



# Environmental Performance

Wisconsin Public Service Tomahawk Hydro Plant

Providing safe, reliable and affordable energy to customers is a responsibility WEC Energy Group companies take seriously. We also are focused on responsibility and commitment to protecting the environment.

## Environmental commitment guiding principles

Include environmental factors as an integral part of planning and operating decisions.

Recognize the contribution every employee can make to improve our environmental performance and encourage employees to become environmental stewards.

Communicate and reinforce environmental values throughout our companies.

Practice responsible environmental stewardship of all properties and natural resources entrusted to our management.

Minimize adverse environmental impacts of operations by meeting or surpassing environmental standards, investing in energy efficiency measures, and supporting our recycling and waste-reduction programs.

Support research and implement new technologies for emissions control, energy efficiency, renewable energy resources, and other environmental and health concerns associated with utility operations.

Accept accountability for our operations by responding to environmental incidents quickly and effectively, and promptly informing appropriate parties.

Provide public participation opportunities and welcome communication from stakeholders on environmental issues.

Continue to foster constructive working relationships with environmental organizations, community leaders, media and government agencies.

Participate with government and others in creating responsible laws and regulations to safeguard the environment, community and workplace.

Commit employee and management resources to support and implement these principles.

Periodically review performance to ensure that programs and practices are consistent with these principles.

## Our approach to environmental stewardship

Consistent with our environmental commitment guiding principles, we pursue a proactive strategy to manage our environmental performance.

Our companies are subject to extensive environmental regulations affecting past, present and future operations, and incur significant expenditures in complying with these environmental requirements, including expenditures for pollution control equipment, environmental monitoring, emissions fees and permits at all generating facilities.

Our governance structure and practices support a strategic focus on environmental issues. WEC Energy Group's chief executive officer has specific responsibility for climate change-related strategies. The vice president – environmental for the utility subsidiaries manages tactical approaches to implement our climate change strategies.

We have a formal mechanism to provide regular environmental issue updates, including climate change, to the audit and oversight committee of the board of directors through quarterly reports from the vice president – environmental. The CEO also provides the board with updates on environmental matters, as necessary.

The Audit and Oversight Committee assists the board of directors in carrying out the board's responsibility to oversee our strategy and compliance with legal and regulatory requirements. The committee's oversight of environmental matters includes reviewing and providing oversight of environmental compliance matters to ensure that appropriate management attention is being given to such matters. The committee is responsible for discussing, among other things, our major environmental risk exposures and the steps management has taken to monitor and control such exposures.

Management report to the committee on legislative, regulatory and legal developments in this area. In addition, our utilities are members of, and actively participate in, several industry organizations, such as Edison Electric Institute, Utility Air Regulatory Group, American Gas Association and Electric Power Research Institute (EPRI), that are involved in the legislative, regulatory, research, development and demonstration processes.

Responsibility for environmental compliance lies within our operating units. The WEC Environmental Compliance Audit program is one way to track the effectiveness of the compliance program across the corporation. This program provides specific requirements for objectivity, scope, auditor qualifications, corporate facility coverage, frequency, quality and responsibilities. Any noncompliance is reported to senior management. The quarterly report to the audit and oversight committee of the board of directors includes the status of the Environmental Compliance Audit program and any significant findings of non-compliance. We also address supplier environmental performance through our procurement processes and through supplier audits that use criteria derived from the International Organization for Standardization's (ISO) 14001 guidelines to measure environmental management system compliance.

We have a commitment to audit all of our utility operating facilities. Our audit schedule is reviewed annually and revised as necessary to meet changing regulatory requirements and the needs of operating facilities, as well as to identify opportunities for continual improvement. We use a risk-based approach to potential environmental exposures to determine the necessary frequency of facility audits. A combined audit program began in mid-2015 to incorporate facilities from legacy Integrys' operating companies with our existing facilities. Our internal environmental audit program includes the key elements of an effective environmental management system.

During 2015, we conducted 36 environmental compliance audits of Power Generation and Customer Operations facilities. The Environmental department also conducted seven environmental permit construction inspections and two supplier endorsement reviews. Third-party audits and system reviews are conducted on an as-needed basis – for example, continuous emission monitoring systems. Regulatory agencies from Wisconsin, Michigan and Illinois conducted 39 inspections at WEC Energy Group facilities.

Our utilities' environmental emergency response process includes spill prevention, control and countermeasure plans for all facilities as well as contingency plans, off-site plans, and site emergency response plans. An environmental incident response team is on call 24/7 to provide assistance with response to chemical spills and incidents throughout our utility service areas.

## Supporting a clean energy future

We are committed to ensuring customers have the energy they need, operating our power plants in an environmentally responsible manner, and making renewable energy a key part of our energy mix.

Our companies evaluate environmental impacts and environmental regulations, including regulation of greenhouse gas (GHG) emissions, in all facets of its strategic business planning. The companies follow a comprehensive approach to address electricity supply and reliability issues for their customers in a way that considers both the economy and the environment.

Our companies' environmental performance effectively demonstrates how environmental issues are integrated into strategic planning. In 2000, we began to strategically reshape our portfolio of electric generation facilities, resulting in reduced environmental impact and improved environmental performance.

### Reducing greenhouse gas and other air emissions

Addressing climate change is an integral component of the strategic planning process, demonstrating commitment to effective environmental stewardship while fulfilling an obligation to provide reliable energy to customers. We have strategically reshaped our portfolio of electric generation facilities with investments that have improved environmental performance, including reduced GHG intensity of our operating fleet.

Investments in repowered generating facilities, new renewable energy facilities, new fossil-fueled generating facilities with state-of-the-art air-quality control systems, power grid upgrades, and additional environmental protection technologies position our electric energy companies well for the future.

Among the steps taken:

- Retired 11 coal-fueled power generation units totaling 652 megawatts (MW)
- Added two combined-cycle natural gas units totaling 1,090 MW that replaced 305 MW of coal-fueled power generation
- Added one combined-cycle natural gas unit of 565 MW
- Added coal-fueled power generation units to provide 1,056 MW of generation, with performance that ranks among the most thermally efficient coal-fueled power generation units in the nation
- Added air-quality control systems to a number of existing coal-fueled power generation units
- Entered into a long-term power purchase agreement for nuclear power generation produced by Point Beach Nuclear Plant, which currently totals approximately 1,030 MW
- Executed short-term power purchase agreements for 75 MW of wind generation
- Increased investment in energy efficiency and conservation



- Added 447 MW of wind generation
- Added 50 MW of biomass cogeneration at an existing paper mill site
- Converted Valley Power Plant from coal to natural gas. The plant is a cogeneration facility located along the Menomonee River in Milwaukee, Wisconsin, which generates electricity for the power grid and produces steam for heating and other purposes for hundreds of downtown Milwaukee buildings

In addition, state-required programs fund energy conservation projects based on utility annual operating revenues. Customers contributed approximately \$65 million toward energy conservation in 2015. Initiatives of demand-side management, power plant efficiency improvements, beneficial use of combustion products in place of carbon-intensive materials, distribution system efficiencies and increased renewable energy generation have reduced systemwide GHG emissions intensity.

### Air emission reductions

Wisconsin Public Service (WPS) is upgrading the emission control system on Unit 3 at Weston Generating Power Plant near Wausau, Wisconsin. The new system, called ReACT (Regenerative Activated Coke Technology) will reduce sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), mercury and other emissions, complementing the controls previously installed at Weston 3: fabric filters, low NO<sub>x</sub> burners and separated over-fire air system, and mercury control system.

Air-quality control systems are in use at other generating facilities: Pleasant Prairie Power Plant and Oak Creek Power Plant units 5-8 have been retrofitted with selective catalytic reduction systems for NO<sub>x</sub> emissions removal and wet flue-gas desulfurization units (scrubbers) for SO<sub>2</sub> emissions removal. These projects, along with additional measures taken at other facilities, have resulted in more than an 80 percent reduction in SO<sub>2</sub> and NO<sub>x</sub> emissions combined when compared to 2000 emissions.

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The Oak Creek Expansion Units are equipped with new technologies for air-quality controls, including selective catalytic reduction systems, fabric filter baghouses, scrubbers and wet electrostatic precipitators.

Presque Isle Power Plant uses EPRI's patented Toxecon process to reduce mercury emissions up to 90 percent compared to tests taken in 2008, the year prior to implementation. The air emission controls installed at the Oak Creek site capture more than 90 percent of the mercury present in flue gas without use of sorbent injection, as practiced at Presque Isle Power Plant. Through the addition of calcium bromide to coal supplies, we are able to capture more than 75 percent of the mercury from the Pleasant Prairie Power Plant and the Oak Creek site.

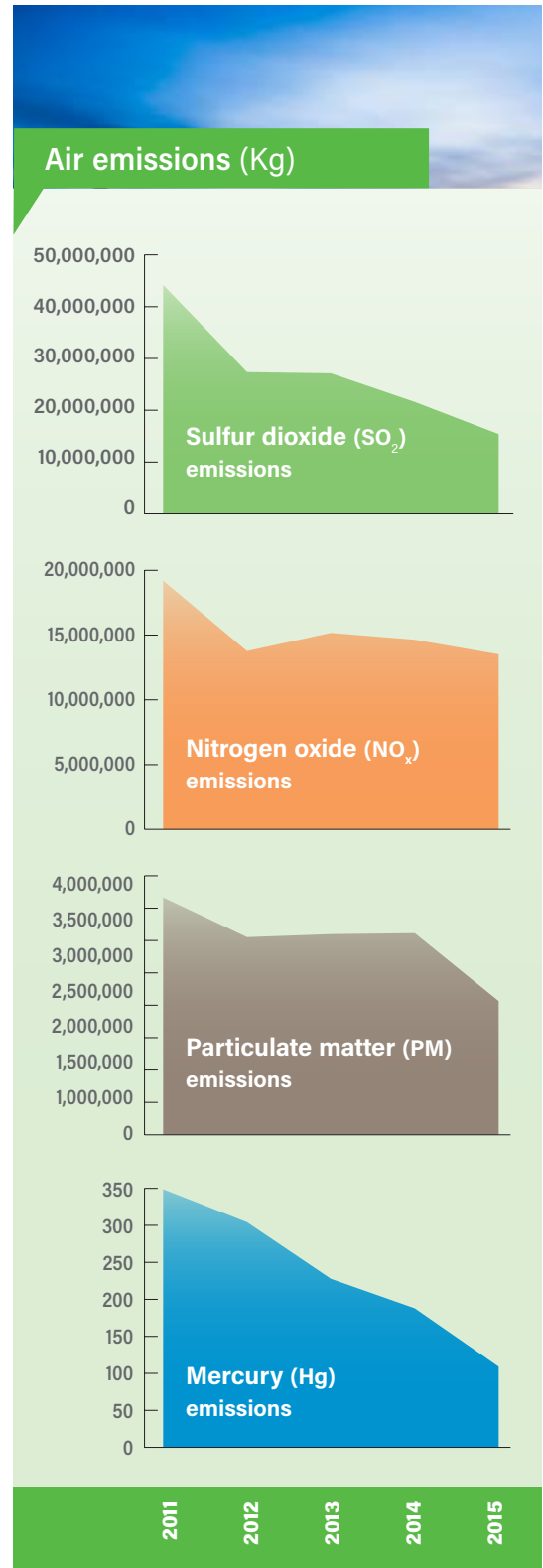
To reduce emissions of particulate matter, we installed high-efficiency fabric filters on generating units at the Oak Creek site, Presque Isle Power Plant and Valley Power Plant. Other plants have high-efficiency electrostatic precipitators that remove more than 99 percent of particulate matter. In addition to the above controls, the units that have SO<sub>2</sub> controls (scrubbers) achieve additional particulate removal.

**GHG and natural gas distribution**

Maintaining more than 45,000 miles of natural gas main and serving more than 2.8 million natural gas customers is no small task. Our companies are addressing the aging infrastructure of our natural gas distribution system. In Illinois, Peoples Gas is continuing work on the System Modernization Program, a 20-year project that began in 2011 under which Peoples Gas is replacing approximately 2,000 miles of Chicago's aging natural gas pipeline infrastructure. Peoples Gas is participating in the U.S. Environmental Protection Agency's (EPA) Natural Gas STAR Methane Challenge Program, in which oil and natural gas companies make and track commitments to reduce their methane emissions. The program helps partners demonstrate their efforts to improve air quality, save energy and increase operational efficiencies. These programs, and other ongoing pipe and component replacement activities, enhance safety and reliability for customers while reducing releases of natural gas to the environment.

Natural gas distributors report GHG emissions to the EPA. We report carbon dioxide equivalent (CO<sub>2</sub>e) amounts related to the natural gas our utilities distribute and sell, as well as emissions due to natural gas distribution system leaks. For 2015, we reported emissions of approximately 27.2 million metric tons of CO<sub>2</sub>e to the EPA related to the distribution and sale of natural gas. The amount associated with fugitive emissions was approximately 1.2 percent. Emissions from electricity generation totaled approximately 31.0 million metric tons of CO<sub>2</sub>e.

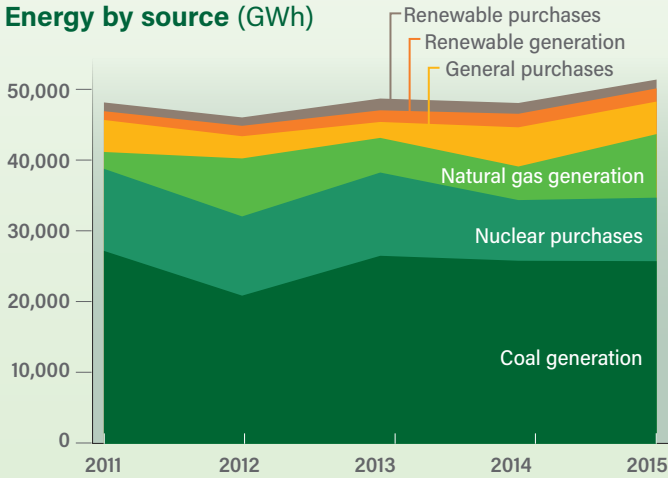
» Because climate change is a global issue, we joined with other organizations and energy companies in tree planting, land protection and sustainable forest management initiatives, in both domestic and international locales. These projects provide not only carbon sequestration benefits but also critical wildlife habitat restoration, soil and water quality improvement, and flood reduction.



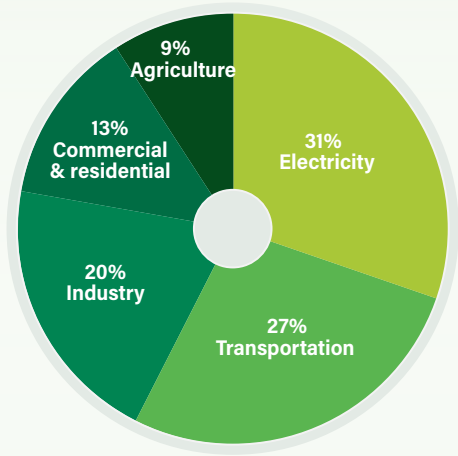
Energy and emissions

Energy by source (GWh)



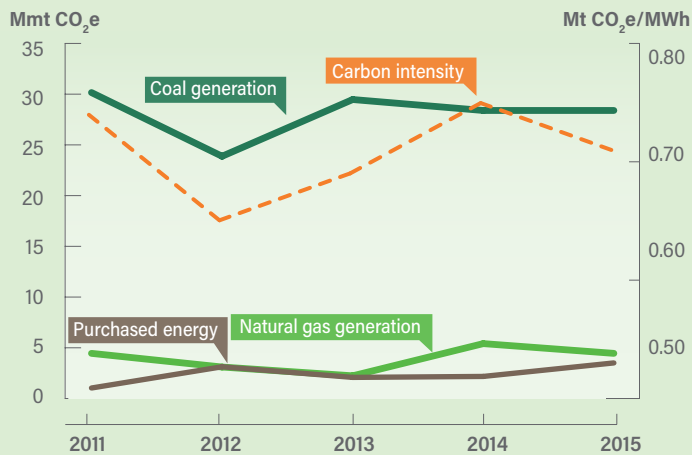
Total U.S. greenhouse gas emissions by economic sector

Source: EPA



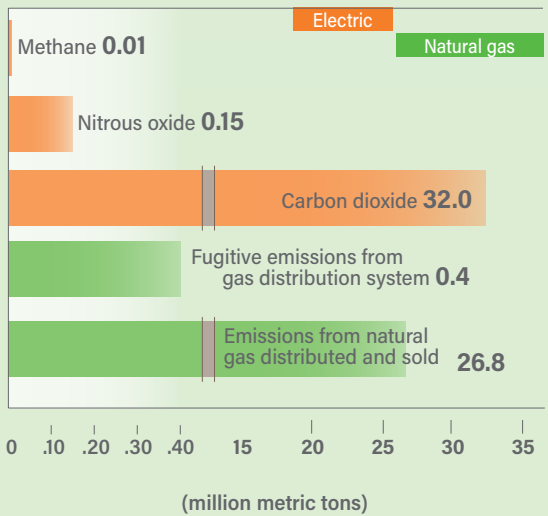
GHG emissions from electricity generation and purchases

carbon dioxide equivalents (CO<sub>2</sub>e)



2015 GHG emissions from electricity and natural gas distribution

carbon dioxide equivalents (CO<sub>2</sub>e)



**U.S. EPA's regulation of GHG emissions from fossil fuel sources**

We have long supported flexible, market-based strategies to curb GHG emissions, including efficiency improvement, emissions trading and credit for early actions. We support an approach that encourages technology development and transfer, and includes all sectors of the economy and all significant global emitters.

We believe environmental and climate policy should foster development of new, cost-effective clean energy technologies. Environmental and economic interests are aligned when environmental regulation allows flexible, cost-effective and market-based approaches to achieving desired environmental results.

In 2015, the EPA issued the Clean Power Plan, which is a final rule that regulates GHG emissions from existing generating units, as well as a proposed federal plan as an alternative to state compliance plans. The rule is seeking GHG emission reductions in Wisconsin and Michigan of 41 percent and 39 percent, respectively, below 2012 levels by 2030. The EPA also issued final performance standards for modified and reconstructed generating units, as well as for new fossil-fueled power plants. If Wisconsin or Michigan decides not to file a state compliance plan, we may be required to comply with the federal plan.

In February 2016, the U.S. Supreme Court stayed the effectiveness of the rule until disposition of the litigation in the D.C. Circuit Court of Appeals and to the extent that review is sought, at the Supreme Court. In addition, on Feb. 15, 2016, the governor of Wisconsin issued Executive Order 186, which prohibits state agencies, departments, boards, commissions or other state entities from developing or promoting a state plan. Therefore the state of Wisconsin has been unable to move forward with any state plan.

We are working with EPRI and other organizations to assess the potential impact of new and proposed rule requirements on our companies and on our customers in the states in which we generate electricity. Our companies are meeting with various stakeholders to discuss and model several options and identify those that could minimize impacts on reliability and customers. Analyses of the many complicated aspects of the final rule will continue to be evaluated, including options available to our electricity generating units to meet the federal plan if the states in which we operate choose not to develop a plan. We believe it is preferable for states to develop and submit a plan rather than await a final federal plan that could vary significantly from the proposal and may not account for a state's particular circumstances.

We expect that these regulations will impact operations and operating costs of existing facilities, particularly our fossil-fueled power plants and biomass facility. The unsettled status of environmental regulations related to GHG creates a great deal of continuing and increasing uncertainty for utility planning and complicates decision-making about the future operation of existing power plants, with additional uncertainty due to the potential outcomes of legal challenges. Capital and operation and maintenance investments in fossil-fueled power plants are expected to be required. Nationally, these changes are leading to additional retirements of coal and natural gas power plants.

Locally, we will continue to assess and address concerns about reliability and other impacts to customers.

» **WEC Energy Group's plan to address GHG emissions from our electric generation fleet continues to achieve reductions in CO<sub>2</sub> emissions. Components of our plan include these actions:**

- Re-powered the Valley Power Plant, which has a capacity of 272 MW, from coal to natural gas. This project, completed in 2015, reduced the CO<sub>2</sub> emission rate from the plant by more than 40 percent.
- Sold the Milwaukee County Power Plant in 2016, which facilitated its conversion from coal to natural gas.
- Working to develop alternative generation resources to serve the Upper Peninsula of Michigan, so that we can retire the Presque Isle Power Plant by the end of 2019.
- Received research and test exemptions to evaluate co-firing of natural gas in some of our coal-fueled units. Testing commenced June 15, 2016.
- Continuing our evaluation of possible future retirements of other coal-fueled units.

**Local generation technology**

As we develop and implement a compliance plan to meet additional regulations for state GHG goal reductions, we will consider various approaches and activities that help reduce or mitigate GHG, including local generation.

Local generation is power production or energy storage technology dispersed throughout the power grid that provides electricity close to the point of use when compared to central station power generation. Local generation resources include fossil and renewable energy technologies (e.g., photovoltaic arrays, wind turbines, microturbines, reciprocating engines, fuel cells, combustion turbines and steam turbines); energy storage devices (e.g., batteries and flywheels); and combined heat and power systems.

We continue to evaluate the impact across our electric energy companies' service areas of the continued adoption of local generation by electric customers. As the number of customers with electric generating devices on their homes and businesses increases, we believe it is important that everyone who relies on the power grid pays their share of the cost to keep it operating reliably and safely.

In addition to the renewable generation facilities described on the next page, we believe it is important that our electric energy companies continue to generate power at central station power plants in order to achieve economies of scale and produce continuous sources of power at a competitive cost. The companies are conducting a collaborative research project with EPRI to investigate the potential for improving power system resiliency by effectively integrating local generation (microgrids) while building on the availability and reliability of the existing power grid in a compatible and interactive way. The results of this and other research

and demonstration efforts will help the companies adapt their business models to realize the potential benefits – to their customers and their power grid – of incorporating local generation technologies.

**Flexibility and reliability: Achieving a balance**

Current GHG emissions regulation, as well as future legislation or regulation that may be adopted, carries with it a wide range of possible effects on our energy business; therefore, we strive for the flexibility to react to this variety of potential outcomes while ensuring a secure, low-cost and reliable supply of fuel for generating needs. Our electric energy companies build flexibility into fuel supply and transportation contracts to address climate change regulation.

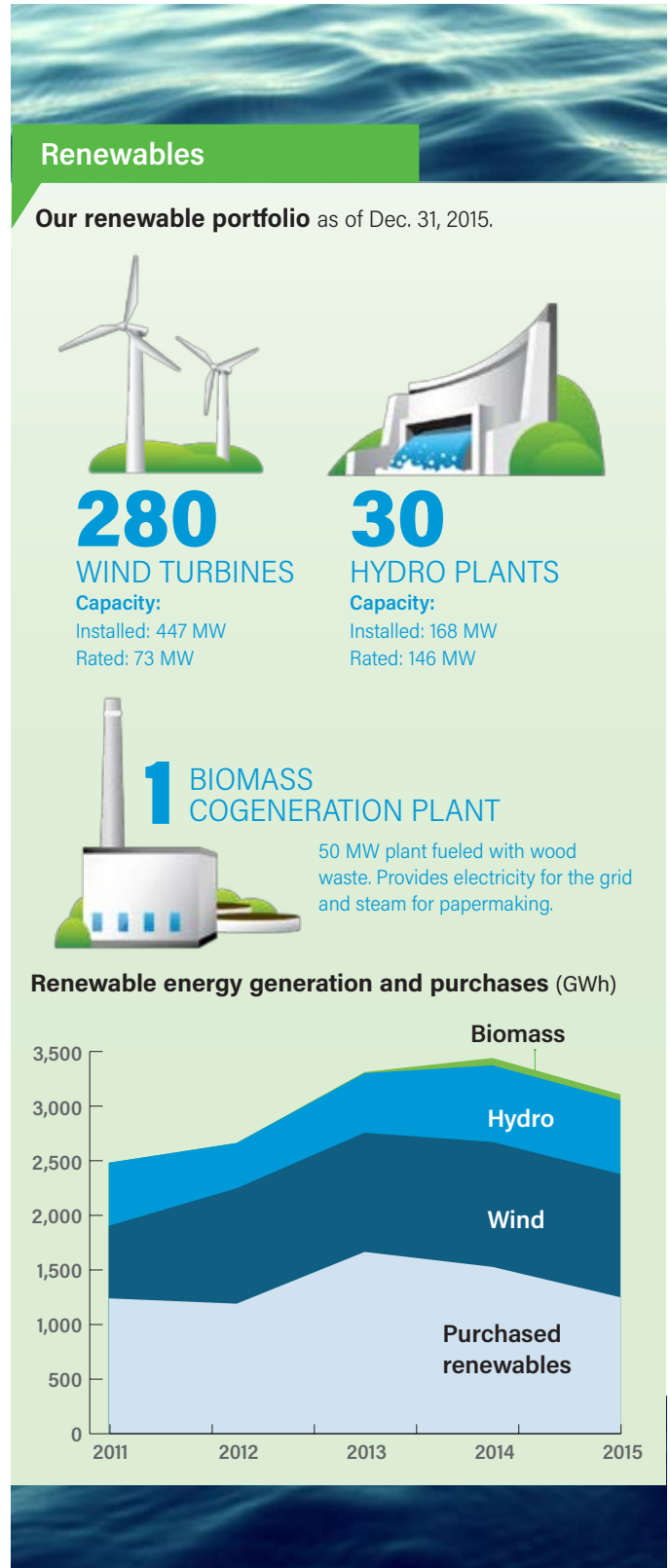
Our companies have no guarantee that they will be allowed to fully recover costs incurred to comply with the Clean Power Plan or that cost recovery will not be delayed or otherwise conditioned. The Clean Power Plan and any other related regulations that may be adopted, either at the federal or state level, to reduce GHG emissions could have a material adverse impact on our electric generation and natural gas distribution operations, could make some of our electric generating units uneconomic to maintain or operate, and could affect unit retirement and replacement decisions. These regulations could also adversely affect our future results of operations, cash flows and possibly financial condition.

**Renewable energy: A plus for the environment**

Fuel diversity in our generation portfolio has been key to our strategy of providing environmental leadership and reliable electricity at competitive prices. Our renewable energy facilities continue to provide non-emitting generation, ensuring compliance with Wisconsin Act 141, the state's renewable portfolio standard, and reducing system carbon intensity. We Energies and WPS met the renewable portfolio standard well in advance of the state deadline:

- Our companies own and operate a total of 280 wind turbines located at five sites around southeast and central Wisconsin and one in northern Iowa, with an installed capacity of 447 MW and a rated capacity of 73 MW as of Dec. 31, 2015.
- Rothschild Biomass Cogeneration Plant is a 50 MW power plant fueled with wood waste (biomass) from northern Wisconsin forests. The plant began commercial operation in 2013, and provides electricity for the grid and steam for papermaking. All biomass suppliers must follow Wisconsin's Woody Biomass Harvesting Guidelines or other applicable biomass harvesting plans, Best Management Practices for Water Quality, and Wisconsin's Forest Management Guidelines.
- The hydroelectric generating system consists of 30 operating plants with a total installed capacity of 168 MW and a rated capacity of 146 MW as of Dec. 31, 2015. Construction is in progress to rebuild the 100-year-old Twin Falls powerhouse, increasing its capacity approximately 50 percent.

For nearly two decades, WPS has implemented SolarWise for Schools, an award-winning solar and renewable energy education program for high schools in the WPS service area. SolarWise schools receive a 2-kilowatt solar energy system installed at the school; a hands-on renewable energy curriculum; teacher training to integrate curriculum

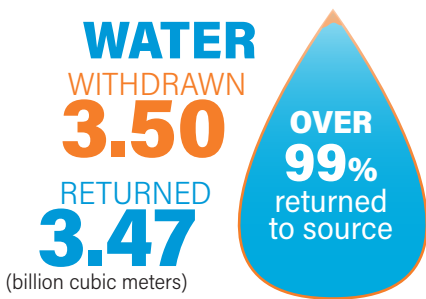


materials into existing courses; and the opportunity to participate in WPS' annual Solar Olympics. The program, supported by tax-deductible donations from WPS customers, provides numerous benefits: renewable electricity produced and carbon dioxide emissions avoided; energy cost savings for the schools; and the education of the next generation of energy consumers about renewable energy.

**Water use.** Our companies recycle water used in power generation and use systems that minimize consumptive water loss. Most of our power plants use open-cycle cooling systems. These systems withdraw surface water from natural cold water sources, pump the water through steam condensers to cool and condense the steam that drives turbine generators, and then all of the cooling water is returned to the source. For facilities with cooling towers, about 25 percent of the water is returned to the source with the balance of the water loss going to the air during the evaporative cooling process.

Several power plants have modified water intake structures to meet requirements of new federal rules. The state regulatory agencies that implement these rules have determined that power plant intake structure modifications at those plants are the best technology available for each facility. Many of the water intake modification projects were installed well ahead of the EPA-required implementation dates. This proactive approach minimized environmental impacts on fish and other aquatic organisms by using intake structures that meet best-technology-available standards.

Fox Energy Center beneficially reuses treated effluent from the Heart of the Valley Metropolitan Sewerage District to supply its process water and cooling water needs. Reuse of treated effluent wastewater that would otherwise be returned to the Fox River is an environmentally preferable alternative to the use of surface water or groundwater resources. Water received at the facility undergoes additional treatment for the removal of pollutants such as mercury, phosphorus and total suspended solids. The beneficial reuse of treated effluent results in a net reduction in the quantity of pollutants that would otherwise be discharged into the Fox River. This results in a net benefit to the public and the aquatic environment in the Fox River.



**Beneficial use of combustion products**

We Energies and WPS have several initiatives that recover and use materials produced from plant operations.

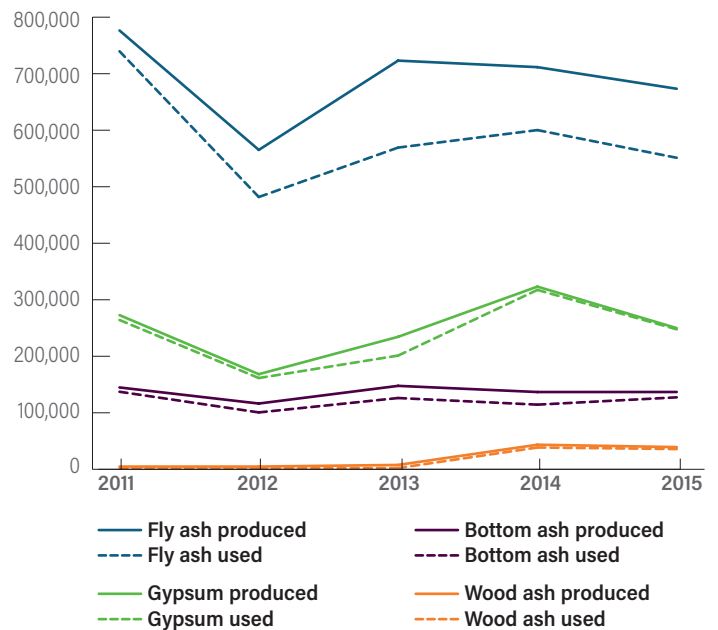
In 2015, more than 88 percent of the systemwide combustion products from our electric energy facilities were beneficially used, including gypsum, fly ash, bottom ash and wood ash from our biomass plant. The national average is approximately 48 percent, according to the American Coal Ash Association.

In the past 15 years, our companies have provided more than 12.8 million metric tons of combustion products for beneficial use. Most of these materials have been used as construction materials in concrete, concrete products, cement manufacturing, wallboard production and as alternative materials to sand, gravel and crushed stone aggregates. A corporate directive specifies that combustion products produced by our companies' power plants are to be used whenever possible on our companies' projects. In addition to uses in construction industries, gypsum and wood ash have been beneficially used in agricultural applications as soil amendments.

Our companies maintain highly successful research and development programs that include numerous patents that have the potential to further support use of combustion products from our power plants. As changes occur in the makeup and quantities of materials produced due to power plant operations or environmental regulations, research and development efforts position our companies to continue beneficial use of these materials.

Since 2000, We Energies has removed, recovered and used approximately 450,000 metric tons of combustion products stored

**Combustion products (tons)**





at its Pleasant Prairie landfill. Using ash from the past has resulted in annual combustion product utilization rates of We Energies that exceeded 100 percent in some years. Due to the full recovery of landfill materials, a landfill cell using new technologies was constructed to replace the original cells.

Part of the effort to maximize beneficial use of byproducts includes reburning some combustion products with coal to recover residual fuel value in the materials and to improve the characteristics of coal ash for beneficial use. Since 2000, these processes have displaced more than 3,880 rail cars or more than 400,000 metric tons of coal that would otherwise need to be purchased.

We Energies does not use any wet coal ash impoundments. The WPS Weston Power Plant site has a small active impoundment that is scheduled for ash removal and conversion to a process wastewater basin by 2020.

**Recycling commitment**

Recycling is an integral part of our corporate environmental commitment, affecting all of our facilities. We encourage employees to be responsible for environmental stewardship by supporting our recycling and waste reduction programs. Waste minimization is the first step in effective use of materials, and our recycling commitment encourages all efforts to minimize waste – reduce, reuse and then recycle. Effectiveness of the recycling program depends on employee participation and results in:

- Avoided disposal costs due to reducing the amount of material for disposal
- Proceeds from the sale of recycled materials that help reduce the cost of operating a recycling program

Environmental, Facility Management, Supply Chain and Corporate Communications staff work together with all employees to provide the tools, materials and information needed to make this program successful.

Since 2011, our companies have recycled about

**50%**

of our nonhazardous materials that would otherwise be waste.



## Other environmental activities

**Investing in research for longer-term alternatives**

Since 2006, we have invested approximately \$5.4 million in climate change research and development programs through membership in EPRI. Examples of supplemental project investments include:

- Innovative technologies for capturing carbon dioxide from flue gas of a coal power plant in a pilot project for demonstrating chilled ammonia scrubbing of CO<sub>2</sub> at Pleasant Prairie Power Plant near Kenosha, Wisconsin
- A larger-scale project at a power plant in West Virginia to demonstrate chilled ammonia scrubbing technology combined with storing captured CO<sub>2</sub> in an underground geologic formation
- An effort to investigate potential to deliver GHG emissions reductions from avoided deforestation in the Amazon's Xingu River Basin
- A project to explore development of algal biotechnology for energy production and carbon recycling
- Two patents for carbon mineralization processes secured

We have made other investments, through EPRI and elsewhere, related to renewable energy and demand-side energy efficiency that also should have potential benefits related to GHG emission reductions.

**Natural resource stewardship**

We seek to enhance the sensitive natural habitats on our companies' properties, using sound practices to manage for multiple uses – aesthetics, biodiversity, cultural resources, forestry, recreation, water quality and wildlife. We support stewardship efforts that reach beyond the properties, across state and national borders. Some electric and natural gas facilities cross protected or potentially sensitive habitats such as wetlands, grasslands, savannas and forests. When we consider new facility locations or routes, or maintain and/or upgrade existing facilities, environmental staff members work with project teams to avoid potentially sensitive areas, protect the surrounding environment, and minimize potential impacts to ecological, social and cultural resources.

Less than an estimated 5 percent of natural gas and electric distribution projects have any sort of natural resource impacts (wetland/waterway/rare species). Of those projects, the impact is estimated to be less than 0.001 acre of natural resource impact per project. Careful planning and implementation during electric distribution and natural gas lateral pipeline projects have resulted in a net improvement in quality of wetland habitat and increased biodiversity following construction activities as a result of restoration and management of impacted wetlands.

Our companies look for opportunities to work with local, state and federal agency staff in a collaborative manner during the regulatory review of our projects. Appropriate stakeholders are brought together to achieve positive stewardship goals through opportunities during construction of proposed distribution projects.

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Members of our companies' staff lead several comprehensive wildlife conservation efforts with the coordination and cooperation of the Wisconsin Department of Natural Resources (WDNR) and multiple partners. Priority goes to species and native ecosystems in the greatest need of protection, recovery and enhancement, including peregrine falcons, bald eagles, osprey, Karner blue butterflies, wood turtles and a number of other endangered or threatened species that have been identified in the service area.



One example is the Karner Blue Butterfly Habitat Conservation Plan. Because Wisconsin is home to the largest remaining Karner blue butterfly (federally endangered) population in the world, our companies have worked with the U.S. Fish and Wildlife Service and the WDNR to develop and implement the habitat conservation plan, which establishes partnerships between public and private sectors and government agencies to promote rare species habitat conservation. Wild lupine is crucial to the survival of Karner blue species, as it is incapable of reproducing without it. Our companies' construction and maintenance projects remove brush along corridors to allow lupine to grow and thrive. Surveys of projects within the Karner blue range help to adjust project activities as needed to eliminate or reduce impacts to the endangered butterfly. Of more than 100 acres of upland habitat being restored with native prairie and barrens habitat along a natural gas lateral project in west-central Wisconsin, more than 55 acres of Karner blue native habitat are being restored or created, approximately three-quarters of which is on a voluntary basis. Large portions of the restored Karner habitat occurs on federally approved recovery properties for this species.

In Michigan, We Energies has worked with the Michigan Department of Natural Resources (MDNR) and local sport fishing organizations since 2003 on a net penning project for Chinook salmon at Presque Isle Power Plant. The net penning process provides an interim habitat for salmon to adapt to the lake rather than stocking these directly into the open waters of Lake Superior. The process allows fish to become better acclimated to the environmental challenges ahead and build defenses against predator birds such as gulls and cormorants. Return rates for similar projects have been up to 20 percent compared with direct stocking return rates of approximately 2 percent.

Peregrine falcons are calling our companies' power plants home. Our companies have maintained nesting boxes on power plant chimneys and rooftops for more than two decades. More than 300 peregrine young – more than 22 percent of the peregrine falcon population in Wisconsin – have been born at our companies' power plant nesting boxes.

To help educate and raise awareness of the species, real-time viewing is available from hourly photos throughout the year and a live video webcam during the nesting season.



Ospreys frequently try to nest on top of power poles, which can result in power outages and harm to the ospreys. Since 1980, field crews have constructed alternative nest structures for osprey breeding pairs and have assisted private and public land owners in erecting nest structures in key habitat locations. Our companies have helped install dozens of osprey platforms in Wisconsin and Michigan's Upper Peninsula. These efforts have supported the recovery of the ospreys, which now exceed more than 500 breeding pairs in Wisconsin alone.

Wood turtles are a protected species occurring throughout much of the companies' service areas. When a project is identified that may have the potential to coincide with wood turtle habitat, we collaborate with the state endangered resources staff to ensure all appropriate measures are taken to avoid any impacts. If natural gas and electric projects cross corridors that are home to wood turtles, construction practices are altered and plans devised to avoid impact. We Energies has been an active partner since 2011 with a nonprofit organization dedicated to the recovery of diminished wood turtle populations in Wisconsin.

### Natural areas and wetlands

We support efforts to create, restore and manage wetland habitats on our companies' properties, including 12 restored and created wetland pothole habitats in Ozaukee and Manitowoc counties. Wetland habitats have been restored and are managed at numerous facilities.

Near the Oak Creek Expansion Units in Oak Creek, Wisconsin, approximately 90 acres of restored wetland, enhanced wetland, upland prairie and upland woodlands are maintained and

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managed. These sites, located near a rapidly urbanizing area along the Lake Michigan migratory bird flyway, have created large habitat blocks, providing a water quality buffer for the Root River, a tributary to Lake Michigan. The sites now are being managed for invasive plant species to continue to improve the habitat. A public bike and recreational path also was constructed through portions of these lands.

A unique migratory bird stopover habitat on the former south coal dock at Port Washington Generating Station was created in 2011. This approximately 5-acre habitat includes native marsh and wet meadow wetlands as well as tallgrass prairie where migrating birds have a resting place along the Lake Michigan shoreline, which is a primary flight corridor in the heart of the Mississippi flyway. Since the initial site restoration occurred in 2011, more than 100 species of waterfowl, shorebirds, passerine and other species have been recorded at the site.

Hundreds of acres of natural areas contained within closed and active ash landfills are actively managed to promote biodiversity, maintain large blocks of intact natural areas and restore native communities occurring within our companies' service areas. Numerous state rare species occur on these properties and their habitats are managed for long-term viability. Additionally, native prairie species are used to convert landfill areas to native grasslands.

At several properties, native plantings are used to augment storm water control facilities. Filter strips and native buffers are being used to reduce sediment loading. Storm water management plans for power distribution sites are incorporating native plants. Native plantings include species not only for their value in storm water management but also those that provide substantial wildlife value for local fauna, including the monarch butterfly.

### Recreational improvements

Our companies work with state agencies in both Wisconsin and Michigan to continue protection of natural resources and public recreational opportunities at lands our companies formerly owned. In two separate transactions, We Energies sold more than 7,500 acres to the WDNR and MDNR to permanently protect unique and environmentally important lands and waterways in northern Wisconsin and the Upper Peninsula of Michigan. The Menominee River State Park and Recreation Area was created as a result of the latest property transaction. Earlier transactions provided upstream protection of a Class I brook trout stream, preservation of an oak-pine barrens landscape, and permanent protection of lands and the addition of six miles of national wild and scenic river within the Sturgeon River Gorge Wilderness.

Repowering the Port Washington Power Plant from coal-fueled units built in the 1930s to high-efficiency natural gas generation facilitated redevelopment of the former north coal dock to a lakefront park in downtown Port Washington, Wisconsin. We Energies worked with a number of agencies and local government to transition land management in support of this community project. In addition,

the city received more than \$1.1 million in grants to support overall redevelopment of the site to improve public access and to provide additional recreational opportunities. We also completed construction of a public access road and kayak/canoe launch south of the repowered Port Washington Generating Station. Open access to the stopover habitat area created on the south dock is afforded to the public through a passive recreational trail loop around the perimeter of the site and is connected to adjacent city parklands. Along the south perimeter of the dock, a cantilevered platform was built closer to the lake level to provide additional public access to the water to allow for shoreline fishing.



Since 1941, WPS has partnered with the WDNR to improve fisheries at the Peshtigo Dam, stocking the area with muskie and lake sturgeon. WPS also partnered to protect the spawning of muskie, white suckers and walleye. In addition, WPS, the WDNR and the U.S. Fish and Wildlife Service work to control the sea lamprey population. The lampreys prey on game fish in Lake Michigan and then travel upstream to spawn in the Peshtigo and Menominee rivers. WPS also works with local communities to promote recreational opportunities for community residents and schools. Some examples:

- Bay Nordic Ski Club's project to install lights along ski trails at the Brown County Reforestation Camp in Suamico, Wisconsin
- An Iron Mountain, Michigan, bike group's project to install a mountain bike course near the Twin Falls hydroelectric facility
- County projects in Wisconsin to install recreational trails, such as the Lake Country Bike Trail on company-owned electric corridors
- A power-line friendly garden at Monk Botanical Gardens in Wausau

### Protection of natural resources

Our companies also support activities aimed at restoring habitat through controlling invasive plants and animals such as buckthorn, Eurasian water milfoil, garlic mustard, purple loosestrife, leafy spurge, giant reed grass, Japanese knotweed, sea lamprey and zebra and quagga mussels, among others. Our companies conduct research and provide ongoing support for research by others on aquatic invasive species management. In addition, resources are contributed to assist agencies and other groups who conduct invasive species surveys, manage natural areas and produce educational materials about invasive species and the threats they pose to biodiversity. Our companies also support land-management activities related to invasive species identification, control and management of thousands of acres within our companies' service areas.

We support habitat protection and/or restoration through the following sites and organizations in our service areas:

- Bain Station Prairie
- Caledonia Conservancy Lands
- Chiwaukee Prairie
- Eagle Bluff Environmental Center
- Friends of the Chicago River
- Friends of the Park
- Forest Beach Migratory Preserve
- Great Lakes Initiative
- High Cliff State Park
- Lake Forest Open lands
- Lapham Peak State Park
- Mequon Nature Preserve
- Milwaukee River Greenway
- Openlands
- Preservation Foundation
- Riveredge Nature Center
- Seven Generations Ahead
- Sidney Woodlands Preserve
- Spread Eagle Barrens State Natural Area
- Ulao Creek Watershed
- Wilderness Shores Recreation Area (along with numerous Wisconsin and Michigan shoreland areas)
- Zumbro Valley Watershed protection



Employee volunteer projects have helped with beach cleanup and restorations, adopt-a-highway and adopt-a-trail projects for semi-annual cleanups, setting of osprey nests, and community garden cleanup projects. Also, line clearance coordinators do a number of "Plant the Right Tree in the Right Location" outreach programs with area school children and community gardens.

### Paying it forward

The We Energies and WPS Foundations and our other operating companies provide grants that promote the environment in areas they serve. We also support others' efforts for the betterment of fish and wildlife, water and air quality, forests, energy efficiency, renewable energy, and recycling.

Our foundations and other company staff review applications received from throughout our service areas and make recommendations for grants and funding. In 2015, contributions were made to nature centers and preserves, county planning and parks departments, land trusts, and other nonprofit organizations. The grants supported a variety of initiatives including prairie, wetland and other habitat creation, restoration, enhancement and expansion activities, fishing and trail accessibility and improvement projects, construction of new animal hospital at the N.E.W. Zoo near Green Bay, invasive species education and control, annual river and other cleanups, conservation programs, sustainable forestry education, Arbor Day programs, raptor education and rescue, lighting for a cross-country ski trail, student scholarships, and more.

Our corporation and company foundations appreciate the opportunity to assist organizations in achieving lasting results that help create brighter futures for the communities in which we do business.

See pages 69-70 for more information on the We Energies and WPS Foundations.

## Environmental Performance - Air

### Air emissions - electricity generation

		2011	2012	2013	2014	2015
Sulfur dioxide (SO <sub>2</sub> )	(kg)	44,216,545	27,374,582	27,141,879	21,611,050	15,393,638
	(kg/MWh)	1.43	0.90	0.82	0.67	0.42
Nitrogen oxide (NO <sub>x</sub> )	(kg)	19,202,620	13,765,548	15,167,519	14,638,243	13,518,417
	(kg/MWh)	0.62	0.45	0.46	0.45	0.37
Particulate matter (PM)*	(kg)	3,665,877	3,052,329	3,099,049	3,114,139	2,064,622
	(kg/MWh)	0.119	0.100	0.094	0.096	0.056
Volatile organic compound (VOC)	(kg)	454,499	395,904	483,081	399,480	433,989
	(kg/MWh)	0.015	0.013	0.015	0.012	0.012
Mercury (Hg)	(kg)	348.8	304.3	227.8	187.9	109.1
	(kg/MWh)	0.000011	0.000010	0.000007	0.000006	0.000003

\* PM now includes all sources of particulate matter in addition to those with continuous emission monitors.

### Greenhouse gas emissions (carbon dioxide equivalents (CO<sub>2</sub>e)) - electricity generation and purchases (1,000 metric tons)

	2011	2012	2013	2014	2015
Oak Creek Site*	9,709	6,137	7,918	10,196	11,422
Pleasant Prairie Power Plant	7,183	6,290	8,789	7,120	7,569
Purchased power**	4,455	3,092	2,223	5,453	4,533
Weston Generating Station	4,634	3,647	4,523	3,698	3,147
Presque Isle Power Plant	2,607	2,248	2,227	2,255	2,088
Port Washington Generating Station	933	1,918	1,309	1,144	1,776
Columbia Energy Center	2,304	2,504	2,433	1,710	1,624
Fox Energy Center	0	994	615	552	1,224
Valley Power Plant***	1,035	850	875	908	623
J.P. Pulliam Generating Station	1,034	664	1,022	1,016	491
Edgewater Generating Station	570	496	521	507	479
Rothschild Biomass Cogeneration Plant	-	-	52	398	385
Milwaukee County Power Plant	145	139	140	128	121
Paris Generation Station	9	92	24	17	93
Concord Generating Station	18	60	34	39	69
West Marinette	18	44	43	47	66
Germantown Generating Station	7	24	9	14	17
De Pere Energy Center	14	28	16	13	13
<b>Total CO<sub>2</sub>e (1,000 metric tons)</b>	<b>34,675</b>	<b>29,227</b>	<b>32,773</b>	<b>35,215</b>	<b>35,740</b>
<b>System GHG Intensity (metric tons/MWh)</b>	<b>0.72</b>	<b>0.63</b>	<b>0.67</b>	<b>0.73</b>	<b>0.70</b>

\* CO<sub>2</sub>e for Oak Creek Expansion Units was revised to reflect the company's ownership share.

\*\* CO<sub>2</sub>e from purchased power was estimated using regional factor published by the Michigan Public Service Commission.

\*\*\* Conversion of Valley Power Plant from coal to natural gas was completed during 2015.

## Environmental Performance - Water

Water (billion cubic meters)	2011	2012	2013	2014	2015
Withdrawn from major sources	3.58	3.26	3.14	3.21	3.50
Municipal water purchases	0.004	0.004	0.004	0.004	0.004
Returned to source	3.55	3.23	3.11	3.17	3.47
<b>Percent returned to source*</b>	<b>99.2</b>	<b>99.1</b>	<b>99.0</b>	<b>98.8</b>	<b>99.1</b>

\* Most of the water use is once-through cooling.

## Environmental Performance - Land

Combustion products (metric tons)	2011	2012	2013	2014	2015
Combustion products produced	1,090,700	769,300	1,011,950	1,109,400	999,900
Combustion products used	1,101,900	687,200	1,036,100	1,016,700	880,600
<b>Percent used</b>	<b>101</b>	<b>89</b>	<b>102</b>	<b>92</b>	<b>88</b>

### Bottom ash and recovered landfill ash (metric tons)

Coal ash reburn	70,420	45,360	41,600	26,970	14,100
Coal displaced	18,630	10,610	5,780	5,490	3,750

### Hazardous and non-hazardous waste (metric tons)

Hazardous waste generated	18	91	117	929	353
Hazardous waste recycled	5	5	69	6	2
Nonhazardous waste generated	19,615	25,562	16,044	19,719	19,847
Nonhazardous waste recycled	9,160	10,208	7,697	11,561	11,728

**Combustion products** include fly ash, bottom ash, wood ash from the Rothschild Biomass Cogeneration Plant and gypsum produced in the flue gas desulfurization process at coal-fueled power plants. Recovery of some previous landfilled ash products resulted in the use of more combustion products than produced in those years.

**Bottom ash and recovered landfill ash** are burned at some generating facilities to recover energy from unburned carbon in the ash, producing high-quality fly ash used as a product to help meet concrete customer demand.

**Hazardous waste** includes boiler cleaning waste, substation soil, baghouse bags and other items such as aerosol cans. **Nonhazardous waste** includes ferrous and nonferrous scrap metal, used oil, mixed paper, cardboard, plastic, wood and other materials, municipal solid waste and other waste products.

## Environmental Performance - Energy

Electric generation (GWh)	2011	2012	2013	2014	2015
Oak Creek Site*	9,438	5,664	7,566	10,012	11,142
Pleasant Prairie Power Plant	6,152	5,353	7,778	6,231	6,659
Weston Generating Station	4,991	4,027	4,983	4,123	3,609
Presque Isle Power Plant	2,251	1,900	1,888	1,892	1,739
Columbia Energy Center	2,227	2,337	2,320	1,560	1,477
Valley Power Plant**	631	482	457	466	181
Edgewater Generating Station***	557	496	536	526	487
J.P. Pulliam Generating Station	922	596	947	968	422
Milwaukee County Power Plant	28	26	27	25	28
<b>Total coal generation</b>	<b>27,197</b>	<b>20,881</b>	<b>26,502</b>	<b>25,803</b>	<b>25,744</b>
Port Washington Generating Station	2,273	4,962	3,351	2,943	4,744
Fox Energy Center	-	2,893	1,369	1,585	3,543
Valley Power Plant**	-	-	-	77	325
Concord Generating Station	22	80	41	45	86
Paris Generation Station	10	125	29	21	121
Germantown Generating Station	5	24	6	7	14
J.P. Pulliam Generating Station	25	25	31	20	80
West Marinette	21	40	49	37	44
De Pere Energy Center	21	42	24	17	20
Weston Generating Station	6	4	5	1	9
<b>Total natural gas/other generation</b>	<b>2,383</b>	<b>8,195</b>	<b>4,905</b>	<b>4,753</b>	<b>8,986</b>
Rothschild Biomass Cogeneration Plant	-	-	10	67	54
Other renewable energy generation	1,241	1,472	1,636	1,846	1,804
<b>Total electric generation</b>	<b>30,821</b>	<b>30,548</b>	<b>33,053</b>	<b>32,469</b>	<b>36,588</b>
General purchased power	4,526	3,141	2,258	5,540	4,605
Purchased power-nuclear	11,601	11,190	11,762	8,572	8,974
Purchased power-renewable energy	1,237	1,188	1,662	1,525	1,247
<b>Total generated and purchased energy (GWh)</b>	<b>48,185</b>	<b>46,067</b>	<b>48,735</b>	<b>48,106</b>	<b>51,414</b>
<b>Total generated and purchased renewable energy (GWh)</b>	<b>2,478</b>	<b>2,660</b>	<b>3,308</b>	<b>3,438</b>	<b>3,105</b>

\* Energy for Oak Creek Expansion Units was revised to include only the company's ownership share.

\*\* Conversion of Valley Power Plant from coal to natural gas was completed during 2015.

\*\*\* We Energies interest in Edgewater Generating Unit 5 was sold in March 2011.