



Zone 4 overview

Zone 4 includes the Wisconsin counties of:

- ❑ Brown
- ❑ Calumet
- ❑ Dodge (northeast corner)
- ❑ Door
- ❑ Fond du Lac (eastern portion)
- ❑ Manitowoc
- ❑ Marinette (southern portion)
- ❑ Menominee, Mich. (southern portion)
- ❑ Menominee, Wis.
- ❑ Oconto
- ❑ Outagamie
- ❑ Kewaunee
- ❑ Shawano (eastern portion)
- ❑ Sheboygan
- ❑ Winnebago (eastern portion)

The physical boundaries of Zone 4 and transmission facilities located in Zone 4 are shown in [Figure ZS-25](#).

Zone 4 land use is a mix of agricultural, forest and urban.

Major population centers in Zone 4 include Appleton, Green Bay, Fond du Lac, Sheboygan, Marinette/Menominee and Manitowoc.

Zone 4 typically experiences peak electric demands during the summer months, though the northern portion of Zone 4 typically experiences nearly equal summer and winter peaks. Paper mills and foundries in the Green Bay and Appleton metropolitan areas are some of the largest electricity users in the zone.

Demographics

The population of the counties in Zone 4 grew at an annual rate of 0.6 percent from 1998 to 2008. The highest growth rate occurred in Calumet County, while the largest increase in population over the period occurred in Brown County, which increased by 23,600 people.

During the same period, the annual employment growth rate was 1.3 percent. The highest growth rate occurred in Calumet County, while the largest increase in employment occurred in Brown County, which increased by 29,400 people.



Future Population and Employment Projections

Population in Zone 4 is projected to grow annually at 0.9 percent for both the 2008 through 2013 and 2013 through 2018 periods. From 2008 to 2013, Brown County is projected to realize the largest increase in population and the highest growth rate.

Employment in Zone 4 is projected to grow at 1.3 percent annually for both the 2008 and 2013 and 2013 through 2018 periods. From 2008 to 2013, Brown County is projected to realize the largest increase in employment, while Door County is projected to have the highest growth rate.

	1998-2008	2008-2013	2013-2018	1998-2008	2008-2013	2013-2018
Employment	Annual Growth Rate			Increase		
Zone 4	1.31	1.32	1.25	90,971	50,676	50,931
Calumet County	3.58					
Door County		1.74	1.60			
Brown County				29,363	16,806	16,813
Population						
Zone 4	0.63	0.87	0.89	67,101	48,829	52,124
Calumet County	1.25					
Brown County		1.16	1.15	23,634	14,584	15,271

Zone 4 environmental considerations

Zone 4 includes lands in the Southeast Glacial Plains, Central and Northern Lake Michigan Coastal, and Northeast Sands ecological landscape regions.

The area drains towards Lake Michigan via the Milwaukee, Sheboygan, Manitowoc, Twin-Door-Kewaunee, Wolf and Lower Fox drainage basins. Lake Winnebago and the Fox Valley are located in the central part of this zone. The eastern boundary of the zone is formed by the shorelines of Lake Michigan and Green Bay. The Niagara Escarpment runs through the center of the zone and out the Door County Peninsula.

Portions of the Kettle Moraine State Forest and the Horicon National Wildlife Refuge are found in the southern end of the zone. Navarino State Wildlife Area and a segment of the Wolf River, classified as a Federal Wild and Scenic River, are located in the northwest part of the zone. Several Indian reservations are also located in this zone.

Zone 4 electricity demand and generation

The coincident peak load forecasts for Zone 4 for 2009, 2013, 2018 and 2023 are shown in Table ZS-11. Existing generation, along with proposed generation based on projected in-



service year, are also shown. The resultant capacity margins, with or without the proposed generation, are shown as well.

This table shows that load is projected to grow at roughly 1.6 percent annually from 2009 through 2018. Comparing load with generation (at maximum output) within the zone indicates that Zone 4 has more generation than load during peak load periods. Actual operating experience indicates that during lighter load periods, Zone 4 is a net exporter of power.

Zone 4 transmission system issues

Key transmission facilities in Zone 4 include:

- ❑ four 345-kV lines extending from the Kewaunee and Point Beach nuclear units, 138-kV network in the Fox River Valley/Green Bay area,
- ❑ two 345-kV lines extending from the Edgewater Power Plant,
- ❑ the eastern portion of the Rocky Run-North Appleton 345-kV line,
- ❑ 345-kV lines from South Fond du Lac to Columbia, Edgewater and Fitzgerald and
- ❑ a 345-kV line from Fitzgerald to North Appleton.

Key system performance issues in Zone 4 include:

- ❑ heavily loaded and aging 138 and 69-kV facilities in the Green Bay area, north of Green Bay and the Fox River Valley,
- ❑ heavily loaded 69-kV facilities in the Upper Peshtigo area,
- ❑ low voltages and heavily loaded 138/69-kV transformers in the northern Door County area,
- ❑ heavily loaded 138-kV lines west of Green Bay and Appleton,
- ❑ insufficient 138/69-kV transformer capability in the Marinette area,
- ❑ heavily loaded 138- and 69-kV facilities in the Oshkosh area and,
- ❑ the limited import capability of northeast Wisconsin and Michigan's Upper Peninsula, resulting in uneconomic dispatch of generating units.