab  
[www.co.marathon.wi.us/Departments/HealthDepartment/WaterTestingLab.aspx](http://www.co.marathon.wi.us/Departments/HealthDepartment/WaterTestingLab.aspx)
- **Marathon County Municipal Drinking Water Systems**  
[wi.water.usgs.gov/gwcomp/find/marathon/watersystems.html](http://wi.water.usgs.gov/gwcomp/find/marathon/watersystems.html)
- **Wisconsin Department of Natural Resources**  
Water Quality and Contamination in Private Wells  
[dnr.wi.gov/topic/Wells/WaterQuality.html](http://dnr.wi.gov/topic/Wells/WaterQuality.html)

**Key Measure:** Unsafe Private Well Test Results in Marathon County, 2000—2014



## COMMUNITY PERSPECTIVES

One-third of Marathon County residents rely on groundwater for drinking water. Given that water is used every day, clean, safe drinking water is one of the most important elements of good health. Private well owners are responsible for ensuring the safety of their own drinking water.

Primary contaminants in Marathon County are coliform bacteria, nitrate-nitrogen, and fluoride. Depending on the type of contamination, indicators such as taste, odor, appearance, or illness problems are not reliable signs to determine whether drinking water is safe.

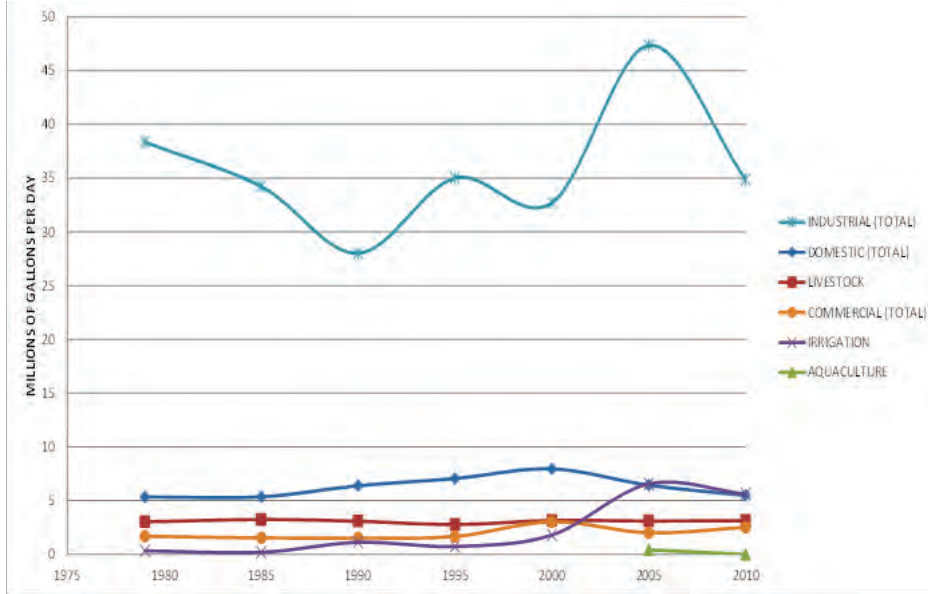
Coliform bacteria serve as an indicator of the potential presence of other disease-causing organisms, such as E. coli (fecal coliform) which can cause severe intestinal illness. E. coli is usually the result of contamination by sewage (failing septic system) or animal waste from farmland. However, bacterial and chemical contaminants can pollute ground water in a variety of ways as well. A water test is necessary and if there's an unsafe sample, the contamination cause can be determined and corrections made. Well professionals can assist if needed.

Nitrate-nitrogen levels at or above 10 ppm pose significant health risks to

infants and pregnant women. These levels reduce the blood's ability to carry oxygen, which could lead to coma or death. Nitrate-nitrogen is colorless, odorless, and has no taste, so testing is the only way to determine its presence. Nitrate-nitrogen sources may include lawn and farm field fertilizers, livestock facilities, and sewage treatment plants. It is also naturally occurring. Do not attempt to remove the nitrate by boiling the water. This will only increase the nitrate concentration. Consult a licensed well driller to help determine whether a new well could provide safer water for the long term or consider treatment devices approved by the Department of Safety and Professional Services (DSPS).

Fluoride occurs naturally in water and is safe and effective to reduce tooth decay. However, fluoride levels above 2.0 mg/liter may increase the risk of staining and pitting of tooth enamel in children. Levels over 4.0 mg/liter can result in bone disorders. Testing drinking water is easy and inexpensive too, just pennies a day to know that water used every day is safe.

### Key Measure: Marathon County Water Use by Category, 1975—2010



### DATA HIGHLIGHTS

- In the 2015 LIFE Community Survey, 43% of respondents ranked “Protect Groundwater” as the most important environmental policy Marathon County should pursue.
- There are 425 approved DNR high capacity wells in Marathon County.
- According to a 2013 DNR Wisconsin Water Use Summary – Marathon County ranked 9<sup>th</sup> out of 72 counties in terms of Total Groundwater Withdrawals by County.
- In 2013, statewide groundwater withdrawals totaled 250 billion gallons of water from over 13,000 high capacity wells.
- In 2013, total statewide withdrawals (surface & ground water) of water exceeded 2.12 trillion gallons of water.

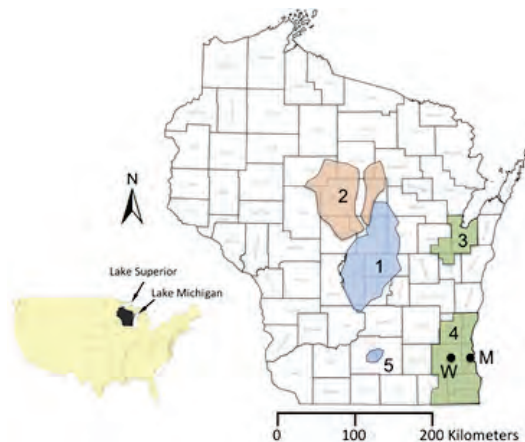
### COMMUNITY PERSPECTIVES

Although Wisconsin is generally considered to be a water rich state, Marathon County is located in a groundwater deficient portion of north-central Wisconsin. Therefore, as usage increases, concerns about water quantity and quality grow. Groundwater quantity is affected both naturally and by human activity.

increased groundwater withdrawal may affect long-term growth. The region identified as (2) indicates groundwater deficient areas of the state.

Comprehensive legislation addressing groundwater quantity has existed for many years, working towards ensuring adequate groundwater quantity for users. The Department of Natural Resources regulates high capacity wells (wells with a capacity to pump more than 100,000 gallons per day). High capacity wells include industrial and municipal water supply systems, energy producers, paper manufacturers, and agricultural producers. The Great Lakes Compact requires Wisconsin to establish water conservation goals within the Great Lakes Basin.

Marathon County should pay greater attention to issues of water quantity as



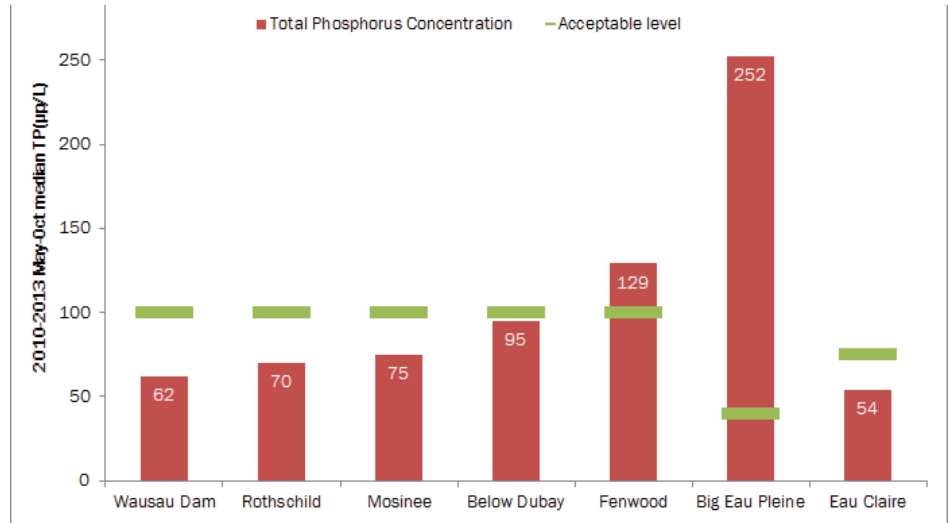
### SOURCES

- **Sustain Rural Wisconsin Network**  
[sustainruralwisconsin.net](http://sustainruralwisconsin.net)
- **Wisconsin Water Science Center**  
[wi.water.usgs.gov](http://wi.water.usgs.gov)
- **Wisconsin Department of Natural Resources**  
[dnr.wi.gov/topic/DrinkingWater](http://dnr.wi.gov/topic/DrinkingWater)

## DATA HIGHLIGHTS

- Phosphorus is the nutrient of most concern regarding water quality in Marathon County.
- Marathon County's eastern streams and the Wisconsin River are currently in compliance with standards.
- Western county streams and the Big Eau Pleine Reservoir are significantly out of compliance with standards.
- Data indicates the western county surface waters are a high risk for health concerns to both the fisheries and human health.

**Key Measure:** Surface Water Phosphorus Concentration (Micrograms per Liter), 2010-2013



## COMMUNITY PERSPECTIVES

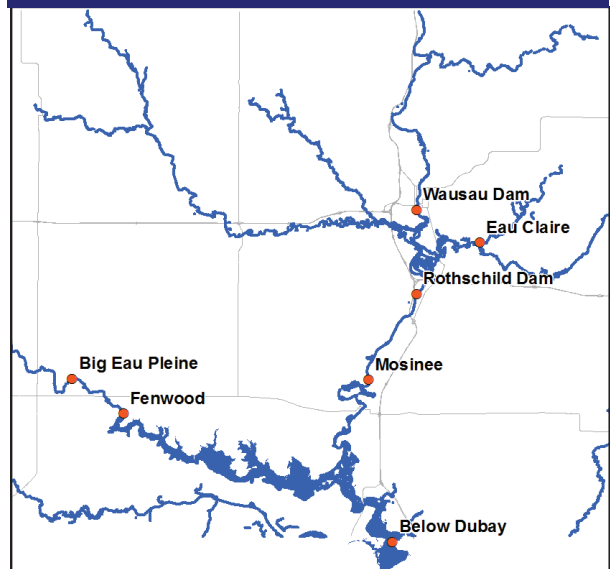
In 2010, the Wisconsin Department of Natural Resources initiated monitoring along the Upper Wisconsin River, its tributaries and its reservoirs to assess the health of these waters relative to phosphorus concentrations. Excessive phosphorus causes algae blooms which lead to low dissolved oxygen. Low levels of oxygen kill fish. The information will be used to develop a Total Maximum Daily Load allocation plan for all dischargers to these waters.

Sources of phosphorus discharges include municipal and industrial wastewater treatment plants and storm-water and agricultural runoff. The data indicates that the heavy agricultural land use in much of western Marathon County contributes significantly to the low water quality of the Big Eau Pleine Reservoir. The east tributaries to the Wisconsin River are at acceptable water quality levels.

One of the ways in which the State of

Wisconsin measures water quality is by the phosphorous concentration. NR 102 has defined an acceptable concentration as 100 micrograms per liter or less for the Wisconsin River, 75 micrograms per liter

### Wisconsin River Main Stem, Tributaries, and Reservoir Monitoring Locations



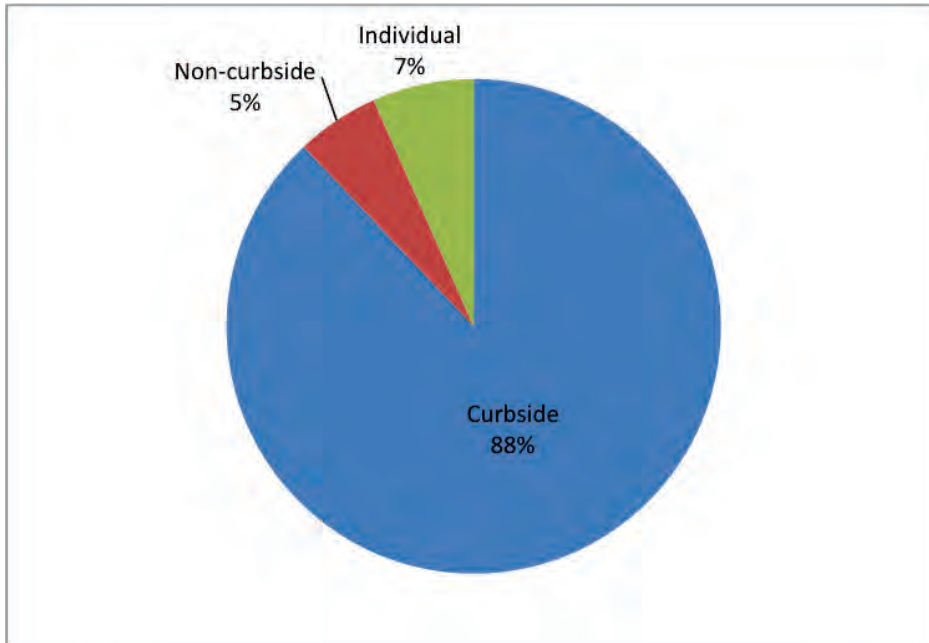
or less for Marathon County streams, and 40 micrograms per liter or less for the Big Eau Pleine Reservoir.

## SOURCES

- **Wisconsin Department of Natural Resources**  
Surface Water  
[dnr.wi.gov/topic/surfacewater/Phosphorus](http://dnr.wi.gov/topic/surfacewater/Phosphorus)  
[dnr.wi.gov/topic/SurfaceWater/phosphorus.html](http://dnr.wi.gov/topic/SurfaceWater/phosphorus.html)
- **Marathon County**  
Land & Water Resource Management Plan  
[www.co.marathon.wi.us/Portals/0/Departments/CPZ/Documents/lwrm2010\\_final\\_PostedVersion.pdf](http://www.co.marathon.wi.us/Portals/0/Departments/CPZ/Documents/lwrm2010_final_PostedVersion.pdf)



**Key Measure:** Percent of Marathon County Residents with Municipal-Coordinated Solid Waste Management, 2013



### COMMUNITY PERSPECTIVES

Environmentally-sound integrated solid waste resource management options are vital to a community's health, safety, and prosperity. The community looks to a network of integrated solid waste resource professionals to reduce the amount of waste produced, to recycle more, and to safely dispose of that which remains. Business and industry rely on

reducing greenhouse gases. Moreover, such diversion has economic benefits as it increases the life of a landfill and may decrease construction, operating, and monitoring costs by minimizing the need for expansion of existing landfills or construction of new landfills. Furthermore, recycling is critical to economic development as local, state, and regional companies use these materials to keep production costs down.

Marathon County residents self-report high participation rates in recycling programs, with 93% of LIFE Community survey respondents indicating that they recycle.

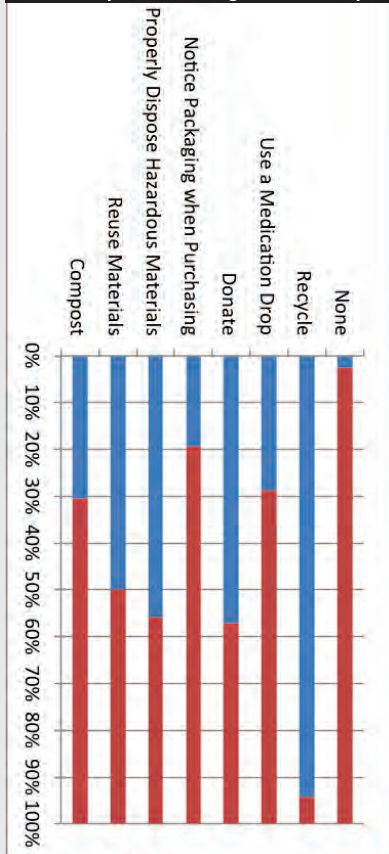


affordable solid waste management strategies for their day-to-day operations, and residents use convenient solid waste management services to dispose of household waste.

Integrated solid waste resource management includes programs and services that reduce, recycle, beneficially reuse, repurpose, collect, transport, and dispose of waste. Reducing materials landfilled benefits the environment by

### DATA HIGHLIGHTS

% Participation - 2015 LIFE Survey



- On average, Marathon County recycles about 100 pounds per capita. By comparison, the state average is about 140 pounds per capita.
- 94.3% of LIFE Community survey respondents participated in recycling programs to reduce trash.

### SOURCES

- 2015 LIFE Community Survey
- Wisconsin Department of Natural Resources Waste Management <http://dnr.wi.gov/topic/Waste/>
- Wisconsin Chapter of the Solid Waste Association of North America [www.swana-wi.org/](http://www.swana-wi.org/)
- Marathon County Solid Waste Management Department [www.marathoncountysolidwaste.org/](http://www.marathoncountysolidwaste.org/)

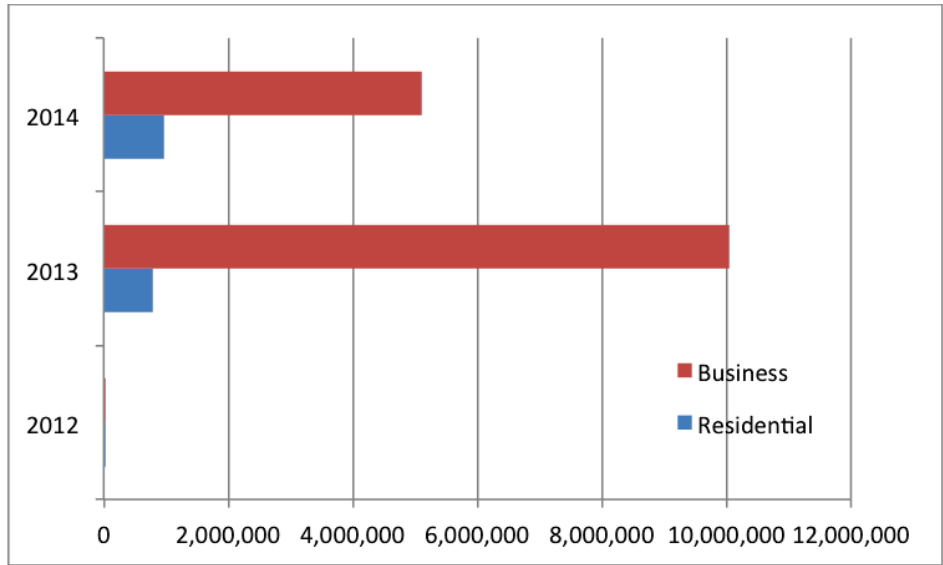
## DATA HIGHLIGHTS

- The Weston power plant has base load generation of 825 MW, down from 975MW in 2014. Weston Unit 1 was retired in 2015 and as of June 2015 Weston 2 only generates electricity with natural gas, removing 90 MW of coal capacity.
- Marathon County has three commercial sources of potential renewable energy generation: Wausau Hydroelectric Dam, 5.4 MW; Domtar Biomass Power Plant, 99MW; Recovery Corporation Ethanol Plant, 2.4 MW.
- In 2014, 42 Marathon County residents had the generation capacity of 301 KW using private renewable energy sources, up from 30 residents at 210 KW in 2013 and 20 residents at 129 KW in 2012.
- Focus on Energy’s appliance recycling program recycled 325 appliances in 2014 (saving 371,679 kWh) down from 408 appliances (457,275 kWh) in 2013 and 469 appliances (496,887 kWh) in 2012.
- All public school districts in Marathon County have their teachers attend the KEEP trainings.

## SOURCES

- **Wisconsin Public Service**  
[www.wisconsinpublicservice.com/](http://www.wisconsinpublicservice.com/)
- **Focus on Energy**  
[www.focusonenergy.com](http://www.focusonenergy.com)
- **UW: Stevens Point**  
K-12 Energy Education Program  
[www4.uwsp.edu/cnr/wcee/keep/](http://www4.uwsp.edu/cnr/wcee/keep/)
- **RENEW Wisconsin**  
[www.renewwisconsin.org/](http://www.renewwisconsin.org/)
- **Public Service Commission of Wisconsin**  
[psc.wi.gov/](http://psc.wi.gov/)

**Key Measure:** Energy Conserved (in kWh) through Focus on Energy Programs in Marathon County, 2012–2014



## COMMUNITY PERSPECTIVES

Economic growth requires labor, capital, and energy. Business and industry specifically need energy at competitive costs to operate, thus energy is vital to attracting the employers that make Marathon County a desirable place to live. Electricity supports productivity, safety, convenience, and comfort. As we grow, the demand for energy increases; however, one of the best ways for residents and businesses to control their energy use, which in turn allows for more growth.

Generation requires infrastructure, which results in increased cost per unit of energy. Additionally, unlike labor and capital, traditional energy (fossil fuels) has a limited source of supply. So as the county grows so does the diversification of power generation both within the utility structure and the community as a whole. Examples of this include the biomass plant, the Wausau hydroelectric dam, the Recovery Corporation landfill and the increase of renewable generation by customers up by 99KWH in 2014.

Focus on Energy is a statewide energy

efficiency and renewable resource program. The program works with residents and businesses on projects such as appliance recycling, upstream lighting (discounts at the time of purchase), and installation of energy efficient equipment and other upgrades to help increase the efficiency of homes and other buildings. Many businesses and organizations have continued to enhance their efficiency efforts by incorporating Energy Teams that review and improve building energy efficiency.

Educating future consumers on managing their energy resources is key to a successful future. The K-12 Energy Education Program (KEEP), out of UW-Stevens Point, was created in 1995 to promote energy education in Wisconsin schools. With support from Alliant Energy, Madison Gas & Electric, We Energies, Wisconsin Public Service, WPPI Energy, and Xcel Energy, KEEP leverages teacher education to improve and increase energy literacy in Wisconsin's K-12 schools as a means of contributing to statewide energy savings.