2013

Wisconsin Energy Statistics

Wisconsin State Energy Office

Acknowledgements

Wisconsin's State Energy Office has produced the annual Wisconsin Energy Statistics publication since 1976. This publication serves as a foundation for evaluating energy activities and trends in Wisconsin.

The Wisconsin State Energy Office relies on many organizations, agencies and private businesses for the information needed to compile the statistics in this report. They include the Wisconsin Division of the American Automobile Association, the U.S. Department of Agriculture/National Agriculture Statistics Service, the U.S. Department of Commerce, and the U.S. Department of Energy / Energy Information Administration, Wisconsin's electric and gas utilities and the Public Service Commission of Wisconsin, the Wisconsin Departments of Administration; Agriculture Trade and Consumer Protection; Commerce; Workforce Development; Natural Resources; Revenue; and Transportation. Publicly-funded programs and private businesses that have contributed data toward this publication include Focus on Energy, landfill and wastewater treatment facilities, railroads, schools, and natural gas pipelines.

Holly Laux O'Higgins and Jim Mapp authored this publication. Design and layout of this publication was created by Kari Hamann Design in Madison, Wisconsin.

Picture 1
The wind turbines are owned and operated by We Energies and are located at Blue Sky Green Field Wind Energy Center in Fond du Lac County. www.we-energies.com/environmental/bluesky_greenfield.htm. The photo is courtesy of We Energies.

Picture 2
Pellets made from biomass represent Wisconsin's biggest opportunity for renewable energy for all economic sectors. Photo courtesy of the Biomass Energy Resource Center.

Picture 3
The photo is of the Kingsford hydroelectric project, located on the Menominee River in Florence County, Wisconsin and Dickinson County, Michigan, with installed capacity of 7,200 kilowatts. Photo courtesy of We Energies.

Picture 4
The United Community Center's (UCC) 13-kilowatt, fixed-rack solar electric system includes more than 70 solar panels on the roof of the main administration building. The panels produce more than 16,000 kilowatt-hours each year. Students of Bruce-Guadalupe Community School at UCC can track energy savings online. The photo is courtesy of UCC.

Picture 5
The grazing cows represent an energy source compliments of Wisconsin's Dairy State status—cow manure. Manure digesters create methane burned to create electricity. Photo courtesy of the Wisconsin Farm Bureau Federation.

Picture 6
The vehicle being refueled with E85 ethanol represents Wisconsin's largest home-grown contribution to renewable transportation fuels. Photo courtesy of the Wisconsin State Energy Office.

This publication is available online at www.stateenergyoffice.wi.gov

2013 Wisconsin Energy Statistics

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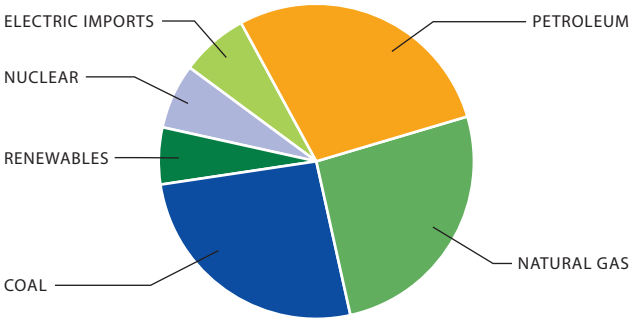
Wisconsin Resource Energy Consumption

Resource energy consumption decreased by 2.7 percent in 2012. Resource energy includes all energy resources used to generate electricity, including the energy content of the coal, petroleum, nuclear and renewable fuels.

TOTAL RESOURCE ENERGY CONSUMPTION: 1,571.4 TRILLION BTU

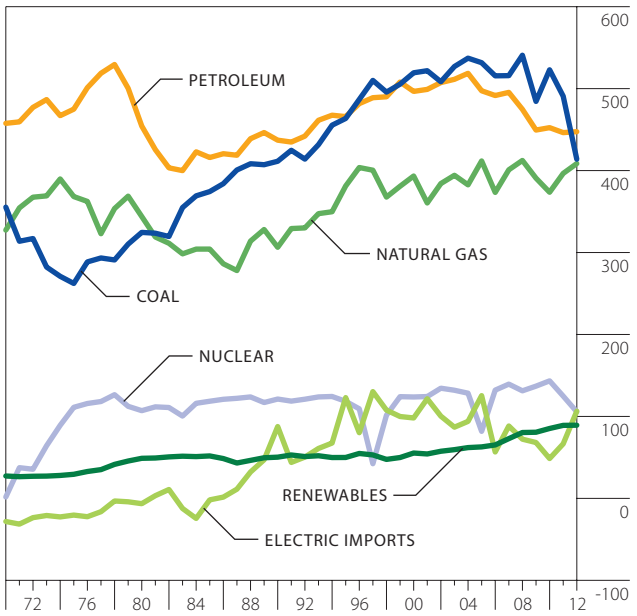
By Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Type of Fuel	2012 Trillions of Btu	2012 Percent of Total
Renewables	89.3	5.7%
Nuclear	105.7	6.7%
Electric Imports	106.4	6.8%
Natural Gas	408.6	26.0%
Coal	413.9	26.3%
Petroleum	447.5	28.5%

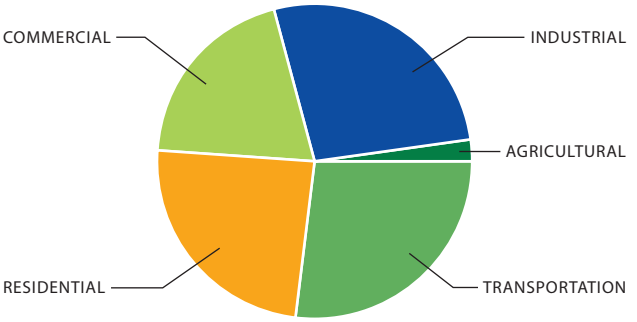
1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

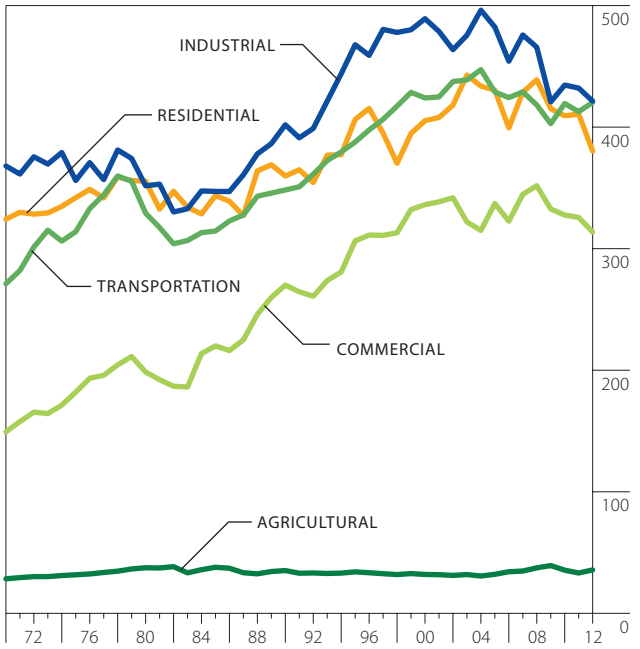
By Economic Sector

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Economic Sector	2012 Trillions of Btu	2012 Percent of Total
Agricultural	35.8	2.3%
Commercial	313.7	20.0%
Residential	380.3	24.2%
Transportation	420.3	26.7%
Industrial	421.4	26.8%

1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

Wisconsin End-Use Energy Consumption

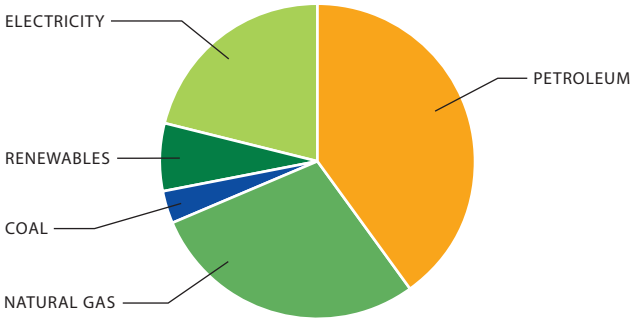
End-use energy decreased by 2.8 percent overall in 2012.

End-use energy is a measure of the energy content of fuels at the point of consumption.

TOTAL END-USE ENERGY CONSUMPTION: 1,114.7 TRILLION BTU

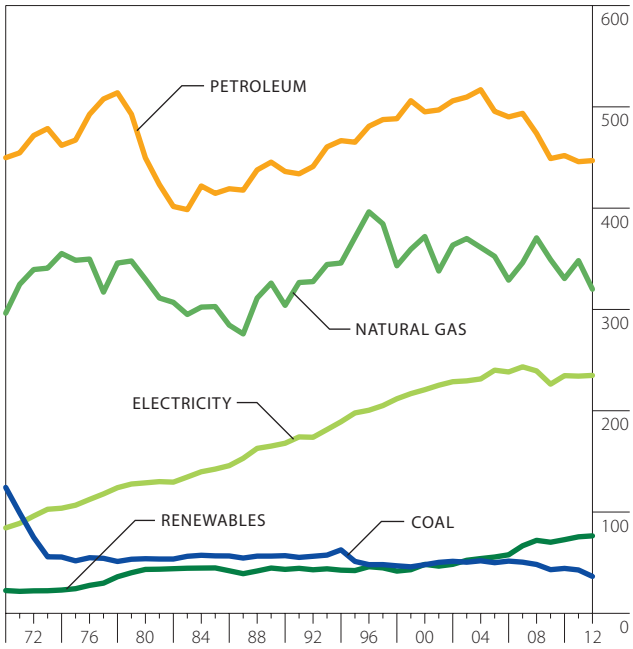
By Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Type of Fuel	2012 Trillions of Btu	2012 Percent of Total
Coal (non-utility)	36.5	3.3%
Renewables	76.5	6.9%
Electricity	234.9	21.1%
Natural Gas	320.0	28.7%
Petroleum	446.9	40.1%

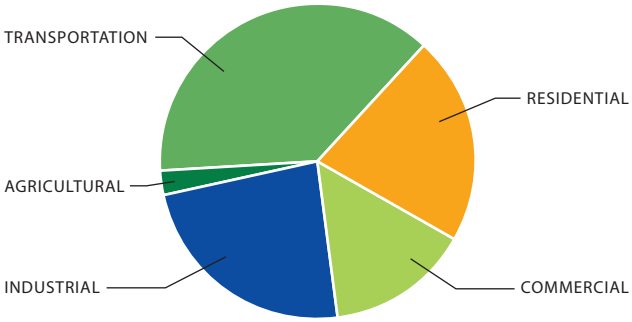
1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

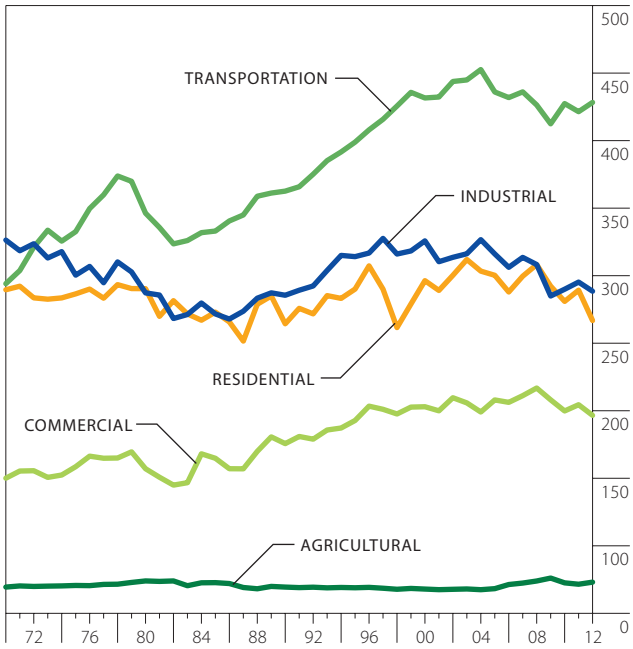
By Economic Sector

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Economic Sector	2012 Trillions of Btu	2012 Percent of Total
Agricultural	25.7	2.3%
Commercial	162.9	14.6%
Residential	240.9	21.6%
Industrial	265.0	23.8%
Transportation	420.3	37.7%

1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

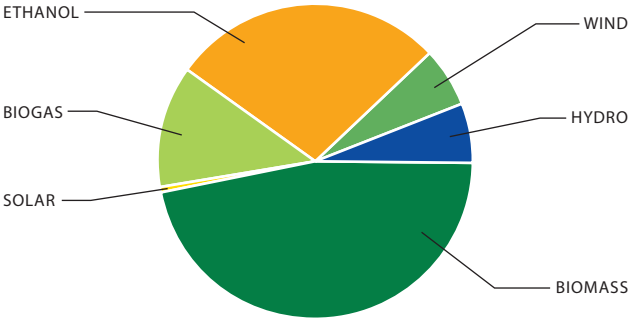
Wisconsin Renewable Energy Production

Overall renewable energy resource use in Wisconsin increased 0.2 percent in 2012.

Renewable energy production includes *all* renewable energy used in Wisconsin for generating electricity and for other applications that displace fossil fuels (e.g., space heating, transportation fuel).

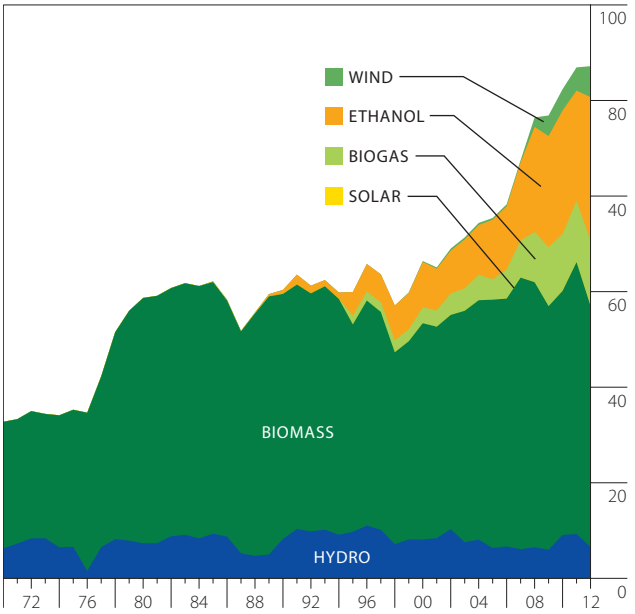
By Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Type of Fuel	2012 Trillions of Btu	2012 Percent of Total
Solar	0.1	0.1%
Wind	5.4	6.1%
Hydro	5.5	6.1%
Biogas	11.2	12.5%
Ethanol	25.1	28.1%
Biomass	42.0	47.1%

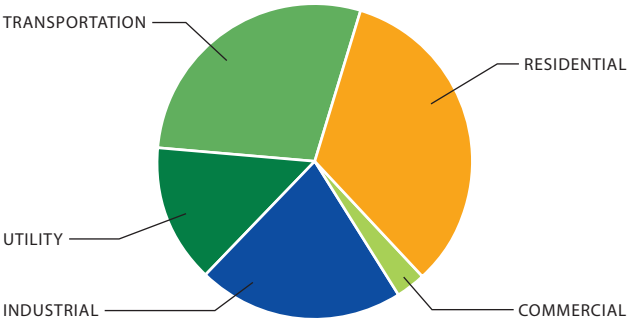
1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

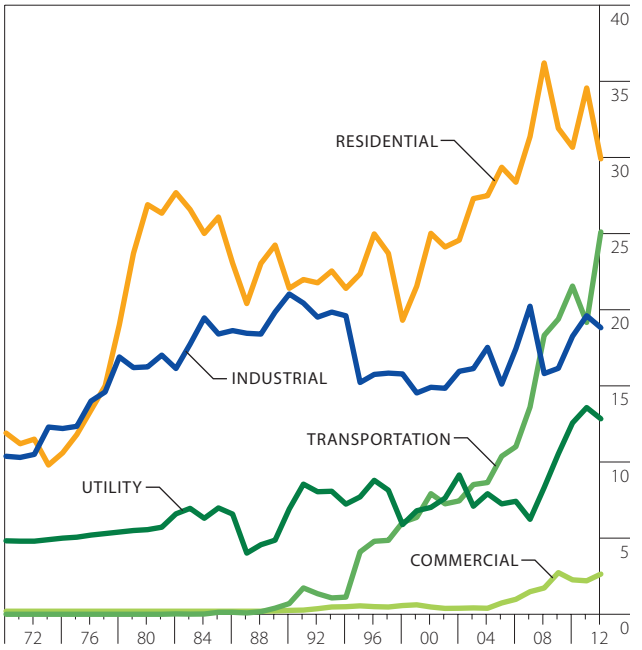
By Economic Sector

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Economic Sector	2012 Trillions of Btu	2012 Percent of Total
Commercial	2.6	3.0%
Utility	12.8	14.4%
Industrial	18.8	21.1%
Transportation	25.1	28.1%
Residential	29.9	33.5%

1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

Wisconsin Renewable Energy Use

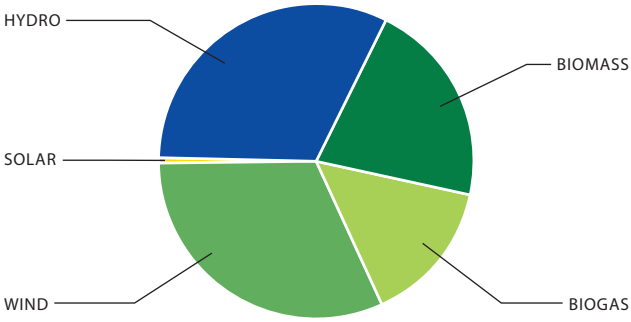
In 2012, Wisconsin's electricity generated from renewable energy sources decreased by 4.8 percent.

Sales of renewable energy comprise 7.3 percent of total electric sales in Wisconsin, a decrease of 5.1 percent over 2011.

Wisconsin is 9th in the nation for biofuels production, thanks to its eight ethanol and four biodiesel production facilities.

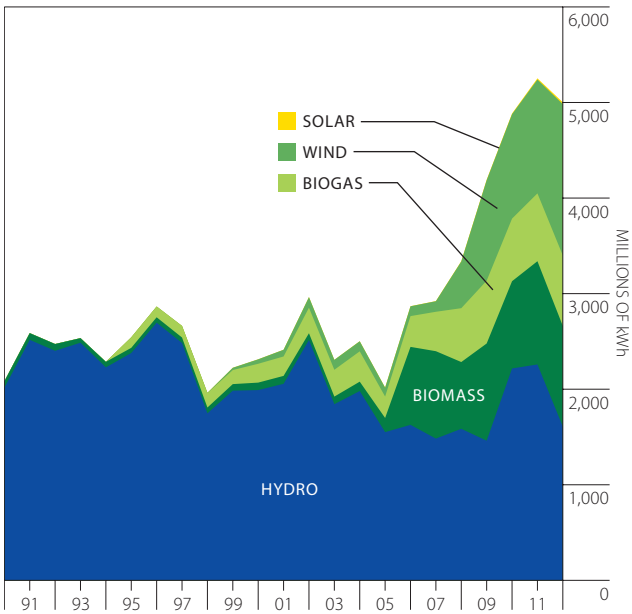
For Electricity Generation

2012 MILLIONS OF kWh AND PERCENT OF TOTAL



Type of Fuel	2012 Millions of kWh	2012 Percent of Total
Solar	19.3	0.4%
Biogas	737.7	14.7%
Biomass	1,053.3	21.1%
Wind	1,583.7	31.7%
Hydro	1,608.2	32.1%

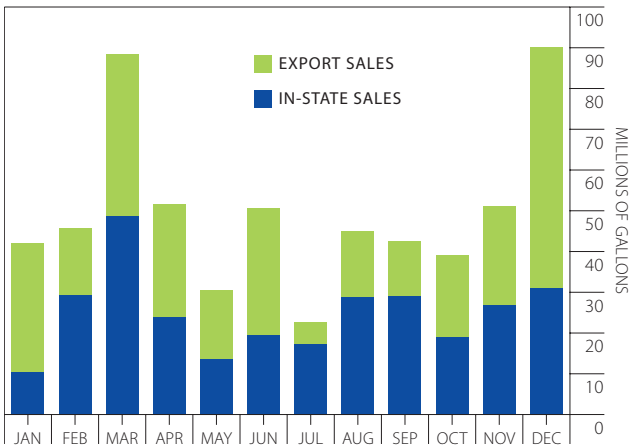
1990-2012 RENEWABLE ENERGY ELECTRICITY GENERATED AND PURCHASED



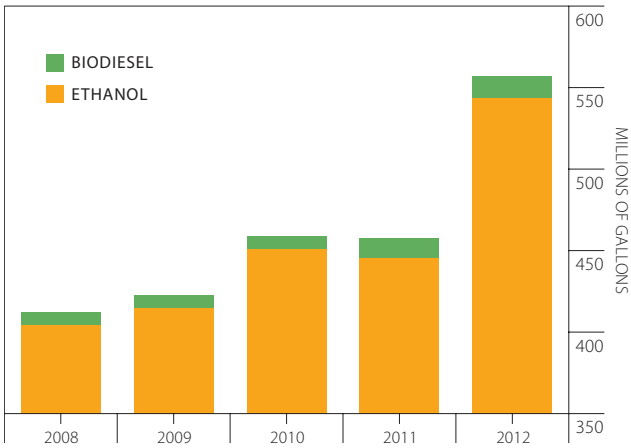
Source: Wisconsin State Energy Office.

For Transportation

2012 ETHANOL SALES BY WISCONSIN PRODUCERS



2008-2012 ETHANOL AND BIODIESEL PRODUCED IN WISCONSIN



Of the 297.5 million gallons of ethanol sold in Wisconsin, 81.2 percent was produced in-state. Wisconsin's biodiesel facilities produced 13.8 million gallons of biodiesel.

Source: Wisconsin State Energy Office.

Wisconsin Residential Energy Use

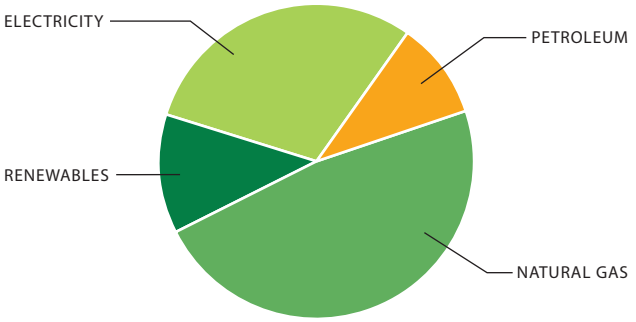
Residential resource energy consumption decreased 7.4 percent while end-use consumption saw a drop of 9.4 percent in 2012.

Natural gas is the dominant fuel used in Wisconsin homes, used primarily for space heating.

Use of natural gas in the residential sector decreased 12.6 percent. Electricity use per customer decreased 0.9 percent.

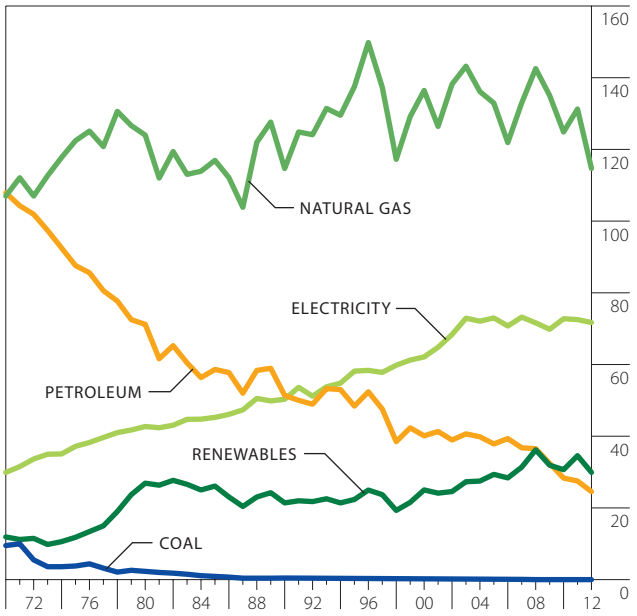
By Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Type of Fuel	2012 Trillions of Btu	2012 Percent of Total
Coal (non-utility)	0.0	0.0%
Petroleum	24.6	10.2%
Renewables[a]	29.9	12.4%
Electricity	71.7	29.8%
Natural Gas	114.7	47.6%

1970-2012 TRILLIONS OF BTU

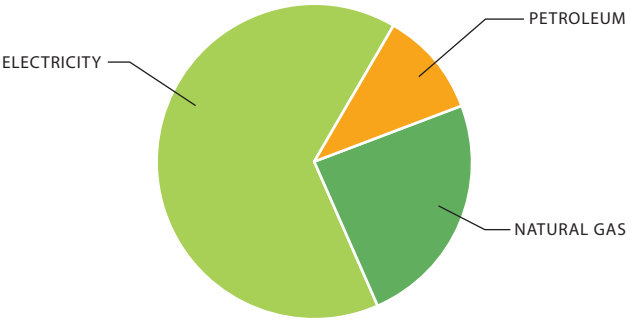


a Renewables includes wood, solar, wind and biogas.

Source: Wisconsin State Energy Office.

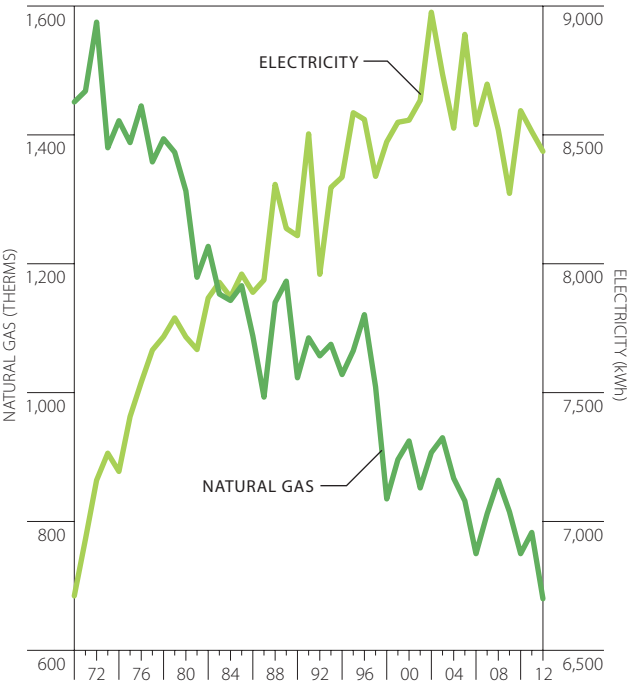
Expenditures and Per Customer Usage

2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL



Type of Fuel	2012 Millions of Dollars	2012 Percent of Total
Petroleum	464.7	10.9%
Natural Gas	1,042.6	24.4%
Electricity	2,772.5	64.8%

1970-2012 ELECTRICITY AND NATURAL GAS USE PER CUSTOMER



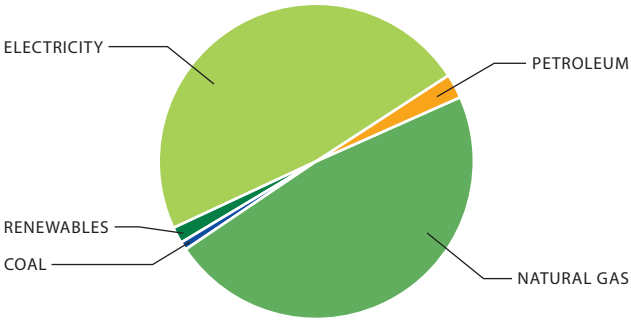
Source: Wisconsin State Energy Office.

Wisconsin Commercial and Industrial Energy Use

Commercial sector end-use energy decreased 5.1 percent, while industrial sector end-use decreased 2.8 percent. In the commercial sector, electricity (47.6 percent) has surpassed natural gas (47.1 percent) as the major energy source, while the industrial sector's primary fuel is natural gas, comprising 47.8 percent of industrial energy consumption.

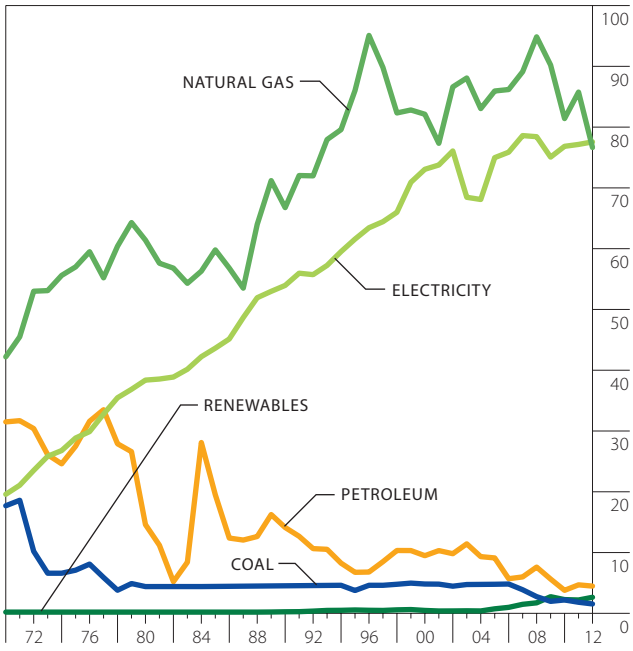
Commercial by Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Type of Fuel	2012 Trillions of Btu	2012 Percent of Total
Coal (non-utility)	1.5	0.9%
Renewables	2.6	1.6%
Petroleum	4.5	2.8%
Natural Gas	76.6	47.1%
Electricity	77.6	47.6%

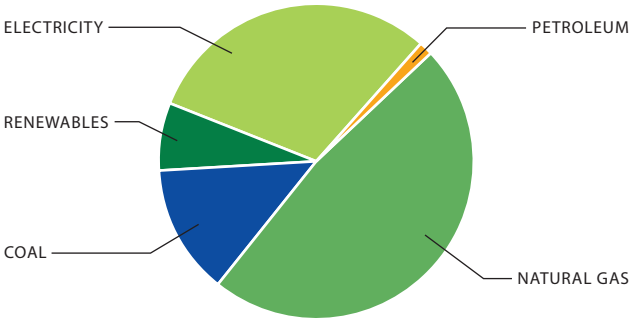
1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

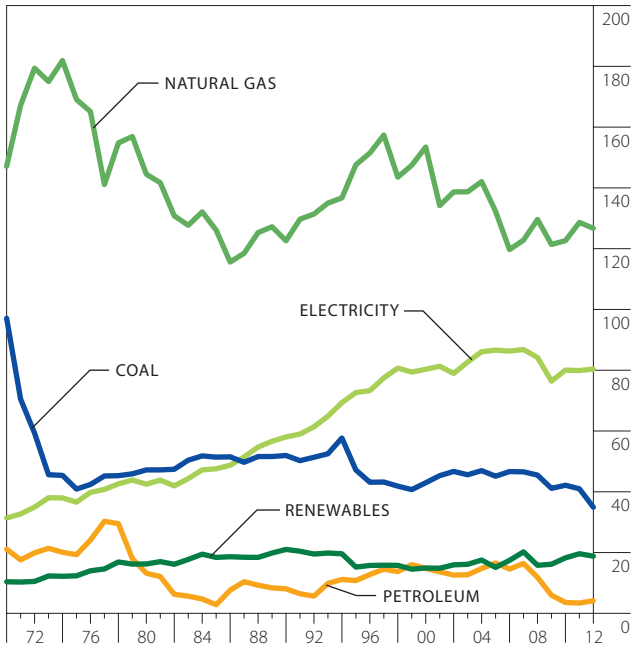
Industrial by Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Type of Fuel	2012 Trillions of Btu	2012 Percent of Total
Petroleum	4.2	1.6%
Renewables	18.8	7.1%
Coal (non-utility)	34.9	13.2%
Electricity	80.4	30.3%
Natural Gas	126.7	47.8%

1970-2012 TRILLIONS OF BTU



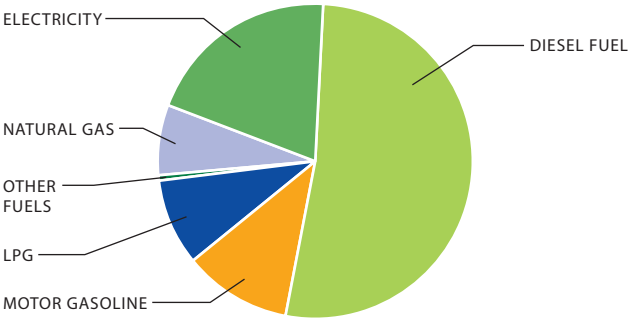
Source: Wisconsin State Energy Office.

Wisconsin Agricultural and Transportation Energy Use

Agricultural end-use petroleum consumption increased 11.0 percent in 2012, while overall end use increased by 7.1 percent. Electricity use increased by 12.5 percent. Using 2012 dollars, the real, average statewide price of gasoline increased by $0.032 a gallon (0.9 percent), to $3.624 a gallon.

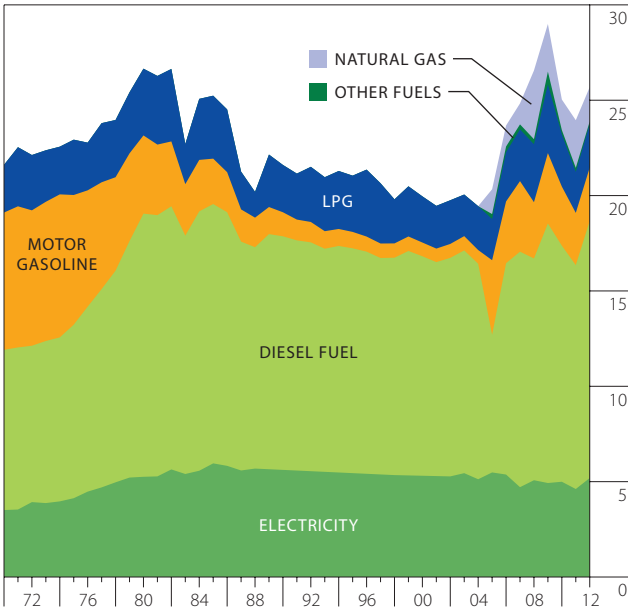
Agricultural by Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Type of Fuel	2012 Trillions of Btu	2012 Percent of Total
Other Fuels	0.1	0.5%
Natural Gas	1.8	7.0%
LPG	2.3	8.9%
Motor Gasoline	2.8	10.9%
Electricity	5.2	20.2%
Diesel Fuel	13.5	52.5%

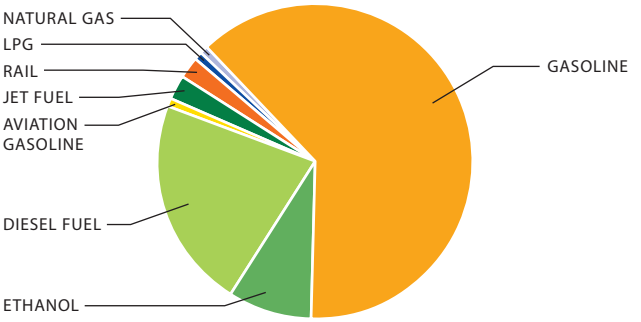
1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

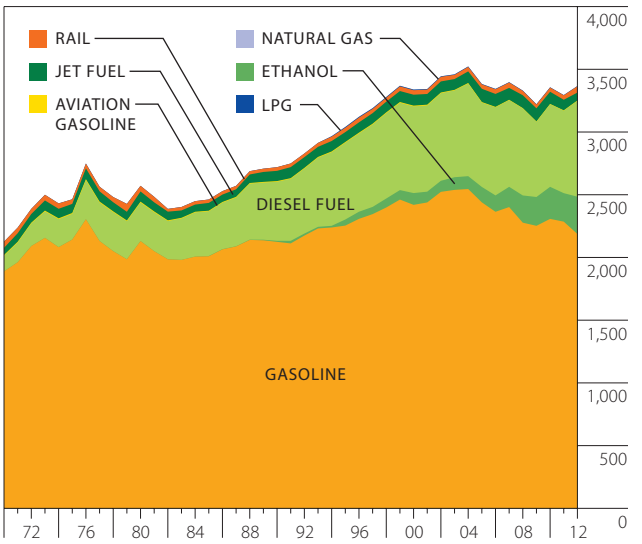
Transportation by Type of Fuel

2012 MILLIONS OF GALLONS AND PERCENT OF TOTAL



Type of Fuel	2012 Millions of Gallons	2012 Percent of Total
Natural Gas	1.5	0.045%
LPG	1.6	0.048%
Aviation Gasoline	3.2	0.1%
Rail	50.2	1.5%
Jet Fuel	62.8	1.9%
Ethanol	297.5	8.8%
Diesel Fuel	764.1	22.7%
Gasoline	2,186.9	64.9%

1970-2012 MILLIONS OF GALLONS



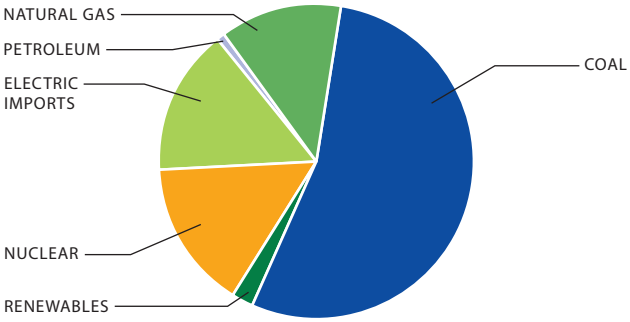
Source: Wisconsin State Energy Office.

Wisconsin Energy Use for Electricity Generation and Electric Utility Sales

Wisconsin's energy use for electric generation decreased by 1.5 percent in 2012, while total electricity sales increased 0.3 percent despite slight decreases in electricity sales in the residential sector. Sales to commercial, industrial and agricultural customers increased.

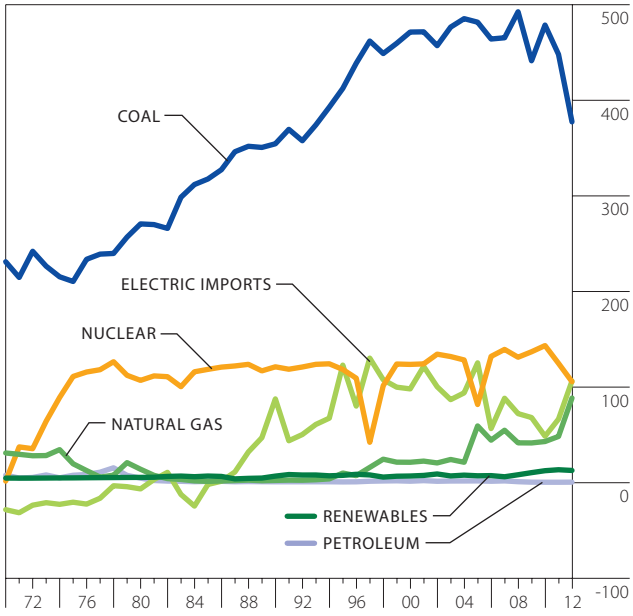
Energy Use for Electricity Generation by Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



Type of Fuel	2012 Trillions of Btu	2012 Percent of Total
Petroleum	0.6	0.1%
Renewables	12.8	1.9%
Natural Gas	88.6	12.8%
Nuclear	105.7	15.3%
Electric Imports	106.4	15.4%
Coal	377.5	54.6%

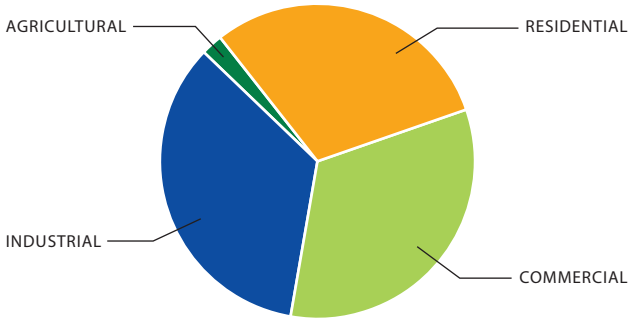
1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

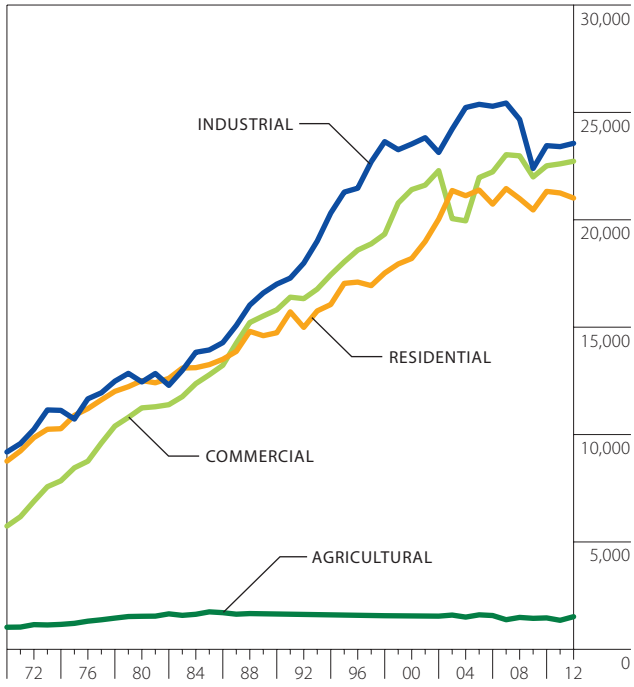
Electric Utility Sales by Economic Sector

2012 MILLIONS OF kWh AND PERCENT OF TOTAL



Economic Sector	2012 Millions of kWh	2012 Percent of Total
Agricultural	1,520	2.2%
Residential	21,012	30.5%
Commercial	22,727	33.0%
Industrial	23,561	34.2%

1970-2012 MILLIONS OF kWh



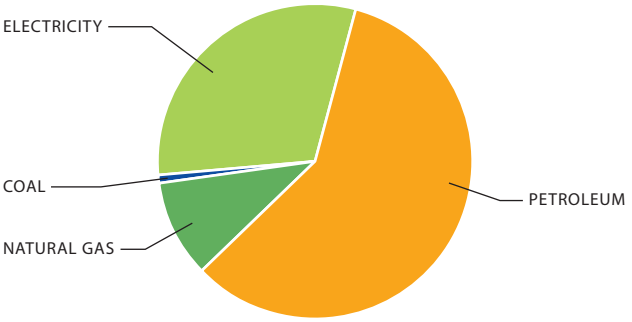
Source: Wisconsin State Energy Office.

Wisconsin End-Use Energy Expenditures

In 2012, Wisconsin's overall energy bill increased by $74.7 million (0.3 percent) from 2011. Expenditures decreased for all sectors, except agriculture and transportation. Expenditures for electricity and petroleum saw small increases, while expenditures on natural gas and coal declined. Since 2000, Wisconsin's total energy expenditures increased by $11.2 billion (93.4 percent increase).

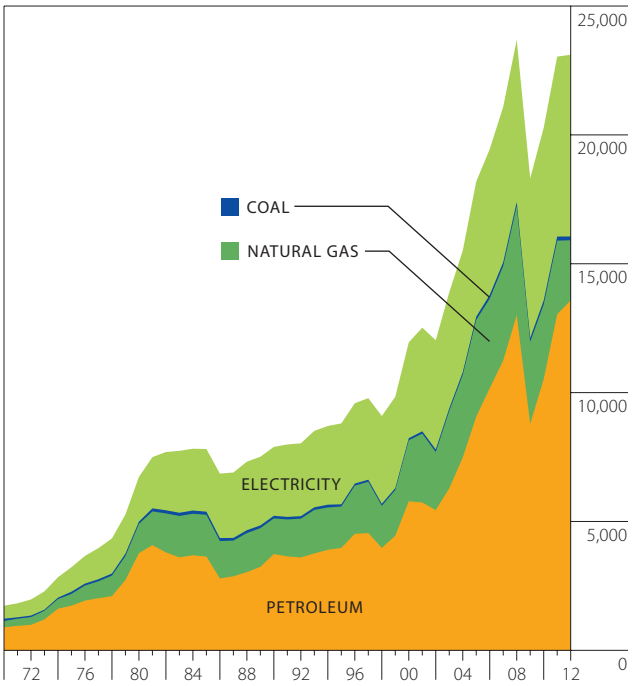
By Type of Fuel

2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL



Type of Fuel	2012 Millions of Dollars	2012 Percent of Total
Coal (non-utility)	146.6	0.6%
Natural Gas	2,332.1	10.1%
Electricity	7,052.6	30.5%
Petroleum	13,579.8	58.8%

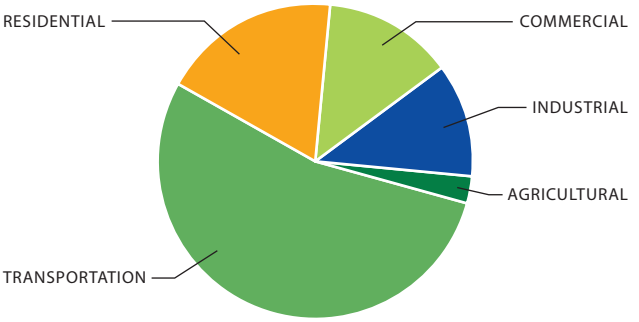
1970-2012 MILLIONS OF DOLLARS



Source: Wisconsin State Energy Office.

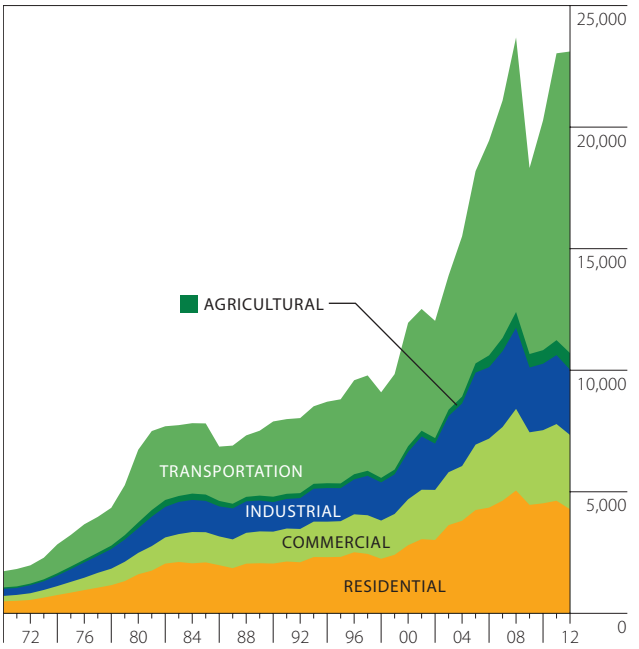
By Economic Sector

2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL



Economic Sector	2012 Millions of Dollars	2012 Percent of Total
Agricultural	681.4	2.9%
Industrial	2,687.2	11.6%
Commercial	3,056.6	13.2%
Residential	4,279.7	18.5%
Transportation	12,406.1	53.7%

1970-2012 MILLIONS OF DOLLARS



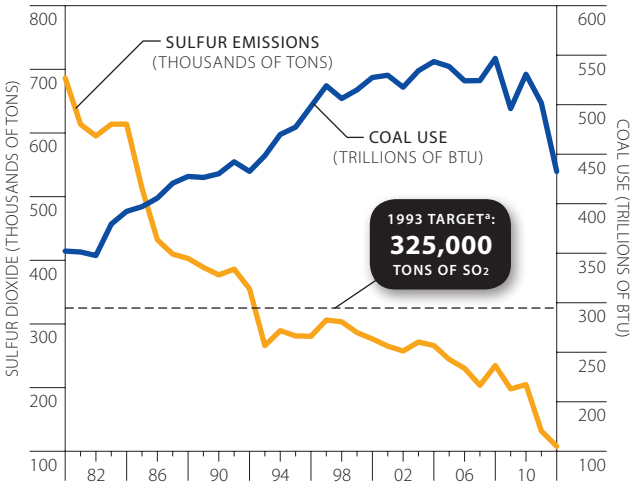
Source: Wisconsin State Energy Office.

Wisconsin Emissions

Future decreases in total emissions will depend on growth in coal-fired generation, old plant retirement, the effectiveness of future energy efficiency efforts, increased use of natural gas and renewable energy, and the disposition of proposed U.S. EPA rules. SO_2 and NOX emissions are pollutants and are measured for air quality monitoring. CO_2 is a greenhouse gas which contributes to climate change.

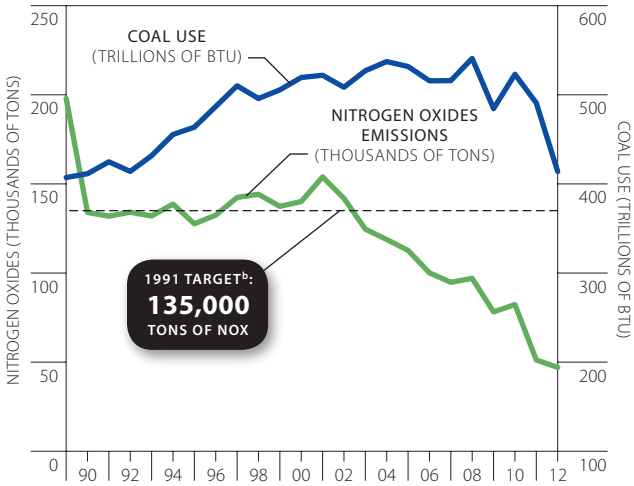
Sulfur Dioxide Emissions and Coal Use

1980-2012



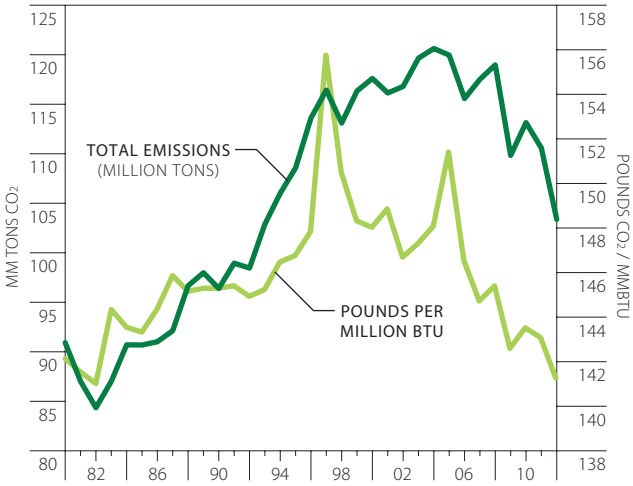
Nitrogen Oxides Emissions and Coal Use

1989-2012



Carbon Dioxide Emissions from Energy Use

1980-2012[c]



Utility Sulfur Dioxide Emissions

decreased 33.0 percent from 2011 to 2012.

Wisconsin CO_2 Emissions from Energy

decreased 6.5 percent in 2012.

Since 1990 total CO_2 emissions have increased 7.4 percent.

Utility Nitrogen Oxides Emissions

decreased 24.4 percent from 2011 to 2012.

a 1993 target established in Wisconsin Statutes, 285.45(2)(a). http://www.legis.state.wi.us/statutes/Stat0285.pdf. Target is for all major utilities and large sources.

b 1991 target established in Wisconsin Statutes, 285.47(2). http://www.legis.state.wi.us/statutes/Stat0285.pdf. Target is for all major utilities.

c Does not include electric imports.

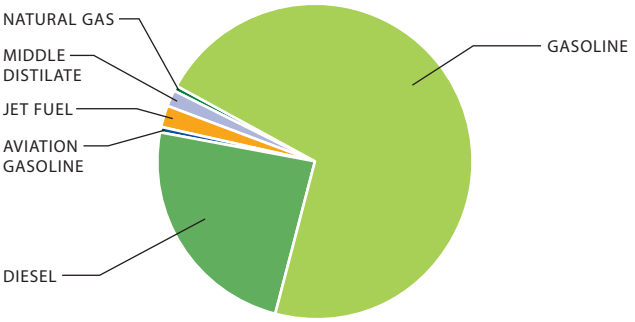
Source: Wisconsin State Energy Office.

Transportation and Heating Fuels

Wisconsinites spent $12.4 billion on transportation in 2012, an increase of 5.1 percent, or $606.6 million, over 2011. The increase in expenditures is due primarily to an increase in prices. Of the $4.3 billion of residential energy spending, about $1.5 billion (35 percent) pays for natural gas and petroleum for space heating.

Transportation Expenditures

2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL

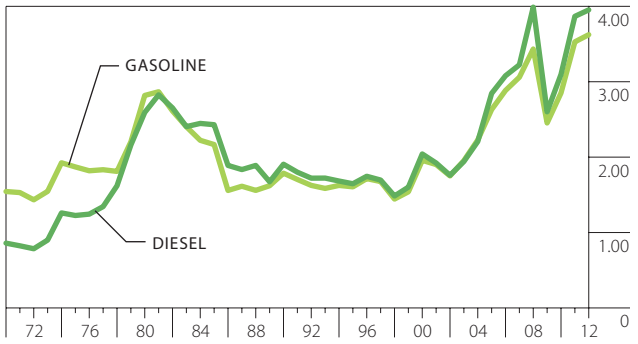


Type of Fuel	2012 Millions of Dollars	2012 Percent of Total
Natural Gas	2.8	0.02%
Aviaton Gasoline	13.3	0.1%
Middle Distillate	172.1	1.4%
Jet Fuel	202.0	1.6%
Diesel	3,012.4	24.3%
Gasoline[a]	9,003.5	72.6%

Transportation Fuel Prices

Type of Fuel	2011 Price Per Gallon[b,c]	2012 Price Per Gallon[b,c]
Gasoline	$3.529	$3.624
Diesel	$3.867	$3.953

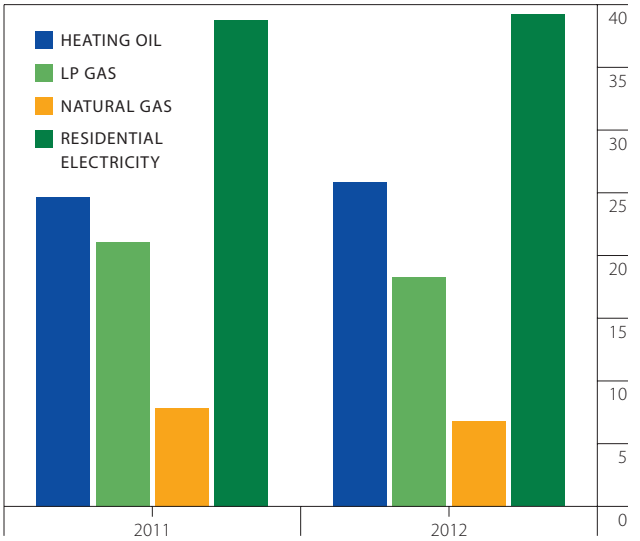
1970-2012 DOLLARS PER GALLON[b,c]



Heating Fuels Prices

Fuel	% Change	2011 Price[d]	2012 Price[d]
Heating Oil	▲ 4.6%	$3.42 per gallon	$3.58 per gallon
LP Gas	▼ 17.0%	$2.01 per gallon	$1.67 per gallon
Natural Gas	▼ 13.0%	$7.85 per MMBtu	$6.83 per MMBtu
Residential Electricity	▲ 1.0%	$0.132 per kWh	$0.134 per kWh

2011-2012 DOLLARS PER MILLION BTU



Prices for residential fuels are updated once a week in the winter (October to March) and once a month in the summer (April to September) and are posted on the SEO webpage. Visit www.stateenergyoffice.wi.gov and click on Statistics/Tables and Heating Fuels.

a Includes ethanol.

b From the American Automobile Association, Daily Fuel Gauge Report. http://www.fuelgaugereport.aaa.com/

c Prices are in 2012 dollars.

d All prices are statewide averages for the calendar year. Heating fuel and LP rates are gathered from fuel retailers across the state as part of an SEO telephone survey funded by the U.S. Department of Energy. Electricity price averages are compiled from rates reported to the Public Service Commission of Wisconsin. Natural gas rates are compiled from residential rates reported by Wisconsin's natural gas utilities.

Source: Wisconsin State Energy Office.

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CHAPTER 1

Total Energy Use

There are two common ways to account for energy use:

resource energy consumption and

end-use energy consumption.

End use refers to the energy content of electricity and other fuels at the point of use by customers. **Resource energy** includes all energy resources used to generate electricity, including the energy content of the coal, petroleum, nuclear and renewable fuels. Resource energy also includes the energy used to produce the electricity imported into Wisconsin from other states and Canada. Because about 70 percent of the energy used to generate and distribute electricity to its point of use is lost as waste heat, resource consumption figures are greater than end use consumption figures.

As generation from coal decreases, generation from natural gas increases, and petroleum continues to be the primary transportation fuel in the state, each of these fuels represents approximately one-quarter of the state's resource energy use: natural gas, 26.0 percent; coal, 26.3 percent; and petroleum, 28.5 percent.

The balance of resource energy fuels in Wisconsin are: renewables (5.7 percent), nuclear energy (6.7 percent) and imported electricity (6.8 percent).

In 2012, renewables increased by 0.2 percent. This category includes hydroelectric generation, solar (photovoltaic and solar thermal), biomass (e.g., wood and wood by-products), biogas (e.g., agricultural manure digesters, landfill gas), and wind.

Nuclear power in Wisconsin is no longer owned by utilities, but by independent power producers who sell the power to customers in Wisconsin.

In general, the residential (24.2 percent), industrial (26.8 percent) and transportation (26.7 percent) sectors each account for about one-quarter of Wisconsin's resource energy consumption.. The commercial and agricultural sectors account for 20.0 percent and 2.3 percent, respectively.

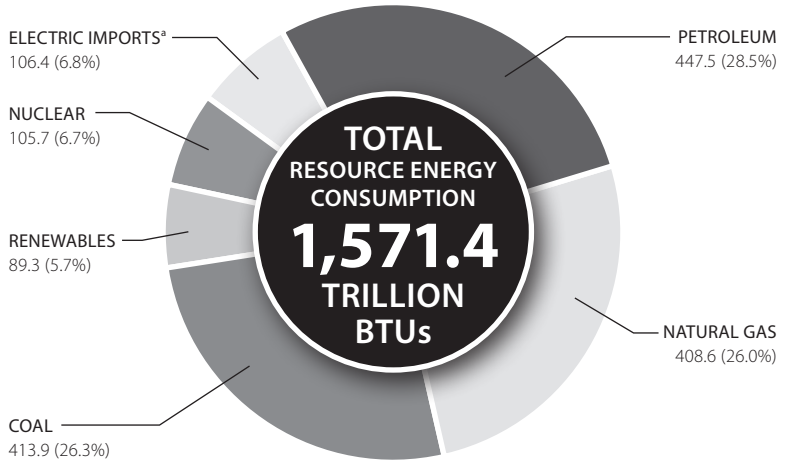
In 2012, end-use energy consumption decreased in all sectors except transportation and agriculture. The residential sector saw a 9.4 percent decrease, the commercial sector a 5.1 percent decrease, and the industrial sector, a decrease of 2.8 percent. End-use consumption increased by 7.2 and 1.8 percent for the agriculture and transportation sectors respectively.

RESOURCE Energy Consumption	2012	Percent of Wisconsin's Resource Energy Consumption
Resource Energy Consumption	↓ 2.7% overall	
BY FUEL		
Coal Consumption, Utilities	↓ 15.7%	26.3%
Petroleum Consumption	↑ 0.3%	28.5%
Natural Gas Consumption	↑ 3.0%	26.0%
Electricity Imports	↑ 59.9%	6.8%
Renewables	↑ 0.2%	5.7%
BY ECONOMIC SECTOR		
Transportation	↑ 1.9%	26.7%
Industrial	↓ 2.5%	26.8%
Residential	↓ 7.4%	24.2%
Commercial	↓ 3.7%	20.0%
Agricultural	↑ 7.8%	2.3%

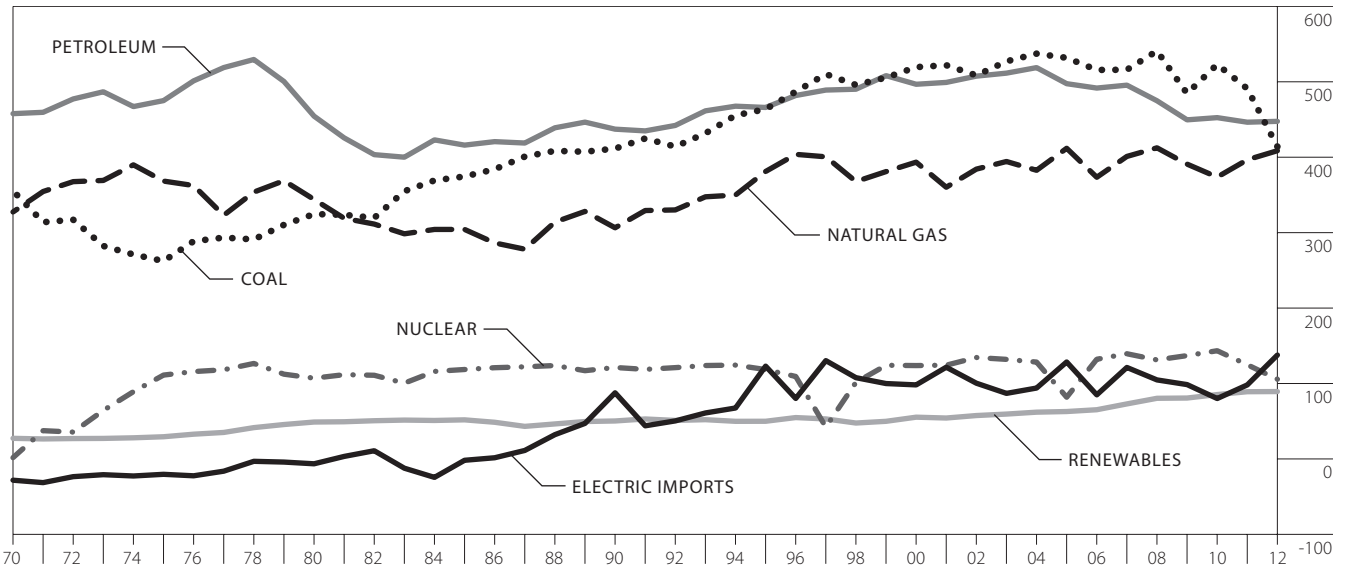
END-USE Energy Consumption	2012	Percent of Wisconsin's End-Use Energy Consumption
End-Use Energy Consumption	↓ 2.8% overall	
BY FUEL		
Petroleum Consumption	↑ 0.2%	40.1%
Natural Gas Consumption	↓ 8.1%	28.7%
Electricity Consumption	↑ 0.3%	21.1%
Renewables Consumption	↑ 1.2%	6.9%
Coal Consumption, Non-Utilities	↓ 14.8%	3.3%
BY ECONOMIC SECTOR		
Transportation	↑ 1.8%	37.7%
Industrial	↓ 2.8%	23.8%
Residential	↓ 9.4%	21.6%
Commercial	↓ 5.1%	14.6%
Agricultural	↑ 7.2%	2.3%

Wisconsin Resource Energy Consumption, by Type of Fuel

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



1970-2012 TRILLIONS OF BTU



a "Electric imports" is the estimated resource energy used in other states or Canada to produce the electricity imported into Wisconsin. This resource energy is estimated assuming 11,300 Btu of resource energy per kWh imported into Wisconsin. Values below the "0" indicate that resource energy was used in Wisconsin to produce electricity that was exported out of state.

Source: Wisconsin State Energy Office

Wisconsin Resource Energy Consumption, by Type of Fuel

RESOURCE ENERGY CONSUMPTION 2.7%

Resource energy consumption decreased 2.7 percent in 2012. Petroleum use increased 0.3 percent; natural gas, increased 3.0 percent; coal, decreased 15.7 percent; and renewables increased 0.2 percent.

1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal[a]		Renewables[b]		Nuclear[d]		Electric Imports[c]		Total
1970[r]	457.7	*40.1%*	327.4	*28.7%*	355.4	*31.1%*	27.3	*2.4%*	1.7	*0.1%*	-28.2	*-2.5%*	1,141.3
1975[r]	475.0	*38.8%*	368.3	*30.0%*	262.3	*21.4%*	29.4	*2.4%*	111.2	*9.1%*	-20.4	*-1.7%*	1,225.8
1980[r]	454.4	*35.7%*	344.0	*27.0%*	324.6	*25.5%*	48.9	*3.8%*	107.0	*8.4%*	-6.5	*-0.5%*	1,272.5
1985[r]	416.0	*32.9%*	304.2	*24.1%*	374.4	*29.6%*	51.8	*4.1%*	118.6	*9.4%*	-1.8	*-0.1%*	1,263.2
1990[r]	437.2	*30.9%*	306.4	*21.7%*	411.4	*29.1%*	50.3	*3.6%*	121.2	*8.6%*	87.7	*6.2%*	1,414.2
1995[r]	465.9	*29.1%*	381.1	*23.8%*	463.7	*28.9%*	49.9	*3.1%*	118.5	*7.4%*	123.0	*7.7%*	1,602.1
1996[r]	481.8	*29.8%*	403.8	*25.0%*	486.9	*30.1%*	54.8	*3.4%*	109.3	*6.8%*	80.2	*5.0%*	1,616.7
1997[r]	489.0	*30.1%*	400.5	*24.6%*	510.1	*31.4%*	53.0	*3.3%*	42.3	*2.6%*	130.3	*8.0%*	1,625.3
1998[r]	490.1	*30.4%*	367.7	*22.8%*	495.8	*30.8%*	47.6	*3.0%*	101.5	*6.3%*	107.7	*6.7%*	1,610.4
1999[r]	508.1	*30.5%*	380.9	*22.8%*	505.5	*30.3%*	49.9	*3.0%*	124.1	*7.4%*	99.9	*6.0%*	1,668.4
2000[r]	496.7	*29.4%*	393.4	*23.3%*	519.4	*30.8%*	55.3	*3.3%*	123.8	*7.3%*	98.1	*5.8%*	1,686.7
2001[r]	499.1	*29.7%*	360.2	*21.4%*	521.9	*31.0%*	54.2	*3.2%*	124.3	*7.4%*	121.6	*7.2%*	1,681.3
2002[r]	507.4	*30.0%*	384.2	*22.7%*	508.5	*30.0%*	57.5	*3.4%*	134.4	*7.9%*	100.4	*5.9%*	1,692.5
2003[r]	511.4	*29.9%*	394.3	*23.0%*	527.0	*30.8%*	59.5	*3.5%*	132.0	*7.7%*	86.9	*5.1%*	1,711.1
2004[r]	518.7	*30.1%*	382.6	*22.2%*	537.2	*31.2%*	62.0	*3.6%*	128.4	*7.5%*	94.0	*5.5%*	1,723.0
2005[r]	497.4	*29.1%*	411.8	*24.0%*	531.7	*31.1%*	62.8	*3.7%*	81.8	*4.8%*	125.4	*7.3%*	1,711.0
2006[r]	491.6	*30.1%*	373.4	*22.8%*	515.7	*31.6%*	65.2	*4.0%*	132.1	*8.1%*	56.6	*3.5%*	1,634.7
2007[r]	495.5	*28.9%*	401.0	*23.4%*	515.9	*30.1%*	72.9	*4.3%*	139.4	*8.1%*	88.3	*5.2%*	1,713.1
2008[r]	474.8	*27.8%*	412.4	*23.9%*	540.8	*31.7%*	80.4	*4.7%*	131.3	*7.7%*	72.3	*4.2%*	1,711.9
2009[r]	449.5	*28.0%*	390.8	*24.1%*	484.5	*30.1%*	80.7	*5.0%*	137.0	*8.5%*	68.2	*4.2%*	1,610.6
2010[r]	452.4	*27.8%*	373.6	*22.9%*	523.0	*32.2%*	85.3	*5.2%*	143.4	*8.8%*	48.6	*3.0%*	1,626.4
2011[r]	446.4	*27.7%*	396.6	*24.4%*	490.8	*30.5%*	89.1	*5.5%*	124.8	*7.7%*	66.5	*4.1%*	1,614.3
2012[p]	**447.5**	***28.5%***	**408.6**	***25.9%***	**413.9**	***26.4%***	**89.3**	***5.7%***	**105.7**	***6.7%***	**106.4**	***6.8%***	**1,571.4**

a Including petroleum coke.

b Renewables includes solar, wind, wood, biogas, biomass, ethanol and hydroelectric.

c Electric imports are the estimated resource energy used in other states or Canada to produce the electricity imported into Wisconsin. This resource energy is estimated assuming 11,300 Btu of resource energy per kWh imported into Wisconsin. Negative percentages indicate that resource energy was used in Wisconsin to produce electricity that was exported out of state.

d Nuclear energy reported here is from power plants formerly owned by Wisconsin utilities and currently owned by independent power producers.

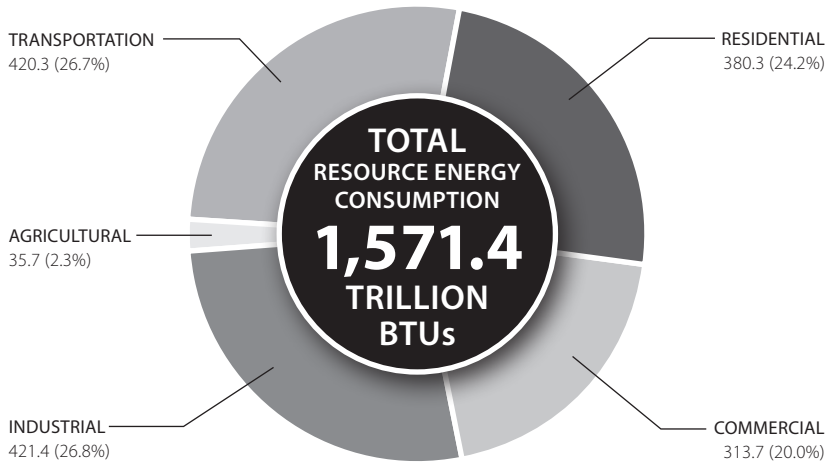
p Preliminary estimates.

r Revised due to revisions in contributing tables.

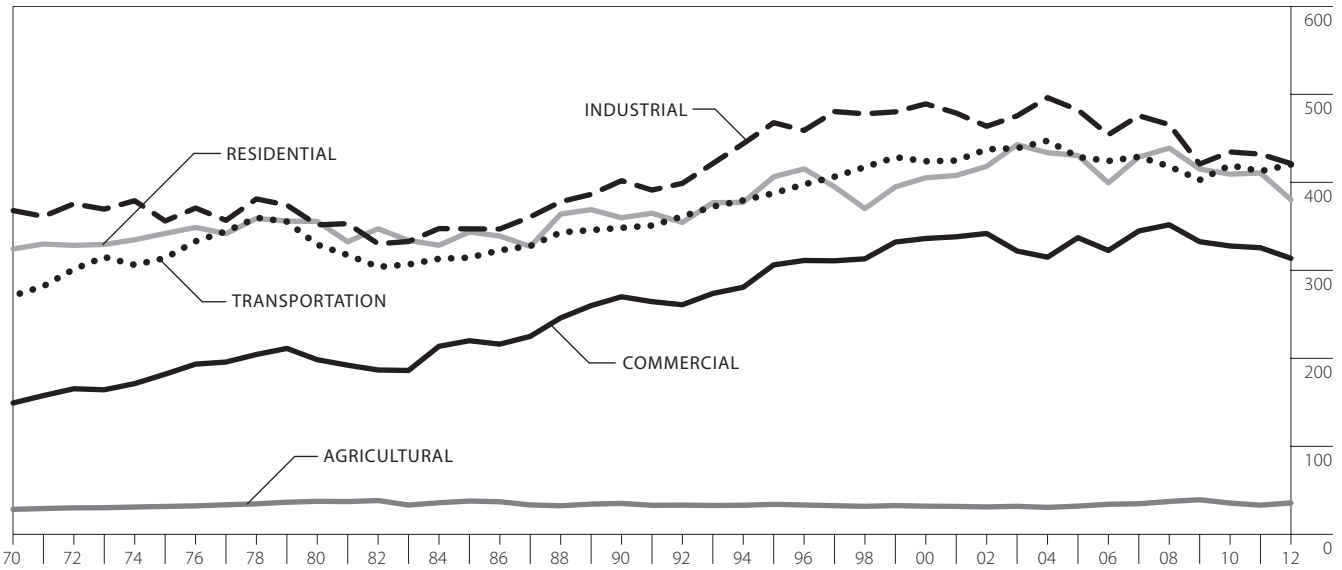
Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewable resources and electricity use, by economic sector, and for Wisconsin electric utility energy use.

Wisconsin Resource Energy Consumption, by Economic Sector

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

Wisconsin Resource Energy Consumption, by Economic Sector

RESOURCE ENERGY CONSUMPTION 2.7%

Total resource energy consumption decreased 2.7 percent in 2012. The transportation and agricultural sectors saw increases of 1.9 and 7.8 percent, respectively. Other sectors saw decreases of 7.4 percent (residential), 3.7 percent (commercial) and 2.5 percent (industrial).

1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Agricultural[a]		Transportation		Total
1970[r]	324.3	*28.4%*	149.3	*13.1%*	368.0	*32.2%*	28.4	*2.5%*	271.2	*23.8%*	1,141.3
1975[r]	341.9	*27.9%*	182.0	*14.9%*	356.1	*29.1%*	31.7	*2.6%*	314.0	*25.6%*	1,225.8
1980[r]	355.6	*27.9%*	198.5	*15.6%*	351.7	*27.6%*	37.5	*2.9%*	329.2	*25.9%*	1,272.5
1985[r]	343.7	*27.2%*	220.0	*17.4%*	347.1	*27.5%*	37.9	*3.0%*	314.5	*24.9%*	1,263.2
1990[r]	359.8	*25.4%*	270.0	*19.1%*	401.9	*28.4%*	35.2	*2.5%*	348.3	*24.6%*	1,415.2
1995[r]	406.3	*25.4%*	306.4	*19.1%*	467.8	*29.2%*	34.1	*2.1%*	387.7	*24.2%*	1,602.2
1996[r]	415.4	*25.9%*	311.2	*19.4%*	459.0	*28.6%*	33.4	*2.1%*	397.7	*24.8%*	1,616.7
1997[r]	395.0	*24.7%*	310.9	*19.4%*	480.4	*30.0%*	32.6	*2.0%*	406.4	*25.4%*	1,625.3
1998[r]	370.2	*23.1%*	313.1	*19.5%*	477.9	*29.8%*	31.9	*2.0%*	417.3	*26.0%*	1,610.4
1999[r]	394.8	*24.6%*	332.2	*20.7%*	480.1	*30.0%*	32.7	*2.0%*	428.6	*26.7%*	1,668.4
2000[r]	405.3	*25.3%*	336.2	*21.0%*	489.2	*30.5%*	32.0	*2.0%*	424.0	*26.5%*	1,686.7
2001[r]	407.9	*25.5%*	338.5	*21.1%*	478.7	*29.9%*	31.8	*2.0%*	424.8	*26.5%*	1,681.6
2002[r]	418.1	*26.1%*	341.9	*21.3%*	463.7	*28.9%*	31.2	*1.9%*	437.5	*27.3%*	1,692.4
2003[r]	442.8	*27.6%*	322.0	*20.1%*	475.6	*29.7%*	31.9	*2.0%*	438.8	*27.4%*	1,711.1
2004[r]	433.7	*27.1%*	315.0	*19.7%*	496.2	*31.0%*	30.7	*1.9%*	447.3	*27.9%*	1,723.0
2005[r]	430.5	*26.9%*	337.2	*21.0%*	482.3	*30.1%*	32.1	*2.0%*	428.9	*26.8%*	1,711.0
2006[r]	399.4	*24.9%*	322.6	*20.1%*	454.2	*28.3%*	34.2	*2.1%*	424.3	*26.5%*	1,634.7
2007[r]	428.7	*26.8%*	344.7	*21.5%*	475.8	*29.7%*	34.8	*2.2%*	429.0	*26.8%*	1,713.1
2008[r]	438.9	*27.4%*	351.8	*22.0%*	465.7	*29.1%*	37.4	*2.3%*	418.2	*26.1%*	1,711.9
2009[r]	415.2	*25.9%*	332.6	*20.8%*	420.8	*26.3%*	39.3	*2.5%*	402.8	*25.1%*	1,610.6
2010[r]	409.3	*25.5%*	327.7	*20.5%*	434.6	*27.1%*	35.5	*2.2%*	419.4	*26.2%*	1,626.5
2011[r]	410.7	*25.6%*	325.7	*20.3%*	432.1	*27.0%*	33.2	*2.1%*	412.7	*25.8%*	1,614.3
2012[p]	**380.3**	***23.7%***	**313.7**	***19.6%***	**421.4**	***26.3%***	**35.7**	***2.2%***	**420.3**	***26.2%***	**1,571.4**

a Beginning in 2005, the Wisconsin SEO discontinued a per-acre approach to gathering fuel data for the agriculture sector and substituted data from the Wisconsin Department of Revenue and from the federal National Agriculture Statistics Service (NASS). Data from NASS were not available previously.

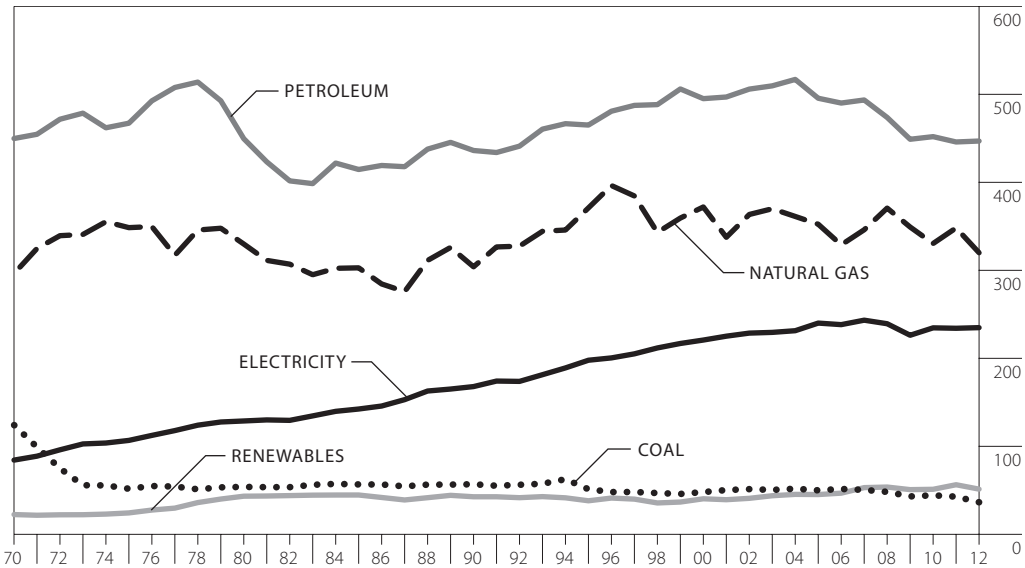
p Preliminary estimates.

r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewable energy and electricity use, by economic sector, and for Wisconsin electric utility energy use.

Wisconsin End-Use Energy Consumption, by Type of Fuel

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Renewables		Electricity		Total
1970[r]	449.8	*46.0%*	296.3	*30.3%*	124.3	*12.7%*	22.5	*2.3%*	84.4	*8.6%*	977.2
1975[r]	467.2	*46.8%*	348.5	*34.9%*	51.8	*5.2%*	24.3	*2.4%*	106.7	*10.7%*	998.6
1980[r]	449.6	*44.7%*	329.9	*32.8%*	53.9	*5.4%*	43.3	*4.3%*	128.8	*12.8%*	1,005.6
1985[r]	414.6	*43.1%*	302.8	*31.5%*	56.7	*5.9%*	44.8	*4.7%*	142.4	*14.8%*	961.4
1990[r]	436.2	*43.3%*	304.0	*30.1%*	56.9	*5.6%*	43.4	*4.3%*	167.9	*16.7%*	1,008.4
1995[r]	465.1	*41.3%*	371.1	*32.9%*	51.3	*4.5%*	42.2	*3.7%*	197.8	*17.5%*	1,127.5
2000[r]	495.1	*41.8%*	372.0	*31.4%*	48.0	*4.1%*	48.3	*4.1%*	220.8	*18.6%*	1,184.2
2005[r]	495.6	*41.5%*	352.4	*29.5%*	50.0	*4.2%*	55.6	*4.7%*	240.1	*20.1%*	1,193.6
2006[r]	490.1	*42.0%*	328.9	*28.2%*	51.6	*4.4%*	57.8	*5.0%*	238.3	*20.4%*	1,166.7
2007[r]	493.6	*41.1%*	346.1	*28.8%*	50.5	*4.2%*	66.7	*5.6%*	243.4	*20.3%*	1,200.2
2008[r]	473.7	*39.3%*	370.7	*30.8%*	48.2	*4.0%*	72.1	*6.0%*	239.3	*19.9%*	1,204.0
2009[r]	449.0	*39.5%*	349.2	*30.7%*	43.1	*3.8%*	70.2	*6.2%*	226.2	*19.9%*	1,137.7
2010[r]	451.9	*39.8%*	330.5	*29.1%*	44.3	*3.9%*	72.7	*6.4%*	234.6	*20.7%*	1,134.2
2011[r]	445.9	*38.9%*	348.2	*30.4%*	42.8	*3.7%*	75.5	*6.6%*	234.2	*20.4%*	1,146.6
2012[p]	**446.9**	***40.1%***	**320.0**	***28.7%***	**36.5**	***3.3%***	**76.5**	***6.9%***	**234.9**	***21.1%***	**1,114.7**

p Preliminary estimates.

r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewable and electricity use, by economic sector, and for Wisconsin electric utility energy use.

END-USE ENERGY 2.8% IN 2012

End use energy is a measure of the energy content of fuels at the point of consumption. Since much of the energy needed to generate electricity is lost in the generation process, end use energy consumption figures will always be lower than the directly linked resource energy consumption figures.

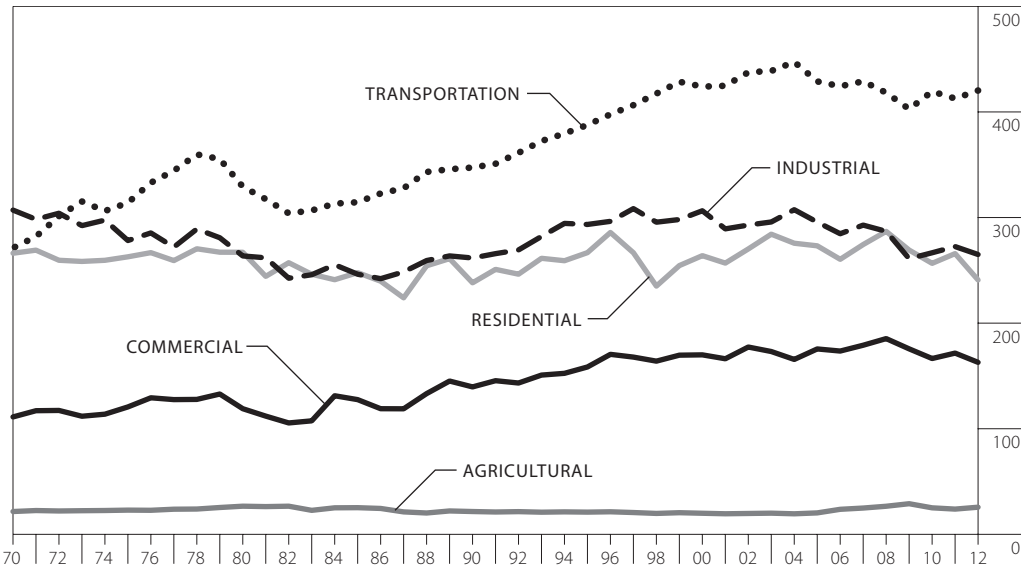
End use energy decreased by 2.8 percent overall in 2012, after increasing by 1.1 percent in 2011. Petroleum continues to be the most-used end use energy source in Wisconsin (40.1 percent).

Wisconsin End-Use Energy Consumption, by Economic Sector

END-USE ENERGY 2.8% IN 2012

End use energy consumption decreased 2.8 percent in 2012. The transportation sector continues to be the largest consumer of end use energy in Wisconsin (37.7 percent).

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Agricultural		Transportation		Total
1970r	266.2	*27.2%*	111.2	*11.4%*	307.0	*31.4%*	21.6	*2.2%*	271.2	*27.8%*	977.2
1975r	262.8	*26.3%*	120.6	*12.1%*	278.2	*27.9%*	22.9	*2.3%*	314.0	*31.4%*	998.6
1980r	267.1	*26.6%*	119.0	*11.8%*	263.6	*26.2%*	26.7	*2.7%*	329.2	*32.7%*	1,005.6
1985r	247.8	*25.8%*	127.6	*13.3%*	246.3	*25.6%*	25.2	*2.6%*	314.5	*32.7%*	961.4
1990r	238.2	*23.6%*	139.6	*13.8%*	261.7	*25.9%*	21.6	*2.1%*	347.3	*34.4%*	1,008.4
1995r	266.8	*23.7%*	158.7	*14.1%*	293.4	*26.0%*	21.0	*1.9%*	387.7	*34.4%*	1,127.5
2000r	263.9	*22.3%*	170.0	*14.4%*	306.4	*25.9%*	20.0	*1.7%*	424.0	*35.8%*	1,184.2
2005r	273.2	*22.9%*	175.6	*14.7%*	295.7	*24.8%*	20.3	*1.7%*	428.9	*35.9%*	1,193.6
2006r	260.4	*22.3%*	173.6	*14.9%*	284.7	*24.4%*	23.7	*2.0%*	424.3	*36.4%*	1,166.7
2007r	274.4	*22.9%*	179.1	*14.9%*	292.8	*24.4%*	24.9	*2.1%*	429.0	*35.7%*	1,200.2
2008r	286.9	*23.8%*	185.4	*15.4%*	286.9	*23.8%*	26.6	*2.2%*	418.2	*34.7%*	1,204.0
2009r	269.2	*23.7%*	175.6	*15.4%*	261.1	*22.9%*	29.0	*2.6%*	402.7	*35.4%*	1,137.7
2010r	256.6	*22.6%*	166.5	*14.7%*	266.6	*23.5%*	25.1	*2.2%*	419.4	*37.0%*	1,134.2
2011r	265.8	*23.2%*	171.6	*15.0%*	272.5	*23.8%*	23.9	*2.1%*	412.7	*36.0%*	1,146.6
2012p	**240.9**	***21.6%***	**162.9**	***14.6%***	**265.0**	***23.8%***	**25.7**	***2.3%***	**420.3**	***37.7%***	**1,114.7**

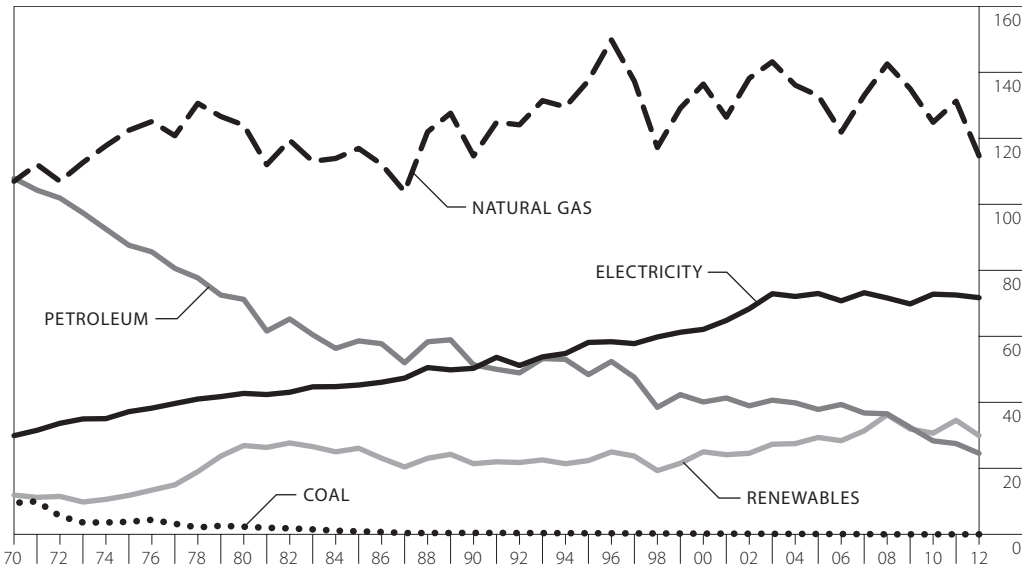
p Preliminary estimates.

r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewable energy and electricity use, by economic sector, and for Wisconsin electric utility energy use.

Wisconsin Residential Energy Use, by Type of Fuel

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum[c]		Natural Gas		Coal		Renewables[a]		Electricity		Total End Use	Total Resource[b]
1970[r]	107.9	*40.5%*	107.0	*40.2%*	9.5	*3.6%*	11.9	*4.5%*	29.9	*11.2%*	266.2	324.3
1975[r]	87.6	*33.3%*	122.4	*46.6%*	3.8	*1.4%*	11.8	*4.5%*	37.2	*14.1%*	262.8	341.9
1980[r]	71.2	*26.7%*	124.0	*46.4%*	2.3	*0.9%*	26.9	*10.1%*	42.7	*16.0%*	267.1	355.6
1985[r]	58.6	*23.7%*	116.9	*47.2%*	0.9	*0.4%*	26.1	*10.5%*	45.2	*18.3%*	247.8	343.7
1990[r]	51.4	*21.6%*	114.7	*48.1%*	0.4	*0.2%*	21.4	*9.0%*	50.3	*21.1%*	238.2	359.8
1995[r]	48.4	*18.1%*	137.5	*51.5%*	0.3	*0.1%*	22.4	*8.4%*	58.2	*21.8%*	266.8	406.3
2000[r]	40.1	*15.2%*	136.4	*51.7%*	0.2	*0.1%*	25.0	*9.5%*	62.1	*23.5%*	263.9	405.3
2005[r]	37.8	*13.9%*	132.9	*48.7%*	0.1	*0.0%*	29.4	*10.7%*	73.0	*26.7%*	273.2	430.5
2006[r]	39.3	*15.1%*	121.9	*46.8%*	0.1	*0.0%*	28.4	*10.9%*	70.7	*27.2%*	260.4	399.4
2007[r]	36.8	*13.4%*	133.0	*48.5%*	0.1	*0.0%*	31.4	*11.4%*	73.2	*26.7%*	274.4	428.7
2008[r]	36.5	*12.7%*	142.5	*49.7%*	0.0	*0.0%*	36.2	*12.6%*	71.6	*25.0%*	286.9	438.9
2009[r]	32.4	*12.0%*	135.0	*50.2%*	0.0	*0.0%*	31.9	*11.9%*	69.8	*25.9%*	269.2	415.2
2010[r]	28.3	*11.0%*	124.9	*48.7%*	0.0	*0.0%*	30.7	*12.0%*	72.8	*28.4%*	256.6	409.3
2011[r]	27.5	*10.3%*	131.3	*49.4%*	0.0	*0.0%*	34.6	*13.0%*	72.5	*27.3%*	265.8	410.7
2012[p]	**24.6**	***10.2%***	**114.7**	***47.6%***	**0.0**	***0.0%***	**29.9**	***12.4%***	**71.7**	***29.8%***	**240.9**	**380.3**

a Renewables includes wood/biomass, solar photovoltaic and solar thermal, wind and biogas.

b Includes energy resources (and losses) attributable to electricity generation.

c Changes in petroleum consumption figures are due in-part to a historical revision of propane consumption data. The propane dataset was revised to bring it in line with federal volumes.

p Preliminary estimates.

r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewables and electricity use, by economic sector, and for Wisconsin electric utility energy use.

RESIDENTIAL END-USE ENERGY 9.4% IN 2012

Residential end use energy decreased 9.4 percent in 2012. Natural gas continues to be the dominant fuel used in Wisconsin homes (47.6 percent), providing just under half of the end use energy used.

Consumption of all fuels in the residential sector declined in 2012—electricity, 1.1 percent; renewables, 13.5 percent; natural gas, 12.6 percent; and petroleum, 10.7 percent.

Between 1970 and 2012, petroleum use in the residential sector declined 77.2 percent.

Wisconsin Commercial Energy Use, by Type of Fuel

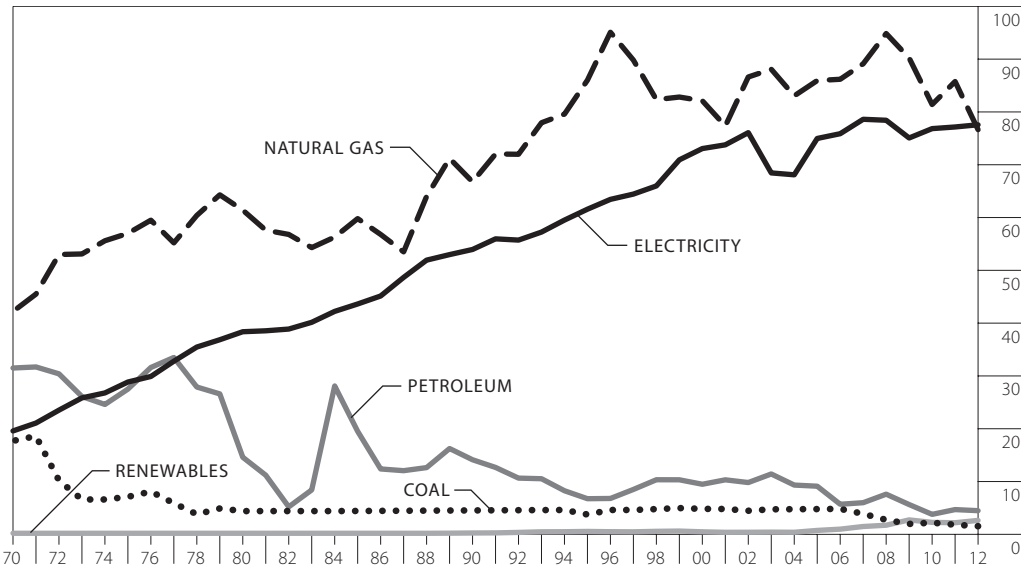
COMMERCIAL END-USE ENERGY 5.1% IN 2012

In 2012, commercial sector end use energy decreased 5.1 percent. Since 1980, commercial end use energy has increased 36.9 percent. Electricity energy use more than doubled (102.1 percent) over the same period.

The commercial sector saw decreases in renewables (2.8 percent) and coal (13.3 percent), and increases in every other sector: petroleum (10.6 percent), natural gas (5.2 percent), and electricity (0.3 percent).

In 2012, electricity overtook natural gas as the major energy source, comprising 47.6 percent of commercial sector energy.

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum[c]		Natural Gas		Coal		Renewables[a]		Electricity		Total End Use	Total Resource[b]
1970[r]	31.5	*28.3%*	42.2	*38.0%*	17.7	*15.9%*	0.2	*0.2%*	19.6	*17.6%*	111.2	149.3
1975[r]	27.5	*22.8%*	57.0	*47.2%*	7.1	*5.9%*	0.2	*0.2%*	28.8	*23.9%*	120.6	182.0
1980[r]	14.6	*12.3%*	61.4	*51.6%*	4.4	*3.7%*	0.2	*0.2%*	38.4	*32.3%*	119.0	198.5
1985[r]	19.5	*15.3%*	59.8	*46.9%*	4.4	*3.5%*	0.2	*0.2%*	43.6	*34.2%*	127.6	220.0
1990[r]	14.1	*10.1%*	66.8	*47.8%*	4.5	*3.2%*	0.3	*0.2%*	54.0	*38.6%*	139.6	270.0
1995[r]	6.7	*4.3%*	86.0	*54.2%*	3.8	*2.4%*	0.6	*0.3%*	61.6	*38.8%*	158.7	306.4
2000[r]	9.5	*5.6%*	82.1	*48.3%*	4.8	*2.8%*	0.5	*0.3%*	73.1	*43.0%*	170.0	336.2
2005[r]	9.1	*5.2%*	85.9	*49.0%*	4.8	*2.7%*	0.7	*0.4%*	75.0	*42.7%*	175.6	337.2
2006[r]	5.7	*3.3%*	86.2	*49.7%*	4.8	*2.8%*	1.0	*0.6%*	75.9	*43.7%*	173.6	322.6
2007[r]	6.0	*3.3%*	89.1	*49.8%*	3.9	*2.2%*	1.5	*0.8%*	78.6	*43.9%*	179.1	344.7
2008[r]	7.6	*4.1%*	94.9	*51.2%*	2.7	*1.5%*	1.7	*0.9%*	78.4	*42.3%*	185.4	351.8
2009[r]	5.6	*3.2%*	90.2	*51.4%*	2.0	*1.1%*	2.7	*1.6%*	75.1	*42.7%*	175.6	332.6
2010[r]	3.8	*2.3%*	81.4	*48.9%*	2.2	*1.3%*	2.3	*1.4%*	76.8	*46.2%*	166.5	327.7
2011[r]	4.7	*2.7%*	85.8	*50.0%*	1.8	*1.1%*	2.2	*1.3%*	77.2	*45.0%*	171.6	325.7
2012[p]	**4.5**	***2.8%***	**76.6**	***47.1%***	**1.5**	***0.9%***	**2.6**	***1.6%***	**77.6**	***47.6%***	**162.9**	**313.7**

a Renewables includes solar, wood, biomass, wind, hydro and biogas.

b Includes energy resources (and losses) attributable to electricity generation.

c Changes in petroleum consumption figures are due in-part to a historical revision of propane consumption data. The propane dataset was revised to bring it in line with federal volumes.

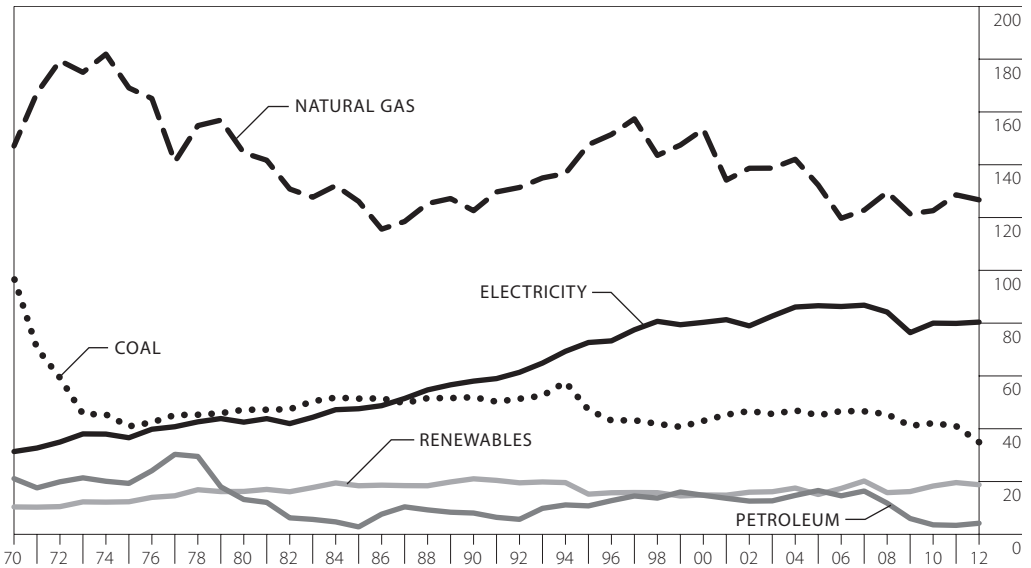
p Preliminary estimates.

r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewables and electricity use, by economic sector, and for Wisconsin electric utility energy use.

Wisconsin Industrial Energy Use, by Type of Fuel

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum[c]		Natural Gas		Coal		Renewables[a]		Electricity		Total End Use	Total Resource[b]
1970[r]	21.1	*6.9%*	147.1	*47.9%*	97.1	*31.6%*	10.4	*3.4%*	31.4	*10.2%*	307.0	368.0
1975[r]	19.3	*6.9%*	169.1	*60.8%*	40.9	*14.7%*	12.3	*4.4%*	36.6	*13.2%*	278.2	356.1
1980[r]	13.2	*5.0%*	144.5	*54.8%*	47.2	*17.9%*	16.2	*6.2%*	42.5	*16.1%*	263.6	351.7
1985[r]	2.8	*1.1%*	126.1	*51.2%*	51.4	*20.9%*	18.4	*7.5%*	47.6	*19.3%*	246.3	347.1
1990[r]	8.1	*3.1%*	122.6	*46.9%*	51.9	*19.8%*	21.0	*8.0%*	58.0	*22.2%*	261.7	401.9
1995[r]	10.8	*3.7%*	147.6	*50.3%*	47.2	*16.1%*	15.2	*5.2%*	72.7	*24.8%*	293.4	467.8
2000[r]	14.8	*4.8%*	153.4	*50.1%*	43.0	*14.0%*	14.9	*4.9%*	80.3	*26.2%*	306.4	489.2
2005[r]	16.6	*5.6%*	132.3	*44.7%*	45.1	*15.3%*	15.1	*5.1%*	86.6	*29.3%*	295.7	482.3
2006[r]	14.6	*5.1%*	119.7	*42.0%*	46.7	*16.4%*	17.4	*6.1%*	86.3	*30.3%*	284.7	454.2
2007[r]	16.4	*5.6%*	122.8	*41.9%*	46.6	*15.9%*	20.2	*6.9%*	86.8	*29.6%*	292.8	475.8
2008[r]	11.8	*4.1%*	129.6	*45.2%*	45.5	*15.9%*	15.8	*5.5%*	84.2	*29.3%*	286.9	465.7
2009[r]	6.0	*2.3%*	121.4	*46.5%*	41.1	*15.8%*	16.2	*6.2%*	76.4	*29.3%*	261.1	420.8
2010[r]	3.6	*1.3%*	122.6	*46.0%*	42.1	*15.8%*	18.3	*6.8%*	80.0	*30.0%*	266.6	434.6
2011[r]	3.4	*1.2%*	128.6	*47.2%*	41.0	*15.0%*	19.6	*7.2%*	79.9	*29.3%*	272.5	432.1
2012[p]	**4.2**	***1.6%***	**126.7**	***47.8%***	**34.9**	***13.2%***	**18.8**	***7.1%***	**80.4**	***30.3%***	**265.0**	**421.4**

a Renewables includes hydro, wood, wind, biogas and biomass.

b Includes energy resources (and losses) attributable to electricity generation.

c Changes in petroleum consumption figures are due in-part to a historical revision of propane consumption data. The propane dataset was revised to bring it in line with federal volumes.

p Preliminary estimates.

r Revised due to revisions in contributing tables.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal, renewables and electricity use, by economic sector, and for Wisconsin electric utility energy use.

INDUSTRIAL END-USE ENERGY 2.8% IN 2012

End use energy consumption in the industrial sector decreased 2.8 percent in 2012, following an increase of 2.2 percent in 2011.

The major industrial energy sources are natural gas (47.8 percent) and electricity (30.3 percent), trailed by coal (13.2 percent), renewables (7.1 percent) and petroleum (1.6 percent).

The use of natural gas, coal and renewables declined in the industrial sector by 1.5, 14.8 and 4.0 percent, respectively. Electricity consumption increased by 0.7 percent, and petroleum saw a 22.6 percent jump.

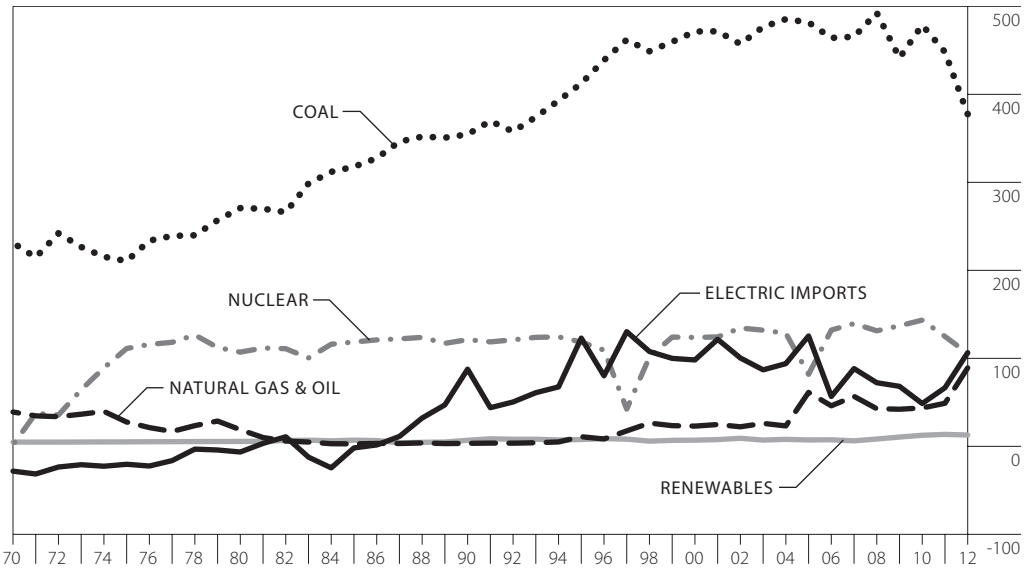
Wisconsin Energy Use for Electricity Generation, in Btu, by Type of Fuel

ENERGY USE FOR ELECTRIC GENERATION
1.5%
IN 2012

Wisconsin's energy use for electric generation decreased by 1.5 percent in 2012. Since the early 1980s, coal and nuclear power have been dominate fuels for electricity generation, with 54.6 and 15.3 percent respectively. In 2012, natural gas is closing in on nuclear power with 12.8 percent of all fuels used to generate electricity.

Petroleum use increased by 17.6 percent while natural gas saw a whopping 83.1 percent increase as utilities switch from coal to natural gas at some power plants.

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal[a]		Renewables		Nuclear[b]		Electric Imports[c]		Hydro		Total[d]
1970	7.9	*3.2%*	31.1	*12.5%*	231.1	*93.0%*	4.8	*1.9%*	1.7	*0.7%*	-28.2	*-11.4%*	4.8	*1.9%*	248.4
1975	7.8	*2.3%*	19.8	*5.9%*	210.5	*63.0%*	5.1	*1.5%*	111.2	*33.3%*	-20.4	*-6.1%*	5.1	*1.5%*	333.9
1980	4.8	*1.2%*	14.1	*3.6%*	270.7	*68.4%*	5.6	*1.4%*	107.0	*27.0%*	-6.5	*-1.6%*	5.6	*1.4%*	395.8
1985	1.4	*0.3%*	1.4	*0.3%*	317.7	*71.5%*	7.0	*1.6%*	118.6	*26.7%*	-1.8	*-0.4%*	7.0	*1.6%*	444.2
1990	1.0	*0.2%*	2.4	*0.4%*	354.5	*61.8%*	6.9	*1.2%*	121.2	*21.1%*	87.7	*15.3%*	6.1	*1.1%*	573.7
1995	0.8	*0.1%*	10.1	*1.5%*	412.4	*61.3%*	7.7	*1.1%*	118.5	*17.6%*	123.0	*18.3%*	7.2	*1.1%*	672.5
2000	1.6	*0.2%*	21.4	*3.0%*	471.4	*65.2%*	7.0	*1.0%*	123.8	*17.1%*	98.1	*13.6%*	6.0	*0.8%*	723.3
2005	1.9	*0.2%*	59.4	*7.8%*	481.7	*63.6%*	7.2	*1.0%*	81.8	*10.8%*	125.4	*16.6%*	5.1	*0.7%*	757.4
2010	0.5	*0.1%*	43.1	*5.9%*	478.7	*65.9%*	12.6	*1.7%*	143.4	*19.7%*	48.6	*6.7%*	6.9	*1.0%*	726.9
2011[r]	0.5	*0.1%*	48.4	*6.9%*	448.0	*63.8%*	13.6	*1.9%*	124.8	*17.8%*	66.5	*9.5%*	6.6	*0.9%*	701.9
2012[p]	**0.6**	***0.1%***	**88.6**	***12.8%***	**377.5**	***54.6%***	**12.8**	***1.9%***	**105.7**	***15.3%***	**106.4**	***15.4%***	**4.6**	***0.7%***	**691.6**

a Includes petroleum coke.

b Based on 10,800 Btu per kWh.

c Estimated assuming 11,300 Btu of resource energy per kWh imported into Wisconsin. Numbers in parentheses and negative percentages indicate resource energy used in Wisconsin to produce electricity that was exported.

d Percentage totals may not add to 100 due to rounding.

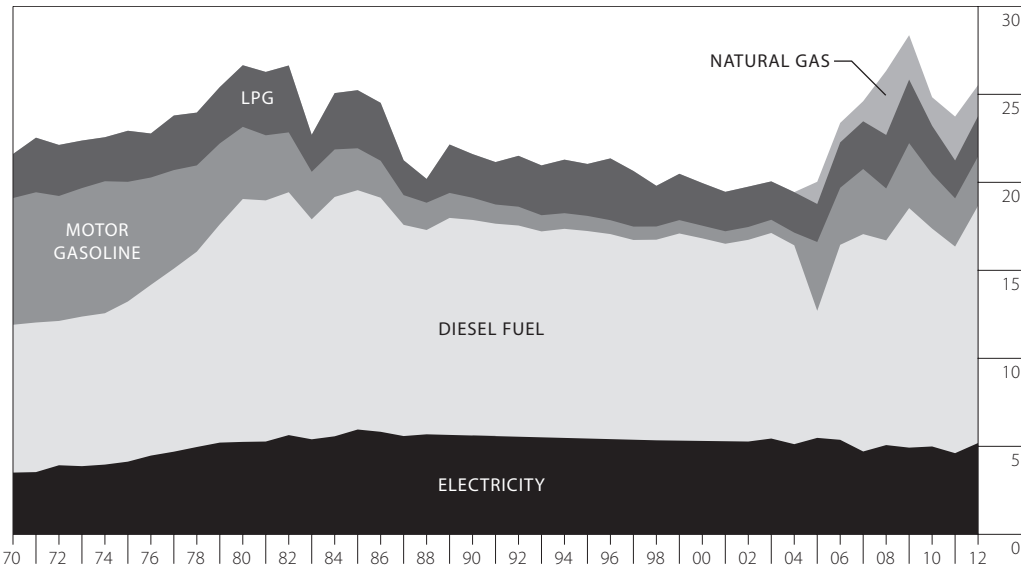
p Preliminary estimates.

r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1970-1994); U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1970-1995); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1971-2012); American Gas Association, *Gas Facts* (1970-1995); U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly*, [DOE/EIA-0226(2013/05)] (May 2013); Public Service Commission of Wisconsin, unpublished data (2005-2012); telephone survey of wastewater treatment facilities and landfills on biogas production (2007-2012).

Wisconsin Agricultural Energy Use, in Btu, by Type of Fuel

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Motor Gasoline	Diesel Fuel[a]	LPG	Other Fuel[b]	Total Petroleum		Electricity[c]		Natural Gas[d]		Total End Use	Total Resource Use
1970	7.2	8.4	2.5		18.1	*83.8%*	3.5	*16.2%*			21.6	28.4
1975	6.8	9.1	2.9		18.8	*82.0%*	4.1	*18.0%*			22.9	31.7
1980	4.1	13.8	3.5		21.4	*80.3%*	5.3	*19.7%*			26.7	37.5
1985	2.4	13.6	3.3		19.3	*76.4%*	6.0	*23.6%*			25.2	37.9
1990	1.3	12.3	2.5		16.0	*74.0%*	5.6	*26.0%*			21.6	35.2
1995	0.9	11.8	3.0		15.6	*74.1%*	5.4	*25.9%*			21.0	34.1
2000	0.7	11.5	2.4		14.7	*73.4%*	5.3	*26.6%*			20.0	32.0
2005[e]	3.9	7.2	2.2	0.3	13.6	*42.2%*	5.5	*17.1%*	1.3	*3.9%*	20.3	32.1
2010	3.1	12.4	2.7	0.2	18.4	*51.9%*	5.0	*14.0%*	1.6	*4.6%*	25.1	35.5
2011[r]	2.7	11.7	2.2	0.2	16.8	*50.8%*	4.6	*13.9%*	2.5	*7.5%*	23.9	33.2
2012[p]	**2.8**	**13.5**	**2.3**	**0.1**	**18.7**	***52.3%***	**5.2**	***14.5%***	**1.8**	***4.9%***	**25.7**	**35.7**

a Includes other light distillates, through 2005.

b This fuel is primarily distillate and kerosene, but may include small amounts of coal and wood.

c Includes energy resources (and losses) attributed to electricity generation.

d Natural gas consumption for 2008 reflects the high price of natural gas in that year, as well as the inclusion of nurseries and greenhouses in the sample.

e Starting in 2005, figures in this table reflect a shift from a per acre approach to gathering fuel data to new data resources for petroleum fuels. Previous to 2005, distillate and kerosene data were included in the diesel figure.

p Preliminary estimates.

r Revised.

Source: Wisconsin Department of Administration, Division of Energy, based on U.S. Department of Agriculture, *Energy and U.S. Agriculture: 1974 Data Base* (September 1976), *1978 Census of Agriculture* (1980) and *Farm Production Expenditures* (1980-1984); Wisconsin Department of Agriculture, Trade, and Consumer Protection, *Wisconsin Agricultural Statistics* (1974-2009) and *Wisconsin Dairy Facts* (1982-2006); Wisconsin Department of Revenue fuels sales and tax data (1991-2012); National Agriculture Statistics Service, unpublished expenditure data (2005-2012); United States Department of Agriculture, Economic Research Service data, http://www.ers.usda.gov/data/FarmIncome (2005-2012); Energy Information Administration, petroleum navigator, http://www.eia.gov/petroleum/data.cfm (2005-2012).

AGRICULTURAL
END-USE ENERGY
7.1%
IN 2012

Agricultural energy end use increased by 7.1 percent in 2012.

Energy use in this sector is affected by changes in mechanization and automation, and by advances in technology such as biodiesel. Agricultural sector energy use accounted for 2.3 percent of total end use energy in Wisconsin.

2011 reflects the first year that natural gas is reported in the agriculture sector. Natural gas is used primarily for space heating and crop drying, along with liquefied propane gas (LPG).

Wisconsin Agricultural Energy Use, in Gallons and kWh, by Type of Fuel

Although farmers use manure digesters and other forms of energy generation such as biomass, and biodiesel to power and heat their farm, their primary energy comes from petroleum sources (72.9 percent).

1970-2012 MILLIONS OF GALLONS AND MILLIONS OF kWh

Year	Motor Gasoline	Diesel[a]	LPG	Other Fuels[b]	Total Petroleum	Electricity (Millions of kWh)
1970	58.0	60.7	26.2		144.9	1,028
1975	54.3	65.8	30.1		150.2	1,210
1980	33.0	99.3	36.9		169.2	1,539
1985	19.1	97.8	34.6		151.5	1,745
1990	10.1	88.5	25.9		124.5	1,645
1995	6.9	85.0	30.9		122.8	1,595
1996	6.3	84.0	36.8		127.1	1,585
1997	6.1	81.9	33.1		121.1	1,575
1998	6.0	82.2	24.2		112.4	1,565
1999	6.1	84.9	27.6		118.6	1,560
2000	5.8	83.1	25.3		114.2	1,555
2001	5.7	81.0	23.5		110.2	1,550
2002	5.8	82.7	24.0		112.6	1,545
2003	6.0	84.2	22.8		113.0	1,595
2004	5.8	81.5	24.1		111.4	1,501
2005[c]	31.2	52.1	22.6	1.9	107.9	1,606
2006	25.9	80.0	27.1	2.2	135.2	1,574
2007	29.6	89.1	28.4	1.9	149.0	1,379
2008	23.6	83.9	31.8	2.0	141.3	1,486
2009	29.5	98.1	37.8	4.8	170.3	1,443
2010	24.8	89.3	28.7	1.7	144.5	1,463
2011[r]	21.9	84.6	22.5	1.5	130.5	1,351
2012[p]	**22.4**	**97.2**	**24.0**	**0.9**	**144.5**	**1,520**

a Fuel oil and kerosene, through 2004.

b This fuel is primarily distillate and kerosene, but may include small amounts of coal and wood.

c The State Energy Office instituted a new method of data collection for fuels used in the agricultural sector. Starting in 2005, agricultural sector data have been revised to reflect the new data collection method. Previous to 2005, kerosene and distillates were included in the diesel figure.

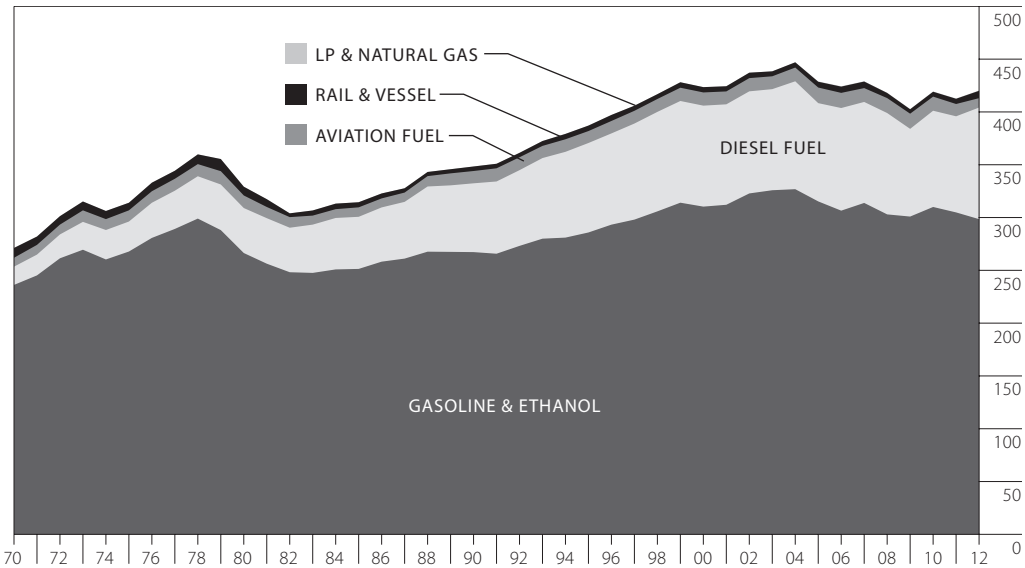
p Preliminary estimates.

r Revised.

Source: Wisconsin Department of Administration, Division of Energy, based on U.S. Department of Agriculture, *Energy and U.S. Agriculture: 1974 Data Base* (September 1976), *1978 Census of Agriculture* (1980) and *Farm Production Expenditures* (1980-1984); Wisconsin Department of Agriculture, Trade, and Consumer Protection, *Wisconsin Agricultural Statistics* (1974-2009) and *Wisconsin Dairy Facts* (1982-2006); and Wisconsin Department of Revenue, *Motor Vehicle Fuel Tax Statistics* (1991-2012); National Agriculture Statistics Service, unpublished expenditure data (2005-2012); United States Department of Agriculture, Economic Research Service data, http://www.ers.usda.gov/data/FarmIncome (2005-2012); Energy Information Administration, petroleum navigator, http://www.eia.gov/petroleum/data.cfm (2005-2012).

Wisconsin Transportation Energy Use, in Btu, by Type of Fuel

1970-2012 TRILLIONS OF BTU



Year	Motor Gasoline[a]	Ethanol	Diesel Fuel	Aviation Gasoline	Aviation Jet Fuel	Rail Distillate & Residual	LPG	Natural Gas[b]	Total
1970	236.2	0.0	17.3	0.7	7.7	9.3	NA		271.2
1975	267.8	0.0	28.4	0.8	9.8	7.2	NA		314.0
1980	266.4	0.0	42.6	0.9	11.0	8.3	NA		329.2
1985	251.2	0.1	49.3	0.6	8.4	4.8	NA		314.5
1990	266.6	0.7	65.2	0.6	11.0	4.3	NA		348.3
1995	281.8	4.1	84.7	0.7	10.6	5.2	0.6		387.7
2000	302.4	7.9	95.6	0.8	11.7	5.0	0.5		424.0
2005	304.9	10.4	93.1	0.5	14.3	5.5	0.3	0.0238	428.9
2006	295.5	11.0	97.2	0.4	13.9	5.9	0.3	0.0247	424.3
2007	300.2	13.6	95.6	0.4	12.8	6.2	0.2	0.0237	429.0
2008	284.7	18.3	96.0	0.3	13.8	4.8	0.2	0.0199	418.2
2009	281.5	19.4	83.1	0.2	14.1	4.2	0.2	0.0204	402.8
2010	288.4	21.6	91.1	0.3	13.1	4.6	0.2	0.0346	419.4
2011[r]	285.7	19.2	91.0	0.3	11.3	5.0	0.2	0.0630	412.7
2012[p]	**273.4**	**25.1**	**105.7**	**0.4**	**8.5**	**7.0**	**0.2**	**0.1698**	**420.3**

a Excludes ethanol.

b Compressed natural gas shown in gasoline gallon equivalents (GGE). Assumes energy content of one standard GGE is 114,818.76 Btus.

p Preliminary estimate.

r Revised.

NA – Not available.

Source: Wisconsin Department of Commerce, Bureau of Petroleum Inspection, *Report on Petroleum Products Inspected and Delivered to Wisconsin* (1970-1995); Wisconsin Department of Revenue, *Motor Vehicle Fuel Tax Statistics* (1970-2012) and *Petroleum Supply Annual*, DOE/EIA-3340 (1982-2012); U.S. Department of Energy, Form EIA-782C, "Monthly Report of Petroleum Products Sold for Consumption" (1983-2012); Wisconsin State Energy Office surveys of airport fixed base operators (2007-2009) and railways (2007-2012).

TRANSPORTATION ENERGY USE **1.9%**

ETHANOL USE **31.0%**

MOTOR GASOLINE USE **4.3%**

Transportation energy use increased 1.9 percent in 2012. Motor gasoline use decreased 4.3 percent, while ethanol use increased 31.0 percent, following 2011 which saw the first decrease in ethanol consumption since ethanol was introduced to Wisconsin in 1982.

Diesel fuel is used primarily for trucking freight. Diesel fuel use increased 16.1 percent. Transportation activities consume 37.7 percent of Wisconsin's total end use energy, accounting for 88.3 percent of petroleum use.

Wisconsin Transportation Energy Use, in Gallons, by Type of Fuel

AVERAGE PRICE OF GASOLINE
$.095
PER GALLON

In 2012, the average statewide price of gasoline increased by $.095 a gallon, to $3.624/gallon.

Ethanol, a renewable energy resource primarily distilled from corn, is used as an oxygenate in reformulated gasoline and in the blending of E10 (10 percent ethanol, 90 percent gasoline) and E85 (85 percent ethanol, 15 percent gasoline).

Wisconsin is seeing a growing use of alternative vehicle fuels. Compressed natural gas (CNG), which burns cleaner than gasoline and is used primarily in heavy-duty fleets, saw a 175.0 percent increase over 2011, while propane (LPG) saw an increase of 3.1 percent.

CNG can be produced from fossil fuel sources, or from biological sources as BioCNG. CNG and BioCNG are measured in gasoline gallon equivalents (GGE), and are available from a variety of fueling stations across the state. See http://www.stateenergyoffice.wi.gov for more information on natural gas as a transportation fuel.

1970-2012 MILLIONS OF GALLONS

Year	Motor Gasoline[a]	Ethanol	Diesel Fuel	Aviation Gasoline	Aviation Jet Fuel	Distillate & Residual Rail	Distillate & Residual Vessel	LPG	Natural Gas[b]	Total
1970	1,889.1	0.0	124.8	5.9	56.7	49.2	17.0	NA		2,142.7
1975	2,142.8	0.0	205.1	6.7	72.4	36.6	14.1	NA		2,477.7
1980	2,130.7	0.0	307.1	7.0	81.4	44.8	14.8	NA		2,585.8
1985	2,009.7	1.5	356.9	4.5	62.2	27.1	7.4	NA		2,469.3
1990	2,124.5	8.3	471.1	5.0	81.6	29.1	9.0	NA		2,728.6
1995	2,254.1	48.5	612.5	5.6	78.6	35.1	6.9	6.1		3,047.3
1996	2,307.8	56.8	624.6	5.7	82.0	38.4	3.7	6.0		3,125.0
1997	2,345.4	57.5	657.6	5.8	84.0	34.1	0.0	5.8		3,190.3
1998	2,398.4	71.5	681.0	5.9	85.0	31.9	0.5	5.7		3,280.0
1999	2,461.5	75.4	696.3	6.1	87.4	37.0	0.0	5.1		3,368.8
2000	2,419.4	93.8	691.2	6.0	87.0	35.9	0.0	5.3		3,338.6
2001	2,438.6	85.9	687.7	5.9	85.0	35.2	0.0	4.6		3,342.9
2002	2,523.0	88.2	698.9	4.9	88.2	36.9	0.0	4.0		3,444.1
2003	2,538.7	100.9	692.1	4.3	86.1	33.7	0.0	3.8		3,459.6
2004	2,545.6	102.5	738.5	4.2	92.5	35.7	0.0	3.7		3,522.7
2005	2,439.2	123.0	672.7	4.1	105.7	35.1	0.0	3.0	0.208	3,383.0
2006	2,364.1	130.4	702.6	3.5	102.9	37.2	0.0	3.2	0.215	3,344.2
2007	2,401.7	161.2	691.3	2.8	94.6	43.2	0.0	2.3	0.207	3,397.4
2008	2,277.3	217.0	693.9	2.6	102.4	34.7	0.0	2.4	0.174	3,330.5
2009	2,252.3	229.7	600.4	1.8	104.7	30.1	0.0	2.2	0.178	3,221.4
2010	2,307.6	255.4	658.8	2.3	96.9	33.3	0.0	2.3	0.302	3,356.8
2011[r]	2,285.5	227.1	657.9	2.5	84.0	35.8	0.0	1.6	0.549	3,295.0
2012[p]	**2,186.9**	**297.5**	**764.1**	**3.2**	**62.8**	**50.2**	**0.0**	**1.6**	**1.509**	**3,367.8**

a Excludes ethanol. See adjacent column for amounts of ethanol.
b Compressed natural gas shown in gasoline gallon equivalents (GGE). Assumes that the energy content of one standard GGE is 114,818.76 Btus.
p Preliminary estimate.
r Revised.
NA – Not available.
Source: Wisconsin Department of Commerce, Bureau of Petroleum Inspection, *Report on Petroleum Products Inspected and Delivered to Wisconsin* (1970-1995); Wisconsin Department of Revenue, *Motor Vehicle Fuel Tax Statistics* (1970-2012) and *Petroleum Supply Annual*, DOE/EIA-3340 (1982-2012); U.S. Department of Energy, Form EIA-782C, "Monthly Report of Petroleum Products Sold Into States for Consumption" (1983-2012); Wisconsin State Energy Office surveys of airport fixed base operators (2000-2009) and railways (2000-2012).

CHAPTER 2

Energy Use by Type of Fuel

Wisconsin Petroleum Use, by Economic Sector

OVERALL PETROLEUM USE
0.3%

Overall petroleum use measured in British thermal units (Btu) increased by 0.3 percent in 2012. Eighty-eight percent of the petroleum used in Wisconsin was in the transportation sector, which saw an increase of 0.4 percent.

All numbers in the petroleum sector have changed due to significant revisions to propane consumption numbers.

Agriculture sector numbers do not include agricultural processing plants; these are classified in the commercial sector.

1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Agricultural[a]		Transportation[b]		Electric Utility		Total	Total End Use
1970[r]	107.9	*23.6%*	31.5	*6.9%*	21.1	*4.6%*	18.1	*4.0%*	271.2	*59.3%*	7.9	*1.7%*	457.7	449.8
1975[r]	87.6	*18.4%*	27.5	*5.8%*	19.3	*4.1%*	18.8	*4.0%*	314.0	*66.1%*	7.8	*1.6%*	475.0	467.2
1980[r]	71.2	*15.7%*	14.6	*3.2%*	13.2	*2.9%*	21.4	*4.7%*	329.2	*72.4%*	4.8	*1.1%*	454.4	449.6
1985[r]	58.6	*14.1%*	19.5	*4.7%*	2.8	*0.7%*	19.3	*4.6%*	314.4	*75.6%*	1.4	*0.3%*	416.0	414.6
1990[r]	51.4	*11.7%*	14.1	*3.2%*	8.1	*1.8%*	16.0	*3.7%*	346.6	*79.3%*	1.0	*0.2%*	437.2	436.2
1995[r]	48.4	*10.4%*	6.7	*1.4%*	10.8	*2.3%*	15.6	*3.3%*	383.6	*82.3%*	0.8	*0.2%*	465.9	465.1
1996[r]	52.4	*10.9%*	6.8	*1.4%*	12.8	*2.6%*	16.0	*3.3%*	392.9	*81.6%*	0.9	*0.2%*	481.8	480.8
1997[r]	47.6	*9.7%*	8.5	*1.7%*	14.5	*3.0%*	15.3	*3.1%*	401.6	*82.1%*	1.5	*0.3%*	489.0	487.4
1998[r]	38.5	*7.9%*	10.3	*2.1%*	13.7	*2.8%*	14.5	*3.0%*	411.3	*83.9%*	1.8	*0.4%*	490.1	488.3
1999[r]	42.3	*8.3%*	10.3	*2.0%*	16.0	*3.2%*	15.2	*3.0%*	422.2	*83.1%*	2.0	*0.4%*	508.1	506.1
2000[r]	40.1	*8.1%*	9.5	*1.9%*	14.8	*3.0%*	14.7	*2.9%*	416.1	*83.8%*	1.6	*0.3%*	496.7	495.1
2001[r]	41.3	*8.3%*	10.3	*2.1%*	13.6	*2.7%*	14.2	*2.8%*	417.5	*83.6%*	2.2	*0.4%*	499.1	497.0
2002[r]	38.9	*7.7%*	9.8	*1.9%*	12.6	*2.5%*	14.5	*2.9%*	430.1	*84.8%*	1.5	*0.3%*	507.4	505.9
2003[r]	40.7	*7.9%*	11.4	*2.2%*	12.7	*2.5%*	14.6	*2.9%*	430.3	*84.1%*	1.8	*0.3%*	511.4	509.7
2004[r]	39.8	*7.7%*	9.3	*1.8%*	14.8	*2.8%*	14.3	*2.8%*	438.7	*84.6%*	1.8	*0.3%*	518.7	516.9
2005[r]	37.8	*7.6%*	9.1	*1.8%*	16.6	*3.3%*	13.6	*2.7%*	418.5	*84.1%*	1.9	*0.4%*	497.4	495.6
2006[r]	39.3	*8.0%*	5.7	*1.2%*	14.6	*3.0%*	17.2	*3.5%*	413.3	*84.1%*	1.5	*0.3%*	491.6	490.1
2007[r]	36.8	*7.4%*	6.0	*1.2%*	16.4	*3.3%*	19.0	*3.8%*	415.4	*83.8%*	1.9	*0.4%*	495.5	493.6
2008[r]	36.5	*7.7%*	7.6	*1.6%*	11.8	*2.5%*	17.9	*3.8%*	399.9	*84.2%*	1.1	*0.2%*	474.8	473.7
2009[r]	32.4	*7.2%*	5.6	*1.3%*	6.0	*1.3%*	21.6	*4.8%*	383.3	*85.3%*	0.6	*0.1%*	449.5	449.0
2010[r]	28.3	*6.3%*	3.8	*0.8%*	3.6	*0.8%*	18.5	*4.1%*	397.8	*87.9%*	0.5	*0.1%*	452.4	451.9
2011[r]	27.5	*6.2%*	4.7	*1.1%*	3.4	*0.8%*	16.8	*3.8%*	393.5	*88.1%*	0.5	*0.1%*	446.4	445.9
2012[p]	**24.6**	***5.5%***	**4.5**	***1.0%***	**4.2**	***0.9%***	**18.7**	***4.2%***	**395.1**	***88.3%***	**0.6**	***0.1%***	**447.5**	**446.9**

a In 2005, the SEO discontinued a per-acre approach to gathering fuel data for the agriculture sector and substituted data from the Wisconsin Department of Revenue and the federal National Agriculture Statistics Service (NASS). Data from NASS were not available previous to 2005.

b These figures do not include any ethanol. In 2011 these figures were historically revised to remove ethanol.

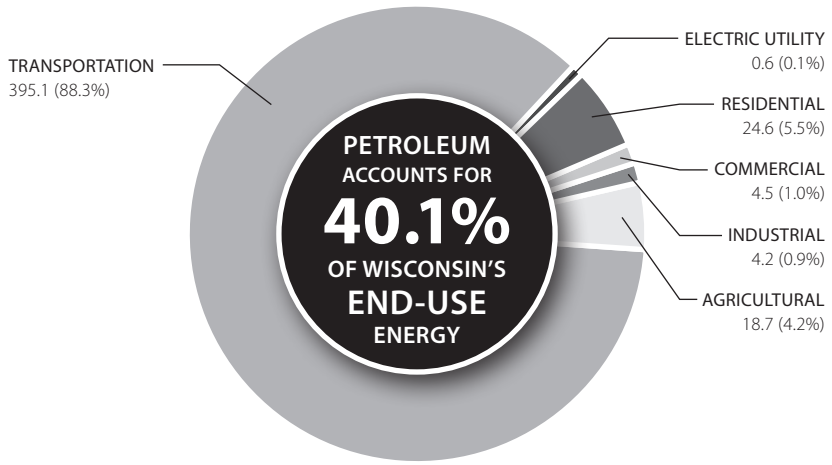
p Preliminary estimates.

r Revised.

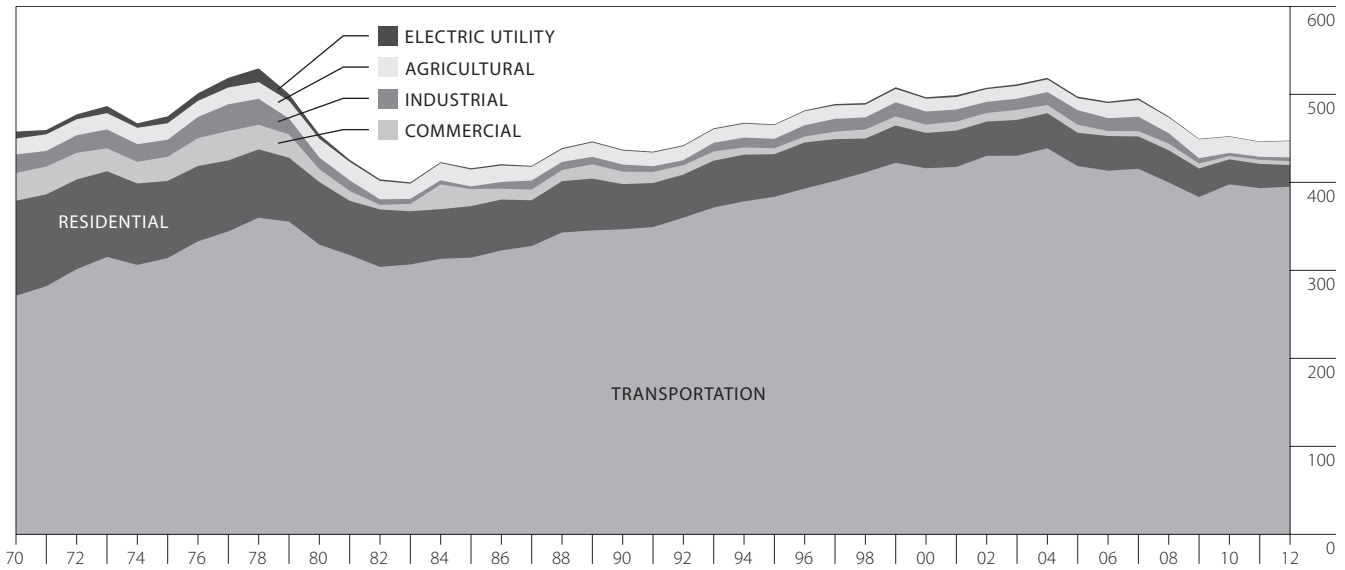
Source: Wisconsin Department of Commerce, Bureau of Petroleum Inspection, *Report on Petroleum Products Inspected and Delivered to Wisconsin* (1970-1995); Wisconsin Department of Revenue, *Collection of Petroleum Inspection Fees* (1996-2006) and *Fuel Tax Statistical Report* (1996-2012); State Energy Office phone and email surveys of airport fixed base operators (2000-2009) and railways (2000-2012); US Department of Energy, Form EIA-782C, *Monthly Report of Petroleum Products Sold into States for Consumption* (1982-2012); US Department of Energy, Form EIA-821 (2003-2012); unpublished data from the National Agriculture Statistics Service (2005-2012); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions for propane, unpublished (1995-2012).

Wisconsin Petroleum Use, by Economic Sector

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

Wisconsin Petroleum Use, in Btu, by Type of Product

Middle distillate, which increased by 14.9 percent since 2011, is used both as a heating fuel in furnaces and boilers, and as diesel fuel in trucks. Light distillate, which increased by 12.8 percent since 2011, includes kerosene and is primarily used as a thinner during periods of cold weather.

All numbers for propane (LPG) have been historically revised to incorporate commercial and industrial data from the Department of Natural Resources' Point Source Emissions survey, and to reflect federally reported volumes of propane transported into the state.

1970-2012 TRILLIONS OF BTU

Year	Gasoline[a,b]	Jet Fuel	Light Distillate	Middle Distillate	Residual Fuel Oil	LPG[c]	Total
1970[r]	244.1	7.7	35.1	123.4	21.9	25.7	457.9
1975[r]	275.4	9.8	16.9	133.5	13.3	26.0	474.9
1980[r]	271.3	11.0	11.3	124.7	11.0	25.2	454.5
1985[r]	254.2	8.4	13.9	114.7	1.7	23.1	416.0
1990[r]	267.4	11.0	10.9	120.0	6.2	21.7	437.2
1995[r]	283.3	10.6	11.1	126.7	4.5	29.7	465.9
1996[r]	290.0	11.1	12.1	129.6	5.8	33.8	482.2
1997[r]	294.7	11.3	12.8	132.1	6.2	31.8	489.0
1998[r]	301.3	11.5	13.0	133.5	6.5	24.3	490.1
1999[r]	309.2	11.8	13.8	140.0	7.7	25.5	508.1
2000[r]	303.9	11.7	12.9	136.6	6.9	24.7	496.7
2001[r]	306.3	11.5	12.9	137.2	7.0	24.4	499.1
2002[r]	316.7	11.9	12.4	134.7	7.1	24.6	507.4
2003[r]	318.6	11.6	12.0	138.1	6.0	25.1	511.4
2004[r]	319.4	12.5	12.5	141.7	7.0	25.6	518.7
2005[r]	309.3	14.3	11.4	128.7	8.6	25.2	497.5
2006[r]	299.2	13.9	11.4	133.0	5.2	29.0	491.6
2007[r]	304.3	12.8	10.3	133.7	5.9	28.5	495.5
2008[r]	287.9	13.8	10.6	130.7	3.9	27.9	474.8
2009[r]	285.5	11.8	9.0	109.7	1.8	29.4	447.1
2010[r]	291.8	13.1	9.5	111.9	0.7	25.4	452.5
2011[r]	288.7	11.3	9.3	111.3	0.7	24.9	446.3
2012[p]	**276.6**	**8.5**	**10.5**	**127.9**	**0.7**	**23.3**	**447.5**

a Includes both vehicle and aviation gasoline.

b Does not include ethanol. In 2011 these figures were historically revised to remove ethanol. Ethanol use in motor gasoline is shown in the Renewable Energy chapter and later in this chapter.

c Liquefied petroleum gas (propane).

p Preliminary estimates.

r Revised.

Source: Wisconsin Department of Commerce, Bureau of Petroleum Inspection, *Report on Petroleum Products Inspected and Delivered to Wisconsin* (1970-1995); Wisconsin Department of Revenue, *Collection of Petroleum Inspection Fees* (1996-2006) and *Fuel Tax Statistical Report* (1996-2012); U.S. Department of Energy, Form EIA-782C, *Monthly Report of Petroleum Products Sold into States for Consumption*, http://www.eia.gov/oil_gas/petroleum/data_publications/prime_supplier_report/psr.html (1983-2012); WI State Energy Office telephone and email surveys of airport fixed base operators (2000-2009) and railways (2000-2012); unpublished expenditure data from the National Agriculture Statistics Service (2005-2012); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions for propane, unpublished (1995-2012).

Wisconsin Petroleum Use, in Gallons, by Type of Product

1970-2012 MILLIONS OF GALLONS

Year	Gasoline[a,b]	Jet Fuel	Light Distillate	Middle Distillate	Residual Fuel Oil	LPG[c]	Total
1970[r]	1,953.0	56.7	260.2	889.7	146.2	269.1	3,574.9
1975[r]	2,203.5	72.4	125.0	962.8	88.8	272.6	3,725.1
1980[r]	2,170.5	81.4	83.4	899.4	73.5	264.2	3,572.4
1985[r]	2,033.3	62.2	103.3	826.9	11.2	242.2	3,279.1
1990[r]	2,139.5	81.6	80.8	864.9	41.2	227.0	3,435.1
1995[r]	2,266.6	78.6	82.0	913.7	30.4	310.7	3,681.9
1996[r]	2,319.8	82.0	89.4	934.2	38.7	353.8	3,817.9
1997[r]	2,357.4	84.0	95.1	952.6	41.7	332.9	3,863.7
1998[r]	2,410.3	85.0	96.0	962.6	43.7	255.0	3,852.6
1999[r]	2,473.7	87.4	102.5	1,009.5	51.6	267.2	3,991.9
2000[r]	2,431.2	87.0	95.7	984.6	45.8	258.9	3,903.1
2001[r]	2,450.2	85.0	95.3	988.9	46.7	255.6	3,921.6
2002[r]	2,533.7	88.2	91.9	971.2	47.5	257.6	3,990.1
2003[r]	2,549.0	86.1	88.7	995.8	40.0	262.8	4,022.5
2004[r]	2,555.6	92.5	92.3	1,021.9	46.6	268.6	4,077.5
2005[r]	2,474.6	105.7	84.6	928.1	57.5	263.9	3,914.3
2006[r]	2,393.6	102.9	84.1	959.0	35.0	303.6	3,878.1
2007[r]	2,434.2	94.6	76.6	963.9	40.1	298.5	3,907.8
2008[r]	2,303.5	102.4	78.6	942.0	25.8	292.3	3,744.7
2009[r]	2,283.7	104.7	66.7	791.0	12.2	308.1	3,566.4
2010[r]	2,334.7	96.9	70.5	807.1	4.4	266.2	3,579.8
2011[r]	2,309.9	84.0	69.2	802.4	4.8	261.3	3,531.7
2012[p]	**2,212.6**	**62.8**	**78.0**	**922.3**	**4.7**	**244.3**	**3,524.7**

a Includes both vehicle and aviation gasoline.

b Does not include the ethanol. In 2011, these numbers were historically revised to remove all ethanol. Ethanol use in motor gasoline is shown in the Renewable Energy chapter and later in this chapter.

c Liquefied petroleum gas (propane).

p Preliminary estimates.

r Revised.

Source: Wisconsin Department of Commerce, Bureau of Petroleum Inspection, *Report on Petroleum Products Inspected and Delivered to Wisconsin* (1970-1995); Wisconsin Department of Revenue, *Collection of Petroleum Inspection Fees* (1996-2006) and *Fuel Tax Statistical Report* (1996-2012); U.S. Department of Energy Form EIA-782C, *Monthly Report of Petroleum Products Sold into States for Consumption* (1983-2012) http://www.eia.gov/oil_gas/petroleum/data_publications/prime_supplier_report/psr.html; WI State Energy Office telephone and email surveys of airport fixed base operators (2000-2009) and railways (2000-2012); unpublished data from the National Agriculture Statistics Service (2005-2012); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions for propane, unpublished (1995-2012).

GASOLINE USE
4.2%
JET FUEL
25.3%
LP USE
6.5%

In 2012, gasoline use decreased by 4.2 percent, jet fuel decreased by 25.3 percent, and LP use decreased by 6.5 percent.

All numbers for propane (LPG) have been historically revised to incorporate commercial and industrial data from the Department of Natural Resources' Point Source Emissions survey, and to reflect federally reported volumes of propane transported into the state.

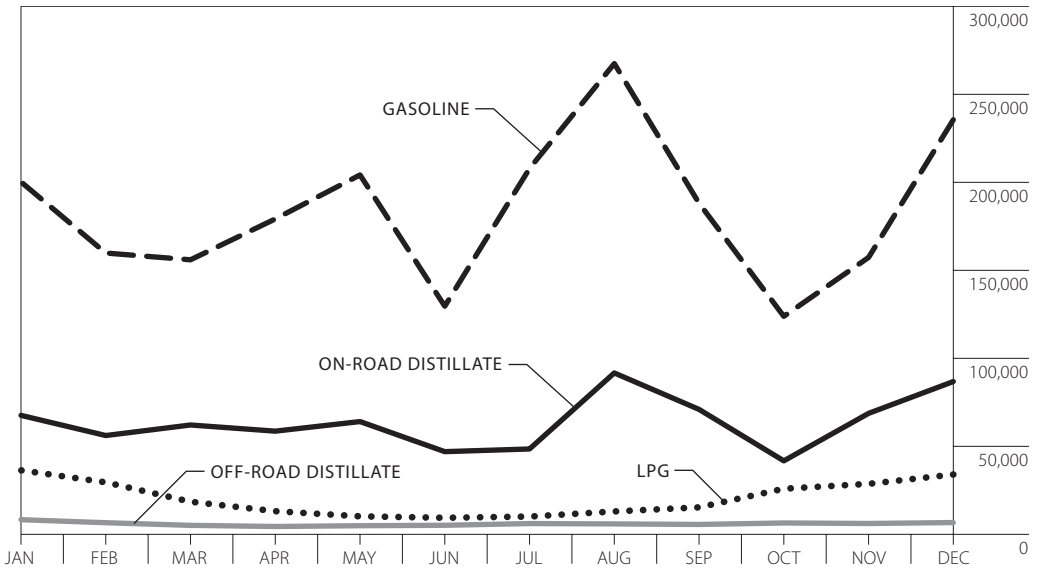
Petroleum Product Deliveries to and Sales in Wisconsin, by Month

In general, gasoline sales peaked during the summer vacation months, while deliveries of fuels used for heating (off-road distillate and LPG) peaked during winter months.

Figures will not match the consumption figures in earlier pages in this chapter because deliveries do not always translate to sales during the same time frame.

A map of Wisconsin's petroleum pipelines can be found in the Map Appendix at the back of the book.

2012 THOUSANDS OF GALLONS



Month	Off-Road Distillate[a]	On-Road Distillate[b]	LPG[c]	Gasoline[d]
January	8,324	67,603	36,375	200,248
February	6,605	56,143	29,560	159,835
March	5,100	62,129	18,526	155,987
April	*4,461*	58,626	13,149	179,209
May	4,898	64,079	10,233	204,197
June	5,148	46,985	9,408	129,621
July	6,119	48,497	10,097	207,884
August	5,927	91,700	13,005	267,480
September	5,619	70,988	15,333	188,133
October	6,457	41,750	25,919	123,864
November	6,168	68,735	28,683	157,328
December	6,690	86,817	33,995	235,580
Total	**71,516**	**764,051**	**244,282**	**2,209,367**

a Kerosene, No. 1 and No. 2 fuel oil used for heating and processing, jet fuel and aviation gasoline used for flying. Does not include non-taxed diesel fuel used on farms. Italicized figures indicate that some data were withheld by the federal Energy Information Administration to protect confidential reporter data.

b On-road diesel fuel sales in Wisconsin.

c Liquefied petroleum gas (propane) deliveries.

d Vehicle gasoline sales; does not include aviation gasoline or ethanol.

Source: Wisconsin Department of Revenue, *Monthly Motor Fuel Consumption Report* (2012); U.S. Department of Energy, Form EIA-782C, "Monthly Report of Petroleum Products Sold into States for Consumption" (2012) http://www.eia.gov/oil_gas/petroleum/data_publications/prime_supplier_report/psr.html.

Wisconsin Production and Use of Ethanol in Reformulated Gasoline, E10 and E85

1994-2012 THOUSANDS OF GALLONS

		Consumption			
Year	Production	RFG[a]	E10[b]	E85[c]	Total
1994	NA	NA	13,331	9	13,340
1995	NA	38,048	10,461	17	48,526
1996	NA	49,784	6,973	36	56,793
1997	NA	49,460	8,012	54	57,526
1998	NA	66,571	4,877	58	71,506
1999	NA	67,400	7,937	63	75,400
2000	NA	70,724	23,080	43	93,847
2001	NA	67,449	18,458	32	85,939
2002	15,529	71,152	17,026	48	88,226
2003	76,947	77,302	23,536	86	100,924
2004	106,886	74,816	27,617	106	102,539
2005	171,764	73,046	49,191	723	122,960
2006	210,386	77,614	50,498	2,302	130,414
2007	283,873	69,963	86,472	4,800	161,235
2008	447,388	68,047	143,849	5,100	216,996
2009	462,022	74,142	150,347	5,200	229,689
2010	438,260	77,968	174,399	2,995	255,362
2011	496,366	76,927	147,704	2,447	227,078
2012[p]	**474,372**	**67,286**	**228,203**	**2,000**	**297,489**

a RFG is reformulated gasoline. Starting January 1, 1995, the federal government mandated its sale in six southeastern Wisconsin counties to comply with the Clean Air Act. Ethanol is used to provide the oxygenate required in RFG.

b E10 is a motor fuel blend consisting of 10 percent ethanol and 90 percent conventional gasoline (non RFG).

c E85 is a motor fuel consisting of 85 percent ethanol and 15 percent conventional gasoline (non RFG).

p Preliminary.

NA – Not Available.

Source: Wisconsin Department of Revenue; Wisconsin State Energy Office survey of E85 distributors (2002-2012); U.S. Department of Energy, Form EIA-782C, *Monthly Report of Petroleum Products Sold into States for Consumption* (1995-2012) http://www.eia.gov/oil_gas/petroleum/data_publications/prime_supplier_report/psr.html.

ETHANOL PRODUCTION
4.4%

In 2012, Wisconsin ethanol production decreased 4.4 percent while ethanol consumption in Wisconsin increased 31.0 percent. Reformulated gasoline saw a decrease of 12.5 percent, E10 an increase of 54.5 percent, and E85 a drop of 18.3 percent.

Ethanol is one of the few energy sources that Wisconsin exports.

Wisconsin Liquefied Petroleum Gas Use, by Economic Sector

LPG USE
6.5%

In 2012, use of liquefied petroleum gas (LPG), also known as propane, decreased 6.5 percent.

All numbers for propane (LPG) have been historically revised to incorporate commercial and industrial data from the Department of Natural Resources' Point Source Emissions survey, and to reflect federally reported volumes of propane transported into the state.

Agriculture sector numbers do not include agricultural processing plants; these are classified in the commercial sector.

1970-2012 MILLIONS OF GALLONS AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Agricultural[a]		Transportation		Total
1970[r]	239.2	*88.9%*	0.3	*0.1%*	3.4	*1.3%*	26.2	*9.7%*	NA	*0.0%*	269.1
1975[r]	238.8	*87.6%*	0.3	*0.1%*	3.4	*1.2%*	30.1	*11.0%*	NA	*0.0%*	272.6
1980[r]	223.9	*84.7%*	0.3	*0.1%*	3.2	*1.2%*	36.9	*14.0%*	NA	*0.0%*	264.2
1985[r]	204.5	*84.4%*	0.2	*0.1%*	2.9	*1.2%*	34.6	*14.3%*	NA	*0.0%*	242.2
1990[r]	198.1	*87.2%*	0.2	*0.1%*	2.8	*1.2%*	25.9	*11.4%*	NA	*0.0%*	227.0
1995[r]	270.6	*87.1%*	0.3	*0.1%*	2.8	*0.9%*	30.9	*9.9%*	6.1	*2.0%*	310.7
1996[r]	307.5	*86.9%*	0.2	*0.1%*	3.3	*0.9%*	36.8	*10.4%*	6.0	*1.7%*	353.8
1997[r]	291.2	*87.5%*	0.1	*0.0%*	2.7	*0.8%*	33.1	*9.9%*	5.8	*1.7%*	332.9
1998[r]	222.4	*87.2%*	0.1	*0.0%*	2.6	*1.0%*	24.2	*9.5%*	5.7	*2.2%*	255.0
1999[r]	231.4	*86.6%*	0.1	*0.0%*	3.0	*1.1%*	27.6	*10.3%*	5.1	*1.9%*	267.2
2000[r]	224.5	*86.7%*	0.2	*0.1%*	3.6	*1.4%*	25.3	*9.8%*	5.3	*2.0%*	258.9
2001[r]	224.3	*87.8%*	0.2	*0.1%*	3.1	*1.2%*	23.5	*9.2%*	4.6	*1.8%*	255.6
2002[r]	227.2	*88.2%*	0.2	*0.1%*	2.3	*0.9%*	24.0	*9.3%*	4.0	*1.5%*	257.6
2003[r]	233.9	*89.0%*	0.1	*0.1%*	2.1	*0.8%*	22.8	*8.7%*	3.8	*1.5%*	262.8
2004[r]	237.5	*88.4%*	0.1	*0.0%*	3.2	*1.2%*	24.1	*9.0%*	3.7	*1.4%*	268.6
2005[r]	234.8	*89.0%*	0.2	*0.1%*	3.3	*1.3%*	22.6	*8.6%*	3.0	*1.1%*	263.9
2006[r]	270.6	*89.1%*	0.2	*0.1%*	2.5	*0.8%*	27.1	*8.9%*	3.2	*1.1%*	303.6
2007[r]	265.7	*89.0%*	0.2	*0.1%*	2.0	*0.7%*	28.4	*9.5%*	2.3	*0.8%*	298.5
2008[r]	253.7	*86.8%*	0.5	*0.2%*	3.9	*1.3%*	31.8	*10.9%*	2.4	*0.8%*	292.3
2009[r]	264.4	*85.8%*	0.5	*0.2%*	3.2	*1.0%*	37.8	*12.3%*	2.2	*0.7%*	308.1
2010[r]	230.7	*86.6%*	0.6	*0.2%*	4.0	*1.5%*	28.7	*10.8%*	2.3	*0.8%*	266.2
2011[r]	231.1	*88.4%*	0.4	*0.2%*	5.7	*2.2%*	22.5	*8.6%*	1.6	*0.6%*	261.3
2012[p]	**213.4**	***87.4%***	**0.4**	***0.2%***	**4.8**	***2.0%***	**24.0**	***9.8%***	**1.6**	***0.7%***	**244.3**

a Starting with 2005 data, the SEO discontinued a per-acre approach to gathering fuel data for the agriculture sector and substituted data from the Wisconsin Department of Revenue and from the federal National Agriculture Statistics Service (NASS).

p Preliminary estimates.

r Revised.

NA – Not available.

Source: U.S. Department of Energy, Form EIA-25, *Prime Supplier's Monthly Report* (1974-2012) and Form EIA-782C, *Monthly Report of Petroleum Products Sold into States for Consumption* (1983-2012) http://www.eia.gov/oil_gas/petroleum/data_publications/prime_supplier_report/psr.html; National Agricultural Statistics Service, unpublished data (2005-2012); Wisconsin Department of Revenue, *Monthly Motor Fuel Consumption Report* (2008-2012); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions for propane, unpublished (1995-2012).

Wisconsin Natural Gas Use, by Economic Sector

In 2012, warmer winter weather led to decreased natural gas use in the residential, commercial, industrial, and agricultural sectors. The electric and transportation sectors saw increased consumption.

The total use of natural gas in all sectors increased by 3.0 percent from 2011, and by 33.3 percent over 1990. Natural gas end-use—where power sector consumption is not counted—is down 8.1 percent from 2011, and 5.2 percent from 1990.

1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential		Commercial[a]		Industrial		Electric[b]		Agricultural[c]		Transportation[d]		Total	Total End Use
1970	107.0	*32.7%*	42.2	*12.9%*	147.1	*44.9%*	31.1	*9.5%*					327.4	296.3
1975	122.4	*33.2%*	57.0	*15.5%*	169.1	*45.9%*	19.8	*5.4%*					368.3	348.5
1980	124.0	*36.0%*	61.4	*17.8%*	144.5	*42.0%*	14.1	*4.1%*					344.0	329.9
1985	116.9	*38.4%*	59.8	*19.7%*	126.1	*41.4%*	1.4	*0.5%*					304.2	302.8
1990	114.7	*37.4%*	66.8	*21.8%*	122.6	*40.0%*	2.4	*0.8%*					306.4	304.0
1995	137.5	*36.1%*	85.9	*22.5%*	147.6	*38.7%*	10.1	*2.7%*					381.1	371.0
1996	149.8	*37.1%*	95.1	*23.6%*	151.5	*37.5%*	7.4	*1.8%*					403.8	396.4
1997	137.3	*34.3%*	89.8	*22.4%*	157.4	*39.3%*	16.0	*4.0%*					400.5	384.5
1998	117.2	*31.9%*	82.3	*22.4%*	143.5	*39.0%*	24.6	*6.7%*					367.7	343.1
1999	129.1	*33.9%*	82.8	*21.7%*	147.5	*38.7%*	21.5	*5.6%*					380.9	359.4
2000	136.4	*34.7%*	82.1	*20.9%*	153.4	*39.0%*	21.4	*5.4%*					393.4	372.0
2001	126.4	*35.1%*	77.0	*21.4%*	134.2	*37.3%*	22.6	*6.3%*					360.2	337.6
2002	138.2	*36.0%*	86.6	*22.5%*	138.7	*36.1%*	20.7	*5.4%*					384.2	363.5
2003	143.2	*36.3%*	88.1	*22.3%*	138.7	*35.2%*	24.3	*6.2%*					394.3	370.0
2004	136.1	*35.6%*	83.0	*21.7%*	142.1	*37.1%*	21.4	*5.6%*					382.6	361.2
2005	132.9	*32.3%*	85.9	*20.9%*	132.3	*32.1%*	59.4	*14.4%*	1.3	*0.3%*	0.02	*0.01%*	411.8	352.4
2006	121.9	*32.6%*	86.2	*23.1%*	119.7	*32.1%*	44.5	*11.9%*	1.1	*0.3%*	0.02	*0.01%*	373.4	328.9
2007	133.0	*33.2%*	89.1	*22.2%*	122.8	*30.6%*	54.9	*13.7%*	1.1	*0.3%*	0.02	*0.01%*	401.0	346.1
2008	142.5	*34.6%*	94.9	*23.0%*	129.6	*31.4%*	41.7	*10.1%*	3.6	*0.9%*	0.02	*0.00%*	412.4	370.7
2009	135.0	*34.6%*	90.2	*23.1%*	121.4	*31.1%*	41.6	*10.6%*	2.5	*0.6%*	0.02	*0.01%*	390.8	349.2
2010	124.9	*33.4%*	81.4	*21.8%*	122.6	*32.8%*	43.1	*11.5%*	1.6	*0.4%*	0.03	*0.01%*	373.6	330.5
2011[r]	131.3	*33.1%*	85.8	*21.6%*	128.6	*32.4%*	48.4	*12.2%*	2.5	*0.6%*	0.06	*0.02%*	396.6	348.2
2012[p]	**114.7**	***28.1%***	**76.6**	***18.8%***	**126.7**	***31.0%***	**88.6**	***21.7%***	**1.8**	***0.4%***	**0.17**	***0.04%***	**408.6**	**320.0**

a Includes sales to government agencies and other public authorities for general or institutional purposes and vehicle fuel, classified as "other" sales by the American Gas Association.

b Includes gas used in electric power generation by utilities and independent power producers.

c Data on agricultural use of natural gas became available in 2005.

d Includes compressed (CNG) and liquified (LNG) natural gas used for vehicle fuel.

p Preliminary estimates.

r Revised using final annual data from the federal Energy Information Administration.

Source: American Gas Association, Gas Facts (1961-1997); Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1963-1989); Public Service Commission of Wisconsin, *Operating Revenue and Expense Statistics; Class A and B Utilities in Wisconsin* (1990-1993), form PSC-AF 2 *Gas Sales and Sales Ratio* (1994-2007) and discussions with Public Service Commission staff; U.S. Department of Energy, *Natural Gas Annual*, 1991-2011 [DOE/EIA-0131(11)] (March 2013) and *Natural Gas Monthly* [DOE/EIA-0130 (2013/03)] (March 2013) http://www.eia.gov/naturalgas/monthly/. http://www.eia.gov/naturalgas/annual/; U.S. Department of Agriculture/ National Agriculture Statistics Service, unpublished data (2005-2012); Wisconsin Department of Revenue *Fuel Tax Statistical Reports* (1996-2012).

NATURAL GAS
END-USE
8.1%
FROM 2011

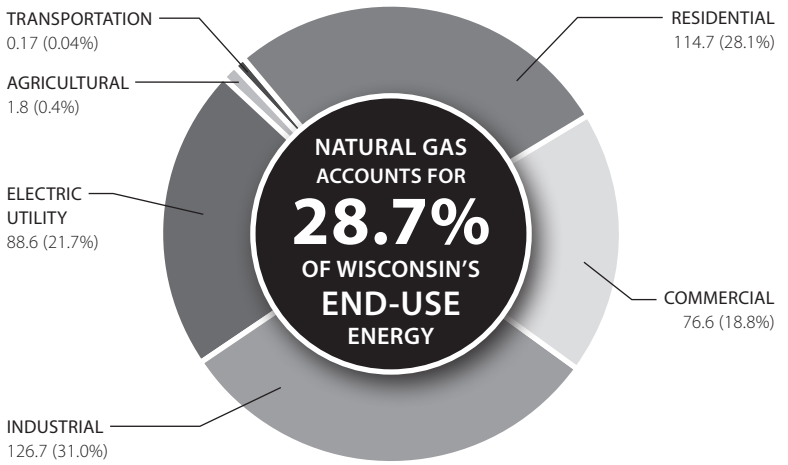
In the power sector, natural gas used to generate electricity increased by 83.1 percent. The electric sector includes natural gas used by utilities and independent power producers who generate and sell electricity to other companies.

The transportation sector—which saw an increase of 169.5 percent over 2011—uses compressed natural gas (CNG) and liquefied natural gas (LNG) as vehicle fuels. Increases in natural gas consumption in this sector are due to a growing infrastructure of refueling stations and increasing numbers of trucks and, public and private fleets, using these fuels.

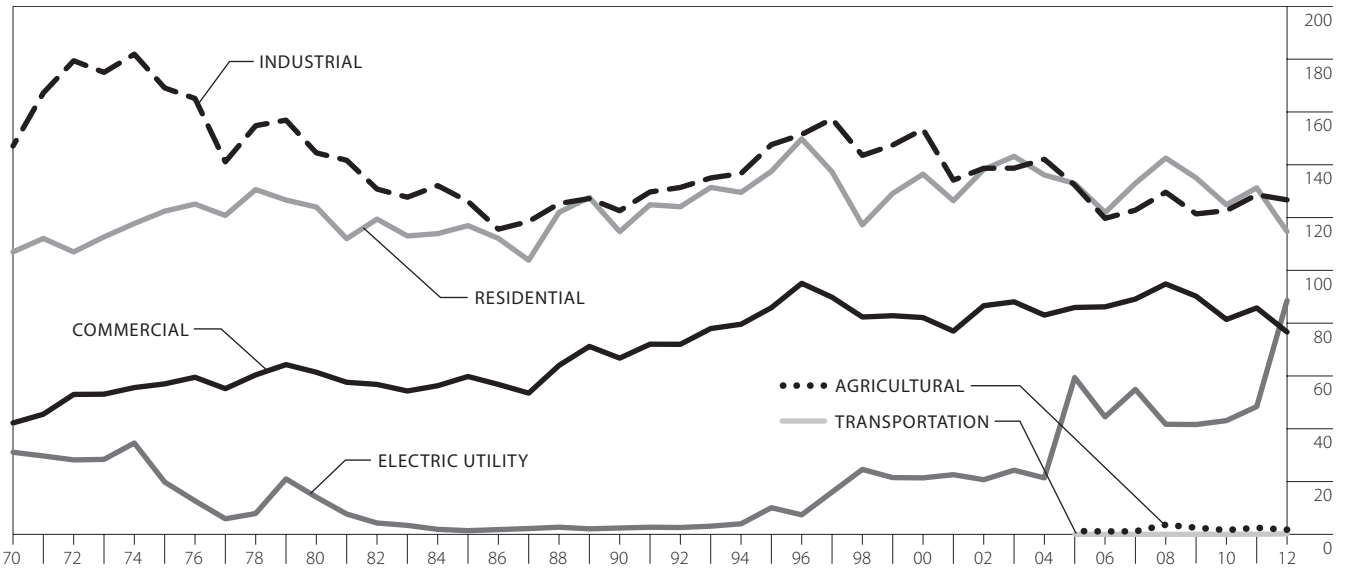
A map of Natural Gas Company Territories and Major Pipelines can be found in the Map Appendix in this publication.

Wisconsin Natural Gas Use, by Economic Sector

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

Wisconsin Natural Gas Sales, by Public Service Commission of Wisconsin Sector

Data presented here are derived from natural gas utility annual reports submitted to the Public Service Commission of Wisconsin. Data collected by the federal Energy Information Administration and the PSCW differ in methodology used to account for natural gas used by a utility for electric generation, resulting in a difference in statewide gas consumption. Figures on this page do not match figures elsewhere in this publication due to different data sources.

1970-2012 TRILLIONS OF BTU

	Residential		Commercial, Industrial & Electric			Total to Ultimate Utility Customers	Commercial, Industrial and Electric Transport Gas	Total Sold and Used[c,d]
Year	General	Heating	Firm[a]	Interruptible[b]	Heating			
1970	7.6	101.3	27.4	121.9	47.6	324.0	0.0	324.0
1975	6.8	112.4	36.6	135.2	60.6	362.8	0.0	362.8
1980	4.3	116.8	25.0	99.6	62.2	343.5	0.0	343.5
1985	2.8	114.7	13.4	95.6	65.6	306.7	0.0	306.7
1990	2.1	112.1	3.7	32.6	59.8	228.4	75.1	303.5
1995	1.8	135.0	3.3	50.2	78.7	289.9	87.4	377.2
1996	1.9	145.8	3.3	37.6	86.2	294.1	103.3	397.4
1997	1.8	134.2	3.3	23.6	79.3	260.6	133.3	394.0
1998	1.6	113.6	3.2	17.1	66.7	216.4	141.8	358.2
1999	1.6	125.1	3.0	18.3	72.5	231.6	147.0	378.6
2000	1.6	132.0	2.8	16.4	77.8	241.9	147.5	389.4
2001	1.4	123.7	3.2	14.7	70.0	224.5	133.3	357.7
2002	1.4	134.6	4.2	16.2	73.6	244.0	138.2	382.2
2003	1.5	140.2	4.3	12.1	77.6	253.9	136.0	390.0
2004	1.5	133.0	4.3	9.1	73.0	234.8	138.2	373.0
2005	1.4	129.9	3.4	9.6	72.8	239.5	157.3	396.8
2006	1.4	118.7	3.0	8.6	69.9	214.1	145.0	359.1
2007	1.5	129.7	3.3	8.6	74.2	232.4	159.7	392.1
2008	1.7	139.0	3.5	9.7	81.2	247.6	158.1	405.7
2009	1.7	131.7	3.5	9.0	76.7	231.4	153.3	384.8
2010	1.7	121.8	3.1	8.5	70.1	214.5	153.8	368.3
2011	1.8	127.7	3.3	8.3	74.2	226.4	155.6	382.0
2012[p]	**1.6**	**111.5**	**3.1**	**11.1**	**64.4**	**205.6**	**178.6**	**384.2**

a Firm service guarantees no interruptions.

b Interruptible service permits interruption on short notice, generally in peak-load seasons.

c Includes gas used by the gas utility and transport gas.

d Totals given here may differ from other tables due to different sources.

p Preliminary estimates.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1963-1989), *Operating Revenue and Expense Statistics; Class A and B Utilities in Wisconsin* (1990-1993), and form PSC-AF 2 (1994-2012)

In 2012, natural gas use for residential and non-residential space heating decreased. Because of its lower cost, transport gas continues to be the preferred method of purchasing gas by large commercial and industrial users. These large users purchase the gas directly from the producers and have the interstate pipelines and local distribution companies transport this gas through their pipeline system for a fee.

Firm natural gas service guarantees no interruptions while *interruptible* service permits interruption on short notice, generally in peak-load seasons. Natural gas classified under "general" is used for applications other than heating, such as running gas appliances like a stove, dryer or water heater.

Wisconsin Natural Gas Sales, by Month

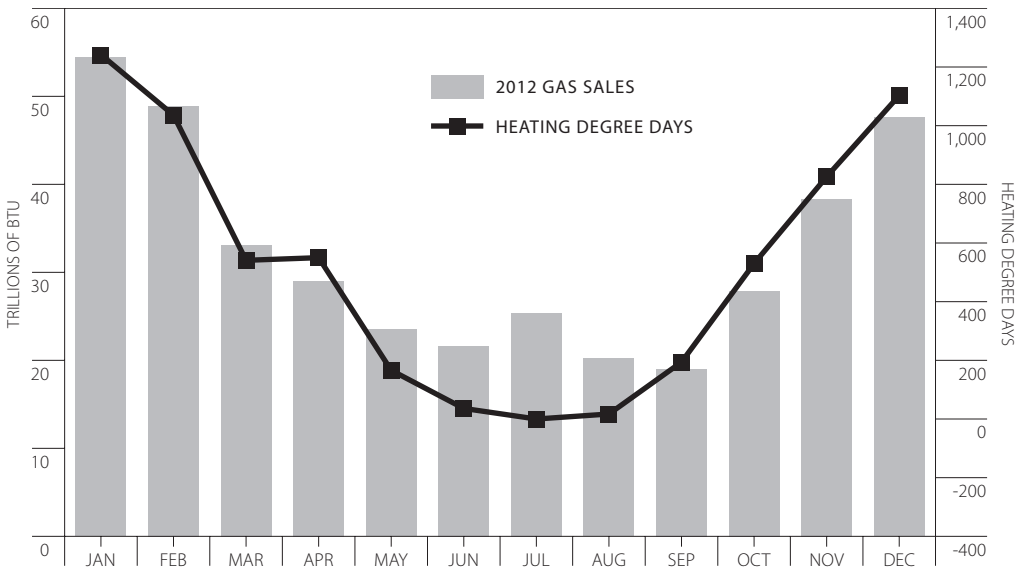
NATURAL GAS
0.6%

In 2012, warmer weather during the winter heating season months led to a 0.6 percent increase in natural gas use compared to 2011. Sales of natural gas are directly related to the number of Heating Degree Days (HDD). For more information on HDDs and Cooling Degree Days (CDD), see Chapter 8 in this publication.

July peaks in consumption are due to utilities using natural gas for electricity generation to meet increased demand driven by air conditioning use.

Springtime consumption is higher because a building's baseline temperature is colder following winter. This trend is reversed in the fall when buildings retain heat from the summer.

2012 GAS SALES AND HEATING DEGREE DAYS



This graph corrects for baseline natural gas consumption unrelated to space heating. Baseline consumption is not weather variable.

1976-2012 TRILLIONS OF BTU

Month	1976	1980	1985	1990	1995	2000	2005	2007	2008	2009	2010	2011	2012[p]
January	50.9	52.8	51.3	40.6	52.7	60.1	60.2	54.3	62.2	67.5	61.4	61.3	54.4
February	40.3	47.3	42.3	39.3	48.7	47.1	45.7	61.5	58.8	49.1	48.7	49.9	48.9
March	38.5	42.9	32.2	34.3	39.1	37.7	48.3	41.1	49.0	43.1	36.4	45.4	33.1
April	26.5	27.4	21.2	25.2	32.9	32.0	28.8	32.4	30.3	30.4	22.3	31.3	29.0
May	22.3	17.6	14.4	18.9	20.0	21.6	22.8	19.1	20.5	18.3	19.5	23.0	23.5
June	16.0	14.1	11.2	12.7	15.5	15.9	21.2	16.0	15.6	17.4	17.8	16.2	21.6
July	14.6	13.4	11.1	11.5	15.2	15.6	20.2	17.7	17.1	14.7	18.6	19.3	25.4
August	15.8	13.5	11.7	12.8	17.6	18.0	21.0	20.3	16.9	16.0	19.9	17.6	20.2
September	16.3	14.8	13.1	14.1	16.9	17.6	18.4	17.3	16.7	17.5	16.7	16.7	19.0
October	27.4	25.9	18.7	22.7	25.2	24.2	24.0	25.1	26.4	28.4	22.0	24.6	27.9
November	38.9	32.2	31.2	30.3	44.7	40.6	35.8	37.4	37.8	32.4	34.7	35.3	38.3
December	51.3	46.3	48.6	44.3	54.5	63.7	55.1	54.6	59.1	54.5	55.1	45.9	47.6
Total[a]	**358.8**	**348.2**	**306.9**	**306.9**	**383.0**	**394.1**	**401.5**	**396.8**	**410.4**	**389.5**	**373.1**	**386.5**	**388.9**

a Totals given here may differ from other tables due to different sources.

p Preliminary estimates.

Source: Wisconsin natural gas utility monthly AF2 reports submitted to the Public Service Commission of Wisconsin (1976-2012), docket number 05-GF-159. http://PSC.wi.gov/apps40/dockets/default.aspx

Average Number of Natural Gas Customers in Wisconsin, by Public Service Commission of Wisconsin Sector

1970-2012

	Residential		Commercial, Industrial & Electric				
Year	General	Space Heating	Firm	Interruptible	Space Heating	Transportation	Total
1970	183,695	566,676	13,806	3,104	50,783		818,064
1975	157,684	700,766	11,685	3,716	65,666		939,517
1980	112,700	853,300	10,058	2,206	78,736		1,057,000
1985	90,500	922,500	9,220	2,312	85,468		1,110,000
1990	77,000	1,046,557	9,713	1,257	101,487	740	1,236,754
1995	62,000	1,229,424	7,723	1,426	122,275	569	1,423,417
1996	60,900	1,263,670	7,115	2,159	124,930	803	1,459,577
1997	59,200	1,302,148	6,954	1,405	130,087	1,138	1,500,932
1998	57,900	1,332,168	7,199	1,255	133,854	1,501	1,533,877
1999	56,000	1,370,909	7,221	1,124	135,241	1,999	1,572,494
2000	54,700	1,404,259	7,095	1,005	139,764	2,136	1,608,959
2001	51,500	1,433,036	7,511	1,233	142,844	2,326	1,638,450
2002	49,200	1,465,500	8,208	1,362	147,404	2,448	1,674,122
2003	48,900	1,492,555	8,295	1,396	148,181	2,394	1,701,721
2004	48,300	1,521,419	8,956	1,377	149,323	2,441	1,731,816
2005	45,700	1,546,921	7,673	1,266	152,145	2,509	1,756,214
2006	45,400	1,566,372	6,790	1,234	154,307	2,450	1,776,553
2007	45,900	1,586,300	6,886	1,195	156,131	2,401	1,798,813
2008	45,900	1,600,744	7,002	1,201	158,421	2,371	1,815,639
2009	45,700	1,610,914	6,927	1,209	159,763	2,340	1,826,853
2010	45,800	1,617,783	6,900	1,203	160,151	2,332	1,834,169
2011	45,800	1,626,034	6,931	1,195	160,910	2,342	1,843,212
2012p	**45,700**	**1,635,301**	**7,781**	**495**	**161,485**	**2,477**	**1,853,239**

p Preliminary estimates.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1963-1989), *Operating Revenue and Expense Statistics; Class A and B Utilities in Wisconsin* (1990-1993), and form PSC-AF 2 Gas Sales and Sales Ratio (1994-2012), U.S. Department of Energy, *Natural Gas Annual*, 1991-2012 [DOE/EIA-0131(12)] (March 2012). Http://www.eia.gov/naturalgas/annual/.

10,027
NEW CUSTOMERS

Wisconsin gas utilities added 10,027 new customers in 2012. Most new customers—9,267—were in the residential sector.

Firm natural gas service guarantees no interruptions while *interruptible* service permits interruption on short notice, generally in peak-load seasons. Natural gas classified under "general" is used for applications other than heating, such as running gas appliances like a stove, dryer or water heater. *Transport* gas is gas piped through utility pipelines, but paid for through a direct contract between an industrial user and the natural gas pipeline company.

Wisconsin Natural Gas Sales Per Customer, by Public Service Commission of Wisconsin Sector

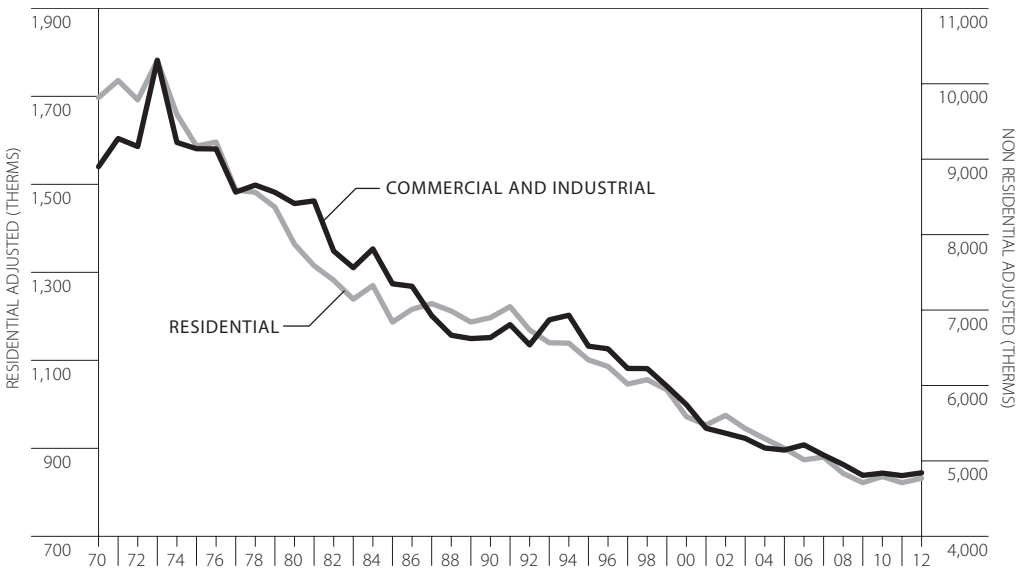
RESIDENTIAL SPACE HEATING
1.2%

COMMERCIAL & INDUSTRIAL SPACE HEATING
0.8%

Natural gas use for residential space heating, adjusted for weather conditions, increased 1.2 percent in 2012, while Commercial and Industrial space heating increased 0.8 percent in 2012. Figures in this table were revised to include updated weather-correction methodology.

Data in this table have been historically revised to reflect 1981-2010 30-year weather normals, and 2010 population weight by weather zone.

1970-2012 THERMS PER CUSTOMER



	Residential			Commercial, Industrial & Electric			
		Space Heating				Space Heating	
Year	General	Actual	Adjusted[a]	Firm	Interruptible	Actual	Adjusted[a]
1970	412	1,788	1,697	19,852	393,886	9,377	8,900
1975	432	1,603	1,587	31,297	364,846	9,234	9,139
1980	384	1,443	1,364	32,065	451,417	8,900	8,412
1985	310	1,250	1,187	19,336	413,392	7,742	7,348
1990	277	1,078	1,197	5,705	259,679	5,973	6,635
1995	295	1,104	1,101	5,991	352,144	6,540	6,521
2000	296	950	972	4,667	163,625	5,615	5,746
2005	304	848	900	5,541	75,815	4,843	5,144
2006	299	763	874	5,710	69,685	4,552	5,213
2007	334	826	880	6,177	71,737	4,768	5,077
2008	372	878	843	6,404	81,151	5,160	4,952
2009	382	827	822	6,524	74,036	4,840	4,808
2010	363	761	836	5,863	70,742	4,405	4,838
2011	395	794	822	6,205	69,211	4,644	4,805
2012[p]	**357**	**690**	**832**	**4,974**	**224,897**	**4,012**	**4,842**

a Space heating categories are adjusted to reflect demand under average heating degree days (HDDs). In the residential category, annual consumption per heating degree day was multiplied by the 1981-2010 30-year normal of 7,531 HDDs. In the commercial category, the space heating use was adjusted the same way.

p Preliminary estimates.

Source: Public Service Commission of Wisconsin, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1963-1989), *Operating Revenue and Expense Statistics; Class A and B Utilities in Wisconsin* (1990-1993), and form PSC-AF 2 (1990-2012).

Wisconsin Natural Gas Deliveries, by Pipeline Company

1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	ANR Pipeline Co.[a]		Viking Gas Trans. Co.[b]		Natural Gas Pipeline Co.[c]		Northern Natural Gas Co.		Guardian Pipeline[d]		Total[f,g]
1970	289.4	*88.2%*	6.0	*1.8%*	6.3	*1.9%*	26.6	*8.1%*			328.3
1975	323.0	*88.5%*	5.7	*1.6%*	7.1	*1.9%*	29.2	*8.0%*			365.0
1980	305.5	*88.8%*	3.9	*1.1%*	7.8	*2.3%*	26.8	*7.8%*			344.0
1985	265.8	*87.4%*	1.2	*0.4%*	7.7	*2.5%*	29.4	*9.7%*			304.1
1990	218.2	*72.0%*	6.0	*2.0%*	7.4	*2.4%*	53.8	*17.7%*			303.2
1995	264.3	*69.6%*	9.1	*2.4%*	23.5	*6.2%*	83.1	*21.9%*			380.0
1996	269.5	*67.7%*	9.9	*2.5%*	26.1	*6.6%*	92.3	*23.2%*			397.8
1997	265.8	*68.1%*	10.4	*2.7%*	23.1	*5.9%*	90.8	*23.3%*			390.1
1998	241.0	*67.6%*	10.2	*2.9%*	19.7	*5.5%*	85.5	*24.0%*			356.4
1999	256.3	*68.8%*	11.4	*3.1%*	16.3	*4.4%*	88.3	*23.7%*			372.3
2000	272.1	*69.0%*	11.1	*2.8%*	21.0	*5.3%*	90.0	*22.8%*			394.2
2001	236.4	*66.0%*	14.1	*3.9%*	23.7	*6.6%*	84.1	*23.5%*			358.3
2002	267.2	*68.7%*	15.1	*3.9%*	22.3	*5.7%*	82.5	*21.2%*	1.9	*0.5%*	389.0
2003	257.0	*64.6%*	16.0	*4.0%*	19.9	*5.0%*	84.8	*21.3%*	20.3	*5.1%*	398.0
2004	241.8	*60.3%*	14.8	*3.7%*	19.8	*4.9%*	84.0	*20.9%*	40.8	*10.2%*	401.2
2005	253.2	*60.9%*	16.1	*3.9%*	19.6	*4.7%*	84.0	*20.2%*	42.9	*10.3%*	415.8
2006	219.0	*57.2%*	14.6	*3.8%*	19.9	*5.2%*	88.6	*23.2%*	40.6	*10.6%*	382.7
2007	249.9	*58.9%*	18.8	*4.4%*	18.0	*4.2%*	88.4	*20.8%*	48.9	*11.5%*	424.0
2008	258.3	*58.4%*	17.9	*4.0%*	17.5	*4.0%*	94.9	*21.4%*	53.9	*12.2%*	442.5
2009	243.0	*58.8%*	17.6	*4.3%*	18.5	*4.5%*	80.6	*19.5%*	53.5	*12.9%*	413.2
2010	226.9	*59.9%*	18.8	*5.0%*	12.2	*3.2%*	77.1	*20.3%*	43.9	*11.6%*	378.7
2011	237.9	*57.7%*	18.8	*4.6%*	11.4	*2.8%*	78.0	*18.9%*	66.1	*16.0%*	412.1
2012[p]	**240.8**	***59.7%***	**18.7**	***4.6%***	**6.6**	***1.6%***	**80.0[e]**	***19.8%***	**57.2**	***14.2%***	**403.3**

The major supplier of natural gas to Wisconsin, ANR, transports most of its gas from Oklahoma and Louisiana. Northern Natural Gas Company transports its gas to Wisconsin from Texas, Oklahoma, Kansas and Alberta, Canada. Natural Gas Pipeline Company transports gas to Wisconsin primarily from Oklahoma, Louisiana and Texas. However, Viking Gas Transmission Company's gas originates primarily from Alberta, Canada. Guardian Pipeline began transporting natural gas to Wisconsin on December 7, 2002.

a Formerly American Natural Resources Pipeline Co.

b Formerly Midwest Gas Transmission Co.

c In 1994, Midcon Corporation became part of the Natural Gas Pipeline Co. Prior to 1994, data in this table included delivery information from Midcon Corporation.

d The Guardian Pipeline became operational on December 7, 2002.

e Estimated.

f Prior to 1990, deliveries represent utility gas sales. Beginning in 1990, deliveries represent total gas used in Wisconsin, including both utility and transported gas deliveries.

g Total purchases differ from the total sold and used by gas utilities due to inventory changes, utility production from liquefied petroleum gas and some unaccounted gas.

p Preliminary estimates.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1970-1993). Telephone conversations and unpublished emails with pipeline representatives 1991-2012.

Wisconsin Coal Use, in Btu, by Economic Sector

TOTAL COAL CONSUMPTION 15.7%

Wisconsin's 2012 total coal consumption decreased 15.7 percent from 2011. This is the second year of decrease; in 2011, coal use decreased 6.2 percent from 2010.

2012 also saw the second year during which coal use declined in all sectors because of decreased economic activity and increased use of natural gas.

Residential coal use dropped off almost entirely in 2008 and that trend continues. Commercial sector use of coal is limited primarily to state facilities and large institutions, and dropped by 15.2 percent. The Industrial sector declined by 14.8 percent, and the utility sector saw a drop of 15.8 percent.

Despite recent declines in coal consumption, the Wisconsin total coal use has increased by 57.8 percent since 1975.

1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

This table represents a conversion from tons to trillions of Btus. The conversion factor from tons to Btus of coal depends on the type of coal used in the sector. For example, the industrial and commercial sectors use bituminous coal with a high energy content (21.0 to 23.6 MMBtu/ton), where the utility sector uses sub-bituminous coal with a lower energy and sulfur content (19.6 MMBtu/ton). Utilities mainly use low-sulfur coal to conform to regulations addressing sulfur emissions from utilities.

Year	Residential		Commercial		Industrial		Electric Utility[a]		Total	Total End Use
1970	9.5	*2.7%*	17.7	*5.0%*	97.1	*27.3%*	231.1	*65.0%*	355.4	124.3
1975	3.8	*1.4%*	7.1	*2.7%*	40.9	*15.6%*	210.5	*80.3%*	262.3	51.8
1980	2.3	*0.7%*	4.4	*1.4%*	47.2	*14.5%*	270.7	*83.4%*	324.6	53.9
1985	0.9	*0.2%*	4.4	*1.2%*	51.4	*13.7%*	317.7	*84.9%*	374.4	56.7
1990	0.4	*0.1%*	4.5	*1.1%*	51.9	*12.6%*	354.5	*86.2%*	411.4	56.9
1995	0.3	*0.1%*	3.8	*0.8%*	47.2	*10.2%*	412.4	*88.9%*	463.7	51.3
1996	0.3	*0.1%*	4.6	*0.9%*	43.1	*8.9%*	438.8	*90.1%*	486.9	48.1
1997	0.3	*0.1%*	4.6	*0.9%*	43.2	*8.5%*	462.0	*90.6%*	510.1	48.1
1998	0.3	*0.1%*	4.8	*1.0%*	41.9	*8.4%*	448.9	*90.5%*	495.8	46.9
1999	0.2	*0.0%*	5.0	*1.0%*	40.7	*8.1%*	459.6	*90.9%*	505.5	45.9
2000	0.2	*0.0%*	4.8	*0.9%*	43.0	*8.3%*	471.4	*90.8%*	519.4	48.0
2001	0.2	*0.0%*	4.8	*0.9%*	45.3	*8.7%*	471.6	*90.4%*	521.9	50.3
2002	0.2	*0.0%*	4.5	*0.9%*	46.7	*9.2%*	457.1	*89.9%*	508.5	51.3
2003	0.2	*0.0%*	4.7	*0.9%*	45.6	*8.7%*	476.6	*90.4%*	527.0	50.5
2004	0.1	*0.0%*	4.8	*0.9%*	47.0	*8.7%*	485.4	*90.4%*	537.2	51.9
2005	0.1	*0.0%*	4.8	*0.9%*	45.1	*8.5%*	481.7	*90.6%*	531.7	50.0
2006	0.1	*0.0%*	4.8	*0.9%*	46.7	*9.0%*	464.1	*90.0%*	515.7	51.6
2007	0.1	*0.0%*	3.9	*0.8%*	46.6	*9.0%*	465.4	*90.2%*	515.9	50.5
2008	0.0	*0.0%*	2.7	*0.5%*	45.5	*8.4%*	492.6	*91.1%*	540.8	48.2
2009	0.0	*0.0%*	2.0	*0.4%*	41.1	*8.5%*	441.4	*91.1%*	484.5	43.1
2010	0.0	*0.0%*	2.2	*0.4%*	42.1	*8.1%*	478.7	*91.5%*	523.0	44.3
2011	0.0	*0.0%*	1.8	*0.4%*	41.0	*8.4%*	448.0	*91.3%*	490.8	42.8
2012[p]	**0.0**	***0.0%***	**1.5**	***0.4%***	**34.9**	***8.4%***	**377.5**	***91.2%***	**413.9**	**36.5**

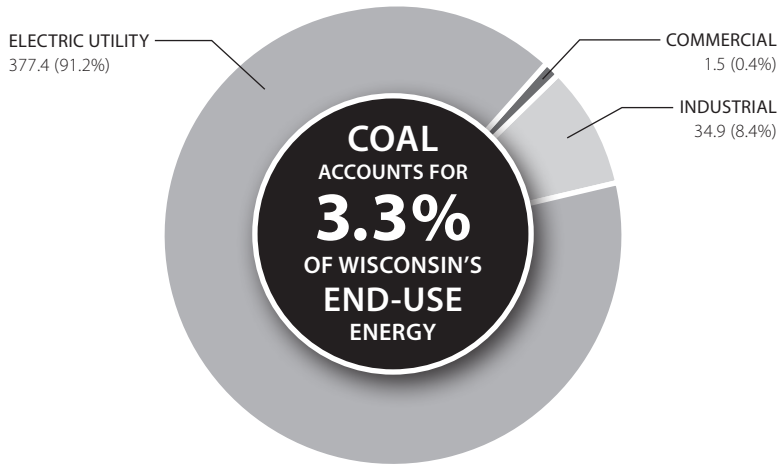
a Includes petroleum coke co-fired with coal.

p Preliminary estimates.

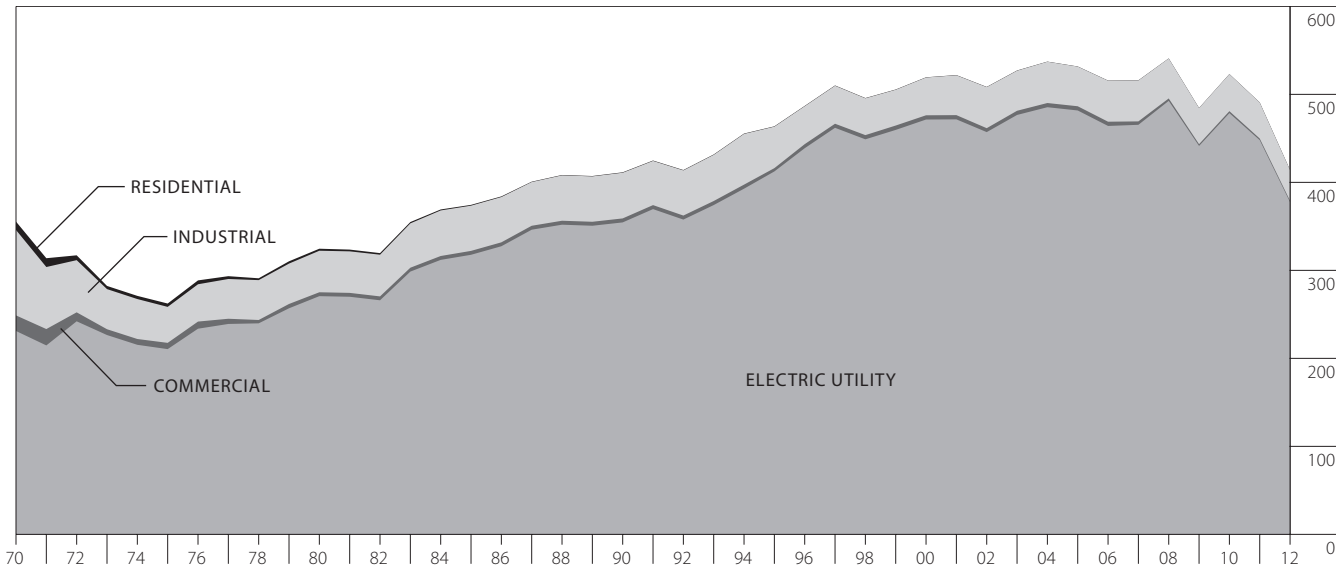
Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data Report*, [DOE/EIA-0214(94)] (October 1996); *Coal Distribution* [DOE/EIA-0125 (95/4Q)] (1980-1995); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1971-2012); annual reports of various Wisconsin electric generating utilities (1995-2012); U.S. Department of Commerce, Bureau of the Census of Housing (1970, 1980, 1990 and 2000).

Wisconsin Coal Use, by Economic Sector

2012 TRILLIONS OF BTU AND PERCENT OF TOTAL



1970-2012 TRILLIONS OF BTU



Source: Wisconsin State Energy Office.

Wisconsin Coal Use, in Tons, by Economic Sector

COAL USE DECREASED 3,871 THOUSAND TONS

The total weight of coal used in Wisconsin decreased 3,871 thousand tons (15.7 percent) in 2012.

1970-2012 THOUSANDS OF TONS AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Electric Utility[a]		Total
1970	453	*2.9%*	840	*5.4%*	3,870	*25.0%*	10,294	*66.6%*	15,457
1975	202	*1.7%*	375	*3.1%*	1,716	*14.2%*	9,776	*81.0%*	12,069
1980	113	*0.7%*	210	*1.3%*	2,001	*12.5%*	13,715	*85.5%*	16,039
1985	40	*0.2%*	211	*1.1%*	2,176	*11.7%*	16,208	*87.0%*	18,635
1990	20	*0.1%*	216	*1.1%*	2,200	*10.7%*	18,087	*88.1%*	20,523
1995	15	*0.1%*	179	*0.8%*	1,998	*8.6%*	21,042	*90.6%*	23,234
1996	14	*0.1%*	220	*0.9%*	1,827	*7.5%*	22,386	*91.6%*	24,447
1997	13	*0.1%*	220	*0.9%*	1,830	*7.1%*	23,571	*92.0%*	25,634
1998	12	*0.0%*	228	*0.9%*	1,773	*7.1%*	22,904	*91.9%*	24,917
1999	11	*0.0%*	237	*0.9%*	1,724	*6.8%*	23,450	*92.2%*	25,422
2000	10	*0.0%*	230	*0.9%*	1,820	*7.0%*	24,050	*92.1%*	26,110
2001	9	*0.0%*	229	*0.9%*	1,919	*7.3%*	24,062	*91.8%*	26,219
2002	8	*0.0%*	213	*0.8%*	1,978	*7.8%*	23,323	*91.4%*	25,522
2003	7	*0.0%*	226	*0.9%*	1,931	*7.3%*	24,314	*91.9%*	26,478
2004	6	*0.0%*	227	*0.8%*	1,989	*7.4%*	24,765	*91.8%*	26,987
2005	5	*0.0%*	228	*0.9%*	1,911	*7.2%*	24,577	*92.0%*	26,721
2006	4	*0.0%*	230	*0.9%*	1,976	*7.6%*	23,679	*91.5%*	25,889
2007	3	*0.0%*	185	*0.7%*	1,972	*7.6%*	23,745	*91.7%*	25,905
2008	0	*0.0%*	131	*0.5%*	1,927	*7.1%*	25,132	*92.4%*	27,190
2009	0	*0.0%*	94	*0.4%*	1,742	*7.2%*	22,518	*92.5%*	24,354
2010	0	*0.0%*	105	*0.4%*	1,785	*6.8%*	24,423	*92.8%*	26,313
2011	0	*0.0%*	87	*0.4%*	1,736	*7.0%*	22,858	*92.6%*	24,681
2012[p]	**0**	***0.0%***	**74**	***0.4%***	**1,479**	***7.1%***	**19,257**	***92.5%***	**20,811**

a Includes petroleum coke co-fired with coal.

p Preliminary estimates.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data Report* [DOE/EIA-0214(94)] (October 1996); U.S. Department of Commerce, Bureau of Census, *Census of Manufacturers and Annual Survey of Manufacturers, Fuels and Electric Energy Consumed* (1971-1982); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1971-2012); annual reports of various Wisconsin electric generating utilities (1995-2012); U.S. Department of Commerce, Bureau of the Census of Housing (1970, 1980, 1990 and 2000); http//www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html

Wisconsin Electric Utility Coal Use, by Plant

1975-2012 THOUSANDS OF TONS

Utility / Plant Name	1975	1980	1985	1990	1995	2000	2005	2009	2010	2011	2012[p]
Dairyland Power Cooperative											
Alma	502	1,188	1,268	1,506	1,231	1,754	2,031	1,732	1,441	1,314	1,251
Genoa	801	915	914	680	788	928	1,172	985	940	543	596
Stoneman	111	74	44	30	0	0	38	13	0	0	0
Madison Gas and Electric Co.											
Blount Street	77	144	61	95	137	215	228	15	12	0	0
Northern States Power Co.											
Bay Front	52	100	36	45	30	115	152	100	60	51	3
Wisconsin Electric Power Co.											
Oak Creek	2,873	2,542	2,528	1,522	2,093	3,410	3,255	2,687	3,670	4,642	3,051
Pleasant Prairie	0	581	2,564	4,703	5,073	5,295	5,373	4,762	4,730	4,096	3,574
Port Washington	691	683	348	126	430	641	0	0	0	0	0
Valley	536	774	528	463	458	690	780	612	566	484	412
Wisconsin Power and Light Co.											
Blackhawk	24	30	8	0	0	0	0	0	0	0	0
Columbia	1,025	3,603	2,991	3,665	4,238	4,355	4,274	4,053	4,589	4,396	4,528
Edgewater	976	1,056	2,112	2,180	2,702	2,531	2,533	2,473	2,624	2,674	2,191
Nelson Dewey	512	552	541	497	615	580	729	569	632	575	488
Rock River	293	245	317	198	253	2	0	0	0	0	0
Wisconsin Public Services Corp.											
Pulliam	753	744	489	674	1,130	1,444	1,627	958	1,161	584	378
Weston	239	329	1,275	1,555	1,702	1,972	2,143	3,363	3,864	3,404	2,746
Municipal Utilities											
Manitowoc[a]	142	67	91	116	160	108	140	144	134	95	40
Marshfield	90	40	48	7	0	0	0	0	0	0	0
Menasha	58	28	25	25	2	10	6	52	0	0	0
Richland Center	21	20	20	0	0	0	0	0	0	0	0
Total[b]	**9,776**	**13,715**	**16,208**	**18,087**	**21,042**	**24,050**	**24,577**	**22,518**	**24,423**	**22,858**	**19,257**

a Includes petroleum coke co-fired with coal.

b The totals do not always match the sum of the individual plants in this table. The totals are drawn from the federal Energy Information Administration, while the plant-specific data comes from the Wisconsin Department of Natural Resources emissions data. Starting in 2008, the totals reflect the WI DNR data.

p Preliminary estimates.

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1975-2012); annual reports of various Wisconsin electric generating utilities (1995-2012); U.S. Department of Energy, *Electric Power Monthly* [DOE/EIA-0226 (2012/03)](March 2012).

COAL USE BY ELECTRIC UTILITIES 15.8%

Coal use by Wisconsin's electric utilities decreased 15.8 percent in 2012. Increased use of natural gas for generating accounted for much of the decrease.

The three largest power plans, Pleasant Prairie, Columbia and Oak Creek, used 57.9 percent of the utility coal burned in Wisconsin, while Wisconsin's newest coal plant Weston 4 (Wisconsin Public Service) uses 9.0 percent of Wisconsin's utility coal.

A map of Wisconsin's coal transportation routes and major coal plants can be found in the Map Appendix at the back of the book.

Wisconsin Manufacturing Industry Coal Use, by Industry Group

PAPER & ALLIED PRODUCTS
91.8%

Wisconsin's industrial coal use continues to be dominated by paper and allied products, which consumed 91.8 percent of the industrial coal used in 2012.

Entries in the table without figures indicate coal tons of less than 500 tons.

1971-2012 THOUSANDS OF TONS

SIC Industry Group	1971	1975	1980	1985	1990	1995	2000	2005	2007	2008	2009	2010	2011	2012p
20 Food and Kindred	213	56	64	72	43	10	15	21	22	14	12	9	10	9
26 Paper and Allied	1,940	1,469	1,737	1,878	1,863	1,825	1,700	1,765	1,838	1,835	1,648	1,661	1,584	1,357
32 Stone, Clay and Glass	79	13	8	49	116	120	80	121	108	51	61	64	70	57
33 Primary Metals	114	50	80	66	95	—	—	—	—	27	21	51	72	56
37 Transport Equipment	107	35	30	37	32	22	12	4	4	—	—	—	—	—
Total Manufacturing	**2,810**	**1,716**	**2,001**	**2,176**	**2,200**	**1,998**	**1,820**	**1,911**	**1,972**	**1,927**	**1,742**	**1,785**	**1,736**	**1,479**

p Preliminary.

Source: U.S. Department of Commerce, Bureau of the Census, *Census of Manufacturers*, and *Annual Survey of Manufacturers* (1972-1981); U.S. Department of Energy, Energy Information Administration, *Coal Distribution* [DOE/EIA-0125 (95/4Q)] (1980-1995); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-2012).

Coal Deliveries to Wisconsin Industries, by Region of Origin

COAL FROM WESTERN U.S.
38.4%

Coal currently used by Wisconsin industry comes primarily from the western part of the country (38.4 percent). There has been a gradual decline in industrial coal use. Industrial coal from Illinois has declined 63.3 percent since 1985.

1975-2012 THOUSANDS OF TONS

Origin[a]	1975	1980	1985	1990	1995	2000	2005	2007	2008	2009	2010	2011	2012p
Eastern PA	39	136	24	4	5	8	137	148	141	48	18	45	109
Western PA	11	125	192	38	33	11	0	0	0	0	0	0	0
Northern WV	93	339	150	230	384	75	175	98	78	99	93	93	144
Ohio	91	129	43	0	10	0	36	19	0	0	0	0	0
Southern No. 1 (WV and VA)	35	88	2	1	15	190	13	0	0	0	2	0	8
Southern No. 2 (WV and KY)	1,210	497	757	628	529	326	243	261	259	125	173	150	74
Western KY	111	127	147	98	196	179	192	197	195	97	91	99	72
Illinois	515	520	624	300	228	147	101	106	135	307	310	295	229
Indiana	55	114	89	43	67	52	207	215	217	214	194	194	204
Western U.S.	11	3	0	0	0	0	0	0	0	0	0	0	0
CO and NM	0	0	0	0	0	0	190	322	203	104	207	218	147
Wyoming	24	16	0	346	250	521	368	423	446	421	405	372	334
Utah	1	0	0	0	0	0	71	0	7	12	18	19	27
MO and WA	281	220	158	0	15	0	0	0	0	0	5	7	15
Total	**2,477**	**2,314**	**2,186**	**1,688**	**1,733**	**1,509**	**1,733**	**1,789**	**1,681**	**1,427**	**1,516**	**1,493**	**1,362**

a Includes shipments to Wisconsin end users and dealers. Does not include deliveries to Superior Midwest Energy Terminal for trans-shipment from Wisconsin.

p Preliminary.

Source: U.S. Bureau of Mines, "Bituminous Coal and Lignite Distribution", *Mineral Industry Surveys* (1973-1976); U.S. Department of Energy, Energy Information Administration, *Bituminous and Subbituminous Coal and Lignite Distribution* (1977-1979), *Coal Industry Annual* [DOE/EIA-0584](2000), *Coal Distribution* [DOE/EIA-0125 (99/4Q)] (1980-1999), *Quarterly Coal Report* [DOE/EIA - 0121(2012/4Q)] (March 2013), www.eia.gov/coal/distribution/quarterly and www.eia.gov/coal/distribution/annual

Coal Deliveries to Wisconsin, by Transportation Mode and Type of Receiving Facility

1975-2012 THOUSANDS OF TONS

Transportation Mode and Type of Receiving Facility	1975	1980	1985	1990	1995	2000	2005	2007	2008	2009	2010	2011	2012[p]
Rail													
Electric Utilities	7,631	11,140	13,194	17,237	18,815	25,072	21,722	24,063	24,996	22,761	23,027	22,782	19,624
Coke Plants	29	11	0	0	0	0	0	0	0	0	0	0	0
Other Industrial	850	1,047	846	811	772	1,169	1,177	1,377	1,469	1,299	1,321	1,164	1,036
Residential/Commercial	170	3	5	1	3	33	417	56	96	75	59	39	0
Subtotal	**8,680**	**12,201**	**14,045**	**18,049**	**19,590**	**26,274**	**23,316**	**25,496**	**26,561**	**24,135**	**24,407**	**23,985**	**20,660**
Great Lakes Shipping													
Electric Utilities	2,211	1,713	1,118	429	1,005	753	1,572	518	69	0	0	0	0
Coke Plants	224	167	0	0	0	0	0	0	0	0	0	0	0
Other Industrial	992	981	1,024	822	788	331	46	39	0	0	0	155	177
Residential/Commercial	212	46	11	1	0	0	0	0	40	14	30	44	23
Subtotal	**3,639**	**2,907**	**2,153**	**1,252**	**1,793**	**1,084**	**1,618**	**557**	**109**	**14**	**30**	**199**	**200**
River Barge													
Electric Utilities	1,756	1,487	1,042	855	1,083	32	1,508	454	12	103	176	0	8
Other Industrial	0	62	246	55	120	4	22	18	11	9	12	11	12
Residential/Commercial	0	1	10	2	126	129	0	0	32	24	19	10	6
Subtotal	**1,756**	**1,550**	**1,298**	**912**	**1,329**	**165**	**1,530**	**472**	**55**	**136**	**207**	**21**	**26**
Truck													
Electric Utilities	0	0	2	31	0	0	0	50	0	60	59	59	35
Other Industrial	0	1	45	1	53	5	488	355	200	119	184	162	137
Residential/Commercial	0	0	0	0	0	0	1	0	1	0	0	0	0
Subtotal	**0**	**1**	**47**	**32**	**53**	**5**	**489**	**405**	**201**	**179**	**243**	**221**	**172**
Total[a]	**14,075**	**16,659**	**17,543**	**20,245**	**22,765**	**27,528**	**26,953**	**26,930**	**26,926**	**24,464**	**24,887**	**24,427**	**21,059**

a Total data reported in this table may differ from other tables because of different sources. Subtotals may not add due to rounding.

p Preliminary.

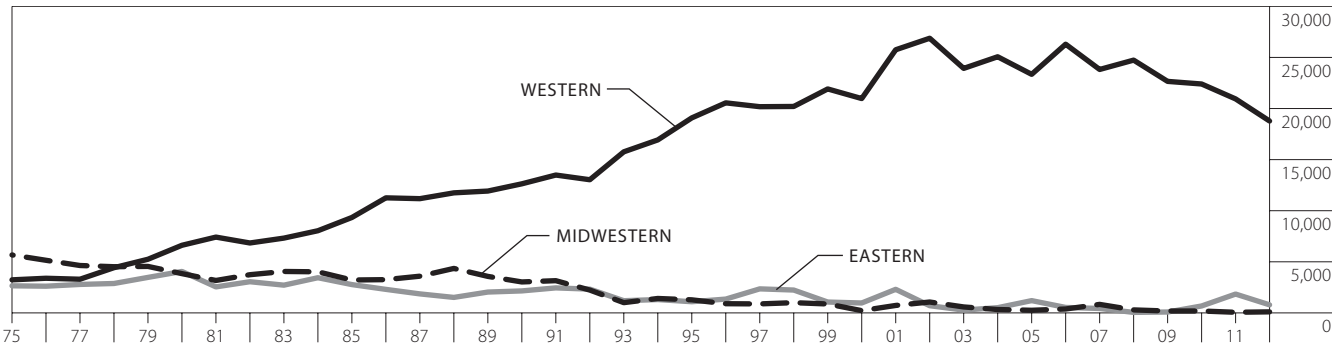
Source: U.S. Bureau of Mines, "Bituminous Coal and Lignite Distribution", *Mineral Industry Surveys* (1973-1976); U.S. Department of Energy, Energy Information Administration, *Bituminous and Subbituminous Coal and Lignite Distribution* (1977-1979), *Coal Industry Annual* [DOE/EIA - 0584] (2000), *Coal Distribution* [DOE/EIA-0125 (99/4Q)] (1980-1999) and *Quarterly Coal Report* [DOA/EIA-0121 (2012/4Q)] (March 2013), www.eia.gov/coal/distribution/quarterly and www.eia.gov/coal/distribution/annual

COAL
SHIPPED BY RAIL
13.9%

Coal shipped by rail decreased 13.9 percent in 2012. Total coal deliveries decreased by 13.8 percent. Ninety-eight percent of coal is delivered to Wisconsin by rail. The long term increase in coal tonnage shipped by rail reflects the increased use of low sulfur western coal. Use of low sulfur eastern coal shipped by the Great Lakes, and Midwest coal shipped by river barge, is expected to continue at near current levels. Changes in Wisconsin coal deliveries will be concentrated in rail deliveries of western coal for electric utilities.

Coal Deliveries to Wisconsin Power Plants, by Region of Origin

1975-2012 THOUSANDS OF TONS



Coal Deliveries to Wisconsin Power Plants, by State of Origin

COAL DELIVERIES 13.9%

Coal deliveries to Wisconsin power plants decreased 13.9 percent. This resulted in a decrease of coal stockpiled at Wisconsin utilities for future use.

1975-2012 THOUSANDS OF TONS

State	1975	1980	1985	1990	1995	2000	2005	2007	2008	2009	2010	2011	2012[p]
Eastern													
Kentucky	2,073	2,816	2,122	196	95	47	758	179	0	10	10	10	0
Pennsylvania	572	1,007	639	1,760	941	826	0	12	0	76	650	1,764	788
West Virginia	5	233	0	136	57	34	252	240	12	0	18	67	0
Other States	1	0	9	59	0	62	191	0	37	0	0	0	0
Subtotal	**2,651**	**4,056**	**2,770**	**2,151**	**1,093**	**969**	**1,201**	**431**	**49**	**86**	**678**	**1,842**	**788**
Midwestern													
Illinois	4,857	3,364	1,478	1,136	1,232	0	97	686	236	86	183	59	57
Indiana	785	205	1,731	1,893	46	221	159	146	56	96	3	0	1
Ohio	27	272	0	0	0	0	0	0	0	0	0	0	43
Other States	0	1	9	0	0	0	0	0	0	0	0	0	0
Subtotal	**5,669**	**3,842**	**3,218**	**3,029**	**1,278**	**221**	**256**	**832**	**292**	**182**	**186**	**59**	**102**
Western													
Montana	2,161	2,575	2,235	1,983	2,102	463	591	1,961	562	548	535	482	871
Wyoming	1,053	4,042	7,101	10,605	15,223	19,192	20,581	19,811	22,569	21,438	21,383	19,841	17,739
Other States[a]	20	0	0	43	1,758	1,320	2,174	2,050	1,605	670	482	617	166
Subtotal	**3,234**	**6,617**	**9,336**	**12,631**	**19,083**	**20,975**	**23,346**	**23,822**	**24,736**	**22,656**	**22,400**	**20,940**	**18,777**
Total	**11,554**	**14,515**	**15,324**	**17,811**	**21,454**	**22,165**	**24,803**	**25,085**	**25,077**	**22,924**	**23,263**	**22,841**	**19,667**

a Colorado.

p Preliminary

Source: U.S. Department of Energy, *Cost and Quality of Fuels for Electric Utility Plants 2000* [DOE/EIA-0191(2001)] (May 2001), and *Quarterly Coal Report* [DOE/EIA-0121 (2012/4Q)] (March 2013), www.eia.gov/coal/distribution/quarterly and www.eia.gov/coal/distribution/annual

Wisconsin Electric Utility Sales, by Economic Sector

1970-2012 MILLIONS OF kWh AND PERCENT OF TOTAL

Year	Residential		Commercial[a]		Industrial		Agricultural[c,d]		Total[e]
1970	8,761	*35.4%*	5,738	*23.2%*	9,188	*37.2%*	1,028	*4.2%*	24,715
1975	10,893	*34.8%*	8,452	*27.0%*	10,721	*34.3%*	1,210	*3.9%*	31,276
1980	12,513	*33.2%*	11,243	*29.8%*	12,450	*33.0%*	1,539	*4.1%*	37,745
1985	13,257	*31.8%*	12,783	*30.6%*	13,940	*33.4%*	1,745	*4.2%*	41,725
1990[b]	14,740	*30.0%*	15,808	*32.1%*	17,005	*34.6%*	1,645	*3.3%*	49,198
1995	17,040	*29.4%*	18,042	*31.1%*	21,290	*36.7%*	1,595	*2.8%*	57,967
1996	17,100	*29.1%*	18,588	*31.6%*	21,471	*36.6%*	1,585	*2.7%*	58,744
1997	16,935	*28.2%*	18,881	*31.4%*	22,703	*37.8%*	1,575	*2.6%*	60,094
1998	17,522	*28.2%*	19,334	*31.2%*	23,640	*38.1%*	1,565	*2.5%*	62,061
1999	17,942	*28.2%*	20,781	*32.7%*	23,264	*36.6%*	1,560	*2.5%*	63,547
2000	18,199	*28.1%*	21,407	*33.1%*	23,528	*36.4%*	1,555	*2.4%*	64,689
2001	18,990	*28.8%*	21,614	*32.8%*	23,823	*36.1%*	1,550	*2.3%*	65,977
2002[f]	20,030	*29.9%*	22,290	*33.3%*	23,134	*34.5%*	1,545	*2.3%*	66,999
2003	21,364	*31.8%*	20,056	*29.8%*	24,226	*36.0%*	1,595	*2.4%*	67,241
2004	21,120	*31.2%*	19,951	*29.4%*	25,228	*37.2%*	1,501	*2.2%*	67,800
2005	21,385	*30.4%*	21,968	*31.2%*	25,376	*36.1%*	1,606	*2.3%*	70,335
2006	20,729	*29.7%*	22,232	*31.8%*	25,286	*36.2%*	1,574	*2.3%*	69,821
2007	21,454	*30.1%*	23,032	*32.3%*	25,436	*35.7%*	1,379	*1.9%*	71,301
2008	20,985	*29.9%*	22,978	*32.8%*	24,672	*35.2%*	1,486	*2.1%*	70,121
2009	20,458	*30.9%*	21,995	*33.2%*	22,390	*33.8%*	1,443	*2.2%*	66,286
2010	21,323	*31.0%*	22,514	*32.7%*	23,452	*34.1%*	1,463	*2.1%*	68,752
2011[r]	21,249	*31.0%*	22,605	*32.9%*	23,407	*34.1%*	1,351	*2.0%*	68,612
2012[p]	**21,012**	***30.5%***	**22,727**	***33.0%***	**23,561**	***34.2%***	**1,520**	***2.2%***	**68,820**

a Includes sales to public authorities (including sales for street and highway lighting) and utility company interdepartmental sales (for example, from electric to gas department of a combined utility).

b Beginning in 1989, U.S. DOE data sources have been used.

c Beginning in 2003, USDA agricultural statistics were used for electricity sales in this sector. To accommodate this shift in data sources, numbers in the residential and agricultural sectors have been historically revised.

d The agricultural sector does not include processing plants for crops and other agricultural products; these are classified under the commercial sector.

e Total sales may vary from other pages due to independent rounding.

f In 2002, EIA shifted their commercial and industrial criteria. Previous editions of this publication corrected for this shift, but revisions based on availability of firm agricultural electric consumption data prompted a historical revision starting in 1989. This publication no longer corrects for shifts in EIA data collection methods which are reflected in 2003.

p Preliminary estimates.

r Revised.

Source: Sectoral disaggregation by Wisconsin State Energy Office, based on Public Service Commission of Wisconsin, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1970-1994); U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1970-1994); U.S. Department of Energy, *Electric Sales and Revenue 1989-1999* [DOE/EIA-0540 (99)] (October 2000), *Electric Power Monthly*, Table 5.4B [DOE/EIA-0226 (2013/05)] (May 2013) (1989-2012). www.eia.gov/electricity/monthly/index.cfml; U.S. Department of Agriculture, Economic Research Service, electricity expenditure data at http://www.ers.usda.gov/ (2009-2012).

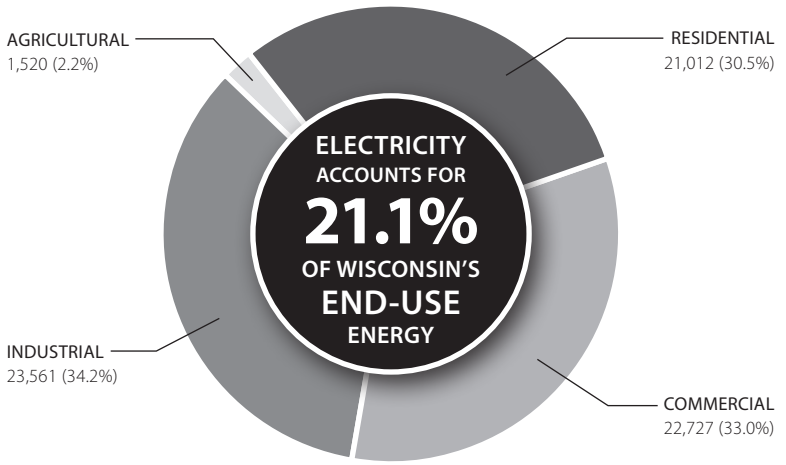
TOTAL ELECTRICITY SALES
0.3%

Total electricity sales increased 0.3 percent in 2012 but have grown 2.7 percent over the past ten years. In 2012, electricity sales decreased in the Residential sector, but increased in all other sectors.

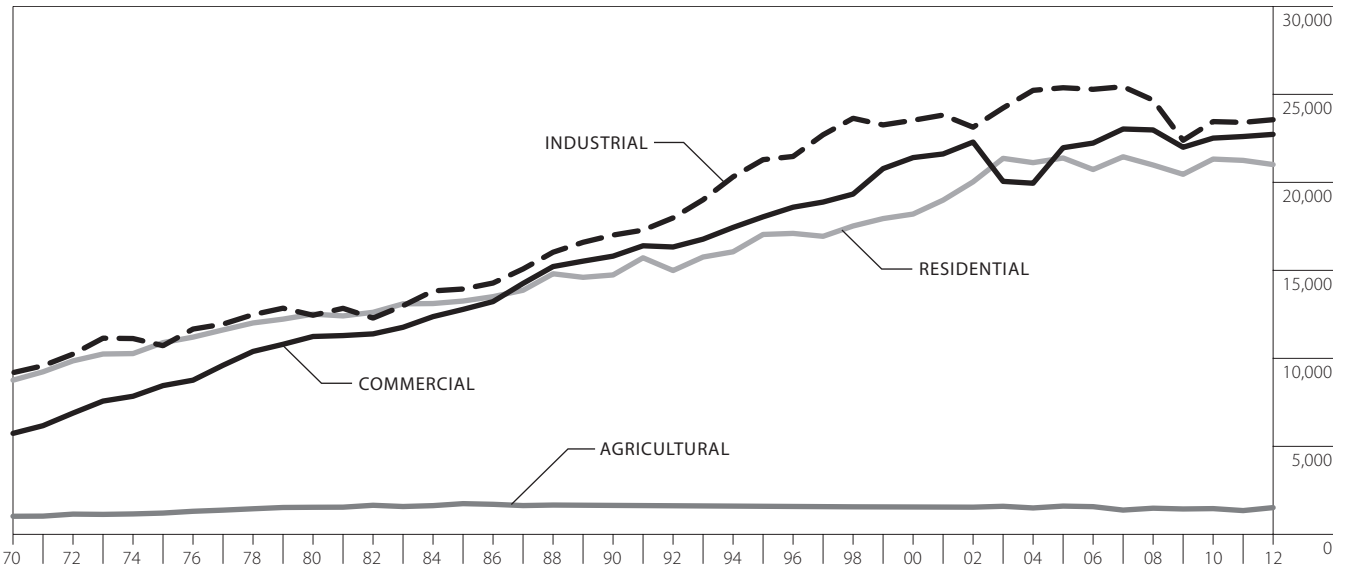
A map of Wisconsin's major electric service territories, generating facilities and transmission lines can be found in the Map Appendix.

Wisconsin Electric Utility Sales, by Economic Sector

2012 MILLIONS OF kWh AND PERCENT OF TOTAL



1970-2012 MILLIONS OF kWh



Source: Wisconsin State Energy Office.

Wisconsin Electricity Sales to Ultimate Customers, by Private and Municipal Utilities and Power Cooperatives

1970-2012 MILLIONS OF kWh AND PERCENT OF TOTAL

Year	Private Utilities		Municipal Utilities		Power Cooperatives		Total
1970	21,515	*87.1%*	2,160	*8.7%*	1,040	*4.2%*	24,715
1975	27,021	*86.4%*	2,784	*8.9%*	1,471	*4.7%*	31,276
1980	32,335	*85.7%*	3,547	*9.4%*	1,864	*4.9%*	37,746
1985	35,497	*85.1%*	4,132	*9.9%*	2,096	*5.0%*	41,725
1990[a]	41,653	*84.7%*	5,263	*10.7%*	2,282	*4.6%*	49,198
1995	48,814	*84.2%*	6,479	*11.2%*	2,674	*4.6%*	57,967
1996	49,332	*84.0%*	6,635	*11.3%*	2,777	*4.7%*	58,744
1997	50,640	*84.3%*	6,627	*11.0%*	2,827	*4.7%*	60,094
1998	52,242	*84.2%*	6,992	*11.3%*	2,827	*4.6%*	62,061
1999	53,517	*84.2%*	7,215	*11.4%*	2,815	*4.4%*	63,547
2000	54,404	*84.1%*	7,375	*11.4%*	2,910	*4.5%*	64,689
2001	55,545	*84.2%*	7,349	*11.1%*	3,083	*4.7%*	65,977
2002	56,250	*84.0%*	7,523	*11.2%*	3,226	*4.8%*	66,999
2003	56,459	*84.0%*	7,500	*11.2%*	3,282	*4.9%*	67,241
2004	57,099	*84.0%*	7,598	*11.2%*	3,279	*4.8%*	67,976
2005	58,899	*83.7%*	7,950	*11.3%*	3,487	*5.0%*	70,336
2006	58,407	*83.7%*	7,902	*11.3%*	3,512	*5.0%*	69,821
2007	59,585	*83.6%*	8,079	*11.3%*	3,637	*5.1%*	71,301
2008	58,429	*83.3%*	7,947	*11.3%*	3,746	*5.3%*	70,122
2009	55,051	*83.1%*	7,485	*11.3%*	3,750	*5.7%*	66,286
2010	57,183	*83.2%*	7,759	*11.3%*	3,810	*5.5%*	68,752
2011[r]	56,914	*83.0%*	7,800	*11.4%*	3,898	*5.7%*	68,612
2012[p]	**57,128**	***83.0%***	**7,856**	***11.4%***	**3,836**	***5.6%***	**68,820**

Investor owned utilities supply the vast majority of power to Wisconsin electricity customers (83.0 percent). The relative amounts of power supplied by the three types of utilities have changed very little over the past 20 years.

a Beginning in 1989, U.S. DOE data sources have been used.

p Preliminary estimates.

r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8, Table 5 (1970-1994); U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1, Table 31 (1970-1994); U.S. Department of Energy, *Electric Sales and Revenue 1989-2000* [DOE/EIA-0540 (2000)] (November 2001), and *Electric Power Monthly* [DOE/EIA-0226 (2013/05)] (May 2013) (1989-2012). www.eia.gov/electricity/monthly/index.cfm

Eastern Wisconsin Electric Utility Power Load and Non-Coincident Peak Demand

SUMMER PEAK DEMAND
0.2%

Wisconsin's 2012 summer peak electricity demand for the eastern Wisconsin utilities[a] increased 0.2 percent due to warmer weather in July. The increase compared to 2011 was 29 megawatts.

WINTER PEAK DEMAND
1.2%

Winter peak demand decreased 1.2 percent in 2012 due to warmer December weather. Summer peak demand in 2012 exceeded winter peak demand by 3,718 megawatts. Winter peak demand includes November through February. Because these data are presented annually, winter peak demand in this chart only includes November and December 2012; the peak demand will be adjusted to include January and February in the next edition of this publication.

Non-coincident peak demand is the sum of the individual monthly peak electric demands from Wisconsin's eastern utilities.

1970-2012

	Load	Peak Demand		Capacity Factor[b]
Year	(Millions of kWh)	Summer (MW)	Winter (MW)	(Percent)
1970	22,818	4,125	3,964	63.1
1975	28,616	5,314	4,903	61.5
1980	34,836	6,009	5,525	66.0
1985	39,325	6,464	6,166	69.4
1990[c]	47,381	8,326	7,210	65.0
1995	55,821	9,833	8,275	64.8
1996	58,408	9,061	8,285	73.4
1997	59,946	9,313	8,302	73.5
1998	59,563	10,099	8,644	67.3
1999	61,990	10,756	8,977	65.8
2000	64,084	10,814	9,152	67.6
2001	61,701	11,645	8,440	60.5
2002	67,698	11,401	8,917	67.8
2003	68,886	11,688	9,192	67.3
2004	68,296	10,981	9,729	70.8
2005	70,441	11,946	9,595	67.3
2006	67,216	12,129	9,238	63.3
2007	68,796	11,698	9,237	67.1
2008	66,931	11,060	9,482	68.9
2009	63,349	11,267	9,114	64.2
2010	65,092	11,568	9,036	64.2
2011[r]	66,300	12,230	8,642	61.9
2012[p]	**65,623**	**12,259**	**8,541**	**60.9**

a Wisconsin Electric Power Co., Wisconsin Power and Light Co., Wisconsin Public Service Corp., and Madison Gas and Electric Co.

b Capacity Factor = Annual Energy Generation (kWh) / [Peak Demand (kW) x 8,760 (hours/year)]

c Beginning in January 1988, data includes Wisconsin Electric Power Co. generation from Presque Isle, Michigan.

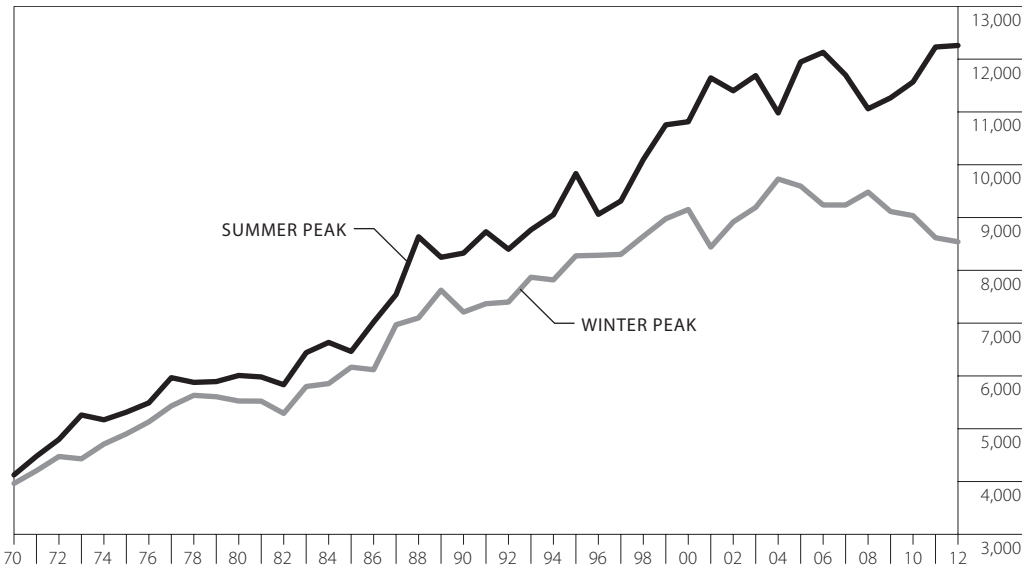
p Preliminary estimates.

r Revised.

Source: Wisconsin electric utility annual reports submitted to the Public Service Commission of Wisconsin (1970-2013); www.psc.wi.gov/apps40/annlreport/default.aspx

Eastern Wisconsin Electric Utility Non-Coincident Peak Demand

1970-2012 MEGAWATTS



HIGHEST PEAK
12,259
MEGAWATTS
JULY 2012

Eastern Wisconsin Electric Utility Power Load and Non-Coincident Peak Demand, by Month

2012

Month	Load (Millions of kWh)[a]	Non-Coincident Peak Demand (MW)[b]
January	5,518	8,642
February	5,054	8,140
March	5,068	7,958
April	4,662	7,385
May	5,250	8,491
June	5,878	11,495
July	7,081	12,259
August	6,230	10,920
September	5,236	10,526
October	5,127	7,879
November	5,288	8,387
December	5,231	8,541
Total	**65,623**	

a Wisconsin Electric Power Co., Wisconsin Power and Light Co., Wisconsin Public Service Corp., and Madison Gas and Electric Co.

b Non-coincident peak demand is the sum of the individual monthly peak electric demands from the four utilities listed above for each month.

Source: Wisconsin electric utility annual reports submitted to the Public Service Commission of Wisconsin (2013). www.psc.wi.gov/apps40/annlreport/default.aspx

The highest non-coincident peak demand in 2012 was seen in July at 12,259 MW.

Wisconsin Electric Generating Capacity, by Type of Plant

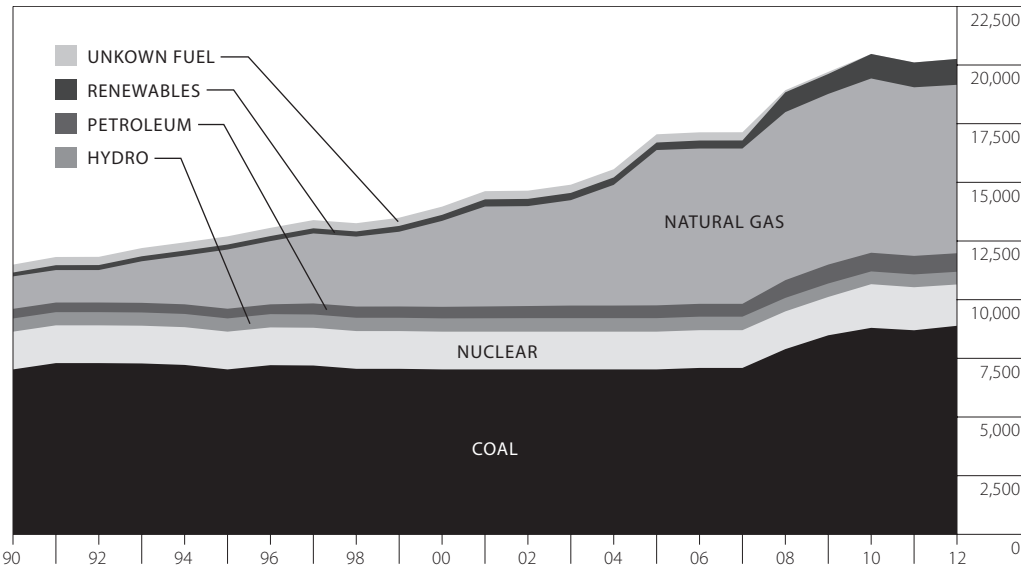
ELECTRIC GENERATION CAPACITY
151.3
MEGAWATTS
(0.8 PERCENT)
IN 2012

In 2012, Wisconsin's electric generation capacity increased by 151.3 megawatts (0.8 percent). These data represent electricity generation capacity by Wisconsin's investor-owned utilities, municipal utilities, electric cooperatives, independent power producers, and other non-utility operations (e.g., paper mills).

The Renewables data include biomass (e.g., wood, paper byproducts), biogas (landfill gas, and methane digester gas), solar photovoltaic and wind. Out-of-state facilities are not included in the Renewables or the hydroelectric figures. These figures include renewable facilities that are not RPS-registered.

All capacity figures are estimates, based on a point-in-time determination.

1990-2012 MEGAWATTS



Year	Coal	Nuclear	Hydro	Petroleum	Natural Gas	Renewables	Unknown Fuel	Total[a,b]
1990	7,028	1,609	562	410	1,383	165	337	11,494
1995	7,028	1,609	564	413	2,522	213	350	12,700
1996	7,209	1,609	566	417	2,694	216	350	13,062
1997	7,194	1,609	566	471	2,982	219	350	13,391
1998	7,053	1,609	567	477	2,982	220	350	13,258
1999	7,053	1,609	567	481	3,185	248	350	13,494
2000	7,028	1,609	567	491	3,662	258	350	13,965
2001	7,028	1,609	571	503	4,258	305	350	14,624
2002	7,028	1,609	576	516	4,258	308	350	14,646
2003	7,028	1,609	576	536	4,491	310	350	14,900
2004	7,028	1,609	576	536	5,143	317	350	15,560
2005	7,028	1,609	576	545	6,618	321	350	17,048
2006	7,091	1,609	576	547	6,618	341	350	17,133
2007	7,091	1,609	576	547	6,618	344	350	17,137
2008	7,893	1,608	575	756	7,161	844	89	18,925
2009	8,482	1,634	574	806	7,272	850	89	19,706
2010	8,799	1,861	544	796	7,426	1,044	0	20,470
2011	8,696	1,834	546	790	7,184	1,058	0	20,107
2012[p]	**8,887**	**1,761**	**541**	**790**	**7,177**	**1,103**	**0**	**20,259**

a Capacity is as of December 31 of each year.

b Totals might not add due to rounding.

p Preliminary.

Sources: Energy Information Administration, *Electric Power Annual*, [DOE/EIA-0348(2007)](October 2007), http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html. In 2008, this table was historically revised with data from the Public Service Commission of Wisconsin. Public Service Commission of Wisconsin, unpublished electrical capacity data (1990-2012); EIA data were used in previous publications.

Wisconsin Electric Generating Capacity, by Type of Plant and Type of Producer

1990-2012 MEGAWATTS

These data represent the generation capacity of utilities, who are required to have power available to customers via the power grid; and merchant producers who produce power for wholesale (Independent Power Producers) to utilities; and non-utilities which are primarily industrial sector businesses producing electricity for in-house use, any excess of which *may* also be sold to utilities for retail re-sale on the power grid.

	Utility Generating Capacity[c]				Non-Utility Generating Capacity			All Producers Capacity Total
Year	Cooperatives	Investor-Owned Utilities	Municipal	Utility Total	IPP[a]	Non-Utility[b]	Non-Utility Total	
1990	937	9,404	204	10,544	62	889	951	11,494
1991	937	9,352	203	10,492	62	916	977	11,469
1992	937	9,352	203	10,492	62	921	983	11,475
1993	937	9,627	289	10,852	62	922	983	11,836
1994	937	9,904	289	11,129	62	922	983	12,113
1995	937	10,452	290	11,678	62	960	1,022	12,700
1996	937	10,379	375	11,691	62	936	998	12,689
1997	937	10,432	376	11,744	350	939	1,289	13,033
1998	937	10,433	382	11,751	530	939	1,469	13,220
1999	937	10,455	410	11,801	830	946	1,775	13,577
2000	937	10,794	421	12,151	830	984	1,814	13,965
2001	1,033	10,798	432	12,263	1,361	1,000	2,361	14,624
2002	1,033	10,804	440	12,277	1,362	1,008	2,370	14,647
2003	1,033	11,057	440	12,530	1,362	1,008	2,371	14,901
2004	1,036	11,058	492	12,586	1,961	1,013	2,974	15,560
2005	1,037	11,098	501	12,636	3,397	1,015	4,412	17,048
2006	1,037	11,098	566	12,702	3,397	1,034	4,431	17,133
2007	1,037	10,024	566	11,628	4,471	1,038	5,509	17,137
2008	1,017	11,201	566	12,784	5,036	1,016	6,052	18,836
2009	1,017	11,960	566	13,543	5,071	1,092	6,163	19,706
2010	1,030	12,772	565	14,367	5,357	745	6,102	20,469
2011	972	12,520	593	14,085	5,306	716	6,022	20,107
2012[e]	**973**	**15,025**	**585**	**16,583**	**2,981**	**694**	**3,675**	**20,259**

a IPPs are independent power producers allowed under law to sell their power to wholesalers such as utility cooperatives. They are barred from selling their power on the retail market.

b Non-utility sources refers to industrial power producers such as paper mills.

c Utilities include investor-owned utilities, electric cooperatives and municipalities.

e Estimate.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994) and personal communications 2002; U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1971-1994); Public Service Commission of Wisconsin, unpublished electrical capacity data (1990-2012).

2012 saw a slight increase of 0.8 percent in capacity over 2011.

The Investor Owned Utilities (IOUs) saw an increase in capacity of 20 percent, and the Cooperatives, an increase of 0.1 percent. The Municipal utilities decreased their capacity by 1.5 percent; non-utilities by 3.1 percent, and IPPs by 43.8 percent.

These data were not available until 1990; the capacity listed for 1990 represents in-place capacity for all previous years of operation.

All capacity figures are estimates, based on a point-in-time determination.

Wisconsin Utility Electric Power Generation, by Type of Fuel

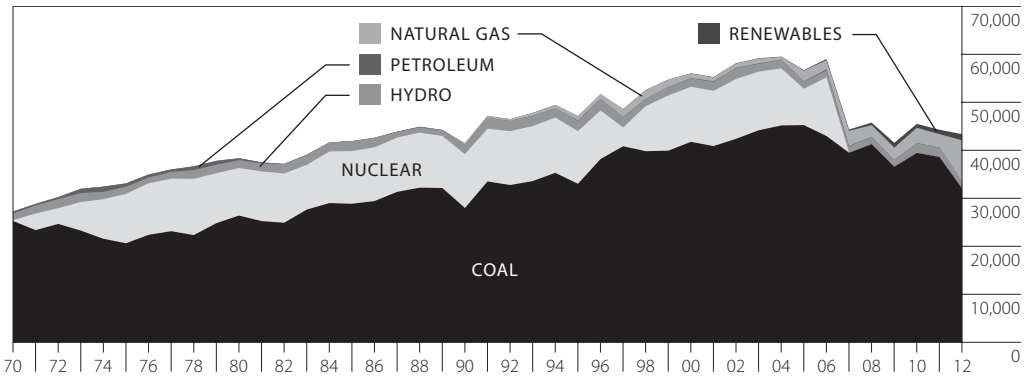
ELECTRIC UTILITY GENERATION 2.1%

Total electric generation by Wisconsin utilities—investor-owned, cooperative and municipal—decreased 2.1 percent in 2012. Generation from Independent Power Producers (IPPs) decreased by 15.6 percent and non-utilities saw 0.9 percent dip. In 2012, 86.3 percent of Wisconsin's power was produced in-state, and power imports increased by 59.9 percent.

Energy production from renewable sources increased by 39.8 percent in 2012, while production from coal decreased by 17.0 percent. The decrease in coal used for generation is due in part to a 210.7 percent increase in cleaner-burning natural gas generation.

Out-of-state generation is not included in these figures.

1970-2012 MILLIONS OF kWh



	Electricity Generation by Utilities											
Year	Coal[b]	Nuclear[g]	Hydro[a]	Petroleum[d]	Natural Gas	Renewables[f]	Total Utilities	IPP	Non-Utility[e]	Total IPP and Non-Utility	Imports & Losses[c]	Total Sales[h]
1970	25,253	155	1,413	390			27,211			0	-2,496	24,715
1975	20,615	10,292	1,483	691			33,081			0	-1,805	31,276
1980	26,383	9,912	1,628	393			38,316			0	-571	37,745
1985	28,840	10,978	2,046	20			41,884			0	-159	41,725
1990	27,956	11,224	1,791	76	393		41,440			0	7,758	49,198
1995	32,994	10,970	2,097	97	924		47,082			0	10,885	57,967
2000	41,736	11,459	1,749	52	965	43	56,004			0	8,685	64,689
2005[r]	45,219	7,574	1,499	75	2,185	105	56,657	2,306	275	2,581	11,098	70,336
2006[r]	42,936	12,234	1,446	215	1,928	234	58,993	3,311	2,506	5,816	5,012	69,821
2007[g]	39,460	0	1,314	123	3,132	277	44,306	16,263	2,913	19,176	7,818	71,301
2008	41,270	0	1,428	70	2,451	508	45,726	15,126	2,874	18,000	6,396	70,122
2009	36,554	0	1,353	38	2,597	997	41,539	16,027	2,687	18,713	6,033	66,286
2010	39,427	0	2,027	39	3,164	817	45,473	16,193	2,783	18,976	4,303	68,752
2011[r]	38,591	0	1,928	37	2,790	906	44,251	15,761	2,794	18,555	5,889	68,695
2012[p]	**32,042**	**0**	**1,348**	**9**	**8,667**	**1,266**	**43,332**	**13,300**	**2,769**	**16,069**	**9,419**	**68,820**

a From 1970 to 1989, hydroelectric data were sourced from the Public Service Commission of Wisconsin bulletins; from 1990 to 2006, and current year data, are from the federal Department of Energy, Energy Information Administration (EIA). Starting in 2007, data are from the Public Service Commission of Wisconsin.

b Coal data may include a small amount of refuse derived fuel (RDF).

c Imports and losses is a reflection of the difference between total sales recorded by EIA and total Wisconsin-based generation. A negative sign indicates Wisconsin utilities exported electric power to other states.

d Petroleum (oil) was split from natural gas as a generation resource starting in 1990. Prior to 1990, they were combined in this table. Propane used to produce electricity is included in this category.

e Non-utility generation sources were available prior to 2005, but not collected separately until then.

f The renewables category includes biomass, methane from landfills and digesters, solar and wind resources.

g Wisconsin utilities no longer own nuclear generation; all nuclear reactors located in Wisconsin are owned by Independent Power Producers.

h Sales figures for all years are from the EIA Electric Power Monthly.

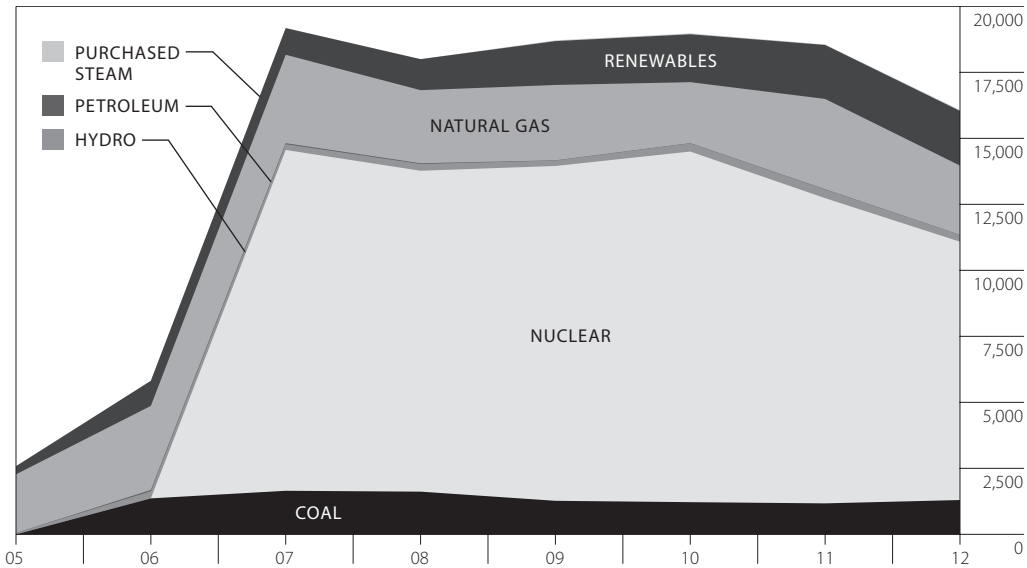
p Preliminary.

r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994) and personal communications 2002; U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1971-1994); U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly* [DOE/EIA-0226 (2012/05)] (May 2012) (1990-2006); Public Service Commission of Wisconsin, unpublished electrical generation data (2007-2012).

Wisconsin Independent Power Producer and Non-Utility Electric Power Generation, by Type of Fuel

2005-2012 MILLIONS OF kWh



Year	Coal	Nuclear[d]	Hydro	Petroleum	Natural Gas	Renewables[c]	Purchased Steam	Total IPP and Non-Utilities	Utilities	Imports & Losses[a]	Total Sales[e]
2005[b,r]	0	0	52	0	2,221	308	0	2,581	56,657	11,098	70,336
2006[r]	1,362	0	272	48	3,184	950	0	5,816	58,993	5,012	69,821
2007[d,r]	1,650	12,910	220	38	3,348	1,010	0	19,176	44,306	7,819	71,301
2008	1,617	12,155	256	29	2,768	1,174	0	18,000	45,726	6,396	70,122
2009	1,270	12,683	209	5	2,855	1,660	30	18,713	41,539	6,034	66,286
2010	1,219	13,281	312	6	2,310	1,814	33	18,976	45,473	4,303	68,752
2011[r]	1,173	11,560	331	8	3,421	2,043	19	18,555	44,251	5,889	68,695
2012[p]	**1,300**	**9,784**	**260**	**1**	**2,623**	**2,070**	**32**	**16,070**	**43,332**	**9,418**	**68,820**

a Imports and losses is a reflection of the difference between total sales recorded by EIA and total generation. A negative sign indicates Wisconsin utilities exported electric power to other states.

b Non-utility generation sources were available prior to 2005, but not collected separately until then.

c The renewables category includes biomass, methane from landfills and digesters, solar and wind resources.

d All nuclear reactors located in Wisconsin are owned by Independent Power Producers.

e Sales figures for all years are from the EIA Electric Power Monthly.

p Preliminary.

r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994) and personal communications 2002; U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1971-1994); U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly* [DOE/EIA-0226 (2012/05)] (May 2012) (1990-2006); Public Service Commission of Wisconsin, unpublished electrical generation data (2007-2012).

IPP AND NON-UTILITY ELECTRIC GENERATION 13.4%

Total Independent Power Producer (IPP) and non-utility electric generation dropped by 13.4 percent in 2012: IPPs saw a 15.6 percent drop, and non-utilities saw 0.9 percent dip. Energy production from renewable sources increased by 1.3 percent in 2012, while production from coal increased by 10.8 percent. Out-of-state generation is not included in these figures.

IPPs are independent power producers allowed under law to sell their power to wholesalers such as utility cooperatives. They are barred from selling their power on the retail market. *Non-Utility* refers to industrial power producers such as paper mills.

Wisconsin Electric Power Generation, All Producers, by Type of Fuel

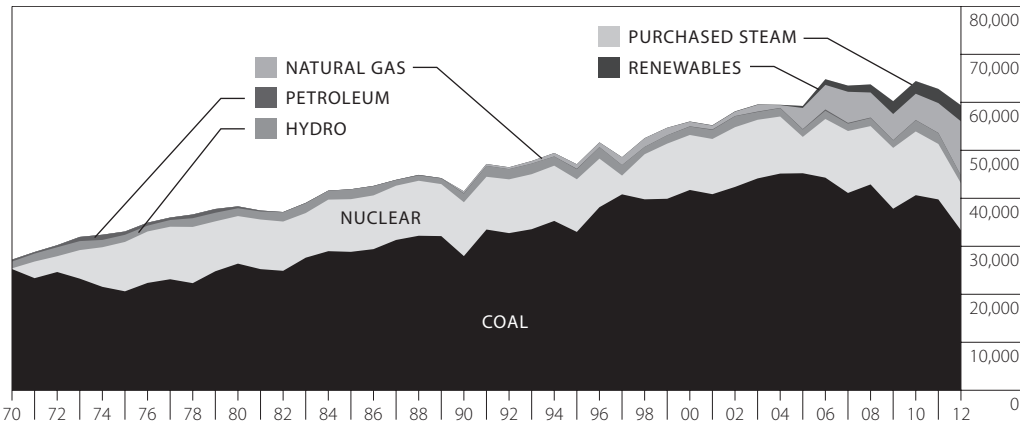
TOTAL ELECTRIC GENERATION BY ALL PRODUCERS 5.4%

Total electric generation in Wisconsin by all producers decreased 5.4 percent in 2012. Utility generation dropped by 2.1 percent, while IPP and non-utility generation decreased by 13.4 percent.

Generation from renewable sources increased by 13.1 percent, while generation from coal decreased 16.1 percent due in part to fuel switching from coal generation to natural gas generation, which saw an overall increase of 81.8 percent from 2011.

Out-of-state generation is not included in these figures.

1970-2012 MILLIONS OF kWh



Year	Coal[b]	Nuclear	Hydro[a]	Petroleum[d]	Natural Gas	Renewables[e]	Purchased Steam	Total Generation	Imports & Losses[c]	Total Sales[f]
1970	25,253	155	1,413	390				27,211	-2,496	24,715
1975	20,615	10,292	1,483	691				33,081	-1,805	31,276
1980	26,383	9,912	1,628	393				38,316	-571	37,745
1985	28,840	10,978	2,046	20				41,884	-159	41,725
1990	27,956	11,224	1,791	76	393			41,440	7,758	49,198
1995	32,994	10,970	2,097	97	924			47,082	10,885	57,967
2000	41,736	11,459	1,749	52	965	43		56,004	8,685	64,689
2005[r]	45,219	7,574	1,551	75	4,406	413		59,238	11,098	70,336
2006[r]	44,298	12,234	1,718	263	5,112	1,184		64,809	5,012	69,821
2007[r]	41,111	12,910	1,534	161	6,479	1,287		63,482	7,819	71,301
2008	42,887	12,155	1,685	100	5,219	1,681		63,727	6,396	70,122
2009	37,824	12,683	1,562	44	5,452	2,658	30	60,253	6,033	66,286
2010	40,646	13,281	2,339	45	5,474	2,631	33	64,449	4,303	68,752
2011[r]	39,763	11,560	2,259	45	6,211	2,949	19	62,806	5,889	68,695
2012[p]	**33,342**	**9,784**	**1,608**	**9**	**11,290**	**3,337**	**32**	**59,401**	**9,419**	**68,820**

a From 1970 to 1989, hydroelectric data were sourced from the Public Service Commission of Wisconsin bulletins; from 1990 to 2006, and current year data, are from the federal Department of Energy, Energy Information Administration (EIA). Starting in 2007, data are from the Public Service Commission of Wisconsin.

b Coal data may include a small amount of refuse derived fuel (RDF).

c Imports and losses is a reflection of the difference between total sales recorded by EIA and total Wisconsin-based generation. A negative sign indicates Wisconsin utilities exported electric power to other states.

d Petroleum (oil) was split from natural gas as a generation resource starting in 1990. Prior to 1990, they were combined in this table. Propane used to produce electricity is included in this category.

e The renewables category includes biomass, methane from landfills and digesters, solar and wind resources.

f Sales figures for all years are from the EIA Electric Power Monthly.

p Preliminary.

r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994) and personal communications 2002; U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1971-1994); U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly* [DOE/EIA-0226 (2012/05)] (May 2012) (1990-2006); Public Service Commission of Wisconsin, unpublished electrical generation data (2007-2012).

Wisconsin Electric Utility Fuel Costs of Power Generation, by Type of Plant

The costs in the table below reflect costs incurred by Wisconsin's five largest investor owned utilities.

1970-2012 CENTS PER kWh

Year	Fossil Fuel Steam (Coal)	Nuclear Steam[b]	Internal Combustion[a]	Total
1970	0.43	0.16	0.75	0.44
1975	1.01	0.36	1.47	0.75
1980	1.72	0.50	3.58	1.40
1985	2.02	0.61	6.76	1.60
1990	1.61	0.52	4.51	1.27
1995	1.33	0.48	3.62	1.12
1996	1.26	0.49	3.15	1.07
1997	1.28	0.50	4.30	1.22
1998	1.25	0.52	3.76	1.13
1999	1.21	0.53	3.70	1.07
2000	1.24	0.52	6.41	1.14
2001	1.27	0.54	6.36	1.15
2002	1.31	0.50	4.61	1.12
2003	1.37	0.48	6.49	1.21
2004	1.44	0.47	6.19	1.24
2005	1.58	0.39	10.29	1.65
2006	1.78	0.35	8.28	1.61
2007	2.00	0.27	7.49	1.84
2008[e]	2.21	Not Available	7.14	1.89
2009[e]	2.33	Not Available	4.52	1.81
2010[e]	2.41	Not Available	3.70	1.85
2011[e]	2.76	Not Available	2.76	2.03
2012[e]	**2.74**	**Not Available**	**2.06**	**1.88**

a Internal combustion includes both gas-powered turbines and diesel-powered engines.

b Nuclear cost.

e Estimate by Wisconsin State Energy Office based on amount of generation by the five major Wisconsin utilities.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994); annual reports of the five major Wisconsin electric generating utilities (1990-2012). www.psc.wi.gov/apps40/annlreport/default.aspx

In this table, only the cost of fuel per kilowatt-hour of generation is reported. The table on the next page includes the annual variable cost of generation. Renewables such as hydroelectric plants, wind turbines and solar photovoltaic installations are not included here because they have no associated fuel costs.

Wisconsin utilities no longer own nuclear generation; all nuclear reactors located in Wisconsin are owned by Independent Power Producers. The data for 2005, 2006, and 2007 show a decline in fuel costs for nuclear generation because these are the years in which the sales of the plants were completed. Fuel cost data for nuclear plants are no longer available because these plants are owned by Independent Power Producers who do not submit annual reports to the Public Service Commission.

Utility Annual Variable Costs of Power Generation, by Type of Plant and Cost of Purchased Power

Wisconsin utilities no longer own nuclear generation; all nuclear reactors located in Wisconsin are owned by Independent Power Producers. The data for 2005, 2006, and 2007 show an increase in the per kWh cost of nuclear generation because these are the years in which sales of the plants were completed. Cost per kWh continues remain high for nuclear generation.

The All Plants and Purchased Power figures are revised from previous editions of this publication due to the break out of nuclear generation from purchased power.

This table shows the annual variable cost of generating one kWh of electricity by various technologies in Wisconsin's electric utility plants. The average cost is 109.7 percent higher than the previous peak in 1983 of 2.21 cents per KWh. The cost of purchased power increased by 10.0 percent from 2011 to 2012, and is 15.2 percent more expensive than electricity generated in Wisconsin.

The costs in the table below reflect costs incurred by Wisconsin's five largest investor-owned utilities.

1970-2012 CENTS PER kWh

Year	Fossil Fuel Steam (Coal)	Nuclear Steam[b]	Internal Combustion[a]	Hydro	All Plants	Purchased Power	Average Cost
1970	0.55	0.29	1.76	0.27	0.53	NA	NA
1975	1.25	0.51	2.73	0.32	0.97	NA	NA
1980	2.13	0.86	5.74	0.52	1.72	NA	NA
1983	2.58	1.61	29.27	0.56	2.21	NA	2.21
1985	2.55	1.32	19.12	0.61	2.09	NA	NA
1990[e]	2.13	1.50	10.87	1.00	1.94	2.22	1.99
1995[e]	1.80	1.63	4.71	0.71	1.75	2.17	1.83
1996[e]	1.68	1.73	4.69	0.64	1.67	2.15	1.77
1997[e]	1.68	4.37	5.09	0.69	1.94	2.27	2.04
1998[e]	1.68	2.83	4.70	1.02	1.94	2.67	2.11
1999[e]	1.68	2.03	4.83	0.87	1.79	2.96	2.05
2000[e]	1.75	2.16	7.73	0.86	1.91	3.36	2.24
2001[e]	1.76	2.37	7.63	0.90	1.95	3.90	2.41
2002[e]	1.87	2.18	6.09	0.75	1.97	3.64	2.40
2003[e]	1.91	2.40	8.02	1.12	2.10	4.05	2.61
2004[e]	1.97	2.46	14.63	1.06	2.19	4.26	2.72
2005[e]	2.11	2.64	16.02	1.21	2.74	5.25	3.48
2006[e]	2.68	2.83	14.81	1.40	3.11	5.83	3.88
2007[e]	2.94	3.05	11.76	1.65	3.42	6.29	4.22
2008[e]	3.49	4.03	13.29	1.53	4.00	6.76	4.74
2009[e]	3.77	4.25	9.84	1.81	4.22	5.78	4.65
2010[e]	3.86	4.15	8.19	1.28	4.16	6.06	4.59
2011[e]	4.25	4.01	7.49	1.37	4.33	5.69	4.65
2012[e]	**4.57**	**4.29**	**4.60**	**1.90**	**4.44**	**5.12**	**4.64**

a Internal combustion includes both gas powered turbines and diesel powered engines.

b Nuclear reactors in Wisconsin are owned by independent power producers.

e Estimate by Wisconsin State Energy Office based on amount of generation by the five major Wisconsin utilities.

NA – Not available.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994); annual reports of the five major Wisconsin electric generating utilities (1990-2012). www.psc.wi.gov/apps40/annlreport/default.aspx

Electric Utility Sulfur Dioxide Emissions

1980-2012 TONS

Year	1980	1990	2000	2005	2007	2008	2009	2010	2011[r]	2012[p]
Dairyland Power Cooperative										
Alma	23,641	6,510	3,445	8,816	10,748	9,558	4,809	4,189	1,196	878
Genoa	43,516	28,130	8,165	13,074	12,480	11,970	6,479	8,874	3,296	2,379
J.P. Madgett	4,088	7,330	5,376	7,762	8,028	9,114	10,041	4,976	4,827	4,276
Stoneman	4,663	790	0	0	0	0	0	0	0	0
Madison Gas and Electric Co.										
Blount Street	8,436	3,851	6,923	5,969	2,762	2,958	397	278	1	1
Northern States Power Co.										
Bay Front	2,708	393	786	1,196	1,149	1,041	735	347	286	68
Wisconsin Electric Power Co.										
Oak Creek	122,472	45,650	22,831	12,903	13,695	14,472	14,823	13,032	14,021	2,200
Pleasant Prairie	4,972	26,933	28,726	33,656	2,229	1,092	988	1,195	928	3,519
Port Washington	42,295	4,009	15,572	2	4	4	6	6	5	739
Valley	41,761	14,053	15,835	8,482	6,848	6,887	5,376	4,890	4,226	11
Wisconsin Power and Light Co.										
Blackhawk	2,006	0	0	0	0	0	0	0	0	0
Columbia 1	24,937	18,616	15,056	13,729	12,093	13,561	11,833	14,527	12,340	12,678
Columbia 2	14,614	13,909	13,270	12,370	13,332	13,303	12,396	13,192	12,429	11,921
Edgewater 1-4	60,014	38,021	8,962	9,103	7,166	7,205	5,666	5,758	5,785	4,547
Edgewater 5	0	6,744	8,744	7,741	9,502	7,858	7,782	8,779	8,340	6,640
Nelson Dewey	32,304	10,985	14,275	14,999	15,064	13,531	12,646	13,454	11,505	3,304
Rock River	14,139	7,220	24	12	2	2	4	0	1	3
Wisconsin Public Services Corp.										
Pulliam	42,087	25,631	6,314	12,175	10,448	8,446	4,386	5,517	3,508	1,846
Weston 1, 2	21,009	6,589	3,340	3,988	2,983	2,852	2,060	2,601	1,679	1,133
Weston 3	0	7,598	8,358	9,540	6,125	7,338	5,912	7,216	5,593	4,236
Weston 4	0	0	0	0	0	333	972	1,120	904	687
Municipal Utilities										
Manitowoc	1,318	1,727	3,282	217	1,033	1,706	794	593	435	91
Marshfield	1,651	139	0	0	0	0	0	0	0	0
Menasha	991	695	79	0	0	0	0	0	0	0
Total										
Utility Sources	**513,622**	**275,523**	**189,363**	**175,734**	**135,691**	**133,231**	**108,105**	**110,544**	**91,305**	**61,157**
All Other Sources	**172,777**	**101,517**	**87,115**	**68,600**	**67,838**	**101,419**	**89,849**	**94,150**	**40,474**	**46,702**
All Stationary Sources	**686,399**	**377,040**	**276,478**	**244,334**	**203,529**	**234,650**	**197,954**	**204,694**	**131,779**	**107,859**
Percent Utility Sources	**74.8%**	**73.1%**	**68.5%**	**71.9%**	**66.7%**	**56.8%**	**54.6%**	**54.0%**	**69.3%**	**56.7%**

p Preliminary estimates.

r Revised.

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, Sulfur Dioxide and Nitrogen Oxides Emissions Report PUBL-AM-343 and published by facility on the Wisconsin Department of Natural Resources website at http://dnr.wi.gov/topic/AirEmissions/ (1986-2012).

SULFUR DIOXIDE EMISSIONS
33.0%

Utility sulfur dioxide emissions decreased 33.0 percent from 2011 to 2012. Declines in total emissions will depend on the growth in coal fired generation, old plant retirement, the effectiveness of future energy efficiency efforts and increased use of natural gas and renewable energy.

Electric Utility Nitrogen Oxides Emissions

NITROGEN OXIDES EMISSIONS
24.4%

Utility nitrogen oxides emissions decreased 24.4 percent from 2011 to 2012. Future decreases in total emissions will depend on the growth in coal fired generation, old plant retirement, the effectiveness of future energy efficiency efforts, increased use of natural gas and renewable energy, and the disposition of proposed U.S. EPA rules.

Recent changes in combustion technology have resulted in reduced NOX emissions for some generating plants.

1989-2012 TONS

Year	1989	1990	2000	2005	2007	2008	2009	2010	2011[r]	2012[p]
Dairyland Power Cooperative										
Alma	1,934	1,962	2,774	3,834	4,883	3,671	1,100	763	367	171
Genoa	5,243	5,304	3,611	3,717	3,556	2,696	1,574	1,669	769	2,841
J.P. Madgett	4,728	4,963	4,845	4,469	4,114	3,962	3,636	2,898	2,932	651
Madison Gas and Electric Co.										
Blount Street	1,511	1,165	1,480	1,187	463	568	78	88	47	66
Northern States Power Co.										
Bay Front	0	0	1,288	1,527	1,590	1,562	916	665	535	255
Wisconsin Electric Power Co.										
Oak Creek	13,967	8,917	19,786	4,650	4,646	4,978	5,530	4,982	5,657	1,978
Pleasant Prairie	17,701	16,356	18,452	11,318	2,560	2,862	2,623	2,711	2,498	1,003
Port Washington	1,005	771	4,074	45	111	129	129	131	115	2,110
Valley	4,414	4,874	7,259	3,893	3,268	3,106	1,817	1,446	1,250	48
Wisconsin Power and Light Co.										
Columbia 1	6,059	6,844	7,981	3,022	2,655	2,715	2,438	2,899	2,781	2,943
Columbia 2	7,943	10,336	6,874	2,829	2,484	2,549	2,329	2,447	2,703	2,655
Edgewater 1-4	16,583	16,684	12,817	3,781	2,697	2,805	1,409	1,503	1,563	1,164
Edgewater 5	2,960	3,638	8,743	2,282	1,976	1,698	1,552	1,791	1,735	1,442
Nelson Dewey	9,997	9,997	5,413	3,060	2,938	2,589	2,382	3,082	3,237	2,626
Rock River	4,367	3,697	419	373	108	88	33	6	6	39
Wisconsin Public Services Corp.										
Pulliam	6,769	7,087	8,045	9,235	8,222	6,591	3,391	2,705	1,348	854
Weston 1, 2	3,003	3,308	3,262	3,754	3,039	2,699	971	1,212	786	511
Weston 3	2,374	2,360	3,228	4,385	2,529	2,593	2,034	1,492	1,165	785
Weston 4	0	0	0	0	0	281	794	922	914	822
Municipal Utilities										
Manitowoc	923	923	102	88	278	593	245	234	22	41
Total										
Utility Sources	**111,481**	**109,186**	**120,453**	**67,449**	**52,117**	**48,735**	**34,981**	**33,646**	**30,429**	**23,005**
All Other Sources	**86,473**	**24,774**	**19,625**	**45,232**	**42,660**	**48,287**	**43,196**	**48,621**	**20,779**	**24,048**
All Stationary Sources	**197,954**	**133,960**	**140,078**	**112,681**	**94,777**	**97,022**	**78,177**	**82,267**	**51,208**	**47,053**
Percent Utility Sources	**56.3%**	**81.5%**	**86.0%**	**59.9%**	**55.0%**	**50.2%**	**44.7%**	**40.9%**	**59.4%**	**48.9%**

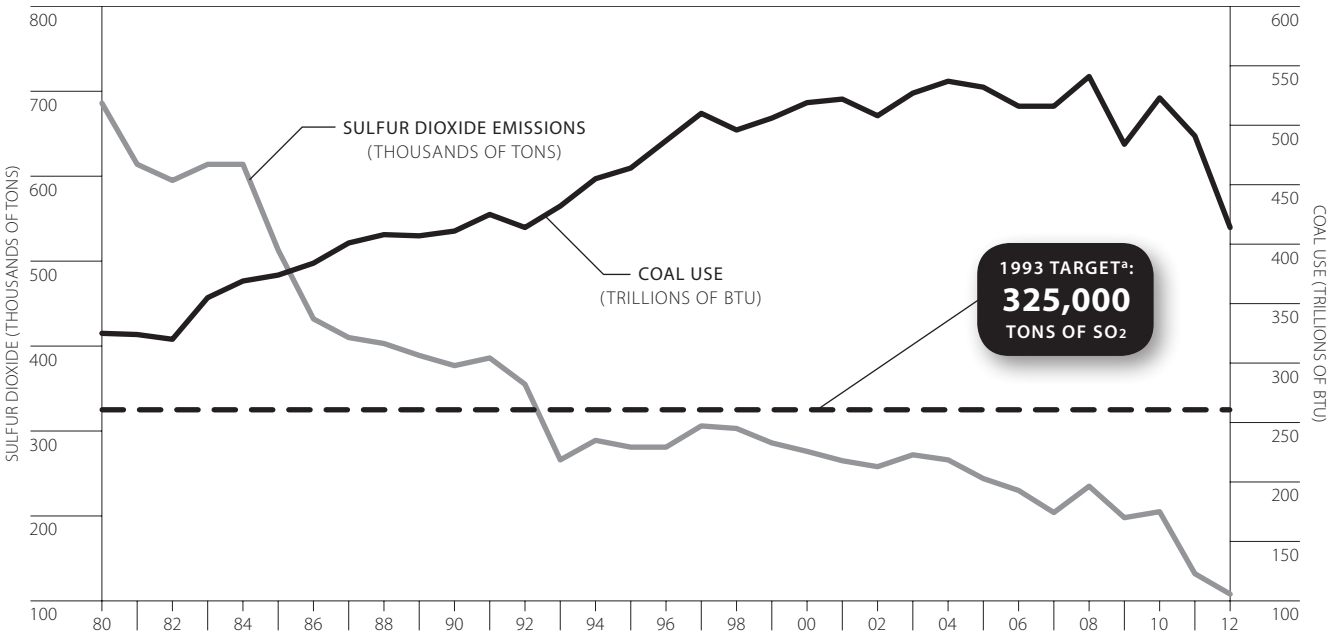
p Preliminary estimates.

r Revised.

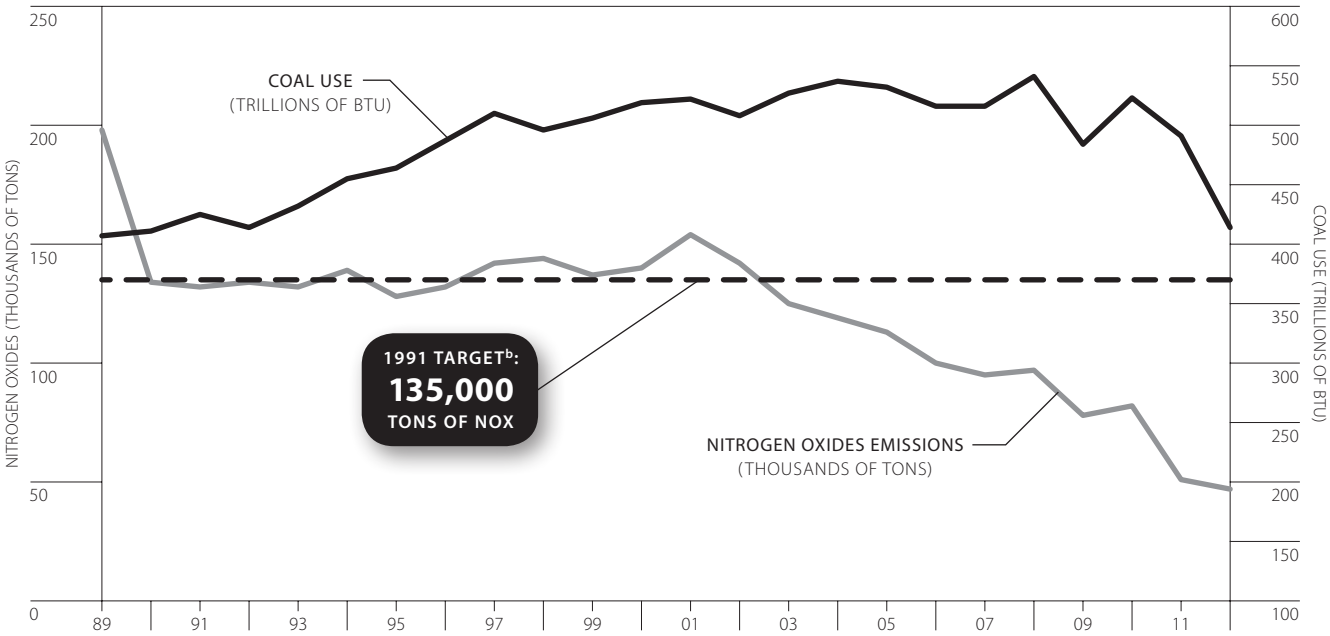
Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, Sulfur Dioxide and Nitrogen Oxides Emissions Report PUBL-AM-343 and published by facility on the Wisconsin Department of Natural Resources website at http://dnr.wi.gov/topic/AirEmissions/ (1986-2012).

Wisconsin Sulfur Dioxide and Nitrogen Oxides Emissions and Coal Use

1980-2012 SULFUR DIOXIDE EMISSIONS AND COAL USE



1989-2012 NITROGEN OXIDES EMISSIONS AND COAL USE



a 1993 target established in Wisconsin Statutes, 285.45(2)(a). http://www.legis.state.wi.us/statutes/Stat0285.pdf. Target is for all major utilities and large sources.

b 1991 target established in Wisconsin Statutes, 285.47(2). http://www.legis.state.wi.us/statutes/Stat0285.pdf. Target is for all major utilities.

Source: Wisconsin State Energy Office.

Wisconsin Power Plant Inventory, 2012

Utility / Site[a]	Nameplate Capacity (MW)	Number of Units	Primary Fuel
Dairyland Power Cooperative			
Alma 4, 5	136.0	2	Coal
Elk Mound	71.0	2	Natural Gas
Flambeau	22.0	3	Hydro[b]
Genoa 3	345.6	1	Coal
J.P. Madgett	387.0	1	Coal
Seven Mile Creek	4.1	4	Biomass LFG[g]
Stiles	1.0	2	Hydro[b]
Various Biogas Methane	1.6	2	Biogas
Washington Island	5.0	7	Fuel Oil
Madison Gas and Electric Co.			
Blount Street 6, 7	100.0	2	Natural Gas
Fitchburg 1, 2	57.6	2	Natural Gas
Nine Springs	16.2	1	Natural Gas
Portables	54.0		Fuel Oil
Rosiere	11.2	17	Wind
Sycamore	41.6	2	Natural Gas
Various Hydrogen	0.01	1	Hydrogen
Various Solar	0.1		Solar
W. Marinette 34	83.0	1	Natural Gas
West Campus	169.3	3	Natural Gas
Northern States Power Co.			
Bay Front 4, 5, 6	67.2	3	Biomass Wood
Flambeau	16.0	1	Natural Gas
French Island 1, 2	30.4	2	Biomass Wood
French Island 3, 4	157.6	2	Fuel Oil
Various Hydro	240.9	58	Hydro[b]
Wheaton 1-4	216.0	4	Natural Gas
Wheaton 5-6	106.2	2	Fuel Oil
Shared Ownership			
Columbia 1[e]	512.0	1	Coal
Columbia 2[e]	511.0	1	Coal
Edgewater 4[f]	330.0	1	Coal
Elm Road C1[i]	1402.6	2	Coal
Weston 4[d]	595.0	1	Coal

Utility / Site[a]	Nameplate Capacity (MW)	Number of Units	Primary Fuel
Wisconsin Electric Power Co.			
Blue Sky Green Field	145.2	88	Wind
Byron	1.3	2	Wind
Concord	381.2	4	Natural Gas
Domtar Rothschild	50.0	1	Biomass Wood
Germantown 1, 2, 3, 4	244.8	4	Fuel Oil
Germantown 5	106.9	1	Natural Gas
Glacier Hills	162.0	90	Wind
Milwaukee	11.0	1	Coal
Montfort	30.0	20	Wind
Paris	381.2	4	Natural Gas
Pleasant Prairie 1, 2	1233.0	2	Coal
Pleasant Prairie 3	2.0	1	Fuel Oil
Port Washington 1-3	1182.0	6	Natural Gas
S. Oak Creek 5-8	1191.6	4	Coal
Valley 1, 2	272.0	2	Coal
Valley 3	2.7	1	Fuel Oil
Various Hydro	13.6	8	Hydro[b]
Various Solar	0.003	3	Solar
Wisconsin Power and Light Co.			
Cedar Ridge	67.7	41	Wind
Edgewater 3, 5	440.0	2	Coal
Neenah	371.0	2	Natural Gas
Nelson Dewey 1, 2	200.0	2	Coal
Riverside	695.7	3	Natural Gas
Rock River 3-6	144.0	4	Natural Gas
Sheboygan Energy Center	380.0	2	Natural Gas
Sheepskin	40.0	1	Natural Gas
South Fond Du Lac	172.0	2	Natural Gas
Various Biogas Methane	0.3	10	Biogas
Various Hydro	36.6	12	Hydro[b]
Various Landfill Gas	2.8	13	Biomass LFG[g]
Various Solar	0.01	5	Solar

Utility / Site[a]	Nameplate Capacity (MW)	Number of Units	Primary Fuel
Wisconsin Public Services Corp.			
DePere	187.2	1	Natural Gas
Fox Energy Center	620.0	3	Natural Gas
Lincoln	9.2	14	Wind
Pulliam 31	91.0	1	Natural Gas
Pulliam 5-8	350.2	4	Coal
Various Hydro	92.2	47	Hydro[b]
Various Solar	0.05	8	Solar
W. Marinette 31, 32	167.1	3	Natural Gas
W. Marinette 33	83.0	1	Natural Gas
Weston 1-3	492.1	3	Coal
Weston 31, 32	76.3	2	Natural Gas
Municipal Utilities			
Manitowoc, City of	117.4	3	Coal/RDF[c]/ Coke
Manitowoc, City of	30.0	2	Natural Gas
Menasha, City of	28.0	3	Coal
Merchant/IPP			
Forward Wind	129.0	86	Wind
Point Beach	1073.6	2	Nuclear
Various Landfill Gas	43.4	38	Biomass LFG[g]
Statewide Utilities			
Statewide	1073.6	2	Nuclear
Statewide	199.9	90	Renewables (biomass, biogas, solar)
Statewide	8554.5	34	Coal
Statewide	406.3	130	Hydro[b]
Statewide	5796.3	57	Natural Gas
Statewide	572.3	17	Fuel Oil
Statewide	555.6	272	Wind
Statewide Totals[h]	17029.4	602	All

a This is not a comprehensive listing of all utility or independent power producer generation plants. Does not include out-of-state sites or non-utility generation.

b Hydroelectric capacity differs from sums on other tables due to different data sources.

c RDF is Refuse Derived Fuel.

d The Weston 4 unit is owned by Wisconsin Public Service Corp. (70%) and Dairyland Power Cooperative (30%).

e The Columbia 1 and 2 units are owned by Alliant Energy (46.2%), Wisconsin Public Service Corp. (31.8%) and Madison Gas & Electric Co.(22.0%).

f The Edgewater 4 unit is owned by Alliant Energy (68.2%) and Wisconsin Public Service Corp.(31.8%).

g LFG is Landfill Gas.

h Statewide totals here are slightly different from capacity totals on other pages in this section because this table is not a comprehensive list of all plants.

i The Elm Road C1 unit is owned by Wisconsin Electric Power Co. (83.34%), WPPI Energy (8.33%) and Madison Gas and Electric (8.33%).

Source: U.S. Department of Energy, Energy Information Administration, Existing Electric Generating Units in the United States by State, Company and Plant, http://www.eia.doe.gov/cneaf/electricity/page/capacity/capacity.html (through 2007); Public Service Commission of Wisconsin, unpublished data (2008-2012); Annual report of Dairyland Power Cooperative submitted to the U.S. Department of Agriculture, Rural Utilities Service (2008-2012).

CHAPTER 3

Renewable Energy

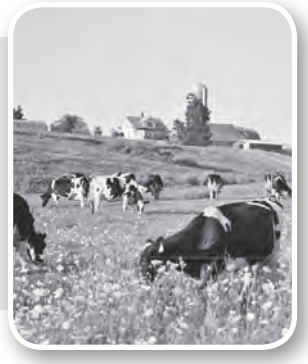
A Quick Guide to Renewable Energy

Biomass is organic matter (plant material, vegetation, agriculture waste, forestry waste) used as a fuel or source of energy. Use of biomass as an energy source results in little net production of carbon dioxide because the CO_2 generated during combustion of plant material equals the CO_2 consumed during the lifecycle of the plant. A map of biomass density across the United States can be found in the back of this publication.

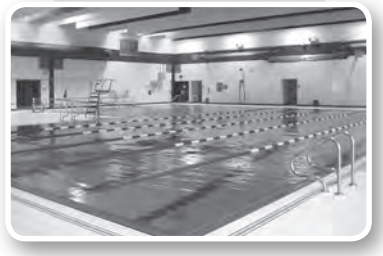
Renewable energy resources play a key role in Wisconsin's efforts to reduce dependence on imported fuels. According to Wisconsin Statutes 196.374(1)(j), a renewable resource "derives energy from any source other than coal, petroleum products, nuclear power, or …natural gas." This energy statistics publication looks at the primary renewable resources used in Wisconsin: solar, wind, water, biomas/biogas, and ethanol.

Wind power uses turbines—residential and commercial or utility sized—to generate electricity for distribution on the electric grid. A map of wind production sites, and wind energy potential across Wisconsin can be found in the back of this publication.

Biogas is produced from the state's landfills and agricultural manure digesters. In Wisconsin statutes and in data from U.S. Energy Information Administration, biogas is included in the definition of biomass. In this statistics book, we break out biogas from biomass to provide further definition and detail about these resources in the state.



Solar thermal uses sunlight to generate heat for applications such as water heating without fossil fuels.



Hydro power uses the kinetic energy of moving water to generate electricity for distribution on the electric grid. A map of hydroelectric sites in Wisconsin can be found in the back of this publication.

Solar photovoltaic uses sunlight to generate electricity to displace energy normally purchased from the electric grid, or to add energy to the electric grid. A map of solar intensity across the United States Wisconsin can be found in the back of this publication.

Ethanol is a renewable transportation fuel primarily made from corn. It is used as the oxygenate in reformulated gasoline sold in southeastern Wisconsin and as E10 and E85 throughout the state. A listing of ethanol facilities is on the State Energy Office website at: http://www.stateenergyoffice.wi.gov/docview.asp?docid=11272&locid=160.

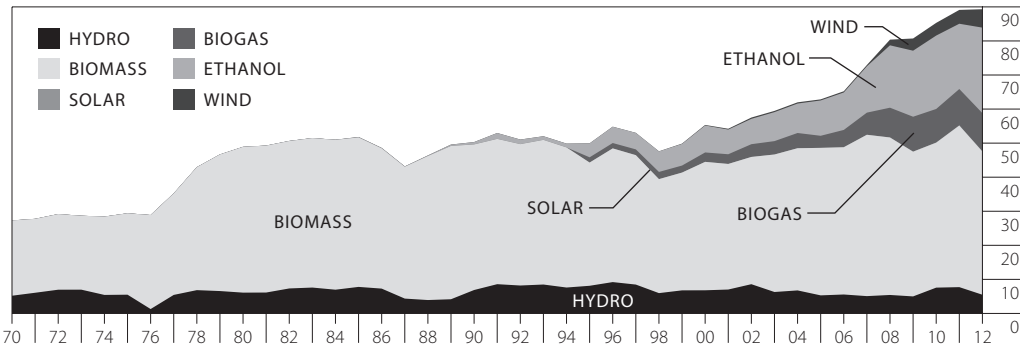
Wisconsin Total Renewable Energy Use, by Type of Fuel

OVERALL RENEWABLE ENERGY END-USE 0.2%

Overall renewable energy resource use in Wisconsin increased 0.2 percent in 2012. Ethanol use in the transportation sector increased 31.0 percent. Hydro generation includes electricity generation by Wisconsin utilities and dams owned by industrial users (e.g., paper mills). Solar and wind energy figures include distributed energy sold to utilities by residential and commercial users.

This table includes all renewable energy used in Wisconsin for all applications, including space heating, electricity generation, transportation fuels, and for other applications that displace fossil fuels.

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Hydro		Biomass		Solar		Biogas		Ethanol[a]		Wind		Total
1970	5.2	*19.0%*	22.1	*81.0%*	0.00000	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	0.00	*0.0%*	27.3
1975	5.5	*18.7%*	23.9	*81.3%*	0.00000	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	0.00	*0.0%*	29.4
1980[r]	6.1	*12.5%*	42.8	*87.5%*	0.00000	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	0.00	*0.0%*	48.9
1985[r]	7.8	*15.0%*	43.9	*84.7%*	0.00000	*0.0%*	0.0	*0.0%*	0.1	*0.2%*	0.00	*0.0%*	51.8
1990[r]	6.9	*13.7%*	42.7	*84.9%*	0.00000	*0.0%*	0.0	*0.0%*	0.7	*1.4%*	0.00	*0.0%*	50.3
1995[r]	8.1	*16.3%*	36.2	*72.5%*	0.00000	*0.0%*	1.5	*3.1%*	4.1	*8.2%*	0.00	*0.0%*	49.9
2000[r]	6.8	*12.3%*	37.7	*68.1%*	0.00000	*0.0%*	2.8	*5.0%*	7.9	*14.3%*	0.16	*0.3%*	55.3
2005[r]	5.3	*8.4%*	43.3	*68.9%*	0.00652	*0.0%*	3.5	*5.6%*	10.4	*16.5%*	0.32	*0.5%*	62.8
2006[r]	5.6	*8.5%*	43.2	*66.3%*	0.01227	*0.0%*	5.1	*7.8%*	11.0	*16.9%*	0.35	*0.5%*	65.2
2007[b,r]	5.1	*7.0%*	47.4	*64.9%*	0.01674	*0.0%*	6.5	*8.9%*	13.6	*18.7%*	0.38	*0.5%*	72.9
2008[r]	5.4	*6.7%*	46.2	*57.5%*	0.02728	*0.0%*	8.7	*10.9%*	18.3	*22.8%*	1.67	*2.1%*	80.4
2009[r]	5.0	*6.2%*	42.5	*52.6%*	0.03528	*0.0%*	10.2	*12.7%*	19.4	*24.0%*	3.59	*4.4%*	80.7
2010[r]	7.6	*8.9%*	42.6	*49.9%*	0.04930	*0.1%*	9.8	*11.5%*	21.6	*25.3%*	3.73	*4.4%*	85.3
2011[r]	7.7	*8.7%*	47.4	*53.2%*	0.07449	*0.1%*	10.6	*12.0%*	19.2	*21.5%*	4.06	*4.6%*	89.1
2012[p]	**5.5**	***6.1%***	**42.0**	***47.1%***	**0.09600**	***0.1%***	**11.2**	***12.5%***	**25.1**	***28.1%***	**5.41**	***6.1%***	**89.3**

a Ethanol is blended with a petroleum-based fuel to produce reformulated gasoline, E10 and E85.

b All figures for solar energy, biomass and biogas were historically revised in 2007 to more accurately represent a revision to methodology and data sources. For example, this table does not include estimated passive solar, municipal solid waste or other refuse derived fuels, (e.g., railroad ties, tires) except where defined by law as a renewable fuel.

p Preliminary estimates.

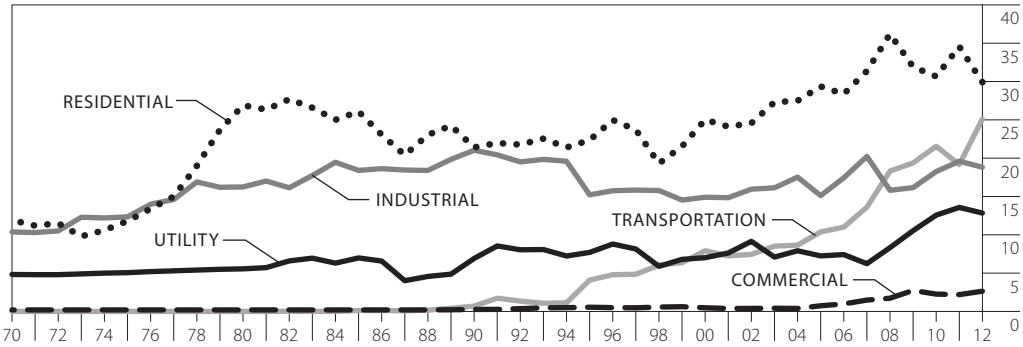
r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981* (August 1983); Public Service Commission of Wisconsin, unpublished data compiled from annual reports (2007-2012); Focus on Energy, aggregated data (2005-2012); survey data from conversations and emails with utilities, independent operators of landfills and/or waste water treatment plants, and public schools (2007-2012); Department of Revenue *Monthly Motor Fuel Consumption Report* (2000-2012); Energy Center of Wisconsin, *Wisconsin Agricultural Biogas* Casebook (2008); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-2012); Wisconsin Department of Administration, Division of Energy, "Wisconsin Residential Wood Energy Model," unpublished (1981-2012); Compiled from renewable energy tables in this publication.

Wisconsin Total Renewable Energy Production and Use, by Economic Sector

This table includes all renewable energy used in Wisconsin for all applications, including space heating, electricity generation, transportation fuels, and for other applications that displace fossil fuels.

1970-2012 TRILLIONS OF BTU



1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Electric Utility		Transportation		Total Resources	Total End Use
1970	11.9	*43.6%*	0.2	*0.7%*	10.4	*38.0%*	4.8	*17.7%*	0.0	*0.0%*	27.3	22.5
1975	11.8	*40.1%*	0.2	*0.7%*	12.3	*42.0%*	5.1	*17.2%*	0.0	*0.0%*	29.4	24.3
1980[r]	26.9	*55.0%*	0.2	*0.4%*	16.2	*33.2%*	5.6	*11.4%*	0.0	*0.0%*	48.9	43.3
1985[r]	26.1	*50.4%*	0.2	*0.4%*	18.4	*35.5%*	7.0	*13.5%*	0.1	*0.2%*	51.8	44.8
1990[r]	21.4	*42.6%*	0.3	*0.5%*	21.0	*41.8%*	6.9	*13.7%*	0.7	*1.4%*	50.3	43.4
1995[r]	22.4	*44.8%*	0.6	*1.1%*	15.2	*30.5%*	7.7	*15.4%*	4.1	*8.2%*	49.9	42.2
2000[r]	25.0	*45.2%*	0.5	*0.9%*	14.9	*26.9%*	7.0	*12.7%*	7.9	*14.3%*	55.3	48.3
2005[r]	29.4	*46.7%*	0.7	*1.2%*	15.1	*24.0%*	7.2	*11.5%*	10.4	*16.5%*	62.8	55.6
2006[r]	28.4	*43.5%*	1.0	*1.5%*	17.4	*26.7%*	7.4	*11.4%*	11.0	*16.9%*	65.2	57.8
2007[a,r]	31.4	*43.0%*	1.5	*2.0%*	20.2	*27.7%*	6.2	*8.5%*	13.6	*18.7%*	72.9	66.7
2008[r]	36.2	*45.0%*	1.7	*2.1%*	15.8	*19.7%*	8.3	*10.4%*	18.3	*22.8%*	80.4	72.1
2009[r]	31.9	*39.5%*	2.7	*3.4%*	16.2	*20.0%*	10.5	*13.1%*	19.4	*24.0%*	80.7	70.2
2010[r]	30.7	*36.0%*	2.3	*2.6%*	18.3	*21.4%*	12.6	*14.7%*	21.6	*25.3%*	85.3	72.7
2011[r]	34.6	*38.8%*	2.2	*2.5%*	19.6	*22.0%*	13.6	*15.2%*	19.2	*21.5%*	89.1	75.5
2012[p]	**29.9**	***33.5%***	**2.6**	***3.0%***	**18.8**	***21.1%***	**12.8**	***14.4%***	**25.1**	***28.1%***	**89.3**	**76.5**

a In 2007, the figures in this table were revised to remove non-metered resources such as passive solar energy and resources not considered renewable under Wisconsin law (e.g., municipal solid waste and refuse derived fuel such as railroad ties and tires). This impacted all sectors when compared to previous versions of this publication.

p Preliminary estimates.

r Revised.

Source: Focus on Energy aggregated and verified savings data (2005-2012); survey data from conversations and emails with utilities, independent operators of landfills and/or waste water treatment plants, and public schools (2007-2012); Department of Revenue *Monthly Motor Fuel Consumption Report* (2000-2012); Energy Center of Wisconsin, *Wisconsin Agricultural Biogas* Casebook (2008); Public Service Commission of Wisconsin, unpublished data compiled from utility annual reports (1970-2012). http://psc.wi.gov/apps40/annlreport/default.aspx

TOTAL RENEWABLE END-USE ENERGY 1.2%

Wisconsin's total, renewable end use energy increased by 1.2 percent. The residential and industrial sectors use the most renewable energy, primarily due to woodburning in these sectors. Residential and commercial data also include solar hot water, photovoltaic systems and wind power. Data reported in the electric sector represents resource energy, meaning that the renewable fuels are used to generate electricity—by the utilities and through distributed generation—sold through the grid. Transportation sector renewable energy measures use of ethanol blended with gasoline and sold as reformulated gasoline, E10 and E85.

Maps of Wisconsin's hydroelectric sites, wind installations ("wind farms") and U.S. potential for biomass and solar can be found in the Map Appendix in the back of this book.

Wisconsin Renewable Energy Electricity Generated and Purchased

RENEWABLE ELECTRICITY GENERATION
4.8%

In 2012, Wisconsin's electric utilities and non-utilities, such as paper mills, decreased their generation of electricity generated from renewable energy sources by 4.8 percent. The primary renewable energy source used was hydropower, which represents 32.1 percent of Wisconsin's renewable electricity generation. Hydropower is followed closely by wind, representing 31.7 percent of Wisconsin's renewable electricity.

Sales of renewable energy generated in Wisconsin comprise approximately 7.3 percent of total electric sales in Wisconsin, a decrease of 5.1 percent over 2011.

Maps of Wisconsin's hydroelectric sites, wind installations ("wind farms") and U.S. potential for biomass and solar can be found in the Map Appendix in the back of the book.

Wind power in this table represents wind power from in-state wind production facilities, and does not include generation at out-of-state sites owned by, or purchased by, Wisconsin utilities. Increases in wind generation represent efforts of Wisconsin's utilities to add wind power to their overall energy portfolio to meet requirements of the Renewable Portfolio Standard (RPS).

In this table, biomass includes wood, paper pellets and black liquor. Biogas includes methane burned at landfills, waste water treatment facilities, and agricultural manure digesters to generate electricity. Solar generation comes primarily from distributed energy sources such as residences with photovoltaic installations that sell power to the electric utility for distribution on the electric grid.

1990-2012 MILLIONS OF kWh AND PERCENT OF TOTAL

Year	Hydro		Biomass		Biogas		Wind		Solar		Total
1990	2,014.4	*96.7%*	68.1	*3.3%*	0.0	*0.0%*	0.0	*0.0%*	0.00	*0.0%*	2,082.5
1995	2,378.5	*93.5%*	54.2	*2.1%*	110.1	*4.3%*	0.0	*0.0%*	0.00	*0.0%*	2,542.8
1996	2,696.0	*94.1%*	56.5	*2.0%*	112.8	*3.9%*	0.0	*0.0%*	0.00	*0.0%*	2,865.3
1997	2,483.3	*93.3%*	57.5	*2.2%*	121.2	*4.6%*	0.0	*0.0%*	0.00	*0.0%*	2,662.0
1998	1,747.4	*89.1%*	60.9	*3.1%*	151.2	*7.7%*	2.2	*0.1%*	0.00	*0.0%*	1,961.7
1999	1,984.6	*89.2%*	68.6	*3.1%*	147.4	*6.6%*	23.7	*1.1%*	0.00	*0.0%*	2,224.3
2000	1,990.8	*86.1%*	78.1	*3.4%*	197.2	*8.5%*	46.6	*2.0%*	0.00	*0.0%*	2,312.7
2001	2,056.2	*85.2%*	83.0	*3.4%*	203.3	*8.4%*	70.2	*2.9%*	0.00	*0.0%*	2,412.7
2002	2,515.0	*84.9%*	70.6	*2.4%*	267.3	*9.0%*	111.1	*3.7%*	0.03	*0.0%*	2,964.0
2003	1,843.3	*79.9%*	79.4	*3.4%*	280.5	*12.2%*	104.0	*4.5%*	0.12	*0.0%*	2,307.3
2004	1,980.7	*79.2%*	98.1	*3.9%*	317.5	*12.7%*	105.3	*4.2%*	0.30	*0.0%*	2,501.9
2005	1,550.7	*76.9%*	148.2	*7.3%*	224.3	*11.1%*	93.5	*4.6%*	0.46	*0.0%*	2,017.1
2006	1,626.9	*56.7%*	815.8	*28.4%*	322.2	*11.2%*	102.7	*3.6%*	0.91	*0.0%*	2,868.6
2007[a]	1,483.2	*50.8%*	914.4	*31.3%*	412.6	*14.1%*	110.4	*3.8%*	1.57	*0.1%*	2,922.2
2008	1,585.6	*47.5%*	698.6	*20.9%*	563.6	*16.9%*	488.4	*14.6%*	3.45	*0.1%*	3,339.6
2009	1,460.9	*34.8%*	1,017.2	*24.3%*	657.1	*15.7%*	1,051.6	*25.1%*	5.31	*0.1%*	4,192.2
2010	2,217.0	*45.4%*	913.0	*18.7%*	655.3	*13.4%*	1,092.3	*22.4%*	7.54	*0.2%*	4,885.1
2011	2,258.9	*43.0%*	1,080.3	*20.6%*	710.0	*13.5%*	1,190.5	*22.7%*	13.20	*0.3%*	5,253.0
2012[p]	**1,608.2**	***32.2%***	**1,053.3**	***21.1%***	**737.7**	***14.7%***	**1,583.7**	***31.7%***	**19.28**	***0.4%***	**5,002.2**

a In 2007 these figures were revised from previous versions of this publication to remove resources that are not considered renewable under Wisconsin law (e.g., municipal solid waste or refuse derived fuels).

p Preliminary estimates.

Source: Public Service Commission of Wisconsin, unpublished data compiled from annual reports (2007-2012); Focus on Energy aggregated and verified savings data (2005-2012); survey data from conversations and emails with utilities, independent operators of landfills and/or waste water treatment plants, and public schools (2007-2012); Department of Revenue *Monthly Motor Fuel Consumption Report* (2000-2012); Energy Center of Wisconsin *Wisconsin Agricultural Biogas* Casebook (2008).

Wisconsin Electric Utility and Non-Utility Hydroelectric Generation

1970-2012 MILLIONS OF kWh

Year	Wisconsin Operated Utility Plant Location: Wisconsin[a,b]	Wisconsin Operated Utility Plant Location: Michigan	Total Utility	Wisconsin Non-Utility	Total Wisconsin	Total Wisconsin Precipitation (inches per year)
1970	1,413.2	448.1	1,861.3	110.0	1,523.2	32.0
1975	1,482.9	450.3	1,933.2	129.4	1,612.3	32.4
1980	1,628.3	488.9	2,117.2	160.4	1,788.7	32.5
1985	2,046.3	543.6	2,589.9	235.9	2,282.2	37.0
1990	1,791.0	340.2	2,131.2	223.4	2,014.4	36.2
1995	2,097.1	440.1	2,537.2	281.4	2,378.5	32.9
1996	2,401.9	500.7	2,902.6	294.1	2,696.0	32.8
1997	2,182.2	458.5	2,640.7	301.1	2,483.3	28.6
1998	1,517.8	324.0	1,841.8	229.6	1,747.4	32.7
1999	1,734.0	416.1	2,150.1	250.6	1,984.6	34.0
2000	1,749.4	369.6	2,119.0	241.4	1,990.8	34.8
2001	1,887.6	383.3	2,270.9	168.6	2,056.2	35.5
2002	2,282.9	485.8	2,768.7	232.1	2,515.0	35.2
2003	1,623.4	373.4	1,996.8	219.9	1,843.3	28.4
2004	1,748.4	401.0	2,149.4	232.3	1,980.7	35.3
2005	1,499.0	338.6	1,837.6	51.7	1,550.7	29.3
2006	1,446.0	326.3	1,772.3	180.9	1,626.9	30.7
2007	1,314.0	272.6	1,586.6	169.2	1,483.2	34.0
2008	1,428.0	272.6	1,700.6	157.6	1,585.6	33.6
2009	1,352.7	251.2	1,603.9	108.2	1,460.9	30.3
2010	2,026.7	330.3	2,357.0	190.3	2,217.0	39.7
2011	2,048.1	339.6	2,387.7	210.8	2,258.9	30.7
2012[p]	**1,455.0**	**257.4**	**1,712.4**	**153.2**	**1,608.2**	**28.0**

a Including Wisconsin power cooperatives and Independent Power Producers.

b From 1970 to 1989, data were sourced from the Public Service Commission bulletins; from 1990 to 2008, data are sourced from the federal Energy Information Administration (EIA). Beginning in 2009, data are from the Wisconsin Public Service Commission. Totals here may not match other hydroelectric totals in the book due to different data sources.

p Preliminary estimates.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994); U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1971-1994); Wisconsin Department of Administration, Division of Energy, Wisconsin Hydroelectric Generation Model, unpublished (1994); National Oceanic and Atmospheric Administration, *Monthly State Heating Degree Days, Historical Climatology Series 5-1* (April 2004); U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly* [DOE/EIA-0226 (2010/03)] (March 2010) (1990-2008), http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html;
Public Service Commission of Wisconsin, unpublished electrical production data (2005-2012).

ELECTRIC UTILITY HYDROELECTRIC PRODUCTION

28.3%

Total Wisconsin hydroelectric production—utility and non-utility—decreased 28.3 percent from 2011 to 2012. Because hydroelectric production is impacted by rainfall, among other factors, precipitation inches are provided in this table. In 2012, total precipitation in Wisconsin fell by 8.8 percent from 2011.

Beginning in 2009, the utility figure includes production by Independent Power Producers who are required under law to sell their power to regulated utilities. Non-utility figures represent hydroelectric generation from the industrial sector, such as paper companies.

A map of Wisconsin's hydroelectric sites can be found in the Map Appendix in the back of the book.

Wisconsin Wood Use, by Economic Sector

WOOD ENERGY USE 12.4%

Wood energy use in Wisconsin decreased by 12.4 percent in 2012. This table shows wood used in Wisconsin for applications that displace the use of fossil fuels, such as space heating or water heating.

Wood used in this table does not represent wood used to generate electricity.

In previous versions of this book, the electric sector was included in this table. Electric sector data is included in tables elsewhere in this chapter.

A map of biomass potential distribution across the United States can be found in the Map Appendix in the back of this book.

Residential wood use is estimated using a variety of factors including heating degree days, cost of other winter fuels and gross domestic product, the efficiency factor of wood, and the number of households in Wisconsin. The Commercial sector wood use includes schools, hospitals, wholesalers and retailers, and construction.

1970-2012 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential[a]		Commercial[b]		Industrial		Total
1970	11.9	*53.8%*	0.20	*0.9%*	10.0	*45.2%*	22.1
1975	11.8	*49.4%*	0.20	*0.8%*	11.9	*49.8%*	23.9
1980[r]	26.9	*62.9%*	0.20	*0.5%*	15.7	*36.7%*	42.8
1985[r]	26.1	*59.4%*	0.20	*0.5%*	17.6	*40.1%*	43.9
1990[r]	21.4	*51.4%*	0.26	*0.6%*	20.0	*48.0%*	41.7
1995[r]	22.4	*62.8%*	0.55	*1.6%*	12.7	*35.6%*	35.6
1996[r]	25.0	*64.7%*	0.50	*1.3%*	13.1	*34.0%*	38.6
1997[r]	23.7	*63.7%*	0.48	*1.3%*	13.1	*35.1%*	37.2
1998[r]	19.3	*59.0%*	0.57	*1.8%*	12.8	*39.2%*	32.7
1999[r]	21.5	*63.9%*	0.62	*1.8%*	11.5	*34.2%*	33.7
2000[r]	25.0	*68.1%*	0.48	*1.3%*	11.2	*30.6%*	36.7
2001[r]	24.1	*67.3%*	0.38	*1.1%*	11.3	*31.6%*	35.8
2002[r]	24.6	*67.4%*	0.37	*1.0%*	11.5	*31.6%*	36.5
2003[r]	27.3	*69.4%*	0.36	*0.9%*	11.7	*29.7%*	39.4
2004[r]	27.5	*67.9%*	0.32	*0.8%*	12.7	*31.4%*	40.5
2005[r]	29.3	*70.2%*	0.27	*0.6%*	12.2	*29.1%*	41.8
2006[r]	28.4	*71.5%*	0.24	*0.6%*	11.0	*27.9%*	39.7
2007[r]	31.4	*71.3%*	0.44	*1.0%*	12.2	*27.7%*	44.0
2008[r]	36.2	*83.2%*	0.54	*1.2%*	6.8	*15.6%*	43.5
2009[r]	31.9	*82.2%*	0.89	*2.3%*	6.0	*15.5%*	38.8
2010[r]	30.6	*78.2%*	0.38	*1.0%*	8.1	*20.8%*	39.2
2011[r]	34.5	*79.4%*	0.28	*0.6%*	8.7	*20.0%*	43.5
2012[p]	**29.9**	***78.4%***	**0.19**	***0.5%***	**8.0**	***21.1%***	**38.1**

a Revisions to the residential sector wood-burn estimates are due to corrections of adjusted pricing figures.

b Commercial sector figures are revised to reflect data incorrectly assigned to the electric production sector which are now correctly categorized with wood/biomass for non-electric production.

p Preliminary estimates.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981* (August 1983); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-2012); USDA Forest Service, *Residential Fuelwood Consumption and Production in Wisconsin* (1994); Wisconsin Department of Administration, Division of Energy, "Wisconsin Residential Wood Energy Model," unpublished (1981-2012), and *Directory of Wisconsin Wood Burning Facilities* (1995).

Wisconsin Manufacturing Industry Use of Wood Fuel, by Industry Group

1972-2012 THOUSANDS OF TONS AND TRILLIONS OF BTU[a]

	Lumber		Furniture		Paper & Allied		Other Manufacturing		Total	
Year	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)
1972	391.2	4.42	13.2	0.15	508.5	5.75	16.1	0.18	929.0	10.50
1975	437.2	4.94	24.5	0.28	575.6	6.50	17.1	0.19	1,054.4	11.91
1980	447.5	5.06	56.9	0.64	872.8	9.86	12.0	0.14	1,389.2	15.70
1985	427.3	4.83	53.9	0.61	1,046.7	11.83	33.5	0.38	1,561.4	17.64
1990	490.9	5.55	64.0	0.72	1,186.5	13.41	30.0	0.34	1,771.4	20.02
1995	480.6	5.43	29.3	0.33	592.3	6.69	19.9	0.23	1,122.1	12.68
1996	435.9	4.93	29.9	0.34	676.8	7.65	18.6	0.21	1,161.2	13.12
1997	402.2	4.54	23.2	0.26	712.3	8.05	17.6	0.20	1,155.3	13.05
1998	408.1	4.61	22.1	0.25	693.2	7.83	10.9	0.12	1,134.2	12.82
1999	455.4	5.15	22.7	0.26	535.1	6.05	7.9	0.09	1,021.1	11.54
2000	432.3	4.89	20.1	0.23	534.5	6.04	7.5	0.09	994.5	11.24
2001	419.9	4.74	19.0	0.21	554.5	6.27	8.9	0.10	1,002.3	11.33
2002	415.2	4.69	17.2	0.19	577.5	6.53	9.0	0.10	1,019.0	11.51
2003	384.3	4.34	15.3	0.17	626.9	7.08	8.2	0.09	1,034.7	11.69
2004	434.5	4.91	13.5	0.15	665.5	7.52	10.5	0.12	1,123.9	12.70
2005	421.8	4.77	10.8	0.12	633.4	7.16	10.5	0.12	1,076.5	12.16
2006	356.1	4.02	7.6	0.09	597.3	6.75	16.5	0.19	977.4	11.05
2007	361.3	4.08	7.5	0.08	690.4	7.80	19.3	0.22	1,078.5	12.19
2008[b]	300.0	3.39	5.6	0.06	272.9	3.08	20.7	0.23	599.3	6.77
2009	256.7	2.90	4.0	0.05	249.3	2.82	21.8	0.25	531.8	6.01
2010	314.2	3.55	2.5	0.03	379.1	4.28	24.5	0.28	720.4	8.14
2011	387.9	4.38	3.2	0.04	353.4	3.99	24.8	0.28	769.2	8.69
2012[p]	**369.7**	**4.18**	**2.5**	**0.03**	**321.4**	**3.63**	**17.6**	**0.20**	**711.2**	**8.04**

The use of wood and wood products as fuel by Wisconsin industries is concentrated among businesses that use or produce a wood product. Lumber mills burn sawdust, bark and scrap wood as a boiler fuel and for kiln drying boards. Furniture and paper companies use scrap wood and wood byproducts for process steam, heating and generating electricity. Wood in Wisconsin is a renewable resource for heating as well as electricity generation.

a Gross heating values of wood range from 8 MMBtu per ton to 17 MMBtu per ton, due in part to differences in moisture content. In this table, 11.3 MMBtu per ton is used, based on estimates of moisture content and type of wood used in Wisconsin.

b Drops in Paper and Allied values beginning in 2008 is due to the removal of tonnage associated with electrical generation.

p Preliminary.

Source: Estimates by the Wisconsin State Energy Office, based on Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-2012); Employment Research Associates, *Biomass Resources: Generating Jobs and Energy*, Technical Papers (January 1986); Department of Administration, Division of Energy, *Directory of Wisconsin Wood Burning Facilities* (1995).

Wisconsin Electric Utility Use of Wood Fuel

WOOD FUEL
USED FOR
ELECTRICITY
8.4%

Wood energy used for electricity generation in Wisconsin increased by 8.4 percent in 2012.

These figures represent resource energy, before conversion of wood fuel to electricity.

NSP began using wood fuel at Bay Front in 1976 and at its French Island facility in 1980. These are the only electric utility generation sites in Wisconsin using significant amounts of wood.

A map of biomass potential distribution across the United States can be found in the Map Appendix at the back of this book.

In the utility sector, Northern States Power (NSP)/Xcel Energy uses wood for their electricity-generation fuel at the Bay Front and French Island generating plants.

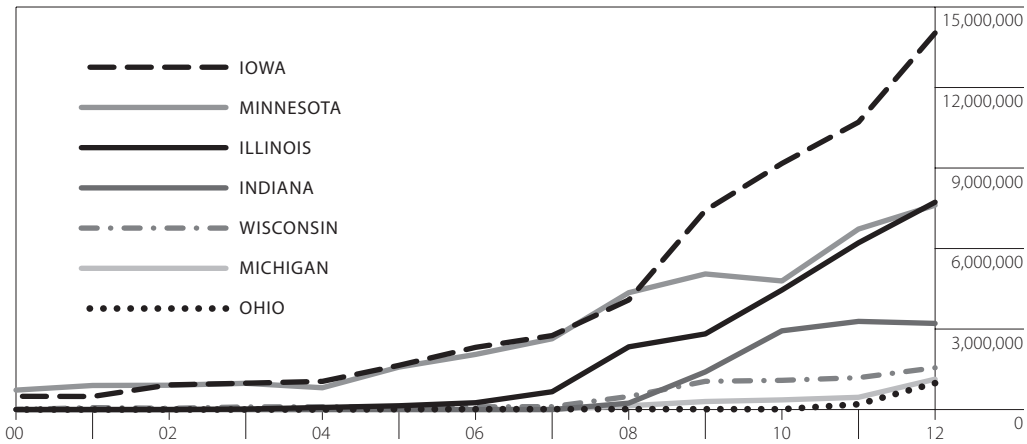
1970-2012

Year	Tons	Billions of Btu
1970-1975	0	0
1980	76,282	740
1985	155,717	1,666
1990	299,464	3,112
1995	327,201	3,506
1996	339,803	3,837
1997	304,618	3,326
1998	334,231	3,871
1999	330,491	3,765
2000	296,739	3,430
2001	301,580	3,484
2002	283,774	3,260
2003	267,446	3,154
2004	242,973	2,877
2005	253,638	2,961
2006	288,907	3,482
2007	315,811	3,437
2008	342,684	3,735
2009	362,471	3,868
2010	380,600	4,333
2011	371,212	4,232
2012	**394,486**	**4,588**

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-1994); annual reports of various Wisconsin electric generating utilities (1995-2012). http://psc.wi.gov/apps40/annlreport/default.aspx

Wisconsin, Midwest and U.S. Wind Generation and Capacity

2000-2012 WIND GENERATION BY STATE AND YEAR (MEGAWATT HOURS)



2000-2012 WIND GENERATION BY STATE (MEGAWATT HOURS)

Year	Wisconsin[a]	Illinois	Indiana	Iowa	Michigan	Minnesota	Ohio	Midwest Total	United States
2000	2,728	0	0	493,820	0	724,524	0	1,221,072	5,593,261
2005	92,544	141,146	0	1,647,134	1,848	1,582,477	13,268	3,478,417	17,810,549
2006	101,376	254,571	0	2,317,821	2,212	2,054,947	14,401	4,745,328	26,589,137
2007	109,283	664,427	0	2,756,676	2,723	2,638,812	14,748	6,186,669	34,449,927
2008	487,141	2,336,996	238,356	4,083,787	141,182	4,354,620	15,084	11,657,166	55,363,100
2009	1,051,965	2,819,532	1,403,192	7,420,520	300,172	5,053,022	14,114	18,062,517	73,886,132
2010	1,088,464	4,453,634	2,934,043	9,170,337	360,340	4,791,723	12,576	22,811,117	94,652,246
2011	1,187,730	6,213,132	3,285,411	10,709,177	456,474	6,725,695	198,443	28,776,062	120,176,599
2012	**1,557,578**	**7,726,810**	**3,210,104**	**14,032,491**	**1,131,688**	**7,615,408**	**985,485**	**36,259,564**	**140,821,703**

2000-2012 WIND CAPACITY BY STATE (MEGAWATTS)

Year	Wisconsin[a]	Illinois	Indiana	Iowa	Michigan	Minnesota	Ohio	Midwest Total	United States
2000	23	0	1	197	1	271	0	493	2,394
2005	53	105	1	820	2	687	7	1,675	8,733
2006	53	105	1	921	2	829	7	1,918	11,334
2007	53	740	1	1,170	2	1,139	7	3,112	16,596
2008	365	962	131	2,661	124	1,481	7	5,731	24,980
2009	449	1,596	1,037	3,448	143	1,636	7	8,316	34,683
2010	469	1,946	1,340	3,665	164	2,009	7	9,600	39,516
2011	631	2,737	1,340	4,302	376	2,580	160	12,126	45,982
2012	**370**	**3,520**	**1,540**	**5,005**	**874**	**2,842**	**462**	**14,613**	**59,075**

a Wind generation figures shows for Wisconsin in this table will differ from wind generation figures elsewhere in this publication due to different data sources.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Consumption Estimates*,1960-2012; [DOE/EIA-0214 (2012/06)], June 2013 (2000-2012), Table CT8, http://www.eia.gov/state/seds

WISCONSIN WIND GENERATION 31.1% FROM 2011

In 2012, wind generation in Wisconsin was the third lowest of seven Midwestern states, and increased 31.1 percent over 2011's generation. The installed wind capacity in Wisconsin is the second lowest in the Midwest and is 1.1 percent of the United States installed wind generation capacity.

Wind generation in the Midwest increased 26 percent from 2011 to 2012, and by 17.2 percent across the country. Wind capacity increased 20.5 percent in the Midwest and 28.5 percent in the U.S.

Since 2000, wind generation in the Midwest has increased 2,869.5 percent, making wind one of the fastest growing renewable resources.

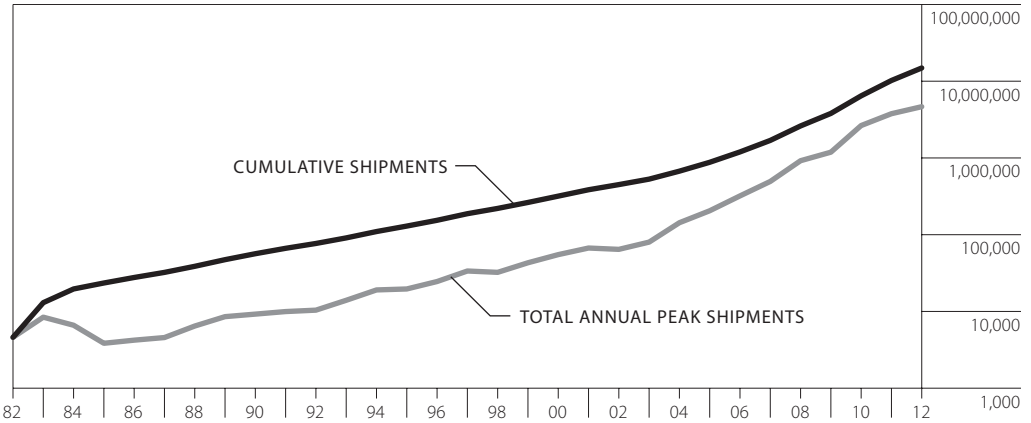
U.S. Photovoltaic Module Shipments and Conversion Efficiency

Shipments of photovoltaic (PV) modules are measured in peak kilowatts (KW), also known as the rated capacity (how much power can be produced under standardized test conditions). Data in the table show KWs of shipments for each year, as well as cumulative shipments since the Energy Information Administration (EIA) began collecting these data.

Since 1982 total shipments of PV systems have exceeded 14,000 Megawatts (MW). Since 2003 annual shipments of PV systems have been doubling every 18 months, an annual average growth of 56.1 percent. The volume of shipments is a good proxy for the growth of PV in the commercial, industrial and residential sectors and demonstrates a steady growth in the purchase and installation of PV in the United States.

The table also includes information about conversion efficiency, which measures the fraction of solar energy that is converted into electrical energy. PV modules average a conversion efficiency of about 16 percent for Crystalline Silicon and about 11 percent for Amorphous Silicon.

1982-2012 PHOTOVOLTAIC SHIPMENTS (KILOWATTS)



	Photovoltaic Shipments[a]		Average Energy Conversion Efficiency Photovoltaic					
			Crystalline Silicon			Thin-Film Silicon		Concentrator
Year	Shipments Total Annual Peak Kilowatts[b]	Cumulative Kilowatts	Single Crystal	Cast	Ribbon	Amorphous Silicon	Other	Silicon
1982[r]	4,600	4,600						
1985[r]	3,848	23,477						
1990[r]	9,229	56,507						
1995[r]	19,627	129,530						
2000[r]	55,007	318,102						
2005[r]	204,996	877,880						
2006[r]	320,208	1,198,088						
2007[r]	494,148	1,692,236	17	14	12	8	12	35
2008[r]	920,693	2,612,929	19	14	13	8	12	34
2009[r]	1,188,879	3,801,808	20	14	13	8	12	38
2010[r]	2,644,498	6,446,306		16		11		27
2011[r]	3,772,075	10,218,381		16		11		29
2012[p]	**4,655,005**	**14,873,386**		**16**		**13**		**30**

a Total shipments in the table represent shipment from outside and within the United States, and do not include export shipments to other counties.

b Revisions to these data reflect the shipment of modules only, and do not include cells.

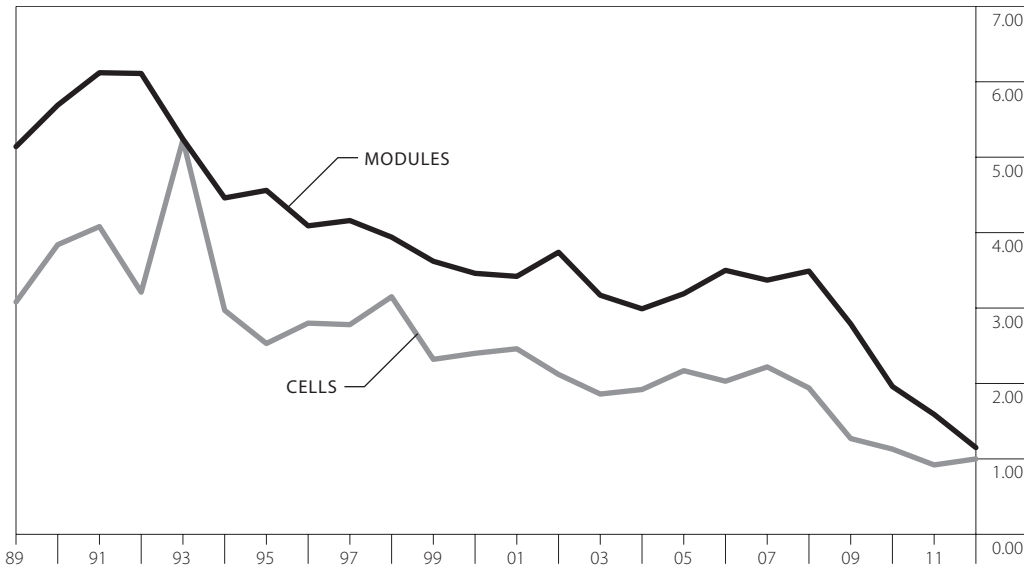
p Preliminary.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* [DOE/EIA-0384(2011) (September 2012)], table 10.8 (2011) www.eia.doe.gov/totalenergy/data/annual; U.S. Department of Energy, Energy Information Administration, December 2009, Form EIA-63B, *Annual Photovoltaic Module/Cell Manufacturers Survey*, Table 3.8, "Average Energy Conversion Efficiency of Photovoltaic Cells and Modules Shipped", 2007-2012 (2013).

U.S. Photovoltaic Modules and Cell Prices

1989-2012 DOLLARS PER PEAK WATT



	Dollars per Peak Watt (nominal[a] dollars)		2012 Dollars[b]	
Year	Modules	Cells	Modules	Cells
1989	5.14	3.08	8.52	5.11
1990	5.69	3.84	9.09	6.13
1995	4.56	2.53	6.45	3.58
2000	3.46	2.40	4.50	3.12
2001	3.42	2.46	4.35	3.13
2002	3.74	2.12	4.68	2.65
2003	3.17	1.86	3.89	2.28
2004	2.99	1.92	3.56	2.29
2005	3.19	2.17	3.68	2.50
2006	3.50	2.03	3.91	2.27
2007	3.37	2.22	3.66	2.41
2008	3.49	1.94	3.71	2.06
2009	2.79	1.27	2.94	1.34
2010	1.96	1.13	2.04	1.17
2011	1.59	0.92	1.62	0.94
2012[p]	**1.15**	**1.00**	**1.15**	**1.00**

a Nominal dollars represent the prices during the year cited, they are not adjusted for inflation.

b 2012 prices indicate the price adjusted for inflation.

p Preliminary estimates.

Source: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* [DOE/EIA-0384(2011) (August 2012)], table 10.8 (2011) www.eia.doe.gov/aer; U.S. Department of Energy, Energy Information Administration, December 2009, Form EIA-63B, *Annual Photovoltaic Module/Cell Manufacturers Survey*, Table 3.8, "Average Energy Conversion Efficiency of Photovoltaic Cells and Modules Shipped", 2007-2012 (2013).

Growth in photovoltaic (PV) is demonstrated by falling prices. From 1990 to 2012, PV module prices fell by 87.3 percent, and the price of cells fell by 83.7 percent.

A PV module is an integrated assembly of PV cells that generate direct current power for PV systems. The price per watt of a module (about $1.15/watt) is about 15 percent higher than the most of PV cells ($1/watt).

A small grid-connected fix-mounted PV system has a retail price of about $7 per watt installed. The PV modules comprise about half of that price.

CHAPTER 4

Energy Efficiency Indices

Indices of Wisconsin Energy Efficiency

Energy efficiency activities in the residential and commercial sectors are measured primarily by recording the number of buildings that have received professional audits, installed energy efficiency improvements or were certified as meeting energy efficiency building codes.

1970-2012 MILLIONS OF BTU

Year	Total Energy Use Per $1,000 GSP[a]	Electric Energy Use Per $1,000 GSP[a]	Residential Energy Use Per Capita[b]	Commercial Energy Use Per Employee[d]	Industrial Energy Use Per $1,000 Manufacturing Value Added[a,c]	Agricultural Energy Use Per Acre
1970	11.9	0.88	73.4		8.3	1.08
1975	11.0	0.96	74.9		6.3	1.19
1980	10.0	1.01	75.6		5.1	1.43
1985	9.1	1.03	72.4		4.7	1.41
1990	8.8	1.05	73.5	161.0	4.4	1.23
1995	8.4	1.03	79.6	162.4	4.1	1.25
1996	8.1	1.01	80.8	162.0	4.0	1.29
1997	7.9	0.99	76.1	158.5	4.1	1.25
1998	7.5	0.98	70.7	156.2	3.8	1.21
1999	7.4	0.96	74.9	161.0	3.8	1.26
2000	7.3	0.96	75.6	159.3	3.8	1.25
2001	7.2	0.96	75.5	159.3	3.8	1.23
2002	7.1	0.96	76.7	160.8	3.8	1.26
2003	7.0	0.95	80.6	150.3	3.7	1.29
2004	6.9	0.93	78.4	145.1	3.9	1.25
2005	6.8	0.95	77.1	153.1	3.7	1.24
2006	6.4	0.93	71.1	145.0	3.5	1.48
2007	6.7	0.95	75.9	153.4	3.6	1.56
2008	6.8	0.95	77.3	155.9	4.0	1.51
2009	6.4	0.91	73.0	151.0	4.1	1.74
2010	6.4	0.92	71.9	148.9	3.8	1.54
2011	6.2	0.91	72.2	146.9	3.7	1.43
2012[p]	**6.0**	**0.90**	**66.8**	**140.2**	**3.4**	**1.59**

a Manufacturing Value Added and Gross State Product in 2009 dollars, deflated with Gross Domestic Product Implicit Price Deflator.

b Not adjusted for yearly variations in temperature.

c Value added data for Wisconsin not available. Value added estimated using U.S. and Wisconsin trends.

d Per Employee Data not available prior to 1990 due to change in coding from SIC to NAICS.

p Preliminary data.

Source: Wisconsin Department of Workforce Development employment data, http://worknet.wisconsin.gov/worknet/dalaus.aspx?menuselection=da; U.S. Department of Commerce, *Annual Survey and Census of Manufacturers* http://www.census.gov/mcd/asm-as3.html (1972-2012); Wisconsin Department of Agriculture, Trade and Consumer Protection, *Wisconsin's Agricultural Statistics, 2012*; other tables in this publication used for household estimates, gross state product, total resource energy use and use by sector.

TOTAL ENERGY USE PER $1,000 OF GROSS STATE PRODUCT

4.0%

These indices can be useful in evaluating energy efficiency trends in Wisconsin. Total Energy Use per $1,000 of Gross State Product (GSP), and Electricity Use per $1,000 of GSP trended downward by 4.0 and 1.1 percent respectively.

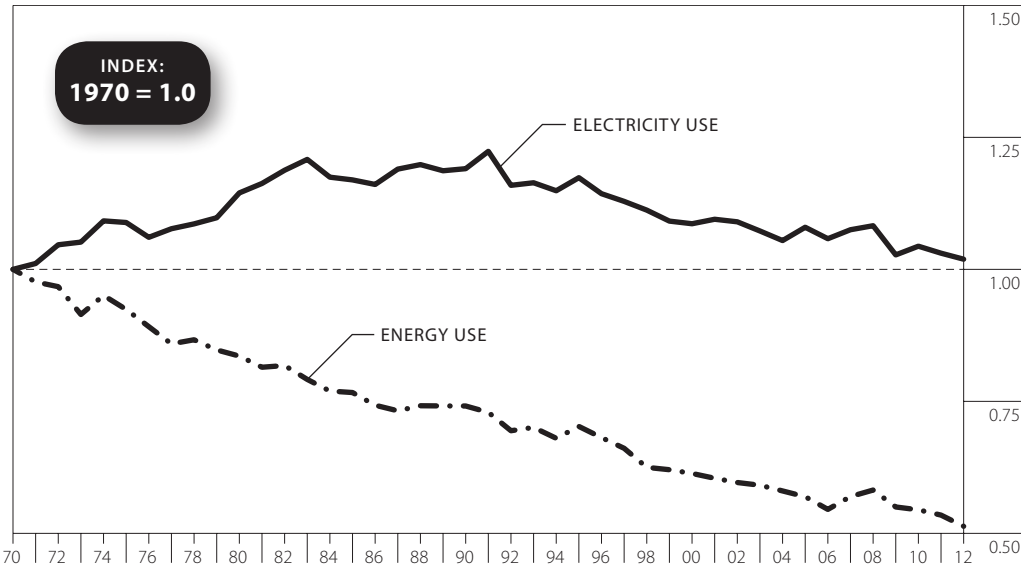
In 2012, Wisconsin Commercial Energy Use per Employee decreased by 4.5 percent; Industrial Energy Use per $1,000 Manufacturing Value Added decreased 7.6 percent and is 58.9 percent lower than in 1970. Agricultural Energy Use per Acre increased 7.1 percent in 2012, from 1.6 to 1.71 MMBtu/acre.

Indices of Wisconsin Energy Efficiency

WISCONSIN ENERGY USE PER DOLLAR OF GROSS STATE PRODUCT

WISCONSIN ELECTRICITY USE PER DOLLAR OF GROSS STATE PRODUCT

1970-2012 ENERGY AND ELECTRICITY USE PER DOLLAR OF GROSS STATE PRODUCT[a]



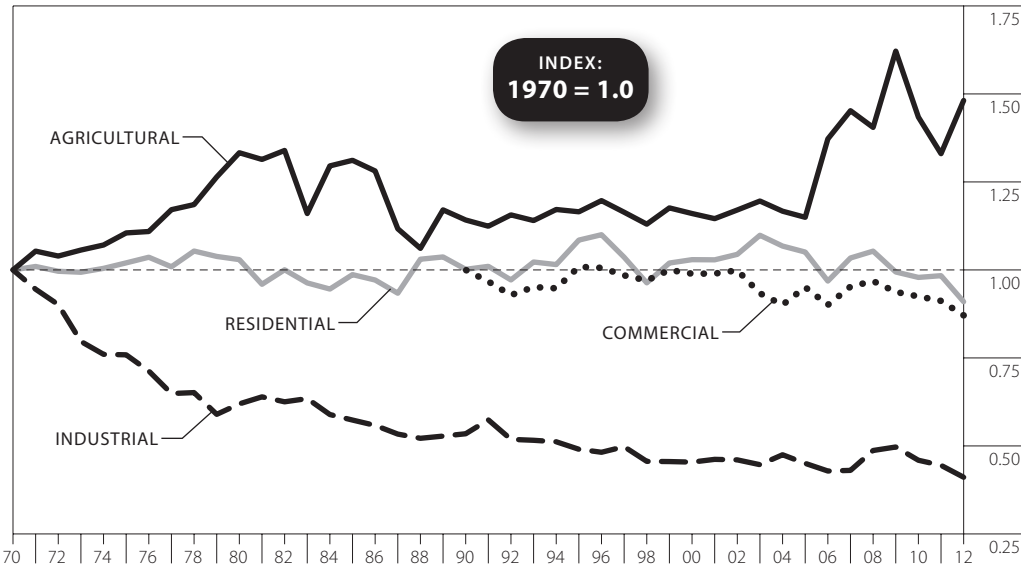
RESIDENTIAL ENERGY USE PER CAPITA

COMMERCIAL ENERGY USE PER EMPLOYEE

INDUSTRIAL ENERGY USE PER UNIT MANUFACTURING VALUE ADDED OUTPUT

AGRICULTURAL ENERGY USE PER ACRE

1970-2012 ENERGY INDICES BY ECONOMIC SECTOR[a]

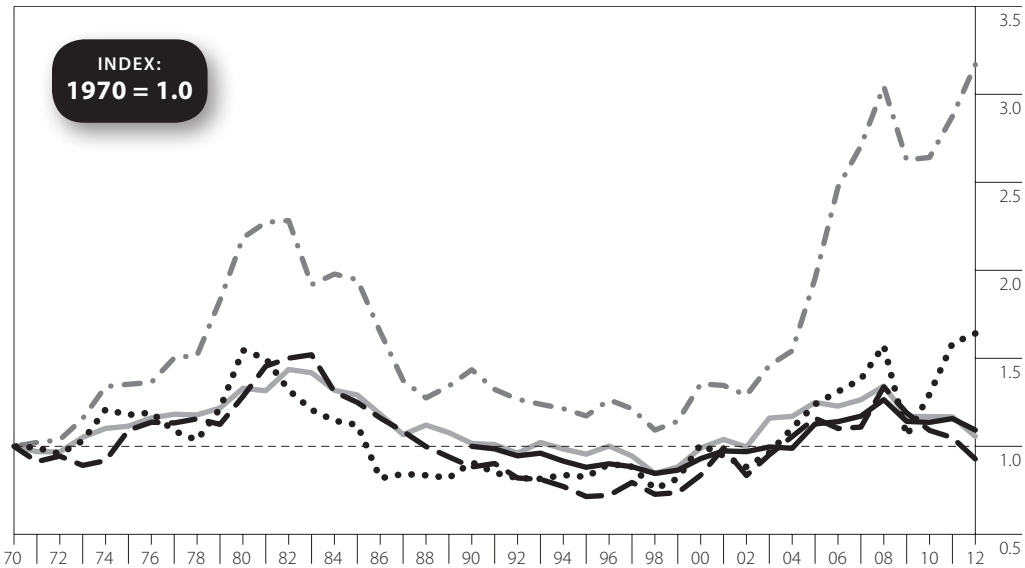


a All data, except commercial employment data, normalized to 1.0 in 1970, an arbitrary baseline to which all other years can be compared. Commercial employment data normalized to 1990, when industrial codes changed from SIC to NAICS.

Source: Wisconsin State Energy Office.

Indices of Wisconsin Energy Expenditures, 2012 Dollars

1970-2012 2012 DOLLARS



Year	Agricultural Expenditures Per Acre	Commercial Expenditures Per Employee[a]	Residential Expenditures Per Household	Industrial Expenditures Per $1,000 Value Added	Transportation Expenditures Per Vehicle
1970	14	1,086	1,765	37	1,434
1975[r]	19	1,375	1,967	41	1,691
1980[r]	31	1,628	2,347	48	2,217
1985	27	1,658	2,280	46	1,608
1990	20	1,251	1,794	33	1,304
1995[r]	16	1,102	1,686	27	1,185
2000	19	1,163	1,748	31	1,448
2001	19	1,218	1,834	37	1,357
2002	18	1,213	1,759	31	1,266
2003	21	1,246	2,048	35	1,382
2004[r]	22	1,237	2,066	39	1,583
2005	27	1,410	2,205	43	1,777
2006	35	1,426	2,168	41	1,880
2007	38	1,465	2,232	41	1,981
2008[r]	43	1,582	2,369	50	2,256
2009[r]	37	1,428	2,065	44	1,520
2010	37	1,421	2,063	40	1,860
2011[r]	40	1,448	2,061	39	2,272
2012[p]	**45**	**1,367**	**1,865**	**34**	**2,354**

a All data, except commercial employment data, normalized to 1.0 in 1970, an arbitrary baseline to which all other years can be compared. Commercial employment data normalized to 1990, when industrial codes changed from SIC to NAICS.

p Preliminary estimate.

r Revised.

Source: Compiled from tables in this publication for Wisconsin residential, commercial, industrial, agricultural and transportation energy use.

In 2012, Wisconsin saw decreases in more than half of the energy expenditure indices.

The Expenditures per Vehicle increased 3.6 percent, Commercial Expenditures per Employee decreased by 5.6 percent, Agricultural Expenditures per acre increased by 8.7 percent, while Residential Expenditures per household decreased 9.5 percent from 2011. The Industrial Expenditures per $1,000 of Value Added decreased by 11.5 percent.

Wisconsin Per Capita Resource Energy Consumption, by Type of Fuel

PER CAPITA
RESOURCE
ENERGY
CONSUMPTION
2.8%

Wisconsin's per capita resource energy consumption decreased 2.8 percent in 2012. However, compared to the low point in 1982, 2012 per capita energy use in Wisconsin is 8.1 percent higher.

1970-2012 MILLIONS OF BTU

Year	Petroleum	Natural Gas	Coal	Renewable	Nuclear	Electric Imports[a]	Total
1970[r]	103.6	74.1	80.4	6.2	0.4	-6.4	258.3
1975[r]	104.0	80.7	57.4	6.4	24.3	-4.5	268.5
1980[r]	96.6	73.1	69.0	10.4	22.7	-1.4	270.4
1982[r]	85.3	65.8	67.6	10.7	23.5	2.3	255.2
1985[r]	87.7	64.1	78.9	10.9	25.0	-0.4	266.2
1990[r]	89.4	62.6	84.1	10.3	24.8	17.9	289.1
1995[r]	91.3	74.7	90.9	9.8	23.2	24.1	314.1
1996[r]	93.7	78.5	94.7	10.7	21.3	15.6	314.3
1997[r]	94.2	77.1	98.2	10.2	8.1	25.1	313.0
1998[r]	93.6	70.2	94.7	9.1	19.4	20.6	307.7
1999[r]	96.3	72.2	95.8	9.5	23.5	18.9	316.3
2000[r]	92.6	73.3	96.8	10.3	23.1	18.3	314.5
2001[r]	92.4	66.8	96.6	10.0	23.0	22.5	311.4
2002[r]	93.0	70.4	93.2	10.5	24.7	18.4	310.3
2003[r]	93.1	71.8	96.0	10.8	24.0	15.8	311.6
2004[r]	93.8	69.2	97.1	11.2	23.2	17.0	311.4
2005[r]	89.1	73.6	95.3	11.3	14.7	22.5	306.4
2006[r]	87.5	66.3	91.8	11.6	23.5	10.1	290.8
2007[r]	87.7	70.8	91.3	12.9	24.7	15.6	303.1
2008[r]	83.7	72.0	95.3	14.2	23.1	12.7	301.0
2009[r]	79.0	68.3	85.2	14.2	24.1	12.0	282.7
2010[r]	79.4	65.3	91.8	15.0	25.2	8.5	285.3
2011[r]	78.5	69.3	86.3	15.7	22.0	11.7	283.4
2012[p]	**78.6**	**71.4**	**72.7**	**15.7**	**18.6**	**18.7**	**275.6**

a "Electric Imports" is the estimated resource energy used in other states or Canada to produce the electricity imported into Wisconsin. This resource energy is estimated assuming 11,300 Btu of resource energy per kWh imported into Wisconsin. A negative sign indicates that resource energy was used in Wisconsin to produce electricity that was exported.

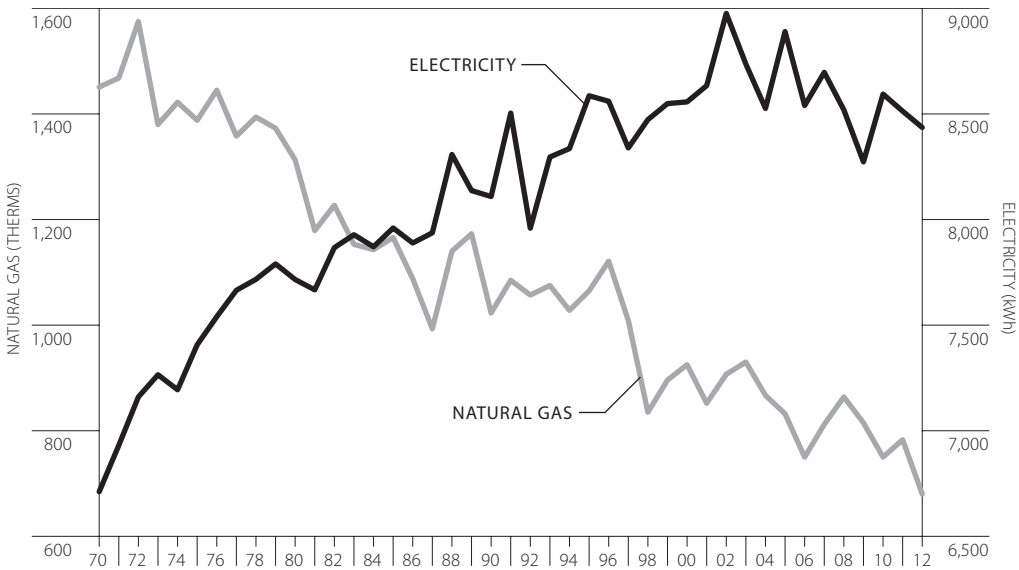
p Preliminary estimates.

r Revised.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal and renewable energy use, electric imports and population.

Wisconsin Residential Electricity and Natural Gas Use Per Customer

1970-2012



Year	Natural Gas[a] Number of Customers (Thousands)	Natural Gas[a] Use Per Customer (Therms)	Electricity Number of Customers (Thousands)	Electricity Use Per Customer (kWh)
1970[r]	750.4	1,451	1,429	6,711
1975[r]	858.5	1,388	1,607	7,407
1980[r]	966.0	1,313	1,801	7,716
1985[r]	1,013.0	1,166	1,870	7,960
1990[r]	1,123.6	1,023	2,017	8,109
1995[r]	1,291.4	1,065	2,170	8,586
2000[r]	1,459.0	925	2,329	8,557
2005[r]	1,592.6	832	2,526	8,890
2006[r]	1,611.8	750	2,550	8,540
2007[r]	1,632.2	812	2,573	8,697
2008[r]	1,646.6	864	2,580	8,519
2009	1,656.6	815	2,589	8,273
2010	1,663.6	750	2,595	8,594
2011[r]	1,671.8	783	2,602	8,513
2012[p]	**1,680.7**	**680**	**2,610**	**8,436**

a U. S. Department of Energy/Energy Information Administration data from EIA forms 176 and 861.

p Preliminary estimates.

r Revised.

Source: Edison Electric Institute, *Statistical Yearbook* (1971-1996); Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1970-1979), Public Service Commission of Wisconsin, form PSC-AF 2 *Gas Sales and Sales Ratio* (1980-2012); U.S. Department of Energy, *Electric Sales and Revenues*, 1993-2012 [DOE/EIA-0226(2013/02)], Table 5.4B (February 2013).

ELECTRICITY USE PER CUSTOMER
0.9%
NATURAL GAS USE PER CUSTOMER
13.2%

Electricity Use per Customer decreased 0.9 percent in 2012, while natural gas use per customer dropped by 13.2 percent.

The decrease in natural gas relates to the relatively low price of the fuel, and a decrease in Heating Degree Days (HDD) in 2012—a 14.2 percent decrease from to 2011. To learn more about HDDs, see the Miscellaneous chapter of this publication.

Natural Gas data are from the AF2 reports submitted to the Public Service Commission of Wisconsin by gas utilities across the state. The complete datasets are published online at www.stateenergyoffice.wi.gov under Statistics/Tables.

Wisconsin Commercial Electricity and Natural Gas Use Per Customer

ELECTRICITY USE PER CUSTOMER
0.1%

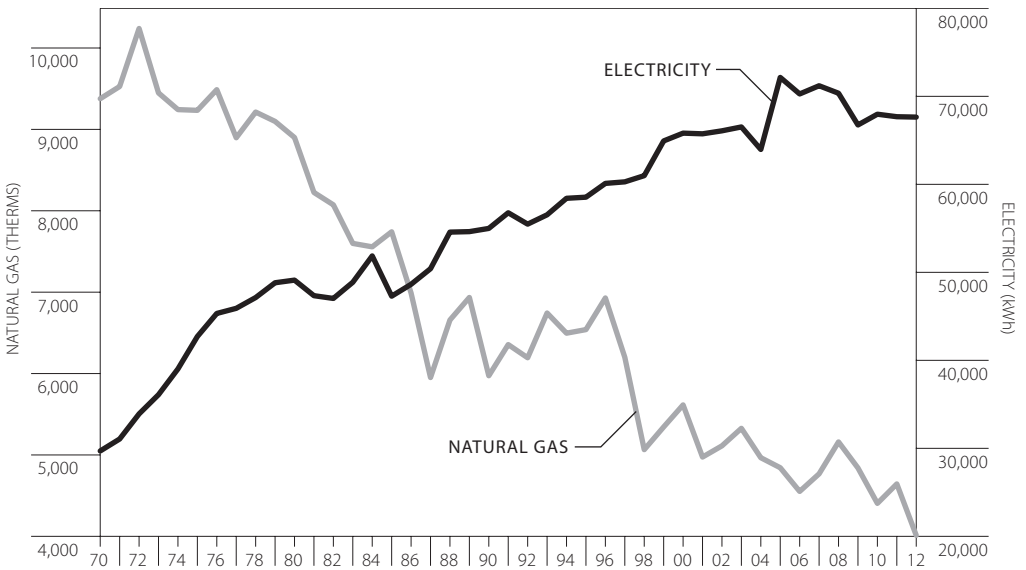
NATURAL GAS USE PER CUSTOMER
13.6%

Commercial electricity use per customer in 2012 decreased slightly (0.1 percent), while natural gas use per customer fell by 13.6 percent.

The decrease in natural gas relates to the relatively low price for natural gas, and a decrease in Heating Degree Days (HDD) in 2012—a 14.2 percent decrease compared to 2011. To learn more about HDDs, see the Miscellaneous chapter in this publication.

Data are from the AF1 and AF2 reports submitted to the Public Service Commission of Wisconsin by gas utilities across the state. The complete datasets are published online at www.stateenergyoffice.wi.gov under Statistics/Tables.

1970-2012



Year	Natural Gas: Number of Customers (Thousands)	Natural Gas: Use Per Customer (Therms)	Electricity: Number of Customers (Thousands)	Electricity: Use Per Customer (kWh)
1970r	50.8	9,377	167	29,701
1975r	65.7	9,234	178	42,709
1980r	76.7	8,900	193	49,115
1985r	87.0	7,742	224	47,292
1990r	106.0	5,973	229	54,990
1995r	125.5	6,540	254	58,540
2000r	140.4	5,615	278	65,817
2005r	155.1	4,843	312	72,150
2006r	159.1	4,552	324	70,272
2007r	160.6	4,768	330	71,203
2008r	163.0	5,160	334	70,353
2009	163.8	4,840	337	66,748
2010	164.2	4,405	338	67,969
2011r	165.0	4,644	341	67,685
2012p	**165.8**	**4,012**	**343**	**67,641**

p Preliminary estimates.

r Revised.

Source: Edison Electric Institute, *Statistical Yearbook* (1971-1996); Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1970-1979), Public Service Commission of Wisconsin, form PSC-AF 2 *Gas Sales and Sales Ratio* (1980-2012); U.S. Department of Energy, *Electric Sales and Revenues*, 1993-2012 [DOE/EIA-0226(2013/02)], Table 5.4B (February 2013).

Focus on Energy Tracked Energy Savings

2001-2012 MILLIONS OF kWhs, THERMS AND DOLLARS

	Verified kWh Saved	Percent of Statewide Sector[a] kWh Saved	Verified Therms Saved	Percent of Statewide Sector Sales[b] Therms Saved	Dollar Value of Energy Saved	Number of Participants
July 1, 2001 - December 31, 2008						
Total Saved	1,777.72	0.344%	87,740,863	0.298%	$247,506,712	1,706,556
Business	1,102.10	0.306%	68,836,442	0.357%	$144,870,333	70,939
Residential	620.94	0.397%	13,393,252	0.132%	$92,833,047	1,634,873
Renewables	54.68		5,511,169		$9,803,332	744
January 1, 2009 - December 31, 2009						
Total Saved	634.62	0.957%	29,661,512	0.759%	$83,273,246	514,714
Business	500.79	1.091%	20,712,687	0.810%	$58,696,839	20,517
Residential	116.89	0.573%	3,591,004	0.266%	$18,660,979	493,780
Renewables	16.93		5,357,821		$5,915,428	417
January 1, 2010 - December 31, 2010						
Total Saved	590.64	0.859%	23,640,236	0.633%	$75,411,086	432,636
Business	470.99	0.993%	20,041,916	0.806%	$56,396,192	17,672
Residential	119.65	0.562%	3,598,320	0.288%	$19,014,894	414,964
Renewables	0.00	0.000%	0	0.000%	$0	0
January 1, 2011 - December 31, 2011						
Total Saved	440.60	0.642%	16,707,201	0.421%	$56,695,791	194,285
Business	346.71	0.731%	13,831,959	0.523%	$41,183,316	12,860
Residential	93.89	0.442%	2,875,242	0.220%	$15,512,475	181,425
Renewables	0.00	0.000%	0	0.000%	$0	0
January 1, 2012 - December 31, 2012						
Total Saved	649.90	0.944%	26,170,452	0.641%	$86,468,000	91,688
Business	448.37	0.938%	22,043,941	0.750%	$56,848,000	6,429
Residential	201.52	0.959%	4,126,511	0.360%	$29,620,000	85,259
Renewables	0.00	0.000%	0	0.000%	$0	0
July 1, 2001 - December 31, 2012						
Total Saved	4093.48	0.519%	38,453,464	0.408%	$549,354,835	2,939,879
Business	2868.97	0.523%	145,466,945	0.486%	$357,994,680	128,417
Residential	1152.90	0.479%	27,584,329	0.182%	$175,641,395	2,810,301
Renewables	71.61	0.000%	10,868,990	0.000%	$15,718,760	1,161

a Statewide sector sales are estimated for the non-annual reporting periods using annual data from the Wisconsin Electric Utility Sales, by Economic Sector table in Chapter Two of this publication.

b Statewide sector sales are estimated for the non-annual reporting periods using annual data from the Wisconsin Natural Gas Use, by Economic Sector table in Chapter Two of this publication. Data from this chapter are converted from tBtus to Therms for the purpose of calculation.

c Annual, first-year energy savings are what an energy saving measure accomplished during the first year, as opposed to lifetime savings.

Source: Public Service Commission of Wisconsin, Focus on Energy *Evaluation Report 2012*, April 30, 2013; https://focusonenergy.com/about/evaluation-reports

Focus on Energy is Wisconsin's rate-payer funded energy efficiency and renewable energy program. It works with energy consumers—individuals, business, industry, government—to evaluate and help fund energy efficiency and renewable energy efforts.

The table shows annual first-year[c] energy savings in Wisconsin due to Focus on Energy efforts. Gross electricity savings are shown in kilowatt hours (kWhs), while gross natural gas savings are shown in therms. The percent column shows the percent of statewide sales, by sector, represented by the verified gross savings.

The efforts of Focus on Energy undergo regular evaluation by independent contractors who certify program-tracked savings. The verified gross kWh, KW and therm savings have been verified by a third-party contractor.

Focus on Energy Ranked Energy Savings Measures

The table shows the five energy savings efforts funded by Focus on Energy that reaped the largest energy savings benefit. The measures are different for the business and residential sectors, and are listed according to the saved energy (e.g., kWhs or therms).

As Focus on Energy has grown, energy savings across Wisconsin have increased. In 2012, verified gross savings are about one percent of annual sales of both electricity and natural gas. The work of Focus on Energy helps to reduce overall consumption of fossil-fuel based energy and increase energy efficiency across the state.

2001-2012 ENERGY SAVING ACTIVITIES RANKED BY OVERALL SAVINGS

	Business Programs		Residential Programs	
Electricity	**Savings (Million kWh)**	**Percent Overall Savings**	**Savings (Million kWh)**	**Percent Overall Savings**
Compact Fluorescent Lights (CFL)	260.56	9.1%	533.01	46.2%
ECM[a] Furnace			113.72	9.9%
High Bay Fluorescent	226.93	7.9%		
Hot Water[b]			32.31	2.8%
Lighting (other than listed)[c]	599.83	20.9%	143.86	12.5%
Other[d]	294.28	10.3%	54.41	4.7%
T8/T5 Fluorescent Lighting	287.78	10.0%		
Electric Total Verified kWh Savings – All Efforts	**2,868.97**		**1,152.90**	

	Business Programs		Residential Programs	
Natural Gas	**Savings (Therm)**	**Percent Overall Savings**	**Savings (Therm)**	**Percent Overall Savings**
Boiler Equipment/Other Heating	21,420,053	14.7%	7,052,506	25.6%
Building Shell			6,294,914	22.8%
Laundry[h]			1,160,621	4.2%
ECM[a] Furnace			2,774,651	10.1%
Energy Recovery[e]	21,204,151	14.6%		
Hot Water[b]			4,465,879	16.2%
HVAC	19,106,962	13.1%		
Process[f]	26,133,733	18.0%		
Other[g]	11,035,484	7.6%	2,459,951	10.2%
Natural Gas Total Verified kWh Savings – All Efforts	**145,466,945**		**27,584,329**	

a Electronically commutative motors (ECM) differ from conventional motors in their overall efficiency.

b Hot water refers to a variety of different measures to improve hot water heating and usage efficiency.

c Lighting improvements such as efficient lighting fixtures, torchieres, and ceiling fans, and motion/occupancy sensors.

d Other includes a wide variety of improvements.

e Recovery of exhaust heat from natural gas combustion.

f Process efforts include in-line energy efficiency and heat capture, primarily in industrial applications. May also include efficiency improvements to compressed air usage.

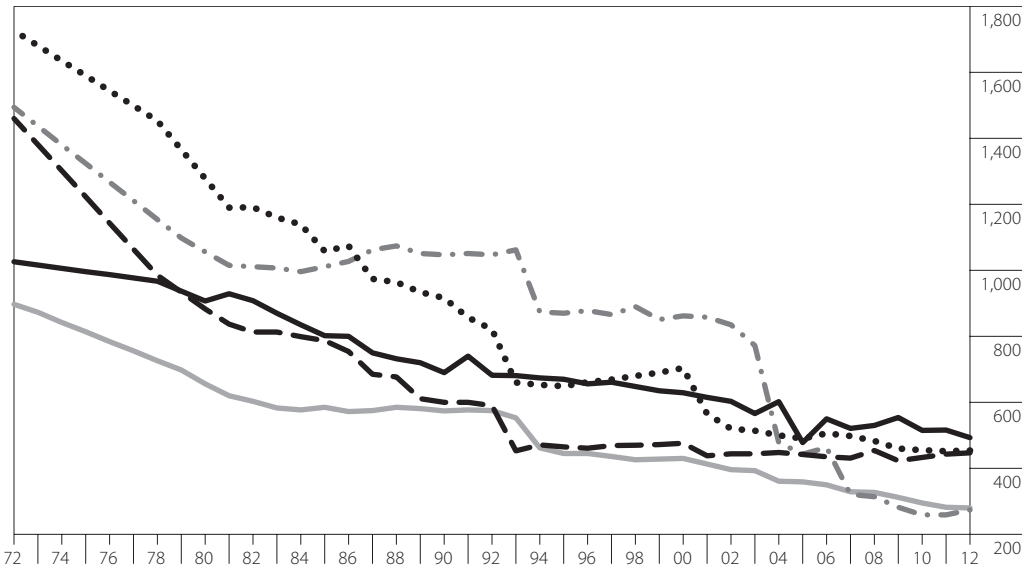
g Steam trap improvement to avoid loss of thermal energy.

h This category was previously named "clothes washer." Focus changed the name in order to more accurately represent the savings measure.

Source: Public Service Commission of Wisconsin, Focus on Energy *Evaluation Report 2012*, April 30, 2013; https://focusonenergy.com/about/evaluation-reports

Energy Consumption by Major New Household Appliances

1972-2012 AVERAGE kWh PER YEAR



Year	Room A/C[a]	Washing Machine[b]	Dishwasher[b]	Refrigerator	Freezer
1972	1,026	1,494	897	1,726	1,460
1975	996	1,324	814	1,590	1,223
1980	907	1,056	656	1,278	883
1985	802	1,011	585	1,058	787
1990	690	1,047	574	916	600
1995	670	870	445	649	465
2000[e]	629	862	430	704	476
2005	478	443	359	490	442
2006	550	463	350	506	435
2007[e]	521	321	329	498	431
2008	530	314	327	483	454
2009	554	282	312	460	423
2010	515	259	295	455	433[c]
2011	516	259	282	452	443
2012	**493**	**274**	**280**	**454**	**447**
Best Available[f]	**405**	**83**	**180**	**390**	**412**
Energy Star[d]	**531**	**208**	**295**	**467**	**471**

a Room air conditioner assumes 600 hours per year.

b Loads per year: washing machine (392), dishwasher (215) . Energy use assumes electric water heater.

c Freezer value estimated.

d U.S. Environmental Protection Agency (EPA) Energy Star efficiency values for average size appliance.

e Refrigerator and freezer standards increased July 1, 2001. Air conditioner standards increased October 1, 2000. Clothes waster standards increased January 1, 2004 and January 1, 2007. Dishwasher standards increased May 14, 1994 and January 1, 2010.

f Best available (most energy efficient) appliance that can be purchased for the average size and type sold today.

Source: Association of Home Appliance Manufacturers (AHAM) Information Center (1972-2012).

REFRIGERATOR

WASHING MACHINE

FREEZER

ROOM A/C

DISHWASHER

Since 1980, energy usage of new household appliances sold in the U.S. has decreased from 45.6 percent (room air conditioners) to 74.1 percent (washing machines), depending upon the appliance.

From 1994 to 2000, average usage remained essentially unchanged. However, changes in federal energy efficiency standards since 2000 have reduced average new appliance energy consumption from 6.1 percent for freezers to 68.3 percent for washing machines.

Appliance data makes it easier to understand residential energy use trends.

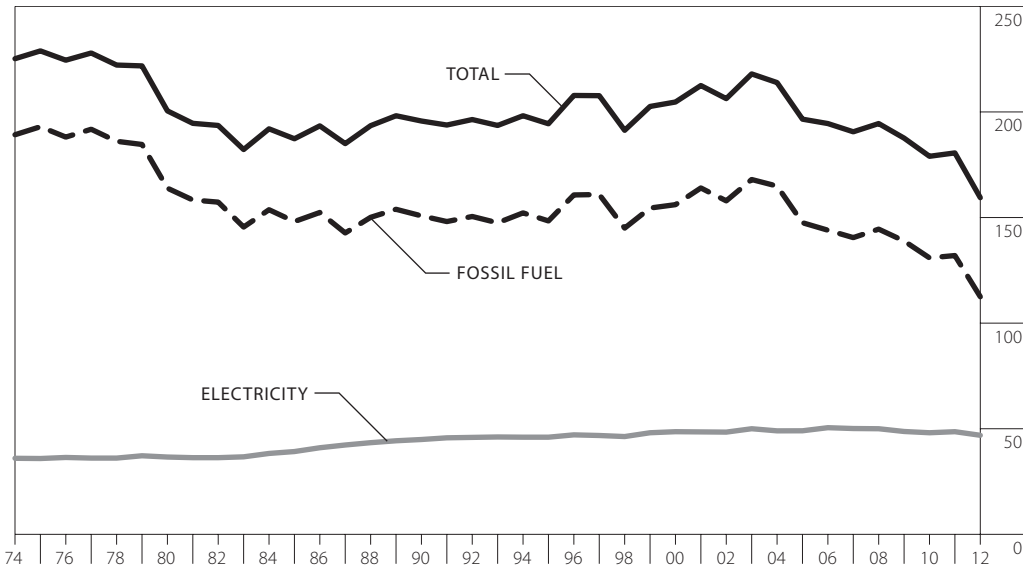
Energy Use in State Owned Buildings

TOTAL ENERGY USE PER GSF
3.4%
IN 2012

In 2012, total energy use per gross square foot (GSF), adjusted for weather, decreased 3.4 percent from 2011. Since 1974, overall use per GSF in state owned buildings fell 29.3 percent. Electricity use increased 30.4 percent per GSF between 1974 and 2012, while fossil fuel use decreased 40.5 percent.

Energy use in state-owned buildings was weather-corrected back to 2005. All data are based on the State Fiscal Year, July 1 – June 30, for example the data for 2012 are for the period July 1, 2011 to June 30, 2012.

1974-2012 THOUSANDS OF BTU PER GROSS SQUARE FOOT PER YEAR



Fiscal Year	Fossil Fuel	Electricity	Total Energy BTU/GSF	Total Energy Weather-Adjusted[a]	Million Gross Square Feet
1974	189.2	36.0	225.2		42.7
1975	193.0	35.9	228.9		43.6
1980	163.9	36.6	200.5		46.2
1985	148.1	39.2	187.3		47.9
1990	150.8	44.9	195.7		49.7
1995	148.4	46.0	194.4		52.6
2000	156.1	48.6	204.7		55.4
2001	164.0	48.5	212.5		56.6
2002[r]	157.9	48.4	206.3		58.0
2003[r]	168.0	50.0	218.0		59.0
2004[r]	164.9	49.0	213.9		59.4
2005[a,r]	147.5	49.0	196.6	196.6	67.4
2006[r]	144.0	50.5	194.5	196.4	67.9
2007[r]	140.5	50.1	190.6	190.1	69.3
2008[r]	144.5	50.0	194.5	187.0	70.7
2009[r]	138.9	48.7	187.6	179.6	71.4
2010[r]	130.9	48.1	179.0	177.7	71.2
2011[r]	132.0	48.6	180.6	174.3	72.0
2012[p]	**112.5**	**46.9**	**159.4**	**168.3**	**74.5**

a Weather-adjusted data are not available previous to 2005.
p Preliminary estimates.
r Revised.
Source: State of Wisconsin, Department of Administration; *Energy Use in State Owned Facilities* (unpublished).

Low Income Units Weatherized Through State- and Utility-Supported Programs

The Wisconsin Division of Energy Services, under the Department of Administration, contracts with various agencies throughout the state to provide weatherization[a] services to the low-income population. Agencies include community action agencies, housing authorities, tribes, local governments, and other non-profit organizations.

The Weatherization Assistance Program was created under Title IV of the Energy Conservation and Production Act of 1976, and was designed to cut heating bills and save imported oil. See http://www.homeenergyplus.wi.gov/ for local information.

NUMBER OF UNITS WEATHERIZED
45.0%

The number of units weatherized[a] in 2012 decreased by 45.0 percent from 2011.

1980-2012

Year[d]	Department of Administration[b]	Wisconsin Utilities	Combined Totals
1980	5,811		5,811
1985	7,355	4,139	11,494
1990	9,302	3,384	12,686
1995	6,126	5,455	11,581
1996	4,575	6,651	11,226
1997	4,530	4,626	9,156
1998	3,854	4,848	8,702
1999	3,703	5,700	9,403
2000[c]	4,246	6,434	10,680
2001	4,867	3,378	8,245
2002[e]	5,948	1,493	7,441
2003	7,368	0	7,368
2004	8,027	0	8,027
2005	8,721	0	8,721
2006	9,057	0	9,057
2007	10,215	0	10,215
2008	8,645	0	8,645
2009	10,534	0	10,534
2010	15,392	0	15,392
2011[r]	15,211	0	15,211
2012	**8,360**	**0**	**8,360**
Total	**254,857**	**81,227**	**330,273**

a Weatherization is any job in which either the state or a utility, or both, installs envelope efficiency measures, appliance efficiency measures, heating equipment replacement/retrofits, or any combination of these.

b In July 1992, the Low Income Weatherization Assistance Program was transferred from the Department of Health and Family Services to the Department of Administration.

c Wisconsin's Public Benefits Program began in October 2000. This program has transitioned responsibility for weatherizing low-income households from the utilities to the Department of Administration, Division of Energy. The transition was completed at the end of December 2002.

d In 1992, the program year was changed to April-March.

e Estimates.

r Revised.

Source: Public Service Commission of Wisconsin, Division of Energy Planning and Programs, unpublished annual data; Wisconsin Department of Health and Family Services, Energy Services Section, unpublished annual data; Department of Administration (DOA), Division of Energy Services, *Annual Weatherization Production*, report to U.S. DOE for 2012, and unpublished data (2012).

Reported Building Activity Affected by Wisconsin Energy Codes

BUILDINGS CERTIFIED IN 2012 DECREASED **5.1%**

More than 10,700 buildings were certified in 2012 as meeting Wisconsin's energy efficiency building codes[a], a 5.1 percent decrease from 2011. The number of buildings certified peaked in 2005 with 35,192.

The codes, developed and enforced by the Wisconsin Department of Safety and Professional Services or local code officials, establish minimum energy standards for new construction, major renovation and existing rental units.

The number of New One and Two Family Units for 2012 is an estimate due to data unavailability.

1979-2012

Year	New One and Two Family Units[b]	New Manufactured Dwelling Units[c,f,g]	Manufactured Homes (HUD Certified)[f,h]	New & Altered Public and Commercial Buildings[d]	Existing Rental Properties[e]	Total
1979	NA	NA	NA	4,332		4,332
1980	3,302	906		3,818		8,026
1985	6,146	1,147		6,380	2,267	15,940
1990	10,286	1,253		7,378	4,849	23,766
1995	12,846	1,991		8,434	6,955	30,226
1996	14,051	2,108		8,088	7,162	31,409
1997	13,390	1,826		7,341	7,488	30,045
1998	14,662	1,856		6,793	7,616	30,927
1999	13,282	2,292		7,387	7,270	30,231
2000	14,799	2,085		6,606	7,510	31,000
2001	14,653	1,926		6,501	6,296	29,376
2002	15,479	1,933		6,516	6,318	30,246
2003	18,851	1,999		6,455	5,136	32,441
2004	18,641	2,141	2,016	6,658	5,221	34,677
2005	19,762	1,962	1,710	6,810	4,948	35,192
2006	14,767	1,596	1,124	8,932	4,181	30,600
2007[g]	13,393	0	698	6,034	3,538	23,663
2008	9,004	0	413	4,840	2,671	16,928
2009	6,911	0	207	3,565	2,680	13,363
2010	6,529	0	0	3,596	2,694	12,819
2011	5,099	0	0	3,693	2,541	11,333
2012	**4,830[e]**	**0**	**0**	**3,493**	**2,434**	**10,757**

a Includes Chapter Commerce 22 of the Uniform Dwelling Code; Chapter Commerce 63 of the Commercial Building Code; and Chapter Commerce 67 (State Rental Unit Energy Efficiency Standards).

b Based on Uniform Dwelling Code permits issued. Through 2004, communities with a population of fewer than 2,500 could opt out from code enforcement and may not have issued permits. Previous numbers may have included some manufactured dwelling units.

c Reporting is required for all manufactured dwelling units. These dwelling units meet state standards and are generally delivered to the dwelling site on a flatbed.

d Includes new building and alteration plans submitted and approved by the state under general building code provisions. Some projects are exempt from plan review or were locally approved instead.

e Estimate.

f Properties certified as meeting code requirements during current year, regardless of year of actual transfer of ownership.

g These dwelling units meet federal HUD standards, which are lower than state standards, have a chassis and generally are towed to the dwelling site.

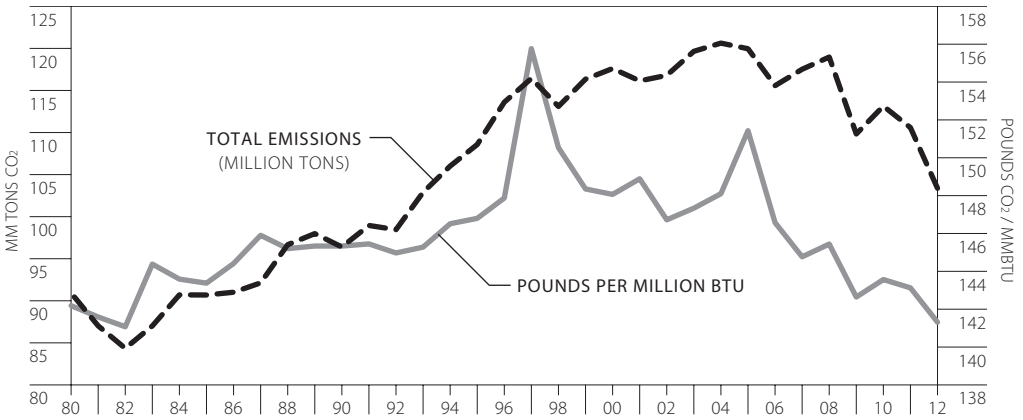
h From 2007 forward, this category is fully captured in the One and Two Family Dwelling total.

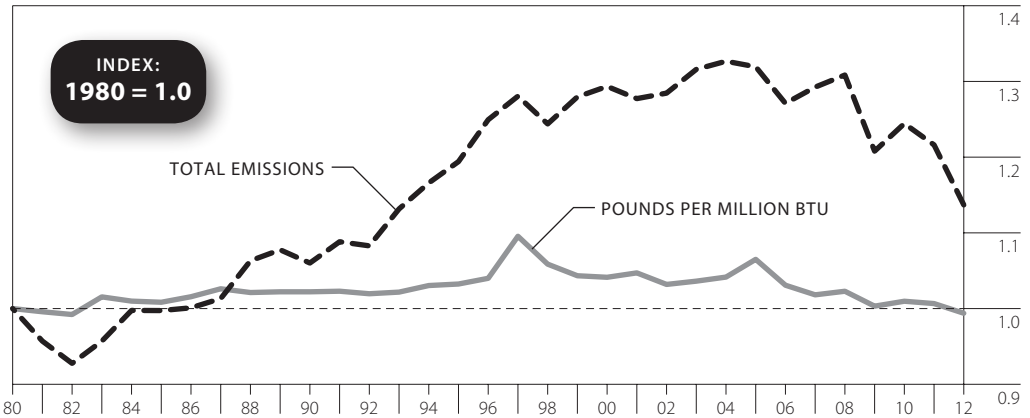
NA – Not applicable. Rental Unit Energy Efficiency Code effective January 1, 1985 and Uniform Dwelling Code Effective June 1, 1980.

Source: Department of Safety and Professional Services, internal data files (unpublished).

Wisconsin Carbon Dioxide Emissions from Energy Use

1980-2012 MILLIONS OF TONS AND POUNDS PER MILLION BTU[a]





Year	Tons CO_2 (Millions)	Pounds CO_2 Per MMBtu
1980	90.9	142.2
1985	90.7	143.4
1990	96.4	145.3
1995	108.6	146.8
2000	117.6	148.1
2005	120.0	151.4
2006	115.6	146.6
2007	117.5	144.8
2008	119.0	145.4
2009	109.8	142.6
2010	113.1	143.6
2011	110.6	143.1
2012[p]	**103.4**	**141.3**

a Does not include electric imports.

p Preliminary estimates.

Source: Compiled from tables in this book for fuel use, and U.S. EPA emission factors.

CO_2 EMISSIONS 1.3%

Wisconsin's CO_2 emissions from energy (pounds per MMBtu) decreased 1.3 percent in 2012. Since 1990, total CO_2 emissions, in millions of tons, have increased 7.4 percent, but 2012 levels reflect a decrease of 6.5 percent from 2011.

Average Miles Driven Per Vehicle and Average Miles Per Gallon of Gasoline, Wisconsin and United States

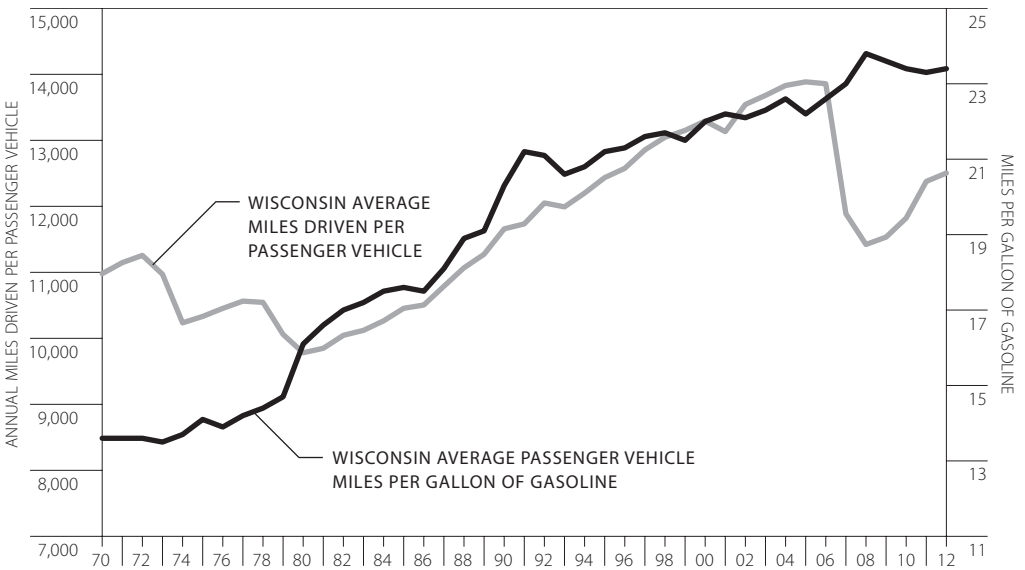
AVERAGE NUMBER OF MILES DRIVEN ANNUALLY
1.0%

The average number of miles driven annually per vehicle in Wisconsin increased 1.0 percent in 2012. It is 27.8 percent higher than in 1980 and 11.0 percent higher than the U.S. average.

Fuel efficiency has been relatively stagnant since 1991 because of the increasing number of less fuel efficient large cars sold each year. Wisconsin cars were 72.1 percent more fuel efficient in 2012 than in 1970.

Data have been modified beginning in 2007 to include additional types of vehicles because of increased use of larger vehicles by residential households.

1970-2012



	Average Annual Miles Per Passenger Vehicle[a,b]		Average Passenger Vehicle Miles Per Gallon of Gasoline[a,b]	
Year	Wisconsin	U.S.	Wisconsin	U.S.
1970	10,980	9,892	13.6	13.5
1975	10,332	9,309	14.1	14.0
1980	9,782	8,813	16.1	16.0
1985	10,455	9,419	17.6	17.5
1990	11,659	10,504	20.3	20.2
1995	12,435	11,203	21.2	21.1
2000	13,293	11,976	22.0	21.9
2005	13,886	12,510	22.2	22.1
2006	13,858	12,485	22.6	22.5
2007	11,888	10,710	23.0	22.9
2008	11,422	10,290	23.8	23.7
2009	11,534	10,391	23.6	23.5
2010	11,822	10,650	23.4	23.3
2011[r]	12,378	11,150	23.3	23.2
2012[p]	**12,504**	**11,265**	**23.4**	**23.3**

a Wisconsin and U.S. figures come from different sources and may not be directly comparable.

b Light duty vehicles with a short wheel base are passenger vehicles including passenger cars, light trucks, vans and sport utility vehicles, all with a wheel base of less than 122 inches.

p Preliminary estimates.

r Revised.

Source: Wisconsin Department of Transportation, Division of Planning and Budget, Bureau of Policy Planning and Analysis, personal communication (1993); U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, table 1.8 [DOE/EIA-0035 (2013/03)] (March 2013) http://www.eia.gov/totalenergy/data/monthly.

CHAPTER 5

United States Energy Use

United States Resource Energy Consumption, by Type of Fuel

U.S. ENERGY CONSUMPTION
2.4%

In 2012, total energy consumption in the United States decreased 2.4 percent.

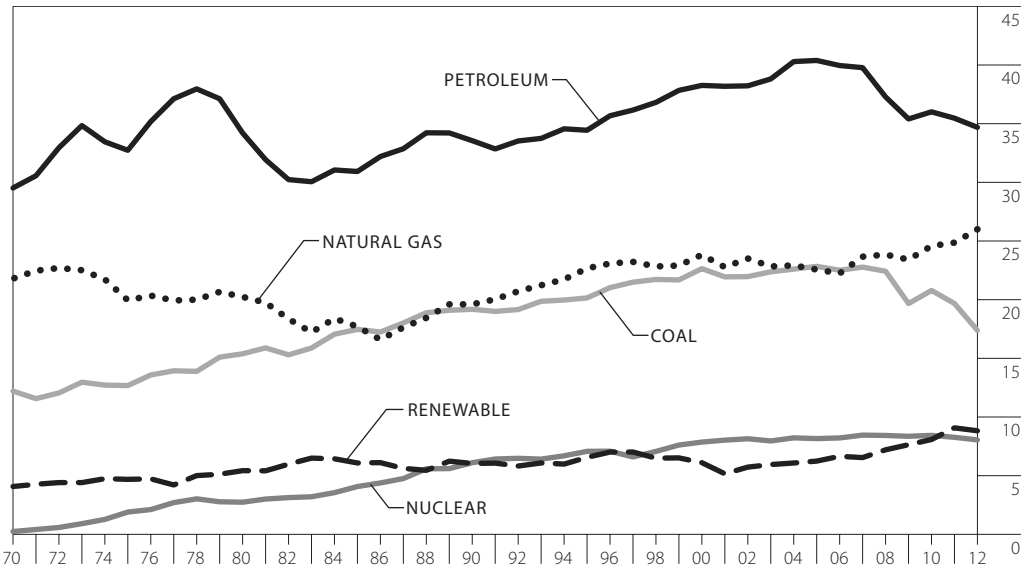
PETROLEUM
2.2%
COAL
11.7%
RENEWABLES
2.7%
NUCLEAR
2.6%

There were decreases for all fuels except for natural gas. Decreases by fuel were: petroleum, 2.2 percent; coal, 11.7 percent; renewables, 2.7 percent; and nuclear, 2.6 percent.

NATURAL GAS
4.6%

Natural gas saw an increase in consumption of 4.6 percent.

1970-2012 QUADRILLIONS OF BTU



1970-2012 QUADRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Nuclear		Renewable[a]		Total[b]
1970[r]	29.5	*43.5%*	21.8	*32.1%*	12.2	*18.0%*	0.2	*0.4%*	4.1	*6.0%*	67.8
1975[r]	32.7	*45.5%*	19.9	*27.7%*	12.7	*17.6%*	1.9	*2.6%*	4.7	*6.5%*	72.0
1980[r]	34.2	*43.8%*	20.2	*25.9%*	15.4	*19.7%*	2.7	*3.5%*	5.4	*7.0%*	78.1
1985[r]	30.9	*40.5%*	17.7	*23.2%*	17.5	*22.9%*	4.1	*5.3%*	6.1	*8.0%*	76.4
1990[r]	33.6	*39.7%*	19.6	*23.2%*	19.2	*22.7%*	6.1	*7.2%*	6.0	*7.1%*	84.5
1995[r]	34.4	*37.8%*	22.7	*24.9%*	20.1	*22.1%*	7.1	*7.8%*	6.6	*7.2%*	91.0
2000[r]	38.3	*38.7%*	23.8	*24.1%*	22.6	*22.9%*	7.9	*8.0%*	6.1	*6.2%*	98.8
2005[r]	40.4	*40.3%*	22.6	*22.5%*	22.8	*22.8%*	8.2	*8.1%*	6.2	*6.2%*	100.3
2006[r]	40.0	*40.1%*	22.2	*22.3%*	22.5	*22.6%*	8.2	*8.2%*	6.6	*6.7%*	99.6
2007[r]	39.8	*39.3%*	23.7	*23.4%*	22.8	*22.5%*	8.5	*8.3%*	6.5	*6.5%*	101.3
2008[r]	37.3	*37.6%*	23.8	*24.0%*	22.4	*22.6%*	8.4	*8.5%*	7.2	*7.3%*	99.3
2009[r]	35.4	*37.4%*	23.4	*24.8%*	19.7	*20.8%*	8.4	*8.8%*	7.6	*8.1%*	94.6
2010[r]	36.0	*36.8%*	24.6	*25.1%*	20.8	*21.2%*	8.4	*8.6%*	8.1	*8.2%*	98.0
2011[r]	35.5	*36.4%*	24.9	*25.5%*	19.7	*20.2%*	8.3	*8.5%*	9.1	*9.3%*	97.5
2012[p]	**34.7**	***36.5%***	**26.0**	***27.3%***	**17.4**	***18.3%***	**8.1**	***8.5%***	**8.8**	***9.3%***	**95.1**

a Includes net imports of electricity.

b Totals vary slightly from U.S. resource consumption totals elsewhere in this publication.

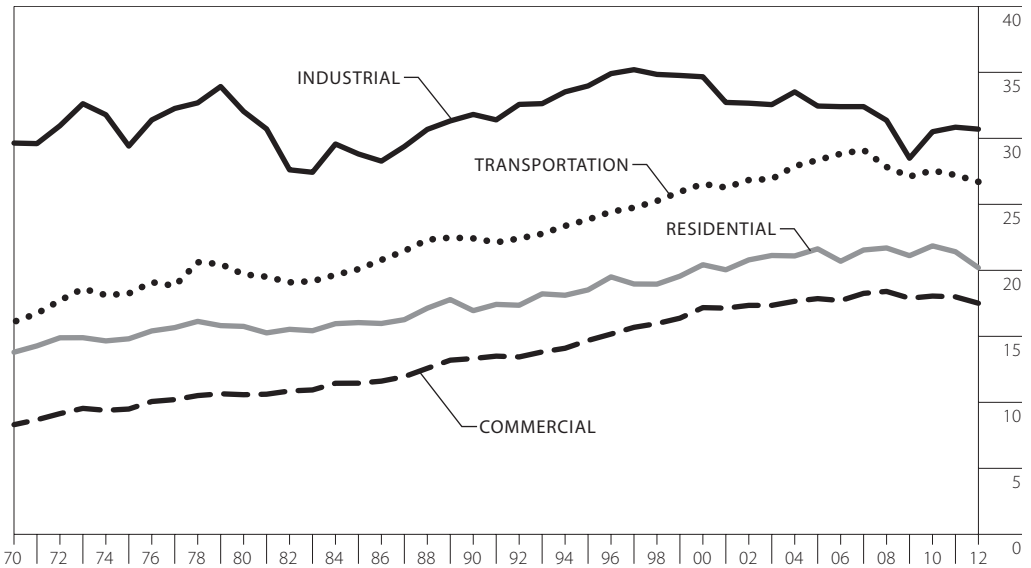
p Preliminary.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 1.3 [DOE/EIA-0035 (2013/04)] (March 2013). http://www.eia.gov/totalenergy/data/monthly/ Annual data in *Annual Energy Review*, Table 1.3 [DOE/EIA-0384 (2012)] (September 2012). http://www.eia.doe.gov/emeu/aer

United States Resource Energy Consumption, by Economic Sector

1970-2012 QUADRILLIONS OF BTU



INDUSTRIAL **0.5%**

COMMERCIAL **2.7%**

RESIDENTIAL **5.7%**

TRANSPORTATION **1.9%**

During 2012, all sectors saw a decrease in consumption for a total decrease of 2.4 percent. The industrial sector saw a decrease of 0.5 percent, the commercial sector saw a 2.7 percent decrease, the residential sector dropped by 5.7 percent, and the transportation sector decreased by 1.9 percent from 2011.

1970-2012 QUADRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential[a]		Commercial[a]		Industrial		Transportation		Total
1970[r]	13.8	*20.3%*	8.3	*12.2%*	29.6	*43.7%*	16.1	*23.7%*	67.8
1975[r]	14.8	*20.6%*	9.5	*13.2%*	29.4	*40.9%*	18.2	*25.4%*	72.0
1980[r]	15.8	*20.2%*	10.6	*13.6%*	32.0	*41.0%*	19.7	*25.2%*	78.1
1985[r]	16.0	*21.0%*	11.5	*15.0%*	28.8	*37.7%*	20.1	*26.3%*	76.4
1990[r]	16.9	*20.1%*	13.3	*15.8%*	31.8	*37.7%*	22.4	*26.5%*	84.5
1995[r]	18.5	*20.3%*	14.7	*16.1%*	34.0	*37.3%*	23.8	*26.2%*	91.0
2000[r]	20.4	*20.7%*	17.2	*17.4%*	34.7	*35.1%*	26.5	*26.9%*	98.8
2005[r]	21.6	*21.6%*	17.9	*17.8%*	32.4	*32.4%*	28.4	*28.3%*	100.3
2006[r]	20.7	*20.8%*	17.7	*17.8%*	32.4	*32.5%*	28.8	*28.9%*	99.6
2007[r]	21.5	*21.3%*	18.3	*18.0%*	32.4	*32.0%*	29.1	*28.7%*	101.3
2008[r]	21.7	*21.9%*	18.4	*18.5%*	31.4	*31.6%*	27.8	*28.0%*	99.3
2009[r]	21.1	*22.3%*	17.9	*18.9%*	28.5	*30.1%*	27.1	*28.7%*	94.6
2010	21.9	*22.3%*	18.1	*18.4%*	30.5	*31.1%*	27.6	*28.1%*	98.0
2011	21.4	*22.0%*	18.0	*18.5%*	30.8	*31.6%*	27.2	*27.9%*	97.5
2012[p]	**20.2**	***21.2%***	**17.5**	***18.4%***	**30.7**	***32.3%***	**26.7**	***28.1%***	**95.1**

a Numbers may not match with previous pages due to independent rounding.

p Preliminary.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 2.1 [DOE/EIA-0035 (2013/03)] (March 2013). http://www.eia.gov/totalenergy/data/monthly/ Annual data in *Annual Energy Review*, Table 2.1 [DOE/EIA-0384 (2012)] (September 2012). http://www.eia.doe.gov/emeu/aer

Sources of U.S. Crude Oil and Petroleum Products

U.S. PETROLEUM USE 2.1%

In 2012, U.S. petroleum use decreased 2.1 percent. U.S. imports of crude oil and petroleum products decreased 7.9 percent, and imports from OPEC decreased 6.6 percent.

Since 1985, U.S. consumption of petroleum products has increased almost 18.0 percent. During this same period, U.S. crude oil production has decreased 27.9 percent (lower 48 production fell 16.9 percent). This resulted in a 109.1 percent increase in imports since 1985, with a corresponding 132.6 percent increase in imports from the Organization of Petroleum Exporting Countries (OPEC).

1970-2012 THOUSANDS OF BARRELS PER DAY

Year	U.S. Petroleum Use	U.S. Field Production[a]	U.S. Crude Oil Production from Oil Wells	Natural Gas Plant Liquids from U.S. Natural Gas Wells[b]	Crude Oil from Wells in Lower 48 States	U.S. Crude Oil & Product Exports	U.S. Crude Oil & Product Imports (Total)[c]	U.S. Crude Oil and Product Imports from OPEC	Imports as a Percent of U.S. Petroleum Use	OPEC Imports as a Percent of U.S. Imports	Imports as a Percent of U.S. Crude Oil Production & Imports
1970[r]	14,697	11,297	9,637	1,660	9,408	259	3,419	1,294	23.3%	37.8%	26.2%
1975	16,322	10,007	8,375	1,633	8,183	209	6,056	3,601	37.1%	59.5%	42.0%
1980	17,056	10,170	8,597	1,573	6,980	544	6,909	4,300	40.5%	62.2%	44.6%
1985	15,726	10,581	8,971	1,609	7,146	781	5,067	1,830	32.2%	36.1%	36.1%
1990	16,988	8,914	7,355	1,559	5,582	857	8,018	4,296	47.2%	53.6%	52.2%
1995	17,725	8,322	6,560	1,762	5,076	949	8,835	4,002	49.8%	45.3%	57.4%
1996	18,309	8,295	6,465	1,830	5,071	981	9,478	4,211	51.8%	44.4%	59.4%
1997	18,620	8,269	6,452	1,817	5,156	1,003	10,162	4,569	54.6%	45.0%	61.2%
1998	18,917	8,011	6,252	1,759	5,077	945	10,708	4,905	56.6%	45.8%	63.1%
1999	19,519	7,731	5,881	1,850	4,832	940	10,852	4,953	55.6%	45.6%	64.9%
2000	19,701	7,733	5,822	1,911	4,851	1,040	11,459	5,203	58.2%	45.4%	66.3%
2001	19,649	7,670	5,801	1,868	4,839	971	11,871	5,528	60.4%	46.6%	67.2%
2002	19,761	7,624	5,744	1,880	4,759	984	11,530	4,605	58.3%	39.9%	66.7%
2003	20,034	7,363	5,644	1,719	4,670	1,027	12,264	5,162	61.2%	42.1%	68.5%
2004	20,731	7,244	5,435	1,809	4,527	1,048	13,145	5,701	63.4%	43.4%	70.7%
2005	20,802	6,903	5,186	1,717	4,322	1,165	13,714	5,587	65.9%	40.7%	72.6%
2006	20,687	6,827	5,089	1,739	4,348	1,317	13,707	5,517	66.3%	40.2%	72.9%
2007	20,680	6,859	5,077	1,783	4,355	1,433	13,468	5,980	65.1%	44.4%	72.6%
2008	19,498	6,784	5,000	1,784	4,318	1,802	12,915	5,954	66.2%	46.1%	72.1%
2009[r]	18,771	7,262	5,353	1,910	4,708	2,024	11,691	4,776	62.3%	40.9%	68.6%
2010[r]	19,180	7,553	5,479	2,074	4,877	2,353	11,793	4,906	61.5%	41.6%	68.3%
2011	18,949	7,848	5,652	2,216	5,091	2,985	11,504	4,555	60.7%	39.6%	67.1%
2012[p]	**18,555**	**8,867**	**6,467**	**2,399**	**5,942**	**3,184**	**10,596**	**4,256**	**57.1%**	**40.2%**	**62.1%**

a Includes crude oil, natural gas plant liquids and a small amount of other hydrocarbons and alcohol.

b Natural gas liquids recovered from natural gas in gas processing plants and, in some situations, from natural gas field facilities.

c Includes crude oil imports for the Strategic Petroleum Reserve (SPR).

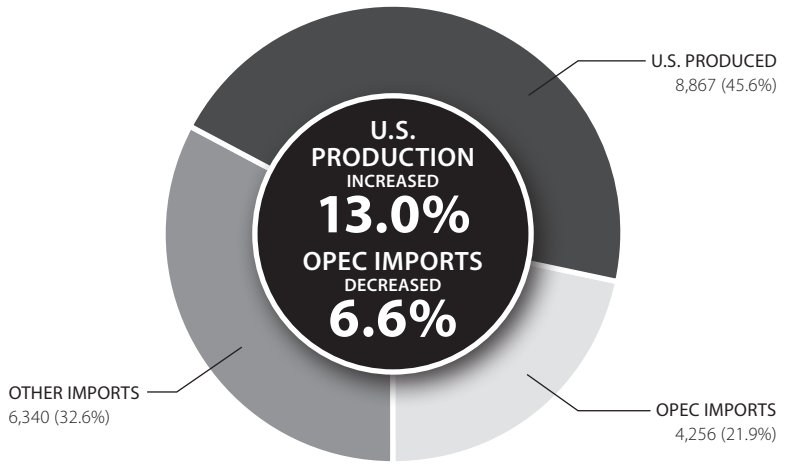
p Preliminary.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 3.1, 3.3a and 3.3b [DOE/EIA-0035 (2013/03)] (March 2013). http://www.eia.gov/totalenergy/data/monthly/

2012 U.S. Petroleum Use Domestically Produced and Imported

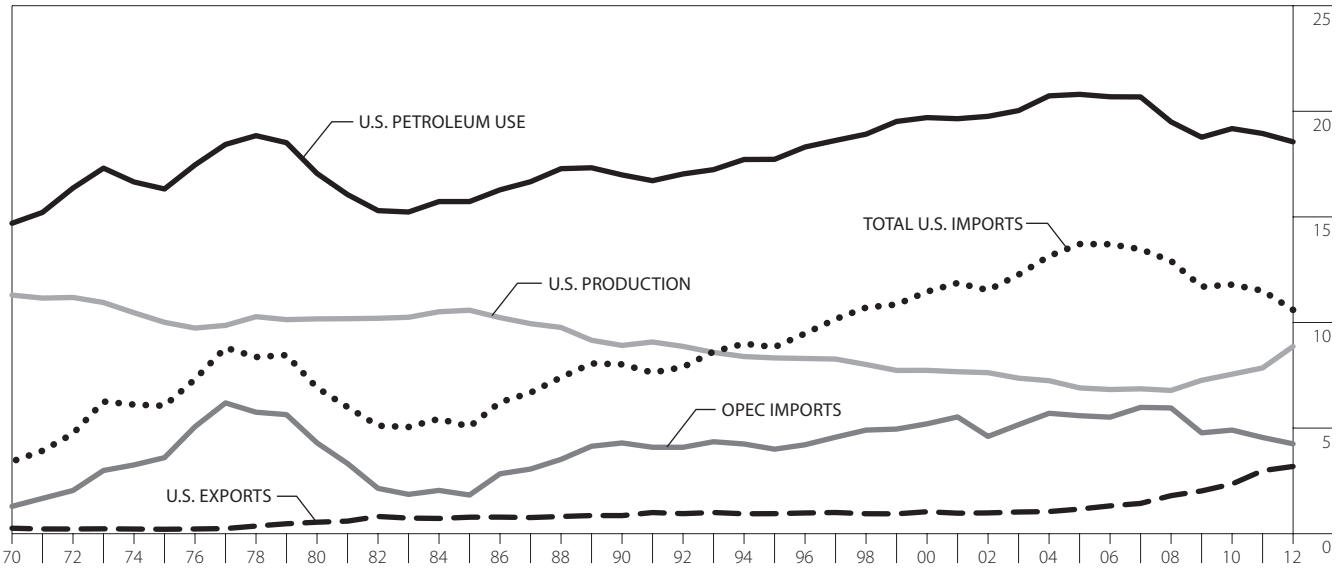
2012 THOUSANDS OF BARRELS PER DAY



In 2012, U.S. petroleum production[a] increased 13.0 percent. OPEC imports decreased 6.6 percent.

U.S. Petroleum Use, Production, Imports and Exports

1970-2012 MILLIONS OF BARRELS PER DAY



a Includes crude oil, natural gas plant liquids and a small amount of other hydrocarbons and alcohol.

Source: Table "Sources of U.S. Crude Oil and Petroleum Products" in this publication.

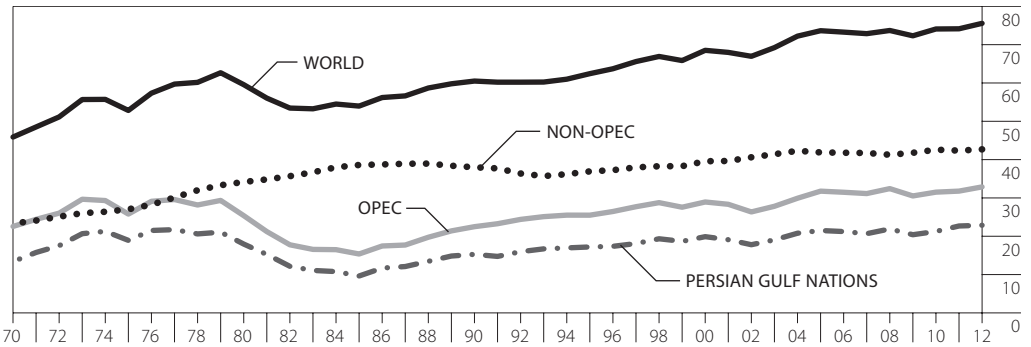
World Crude Oil Production

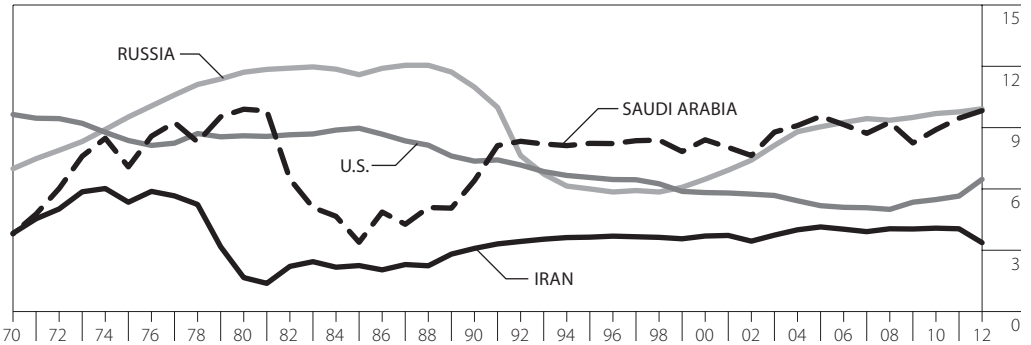
WORLD CRUDE OIL 1.9%

In 2012, world production of crude oil was 75.6 million barrels per day, an increase of 1.9 percent from a year ago[d]. The Organization of Petroleum Exporting Countries (OPEC) produced 43.5 percent of the world's crude oil in 2012.

The top four producers of crude oil in 2012 were Russia (13.1 percent), Saudi Arabia (13.0 percent), the U.S. (8.6 percent) and Iran (4.5 percent).

1970-2012 MILLION BARRELS PER DAY





Year	World	Non-OPEC	OPEC[b]	Persian Gulf Nations[c]	Major Crude Oil Producers			
					U.S.	Saudi Arabia	Iran	Russia[a]
1970[r]	45.89	23.32	22.56	13.39	9.64	3.80	3.83	6.99
1975	52.83	27.04	25.79	18.93	8.37	7.08	5.35	9.52
1980[r]	59.56	34.17	25.38	17.96	8.60	9.90	1.66	11.71
1985	53.97	38.60	15.37	9.63	8.97	3.39	2.25	11.59
1990	60.50	38.00	22.50	15.28	7.36	6.41	3.09	10.98
1995[r]	62.43	36.93	25.50	17.21	6.56	8.23	3.64	6.00
2000[r]	68.52	39.58	28.94	19.89	5.82	8.40	3.70	6.48
2005[r]	73.64	41.88	31.77	21.50	5.18	9.55	4.14	9.04
2010[r]	74.09	42.59	31.51	21.26	5.48	8.90	4.08	9.69
2011	74.14	42.35	31.78	22.68	5.65	9.46	4.05	9.77
2012[p]	**75.56**	**42.68**	**32.88**	**22.87**	**6.47**	**9.83**	**3.37**	**9.92**

a Prior to 1992, production was for the former U.S.S.R.

b The OPEC countries include the Persian Gulf nations (with the exception of Bahrain) and Algeria, Indonesia, Libya, Nigeria and Venezuela. Ecuador rejoined OPEC in 2007 while Indonesia left OPEC at the end of 2008.

c The Persian Gulf nations are Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, the United Arab Emirates, and the Neutral Zone.

d This figure does not include oil sands or other unconventional oil sources.

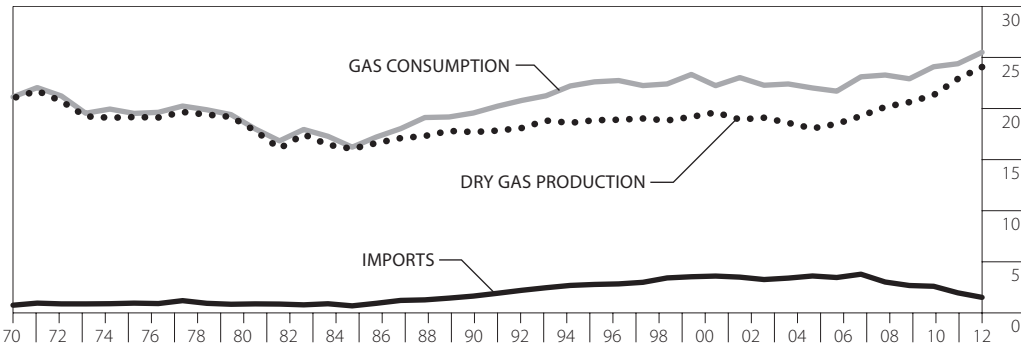
p Preliminary.

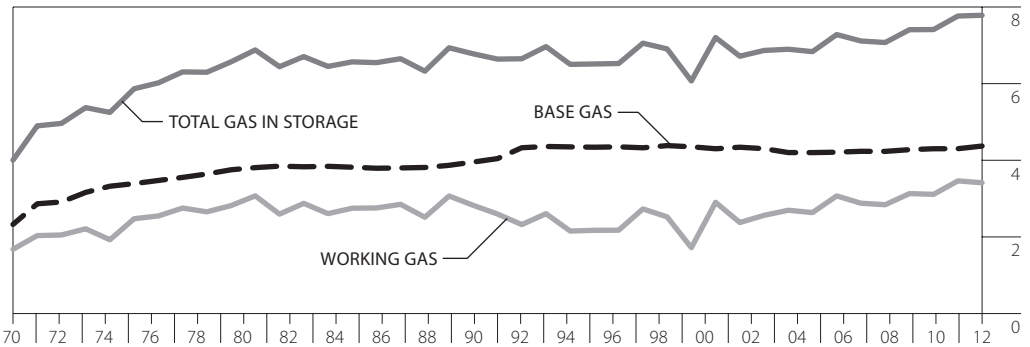
r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 11.1a and 11.1b [DOE/EIA-0035 (2013/03)] (March 2013). http://www.eia.gov/totalenergy/data/monthly/

United States Natural Gas Production, Imports, Consumption and Storage

1970-2012 TRILLIONS OF CUBIC FEET





Year	U.S. Dry Natural Gas Production[a]	Net Imports	Consumption	Natural Gas in Underground Storage – Year End		
				Base Gas[b]	Working Gas[c]	Total
1970	21.0	0.8	21.1	2.326	1.678	4.004
1975	19.2	0.9	19.5	3.162	2.212	5.374
1980	19.4	0.9	19.9	3.642	2.655	6.297
1985	16.5	0.9	17.3	3.842	2.607	6.449
1990	17.8	1.4	19.2	3.868	3.068	6.936
1995	18.6	2.7	22.2	4.349	2.153	6.503
2000	19.2	3.5	23.3	4.352	1.719	6.071
2005[r]	18.1	3.6	22.0	4.200	2.635	6.835
2010[r]	21.3	2.6	24.1	4.301	3.111	7.412
2011[r]	22.9	2.0	24.4	4.302	3.462	7.764
2012[p]	**24.1**	**1.5**	**25.5**	**4.371**	**3.413**	**7.784**

a Dry Natural Gas Production is natural gas used to heat homes and buildings, and to power industry after the natural gas liquids, such as liquid propane, are removed.

b Base Gas is the volume of gas needed as permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates during the withdrawal season.

c Working Gas is the gas that can be withdrawn from storage to heat buildings and power industry.

p Preliminary.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 4.1 and 4.4 [DOE/EIA-0035 (2013/03)] (March 2013). http://www.eia.gov/totalenergy/data/monthly/. Annual data in *Annual Energy Review*, Tables 6.1 and 6.6 [DOE/EIA-0384 (2012)] (September 2012). http://www.eia.doe.gov/emeu/aer.

CONSUMPTION
4.6%

In 2012, U.S. natural gas consumption increased 4.6 percent.

PRODUCTION
5.1%

Domestic natural gas production increased 5.1 percent.

NET IMPORTS
22.6%

Net imports, primarily from Canada, decreased 22.6 percent.

GAS IN STORAGE
0.3%

Working gas[c] in storage increased 0.3 percent.

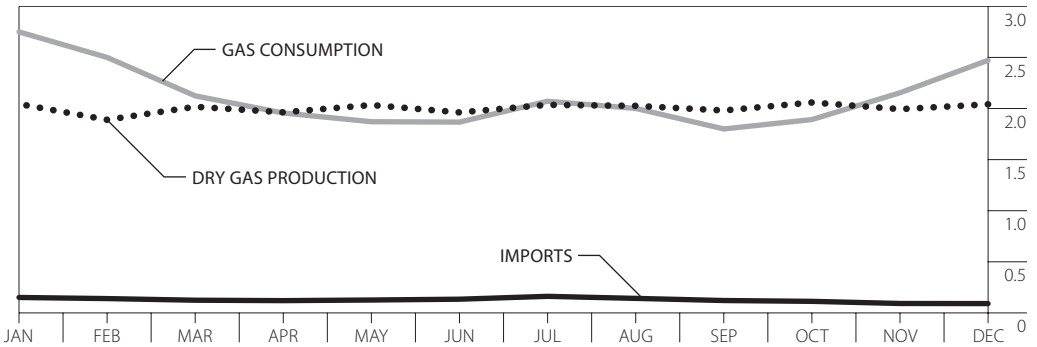
United States Monthly Natural Gas Production, Imports, Consumption and Storage

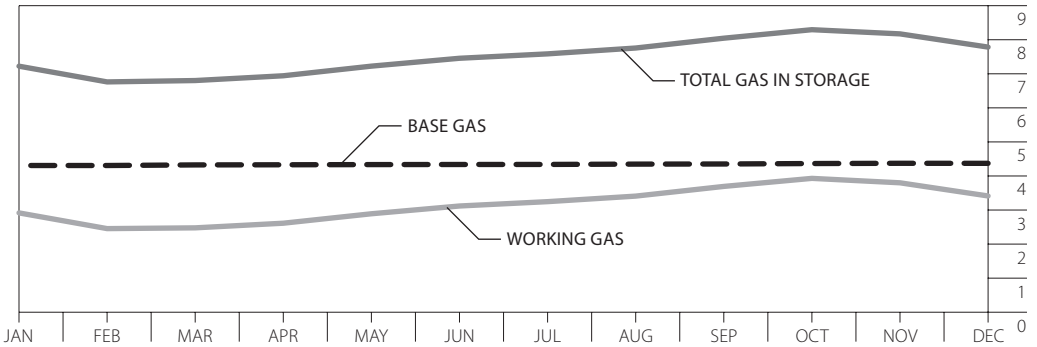
100
CUBIC FEET OF NATURAL GAS = 1 THERM

1 THERM = 100,000 BRITISH THERMAL UNITS (BTU)

Domestic natural gas production and imports remain relatively constant throughout the year. However, consumption increases significantly during the winter heating months. To provide sufficient natural gas for the winter heating months, the working gas in storage is withdrawn during these months, while natural gas is injected into storage during the non-heating months. Therefore, natural gas in storage generally peaks in October or November and is at a minimum in March.

2012 TRILLIONS OF CUBIC FEET





2012	U.S. Dry Natural Gas Production[a]	Net Imports	Consumption		Natural Gas in Underground Storage – Month End		
					Base Gas[b]	Working Gas[c]	Total[d]
January	2.044	0.151	2.750		4.307	2.916	7.223
February	1.890	0.140	2.500		4.307	2.455	6.762
March	2.017	0.124	2.124		4.325	2.477	6.802
April	1.963	0.120	1.956		4.329	2.613	6.942
May	2.034	0.126	1.871		4.334	2.890	7.225
June	1.962	0.134	1.867		4.337	3.118	7.456
July	2.036	0.162	2.071		4.339	3.246	7.585
August	2.026	0.142	2.001		4.348	3.409	7.757
September	1.981	0.121	1.800		4.352	3.693	8.045
October	2.059	0.113	1.892		4.365	3.930	8.295
November	1.994	0.092	2.154		4.372	3.799	8.172
December	2.041	0.091	2.472		4.371	3.413	7.784
Total[d]	**24.047**	**1.516**	**25.458**	**Average**	**4.340**	**3.163**	**7.504**

a Dry Natural Gas Production is natural gas used to heat homes and buildings, and to power industry after the natural gas liquids, such as liquid propane, are removed.

b Base Gas is the volume of gas needed as permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates during the withdrawal season.

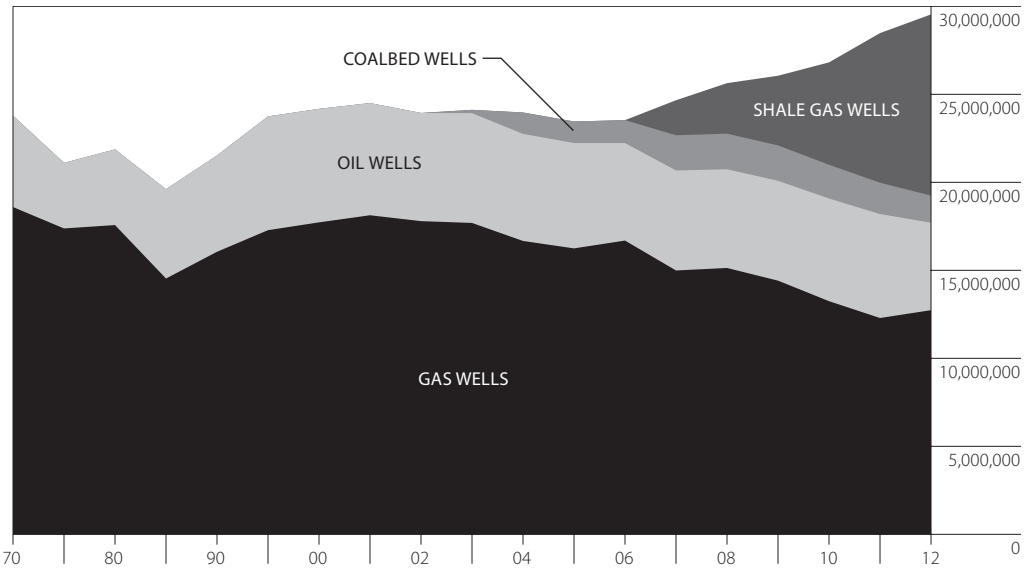
c Working Gas is the gas that can be withdrawn from storage to heat buildings and power industry.

d Totals may not add due to rounding.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 4.1 and 4.4 [DOE/EIA-0035 (2013/03)] (March 2013). http://www.eia.gov/totalenergy/data/monthly/ Annual data in *Annual Energy Review*, Tables 6.1 and 6.6 [DOE/EIA-0384 (2012)] (September 2012). http://www.eia.doe.gov/emeu/aer.

Natural Gas Withdrawals by Source

1970-2012 MILLIONS OF CUBIC FEET



1970-2012 MILLIONS OF CUBIC FEET AND PERCENT OF TOTAL

Year	Gas Wells		Oil Wells		Shale Gas Wells		Coalbed Wells		Natural Gas, Gross Withdrawals, All Wells
1970	18,594,658	*78.17%*	5,191,795	*21.83%*	0	*0.00%*	0	*0.00%*	23,786,453
1980	17,572,526	*80.35%*	4,297,166	*18.07%*	0	*0.00%*	0	*0.00%*	21,869,692
1990	16,053,566	*74.59%*	5,469,055	*22.99%*	0	*0.00%*	0	*0.00%*	21,522,621
2000	17,726,056	*73.33%*	6,447,820	*27.11%*	0	*0.00%*	0	*0.00%*	24,173,876
2001	18,129,408	*74.00%*	6,371,371	*26.79%*	0	*0.00%*	0	*0.00%*	24,500,779
2002	17,794,858	*74.33%*	6,146,420	*25.84%*	0	*0.00%*	0	*0.00%*	23,941,278
2003	17,693,053	*73.36%*	6,237,176	*26.22%*	0	*0.00%*	188,749	*0.79%*	24,118,978
2004	16,669,139	*69.54%*	6,084,431	*25.58%*	0	*0.00%*	1,216,108	*5.11%*	23,969,678
2005	16,246,904	*69.26%*	5,984,975	*25.16%*	0	*0.00%*	1,224,943	*5.15%*	23,456,822
2006	16,691,061	*70.92%*	5,539,464	*23.29%*	0	*0.00%*	1,304,493	*5.48%*	23,535,018
2007	14,991,891	*60.79%*	5,681,871	*23.89%*	1,990,145	*8.37%*	1,999,748	*8.41%*	24,663,655
2008	15,134,644	*59.04%*	5,609,425	*23.58%*	2,869,960	*12.07%*	2,022,228	*8.50%*	25,636,257
2009	14,414,287	*55.32%*	5,674,120	*23.85%*	3,958,315	*16.64%*	2,010,171	*8.45%*	26,056,893
2010	13,247,498	*49.40%*	5,834,703	*24.53%*	5,817,122	*24.46%*	1,916,762	*8.06%*	26,816,085
2011	12,291,070	*43.16%*	5,907,919	*24.84%*	8,500,983	*35.74%*	1,779,055	*7.48%*	28,479,027
2012p	**12,736,678**	***43.11%***	**4,969,668**	***20.89%***	**10,296,572**	***43.29%***	**1,539,395**	***6.47%***	**29,542,313**

p Preliminary.

Source: U.S. Department of Energy, Energy Information Administration, *Natural Gas Gross Withdrawals and Production*, http://www.eia.gov/dnav/ng/ng_prod_sum_dcu_NUS_a.htm (April 2014).

Natural Gas production in the United States was significantly changed when shale gas resources and coalbed wells became available. Without shale natural gas production due to fracking, and coalbed mines, natural gas withdrawals would have declined to levels not seen since 1965.

In 2012, the percent of total natural gas withdrawals from shale wells increased 21.1 percent over 2011. The availability of natural gas from coalbed wells is gradually decreasing and flattening out, because the available gas is finite, and due to decreased activity in the underground mining industry.

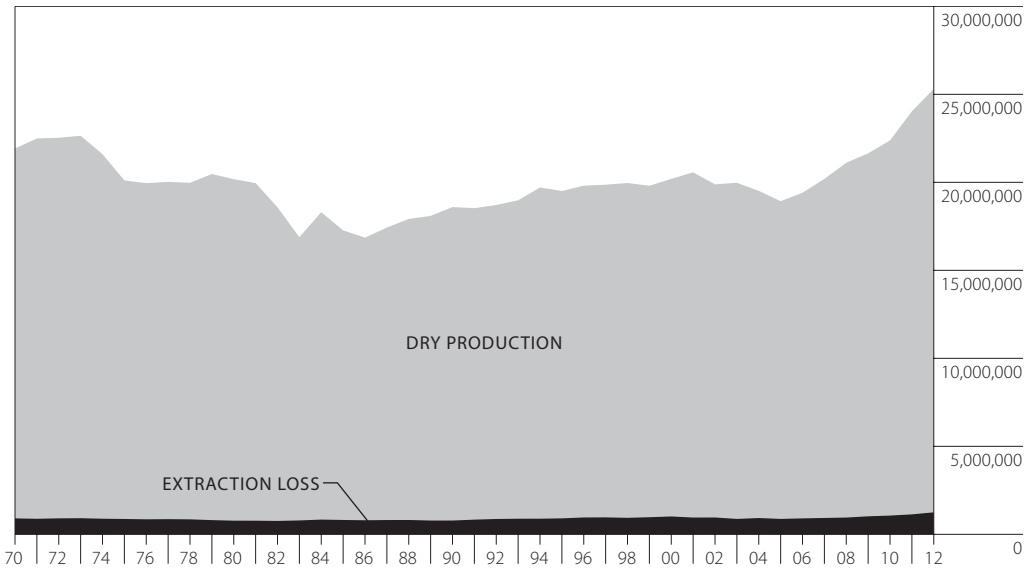
The Gross Withdrawals shows all of the sources of natural gas production.

Natural Gas Production

A co-product of oil production, natural gas occurs naturally in oil as a dissolved gas under pressure. During the oil extraction process, this gas is freed up and then reinserted—or, repressured—into the oil well to enhance or maintain oil production from the well. When the natural gas cannot be captured for market delivery, or repressured, the gas may be flared (burned) or vented into the atmosphere. Non-hydrocarbon, naturally occurring gasses such as carbon dioxide, helium, hydrogen sulfide and nitrogen are removed.

The Marketed Production is the gas available after repressuring, flaring/venting and the removal of non-hydrocarbon gasses. When this gas is compressed it can be pumped and shipped via pipeline, hydrocarbon gasses such as ethane, propane and butane are removed and the remaining Dry Production is available for sale on the market.

1970-2012 MILLIONS OF CUBIC FEET



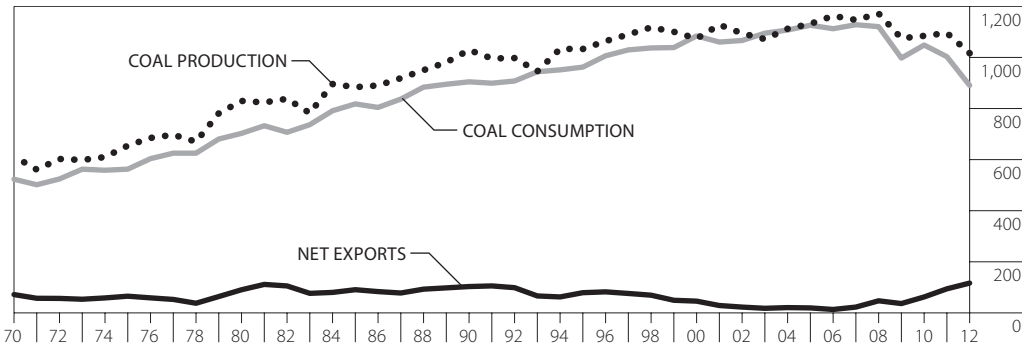
Year	Marketed Production	Repressuring	Vented and Flared	Non-Hydrocarbon Gases Removed	Extraction Loss	Dry Production
1970	21,920,642	1,376,351	489,460	0	906,413	21,014,229
1975	20,108,661	860,956	133,913	0	872,282	19,236,379
1980	20,179,724	1,365,454	125,451	199,063	776,605	19,403,119
1985	17,270,223	1,915,197	94,778	326,497	816,370	16,453,853
1990	18,593,792	2,489,040	150,415	289,374	784,118	17,809,674
1995	19,506,474	3,565,023	283,739	388,392	907,795	18,598,679
2000	20,197,511	3,379,661	91,232	505,472	1,015,542	19,181,980
2001	20,570,295	3,370,832	96,913	462,738	953,984	19,616,311
2002	19,884,780	3,455,145	99,178	502,176	956,992	18,927,788
2003	19,974,360	3,547,781	98,113	498,724	875,816	19,098,544
2004	19,517,491	3,701,656	96,408	654,124	926,600	18,590,891
2005	18,927,095	3,699,535	119,097	711,095	876,497	18,050,598
2006	19,409,674	3,264,929	129,469	730,946	906,069	18,503,605
2007	20,196,346	3,662,685	143,457	661,168	930,320	19,266,026
2008	21,112,053	3,638,622	166,909	718,674	953,451	20,158,602
2009	21,647,936	3,522,090	165,360	721,507	1,024,082	20,623,854
2010	22,381,873	3,431,587	165,928	836,698	1,066,366	21,315,507
2011	24,036,352	3,365,313	209,439	867,922	1,134,473	22,901,879
2012p	**25,307,949**	**3,259,680**	**212,848**	**761,836**	**1,250,340**	**24,057,609**

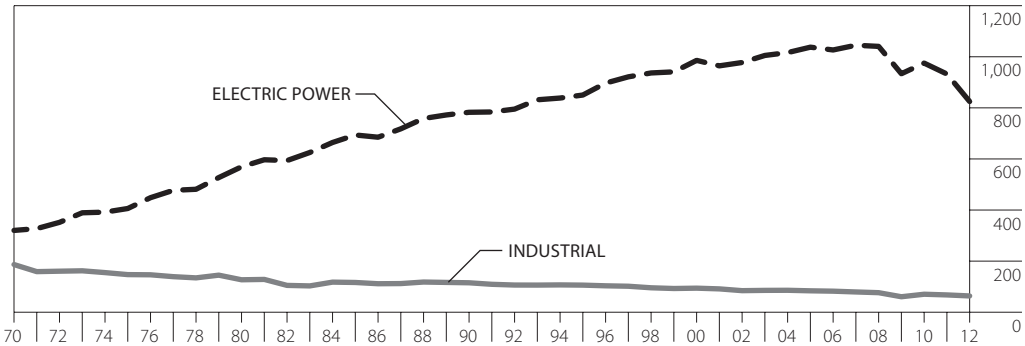
p Preliminary.

Source: U.S. Department of Energy, Energy Information Administration, *Natural Gas Gross Withdrawals and Production*, http://www.eia.gov/dnav/ng/ng_prod_sum_dcu_NUS_a.htm (April 2014).

United States Coal Production, Net Exports, Consumption and Sector Usage

1970-2012 MILLIONS OF TONS





Year	Coal Production	Net Exports	Consumption	Coal Use by Sector		
				Res. & Com.[a]	Industrial	Electric Power
1970[r]	612.7	71.7	523.2	16.1	186.6	320.2
1975[r]	654.6	65.4	562.6	9.4	147.2	406.0
1980[r]	829.7	90.5	702.7	6.5	127.0	569.3
1985[r]	883.6	90.7	818.0	7.8	116.4	693.8
1990[r]	1,029.1	103.1	904.5	6.7	115.2	782.6
1995[r]	1,033.0	79.1	962.1	5.8	106.1	850.2
2000[r]	1,073.6	46.0	1,084.1	4.1	94.1	985.8
2005[r]	1,131.5	19.5	1,126.0	4.7	83.8	1,037.5
2006[r]	1,162.7	13.4	1,112.3	3.2	82.4	1,026.6
2007[r]	1,146.6	22.8	1,128.0	3.5	79.3	1,045.1
2008[r]	1,171.8	47.3	1,120.5	3.5	76.5	1,040.6
2009[r]	1,074.9	36.5	997.5	3.2	60.6	933.6
2010[r]	1,084.4	62.4	1,048.5	3.1	70.4	975.1
2011	1,095.6	94.2	1,002.9	2.8	67.7	932.5
2012[p]	**1,016.4**	**116.6**	**890.5**	**2.0**	**63.7**	**824.8**

a Res. & Com. represents residential and commercial.

p Preliminary.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 6.1 and 6.2 [DOE/EIA-0035 (2013/03)] (March 2013). http://www.eia.gov/totalenergy/data/monthly/

DOMESTIC PRODUCTION EXCEEDS DEMAND

Unlike petroleum or natural gas, domestic production of coal exceeds demand, and the U.S. is a net exporter of coal.

IN THE U.S. 92.6% OF COAL GENERATES ELECTRIC POWER

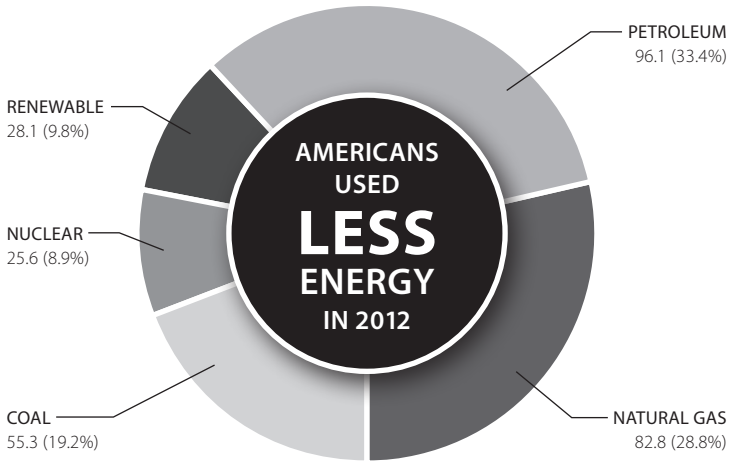
Of the coal consumed in the United States, 92.6 percent is used in the electric sector which accounts for 37.4 percent of all electricity generation. In Wisconsin, coal accounts for 74.0 percent of all electricity generation. The industrial sector uses 7.2 percent, with the residential and commercial sectors combined using 0.22 percent of total domestic consumption.

United States Per Capita Resource Energy Consumption, by Type of Fuel

U.S. PER CAPITA
ENERGY
CONSUMPTION
3.2%

In 2012, U.S. per capita energy consumption decreased 3.2 percent.

2012 MILLIONS OF BTU AND PERCENT OF TOTAL



1970-2012 MILLIONS OF BTU AND PERCENT OF TOTAL

Year	Petroleum[a]		Natural Gas		Coal		Nuclear		Renewables[b]		Total
1970[r]	126.1	*40.3%*	106.3	*33.9%*	59.8	*19.1%*	1.2	*0.4%*	19.9	*6.3%*	313.2
1975[r]	133.2	*42.3%*	92.4	*29.4%*	58.6	*18.6%*	8.8	*2.8%*	21.7	*6.9%*	314.7
1980[r]	128.0	*39.9%*	89.1	*27.8%*	67.9	*21.2%*	12.1	*3.8%*	23.9	*7.4%*	320.9
1985[r]	112.8	*37.2%*	74.4	*24.5%*	73.5	*24.2%*	17.1	*5.6%*	25.6	*8.4%*	303.4
1990[r]	113.9	*35.8%*	78.5	*24.7%*	76.8	*24.2%*	24.5	*7.7%*	24.2	*7.6%*	317.9
1995[r]	109.9	*34.2%*	85.1	*26.5%*	75.4	*23.4%*	26.6	*8.3%*	24.6	*7.7%*	321.7
2000[r]	116.0	*35.2%*	84.4	*25.6%*	80.0	*24.2%*	27.9	*8.4%*	21.6	*6.6%*	330.0
2001[r]	114.3	*36.0%*	79.9	*25.2%*	76.9	*24.2%*	28.2	*8.9%*	18.1	*5.7%*	317.4
2002[r]	113.3	*35.5%*	81.7	*25.6%*	76.2	*23.8%*	28.3	*8.9%*	19.9	*6.2%*	319.4
2003[r]	113.8	*35.9%*	78.7	*24.8%*	76.9	*24.2%*	27.4	*8.6%*	20.5	*6.5%*	317.4
2004[r]	116.4	*36.4%*	78.3	*24.4%*	76.7	*24.0%*	28.1	*8.8%*	20.8	*6.5%*	320.3
2005[r]	116.1	*36.5%*	76.4	*24.0%*	77.1	*24.2%*	27.6	*8.7%*	21.1	*6.6%*	318.3
2006[r]	113.4	*36.2%*	74.5	*23.8%*	75.2	*24.0%*	27.5	*8.8%*	22.3	*7.1%*	312.9
2007[r]	112.4	*35.6%*	78.6	*24.8%*	75.5	*23.9%*	28.1	*8.9%*	21.7	*6.9%*	316.3
2008[r]	105.3	*34.1%*	78.4	*25.4%*	73.6	*23.8%*	27.7	*9.0%*	23.7	*7.7%*	308.7
2009[r]	100.1	*34.2%*	76.3	*26.1%*	64.2	*21.9%*	27.2	*9.3%*	24.9	*8.5%*	292.8
2010[r]	100.9	*33.5%*	79.4	*26.4%*	67.2	*22.3%*	27.3	*9.1%*	26.1	*8.7%*	301.0
2011[r]	99.0	*33.3%*	79.8	*26.8%*	63.1	*21.2%*	26.5	*8.9%*	29.1	*9.8%*	297.6
2012[p]	**96.1**	***33.4%***	**82.8**	***28.8%***	**55.3**	***19.2%***	**25.6**	***8.9%***	**28.1**	***9.8%***	**288.0**

a To allow a more direct comparison with Wisconsin data, this figure excludes asphalt, road oil, lubricants, waxes, petroleum feedstocks and other petroleum products not used as energy sources.

b Renewables includes biomass, hydro power, wood, solar, wind and geothermal.

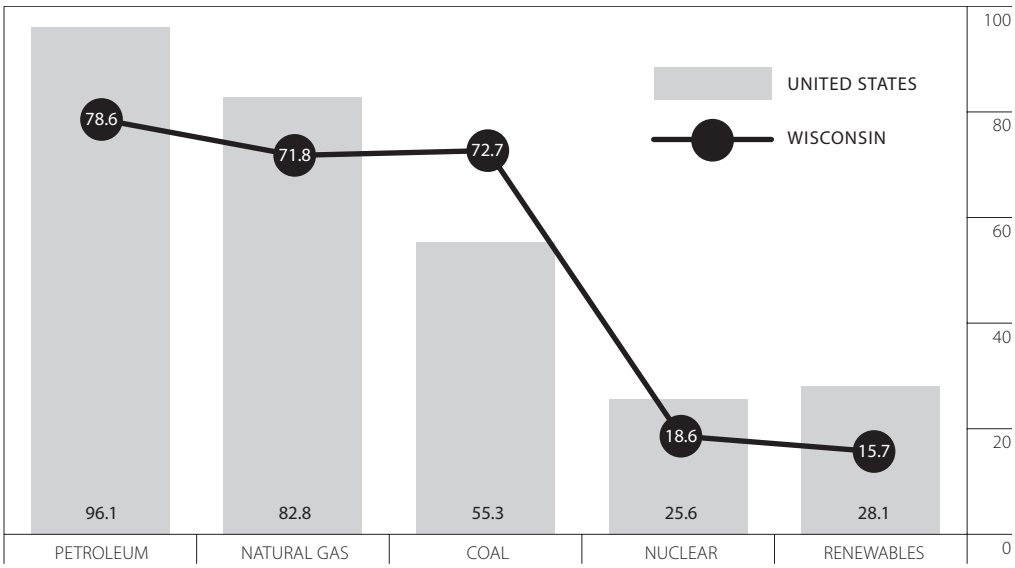
p Preliminary.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2013/03)] (March 2013) Table 3.6. http://www.eia.doe.gov/emeu/mer. Annual data in *Annual Energy Review*, Tables 1.3 and 5.12 [DOE/EIA-0384 (2012)] (September 2012) http://www.eia.doe/gov/emeu/aer. U.S. Census Bureau, Population Division, Release 3/2012, *Table 1: Preliminary Annual Estimate of the Resident Population of the United States*. http://www.census.gov/popest/eval-estimates/eval-est2010.html

Wisconsin Per Capita Resource Energy Consumption as Percent of United States, by Type of Fuel

2012 PER CAPITA RESOURCE ENERGY CONSUMPTION – MILLIONS OF BTU



1970-2012 WISCONSIN PER CAPITA RESOURCE ENERGY CONSUMPTION AS A PERCENT OF U.S.

Year	Petroleum[a]	Natural Gas	Coal	Nuclear	Renewables[b]	Total
1970	82.2	69.7	134.5	32.5	31.1	82.5
1975	78.1	87.3	98.0	276.8	29.7	85.3
1980	75.4	82.1	101.6	188.7	43.5	84.3
1985	77.7	86.2	107.4	145.9	42.7	87.8
1990	78.5	79.8	109.5	101.3	42.5	90.9
1995	83.1	87.8	120.5	87.4	39.7	97.6
2000	79.8	86.9	121.0	82.8	47.7	95.3
2005	76.8	91.6	123.5	53.1	53.3	96.3
2006	77.2	90.5	122.0	85.4	52.1	93.0
2007	78.0	84.9	120.9	87.9	59.5	95.9
2008	79.5	88.0	129.5	83.5	59.8	97.7
2009	78.9	86.9	132.7	88.4	57.0	96.7
2010	78.7	83.5	136.6	92.4	57.3	94.9
2011	79.2	86.2	136.8	82.7	53.8	95.4
2012[p]	**81.8**	**91.3**	**131.4**	**72.4**	**55.8**	**95.8**

a This list excludes asphalt, road oil, lubricants, waxes, petroleum feedstocks and other petroleum products not used as energy sources.
b Renewables includes biomass, biogas, hydro power, wood, solar and wind.
p Preliminary estimates.
Source: Compiled from tables in this publication for United States and Wisconsin per capita resource energy use.

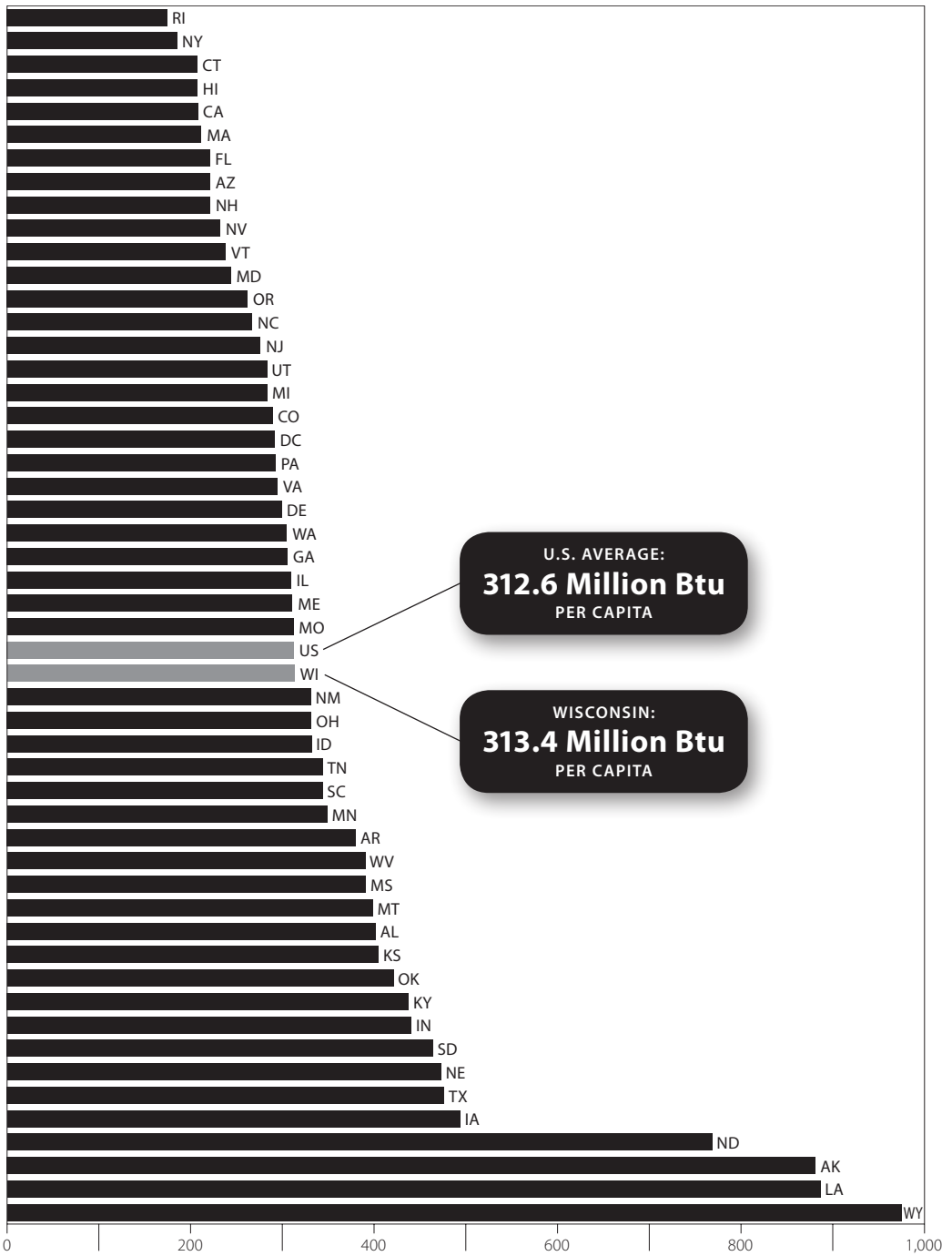
IN 2012 **WISCONSIN** USED **95.8%** AS MUCH ENERGY **PER CAPITA** AS THE **NATIONAL AVERAGE**

In 2012, Wisconsin used 95.8 percent as much energy per capita as the national average. Wisconsin used significantly more coal than the national average because of the state's high use of electricity generated from coal. Wisconsin used less petroleum, natural gas, renewable and nuclear energy per capita than the national average.

U.S. Per Capita Resource Energy Consumption, by State

In 2011, when non-energy uses of petroleum are included (such as road oil, asphalt and lubricants), Wisconsin was the 24th largest state user in the nation, including the District of Columbia, in per capita energy consumption[a]. At 313.4 Million Btu (MMBtu) per capita, Wisconsin's consumption was 100.3 percent of the U.S. consumption at 312.6 MMBtu per capita. This is an increase of 0.13 percent from 2010 when Wisconsin's per capita consumption was 100.1 percent of the U.S. per capita consumption.

2011 MILLIONS OF BTU PER CAPITA

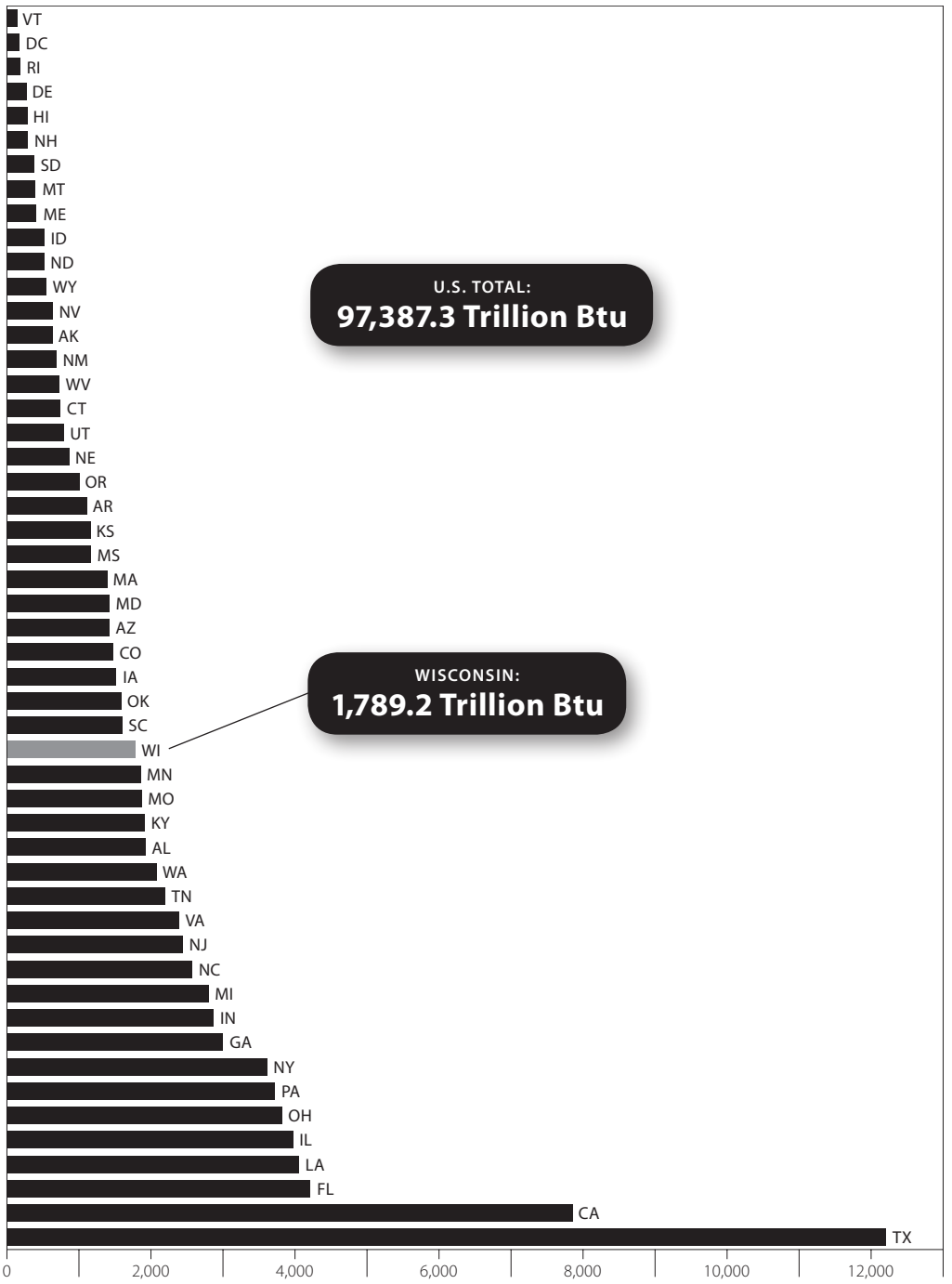


a Data reported in this table may differ from other tables because of different sources.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data 2011: Consumption*, Table C11. http://www.eia.doe.gov/state/seds/sep_use/notes/use_print2011.pdf

U.S. Resource Energy Consumption, by State

2011 TRILLIONS OF BTU



From 2009 until 2011, when non-energy uses of petroleum are included (such as road oil, asphalt and lubricants), Wisconsin used 1.8 percent of total energy consumed in the United States[a].

a Data reported in this table may differ from other tables because of different sources.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data 2010: Consumption*, Table C10. http://www.eia.doe.gov/state/seds/sep_use/notes/use_print2011.pdf

Primary Energy Intensity, by Country and Region

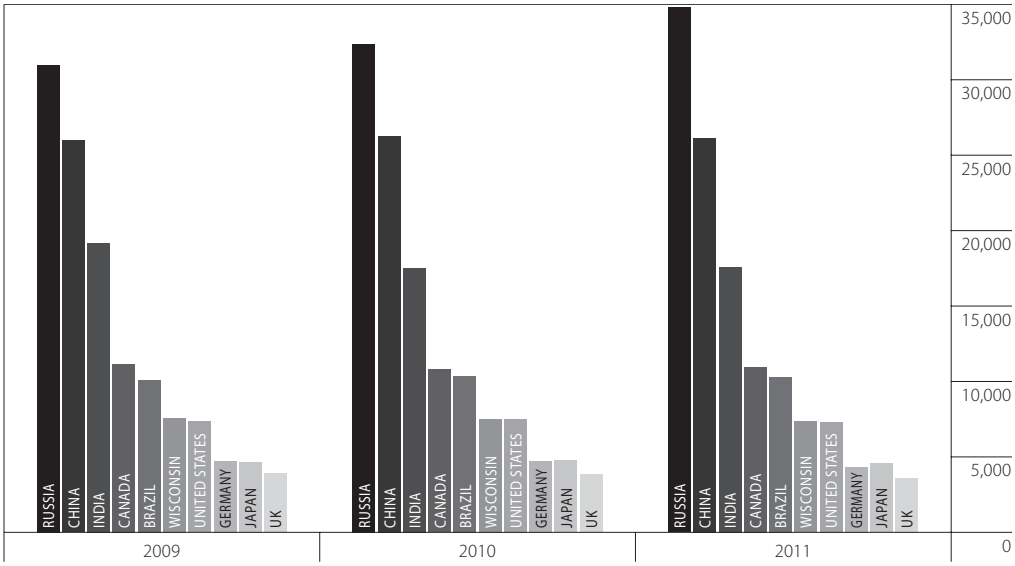
WORLD WIDE AVERAGE 9.8 kBtu/$GDP

Energy intensity demonstrates the efficiency with which a country uses the energy it consumes, relative to its economic activity, the country's Gross Domestic Product (GDP).

The chart and graph below show energy intensity as a factor of Btu per 2005 U.S. Dollars. The higher the intensity, the less efficiently energy is used, while lower intensity numbers show efficient energy consumption relative to other nations. Another way to describe energy intensity is that it measures how much energy a country requires to produce a dollar of GDP.

The world wide average is 9.8 kBtu/$GDP. The United States and Wisconsin are more efficient than the world at 7.3 and 7.4 kBtu/$GDP, respectively.

2006-2011 BTU PER 2005 U.S. DOLLARS



	2006	2007	2008	2009	2010	2011
State						
Wisconsin	7,463	7,794	8,063	7,543	7,516	7,400
Country						
Canada	11,850	11,769	11,289	11,225	10,796	10,962
United States	7,688	7,670	7,543	7,412	7,505	7,329
Brazil	10,582	10,416	10,109	10,262	10,346	10,312
France	5,198	5,047	5,057	4,936	5,001	4,816
Germany	5,121	4,799	4,818	4,768	4,744	4,325
Italy	4,415	4,372	4,320	4,275	4,380	4,228
United Kingdom	4,159	3,950	3,880	3,838	3,827	3,624
Russia	33,506	31,990	31,393	31,821	32,390	34,797
China	29,205	27,326	26,685	27,144	26,274	26,131
India	19,270	18,725	18,878	18,619	17,513	17,581
Japan	4,922	4,849	4,660	4,702	4,752	4,554
Region						
North America	8,039	8,017	7,850	7,742	7,788	7,667
Central and South America	11,735	11,190	11,116	10,990	11,053	11,000
Europe	5,583	5,431	5,350	5,289	5,347	5,250
Eurasia	37,078	35,207	34,333	33,142	33,679	34,000
Middle East	19,543	18,564	19,258	20,116	20,203	20,100
Africa	13,694	13,274	13,519	13,109	12,843	12,500
Asia and Oceania	13,483	13,310	13,412	14,188	13,996	14,000
World	**9,860**	**9,734**	**9,756**	**9,911**	**9,992**	**9,800**

Source: U.S. Department of Energy, Energy Information Administration, International Energy Statistics, (2012) http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm.

Primary Energy Usage and GDP, by Country and Region

2011 QUADRILLION BTUs AND BILLIONS OF 2005 U.S. DOLLARS

	2011		Gross Domestic Product[a]		Primary Energy Intensity
	Quadrillion Btu	Percent of Wold Total	Billions of 2005 U.S. Dollars	Percent of Wold Total	Btu per 2005 U.S. Dollars
Country					
Brazil	11.66	2.3%	1,131	2.2%	10,312
Canada	13.50	2.7%	1,231	2.4%	10,962
China	109.62	21.9%	4,195	8.2%	26,131
France	10.78	2.2%	2,238	4.4%	4,816
Germany	13.08	2.6%	3,024	5.9%	4,325
India	23.61	4.7%	1,343	2.6%	17,581
Italy	7.41	1.5%	1,753	3.4%	4,228
Japan	20.86	4.2%	4,581	9.0%	4,554
Russia	32.77	6.6%	942	1.8%	34,797
United Kingdom	8.52	1.7%	2,351	4.6%	3,624
United States	97.47	19.5%	13,299	26.1%	7,329
Region					
Africa	15.00	3.0%	1,200	2.4%	12,500
Asia and Oceania	200.00	40.0%	14,286	28.0%	14,000
Central and South America	25.00	5.0%	2,273	4.5%	11,000
Eurasia	40.00	8.0%	1,176	2.3%	34,000
Europe	85.00	17.0%	16,190	31.7%	5,250
Middle East	30.00	6.0%	1,493	2.9%	20,100
North America	118.79	23.8%	15,493	30.4%	7,667
World	**500.00**		**51,020**		**9,800**

a Gross Domestic Product is calculated using available data from the Energy Information Administration, International Energy Statistics data.

Source: U.S. Department of Energy, Energy Information Administration, International Energy Statistics, (2012) http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm.

Primary Resource energy use varies widely from country to country. Industrialized countries such as those in North America and Western Europe each use about 2 percent of the annual worldwide primary energy consumption, while the U.S. uses significantly more at 19.5 percent.

Developing nations such as Russia (6.6 percent), China (21.9 percent) and India (4.7 percent) use a significantly larger share of the annual, worldwide primary energy with a smaller Gross Domestic Product.

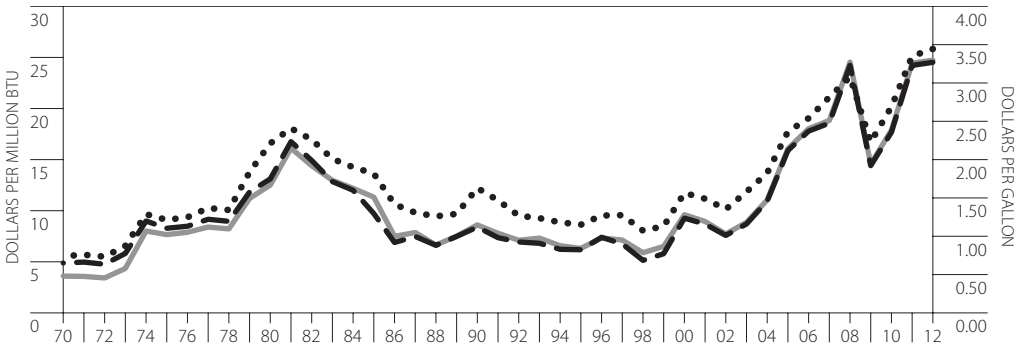
Although the U.S. has a much larger economy, uses more energy and is more developed in terms of economic activity, the countries of Western Europe use energy more efficiently to drive their economy.

CHAPTER 6

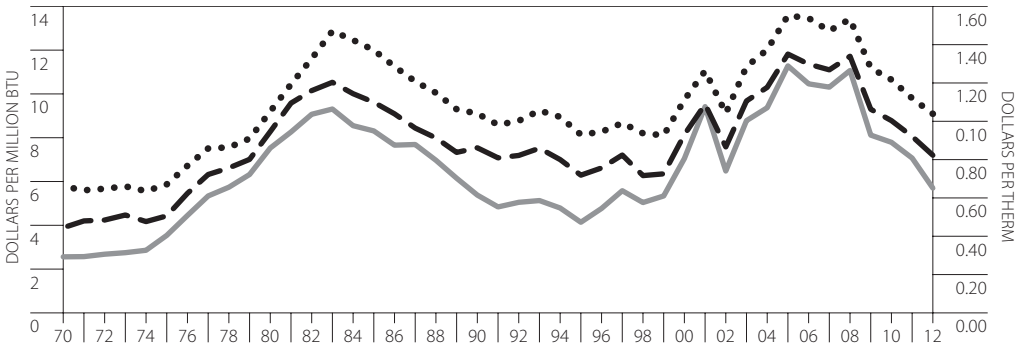
Wisconsin and U.S. Prices and Average Costs of Fuels

Wisconsin Energy Prices

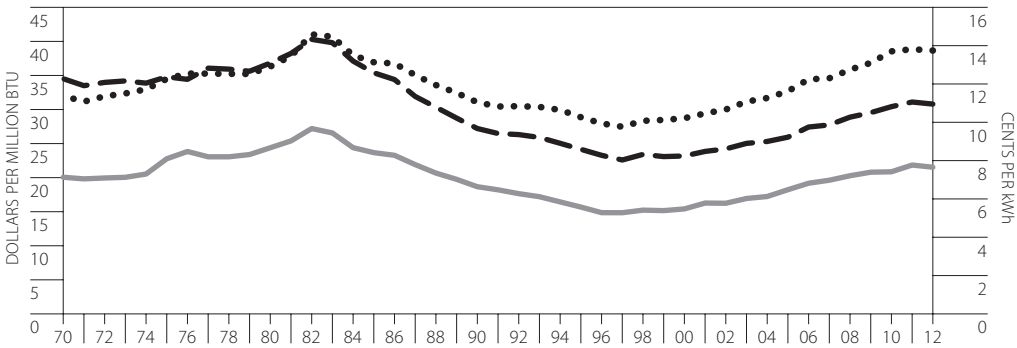
1970-2012 DISTILLATE PRICES (2012 DOLLARS)



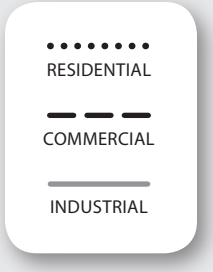
1970-2012 NATURAL GAS PRICES (2012 DOLLARS)



1970-2012 ELECTRICITY PRICES (2012 DOLLARS)



Source: Wisconsin State Energy Office.



Historical prices can be presented in two ways - the current or nominal price, which was gathered during that year. The real or constant price which uses Gross Domestic Product price deflator for inflation. In other words, actual prices are adjusted to be comparable to 2012 prices, in "real" terms, with the effects of inflation removed. All prices are reported in current or nominal terms unless noted explicitly as being real, constant or adjusted.

Wisconsin Residential Energy Prices, by Type of Fuel

REAL PRICE
IN 2012 DOLLARS
FUEL OIL
2.8%

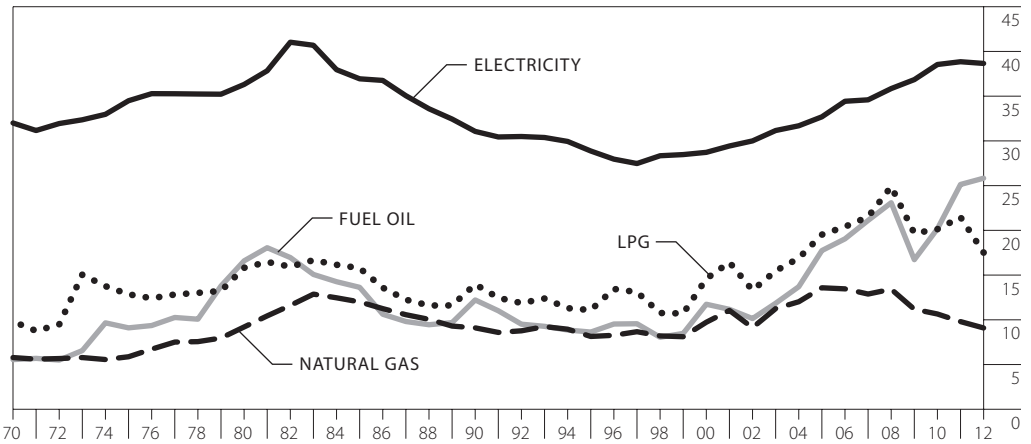
REAL PRICE
IN 2012 DOLLARS
LPG
18.4%
NATURAL GAS
7.3%
ELECTRICITY
0.5%

In 2012, the real prices (2012 dollars) of residential energy fuels decreased for all fuels except fuel oil, which increased by 2.8 percent over 2011. The prices for other fuels decreased: liquefied petroleum gas (LPG) by 18.4 percent, natural gas by 7.3 percent, and electricity by 0.5 percent.

In 2012 dollars, natural gas prices have decreased by 33.1 percent from the 2005 peak price, adjusted for inflation. In 2012, electricity prices dropped for the first time since 1997.

The last four columns in the table show the prices after adjusting for inflation. Prices for electricity and natural gas have been historically revised to align with federal Energy Information Administration data.

1970-2012 DOLLARS PER MILLION BTU (2012 DOLLARS)



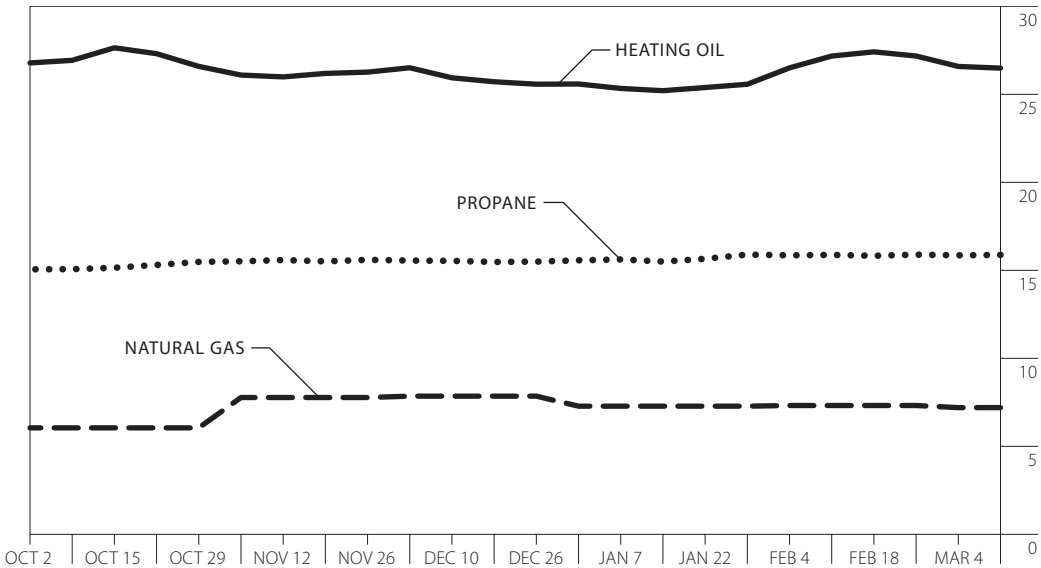
1970-2012 DOLLARS PER MILLION BTU

	Current Dollars				2012 Dollars[a]			
Year	Fuel Oil	LPG	Natural Gas	Electricity	Fuel Oil	LPG	Natural Gas	Electricity
1970[r]	1.17	2.07	1.22	6.75	5.55	9.81	5.78	32.00
1975[r]	2.65	3.74	1.71	10.04	9.10	12.85	5.87	34.49
1980[r]	6.87	6.55	3.81	15.04	16.59	15.81	9.20	36.31
1985[r]	7.28	8.43	6.41	19.73	13.63	15.78	12.00	36.94
1990[r]	7.65	8.75	5.70	19.45	12.22	13.97	9.10	31.06
1995[r]	6.10	7.84	5.76	20.42	8.63	11.09	8.14	28.87
2000[r]	9.03	11.22	7.48	22.08	11.74	14.59	9.73	28.72
2005[r]	15.37	16.92	11.77	28.33	17.74	19.52	13.58	32.69
2006[r]	17.04	18.26	12.04	30.80	19.05	20.41	13.46	34.43
2007[r]	19.43	19.80	11.86	31.84	21.11	21.51	12.88	34.59
2008[r]	21.73	23.43	12.63	33.74	23.09	24.90	13.42	35.85
2009[r]	15.87	18.67	10.61	34.98	16.72	19.67	11.18	36.85
2010[r]	19.40	19.36	10.24	37.07	20.17	20.13	10.65	38.54
2011[r]	24.69	21.09	9.63	38.17	25.13	21.47	9.80	38.85
2012[p]	**25.83**	**17.51**	**9.09**	**38.66**	**25.83**	**17.51**	**9.09**	**38.66**

a 2012 dollar values computed with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.
p Preliminary estimates.
r Revised.
Source: U.S. Department of Energy, Energy Information Administration, State Energy Data System, Wisconsin prices (1970-2012), http://www.eia.gov/state/seds/seds-data-complete.cfm; Wisconsin State Energy Office, periodic telephone surveys of fuel oil and LP gas retailers and natural gas and electricity price monitoring reports (2001-2012).

Wisconsin Residential Energy Prices, by Type of Fuel, Winter Heating Season

2012-2013 DOLLARS PER MILLION BTU



2012-2013 DOLLARS PER GALLON AND DOLLARS PER MILLION BTU

Date 2012-2013	Heating Oil[a]		Propane[b]		Natural Gas
	$/Gallon	$/MMBtu	$/Gallon	$/MMBtu	$/MMBtu
Oct. 2, 2012	3.71	26.78	1.44	15.06	6.05
Oct. 15, 2012	3.83	27.64	1.45	15.15	6.05
Oct. 29, 2012	3.69	26.59	1.48	15.48	6.05
Nov. 12, 2012	3.60	25.99	1.49	15.58	7.77
Nov. 26, 2012	3.64	26.26	1.49	15.60	7.77
Dec. 10, 2012	3.60	25.94	1.48	15.54	7.85
Dec. 26, 2012	3.55	25.58	1.48	15.49	7.85
Jan. 7, 2013	3.51	25.34	1.49	15.62	7.28
Jan. 22, 2013	3.52	25.39	1.49	15.66	7.28
Feb. 4, 2013	3.68	26.50	1.51	15.85	7.32
Feb. 18, 2013	3.80	27.41	1.51	15.83	7.32
Mar. 4, 2013	3.69	26.58	1.51	15.86	7.20
Average Price for the Heating Season	**3.65**	**26.33**	**1.49**	**15.58**	**7.25**

a Heating Oil contains 0.138690 MMBtu/gallon.

b Propane contains 0.095475 MMBtu/gallon.

Source: Telephone survey of energy retailers conducted by the Wisconsin State Energy Office throughout the winter heating season, starting October 2, 2012 and ending March 18, 2013; Wisconsin Natural Gas utility websites and public pricing information (2009-2012).

For the 2012-2013 winter heating season, propane prices peaked in January 2013, heating oil peaked in October 2012, while natural gas prices peaked in December 2012.

Natural gas pricing data presented here are different from other data in this book due to difference in data source and duration of the average. For example, these data cover only the heating season (October-March).

Heating oil and LP data are sourced from a weekly survey of federally-identified fuel wholesalers and retailers, and natural gas data is from Wisconsin's Class A utilities. Data elsewhere in the book are derived from Public Service Commission utility data and the federal Energy Information Administration.

Wisconsin Commercial Energy Prices, by Type of Fuel

REAL PRICE
IN 2012 DOLLARS
DISTILLATE OIL
1.2%
RESIDUAL OIL
4.9%

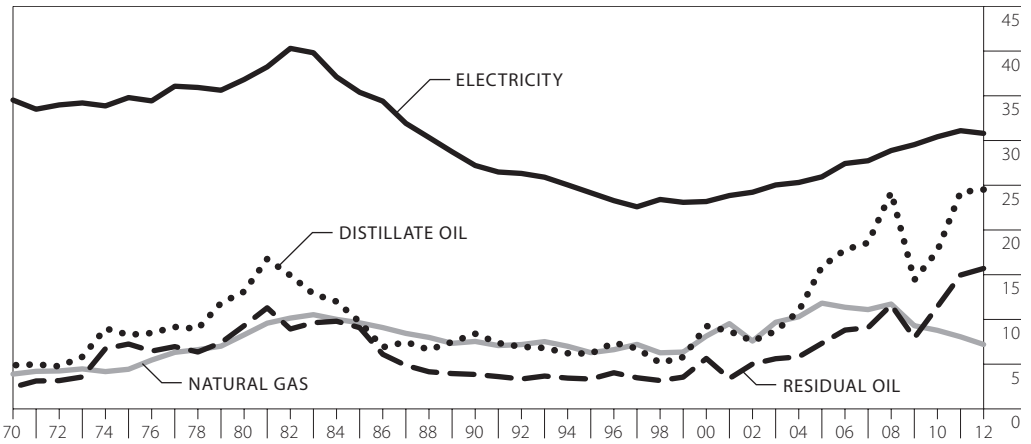
In 2012, the real price of distillate and residual oils (in 2012 dollars) increased: distillate oil by 1.2 percent, and residual oil by 4.9 percent.

REAL PRICE
IN 2012 DOLLARS
NATURAL GAS
10.7%
ELECTRICITY
1.0%

The real price of natural gas decreased by 10.7 percent. Electricity, the major energy expense in the commercial sector, dropped 1.0 percent since 2011, and is 23.6 percent lower than its 1982 peak price, adjusted for inflation.

Prices for electricity and natural gas have been historically revised to align with federal Energy Information Administration data.

1970-2012 DOLLARS PER MILLION BTU (2012 DOLLARS)



1970-2012 DOLLARS PER MILLION BTU

Year	Current Dollars				2012 Dollars[a]			
	Distillate Oil[c]	Residual Oil[b,c]	Natural Gas	Electricity	Distillate Oil[c]	Residual Oil[b,c]	Natural Gas	Electricity
1970[r]	1.03	0.51	0.82	7.28	4.88	2.42	3.89	34.52
1975[r]	2.41	2.11	1.29	10.13	8.28	7.25	4.43	34.80
1980[r]	5.43	3.85	3.43	15.25	13.11	9.30	8.28	36.82
1982[r]	7.17	4.29	4.88	19.37	14.92	8.93	10.15	40.30
1985[r]	5.19	4.85	5.14	18.90	9.72	9.08	9.62	35.39
1990[r]	5.26	2.41	4.72	17.04	8.40	3.85	7.54	27.21
1995[r]	4.37	2.36	4.45	17.09	6.18	3.34	6.29	24.16
2000[r]	7.13	4.34	6.26	17.82	9.27	5.64	8.14	23.18
2005[r]	13.77	6.35	10.24	22.48	15.89	7.33	11.82	25.94
2010[r]	17.01	11.00	8.45	29.26	17.68	11.43	8.78	30.42
2011[r]	23.79	14.70	7.92	30.55	24.22	14.96	8.06	31.10
2012[p]	**24.52**	**15.70**	**7.20**	**30.80**	**24.52**	**15.70**	**7.20**	**30.80**

a 2012 dollar values computed with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.

b Beginning in 2009, the residual fuel oil price is for the Petroleum Administration Defense District (PADD) II. The PADD II includes 15 Midwestern states including Wisconsin. State-specific pricing data for RFO is withheld or not available according to publishing policies used by the Energy Information Administration (EIA).

c Beginning in 2011, the distillate oil price is estimated based on the refiner retail price in Wisconsin. The price for residual oil is estimated based on refiner retail prices for the United States. The reports previously used by the Wisconsin SEO were suspended as part of EIA's response to the U.S. budget sequester.

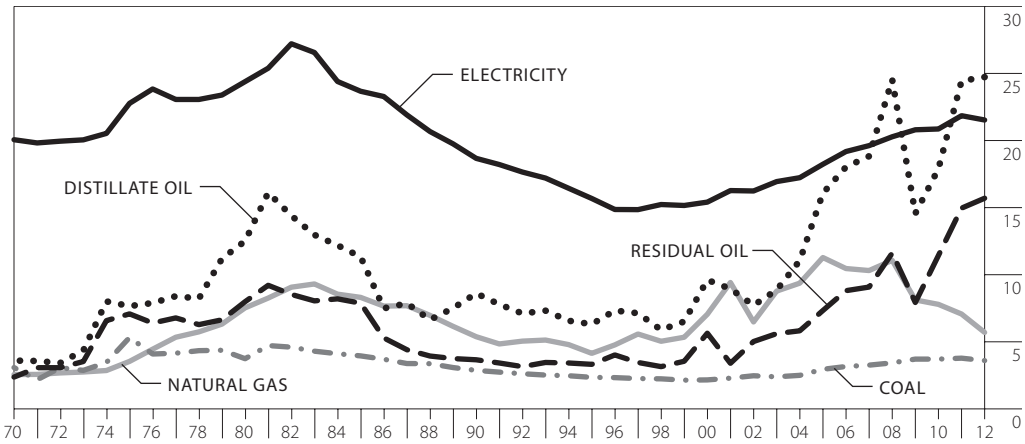
p Preliminary estimates.

r Revised.

Source: U.S. Department of Energy, "State Btu Unit Price Data Base", unpublished (May 1981); *Petroleum Marketing Monthly*, (January 1985 - March 2008), and unpublished analysis of Wisconsin residual oil prices (1985-2006); *Petroleum Marketing Annual* (2007-2009) [DOE/EIA-0487 (2009)] (August 2010), Tables 35 and 38; Oil Daily/Daily Oil and Gas Price Review, by subscription (2008-2009); *Wisconsin No. 2 Distillate Retail Sales by Refiners* (2011); *U.S. Residual Fuel Oil Sales by Refiners* (2011); U.S. Department of Energy, Energy Information Administration, State Energy Data System, Wisconsin prices (1970-2012), http://www.eia.gov/state/seds/seds-data-complete.cfm.

Wisconsin Industrial Energy Prices, by Type of Fuel

1970-2012 DOLLARS PER MILLION BTU (2012 DOLLARS)



1970-2012 DOLLARS PER MILLION BTU

	Current Dollars					2012 Dollars[a]				
Year	Distillate Oil[c]	Residual Oil[b,c]	Natural Gas	Coal	Electricity	Distillate Oil[c]	Residual Oil[b,c]	Natural Gas	Coal	Electricity
1970[r]	0.76	0.50	0.54	0.65	4.23	3.60	2.37	2.56	3.08	20.06
1975[r]	2.23	2.06	1.03	1.55	6.63	7.66	7.08	3.54	5.32	22.77
1980[r]	5.18	3.31	3.12	1.55	10.10	12.51	7.99	7.53	3.74	24.39
1981[r]	7.30	4.17	3.74	2.14	11.50	16.12	9.21	8.26	4.72	25.39
1982[r]	6.92	4.10	4.36	2.21	13.08	14.40	8.53	9.07	4.60	27.21
1985[r]	6.05	4.21	4.44	2.11	12.64	11.33	7.88	8.31	3.95	23.67
1990[r]	5.39	2.29	3.37	1.80	11.69	8.61	3.66	5.38	2.87	18.67
1995[r]	4.46	2.35	2.93	1.66	11.09	6.31	3.32	4.14	2.35	15.68
2000[r]	7.39	4.34	5.42	1.66	11.85	9.61	5.64	7.05	2.16	15.41
2005[r]	13.92	6.35	9.78	2.56	15.80	16.07	7.33	11.28	2.95	18.23
2010[r]	17.20	11.00	7.49	3.57	20.07	17.89	11.43	7.79	3.71	20.86
2011[r]	24.01	14.70	6.95	3.71	21.47	24.44	14.96	7.07	3.78	21.85
2012[p]	**24.73**	**15.70**	**5.70**	**4.02**	**21.53**	**24.73**	**15.70**	**5.70**	**4.02**	**21.53**

a 2012 dollar values computed with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.

b Beginning in 2009, the residual fuel oil price is for the Petroleum Administration Defense District (PADD) II. The PADD II includes 15 midwestern states including Wisconsin. State-specific pricing data for RFO is withheld or not available according to publishing policies used by the Energy Information Administration (EIA).

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p Preliminary estimates.

r Revised.

Source: U.S. Department of Energy, "State Btu Unit Price Data Base", unpublished (May 1981); *State Energy Consumption, Price and Expenditure Report* 1960-2008 http://www.eia.doe.gov/emeu/states/_seds.html, (June 2010); *Petroleum Marketing Monthly* (January 1985-March 2008); *Quarterly Coal Report*, Table 27 [DOE/EIA-0121(2009/4Q)] (April 2010), http://www.eia.doe.gov/cneaf/coal/quarterly/qcr.pdf; *Petroleum Marketing Annual* (2007-2009) [DOE/EIA-0487 (2009)] (August 2010), Tables 35 and 38; Oil Daily/Daily Oil and Gas Price Review, by subscription (2008-2009); *Wisconsin No. 2 Distillate Retail Sales by Refiners* (2011); *U.S. Residual Fuel Oil Sales by Refiners* (2011); U.S. Department of Energy, Energy Information Administration, State Energy Data System, Wisconsin prices (1970-2012), http://www.eia.gov/state/seds/seds-data-complete.cfm.

REAL PRICE
IN 2012 DOLLARS
COAL
6.5%
DISTILLATE OIL
1.2%
RESIDUAL OIL
4.9%

In 2012, the real prices of coal, distillate and residual oils increased, while all other fuels decreased. Coal increased by 6.5 percent, distillate oil by 1.2 percent and residual oil by 4.9 percent.

REAL PRICE
IN 2012 DOLLARS
NATURAL GAS
19.4%
ELECTRICITY
1.5%

Natural gas dropped by 19.4 percent and electricity by 1.5 percent from 2011.

The real price of coal and electricity are 14.9 and 20.9 percent lower than their respective 1981 and 1982 price peaks, adjusted for inflation.

Prices for electricity and natural gas have been historically revised.

Wisconsin Motor Gasoline and Diesel Fuel Retail Prices

REAL PRICE
IN 2012 DOLLARS

GASOLINE
0.9%

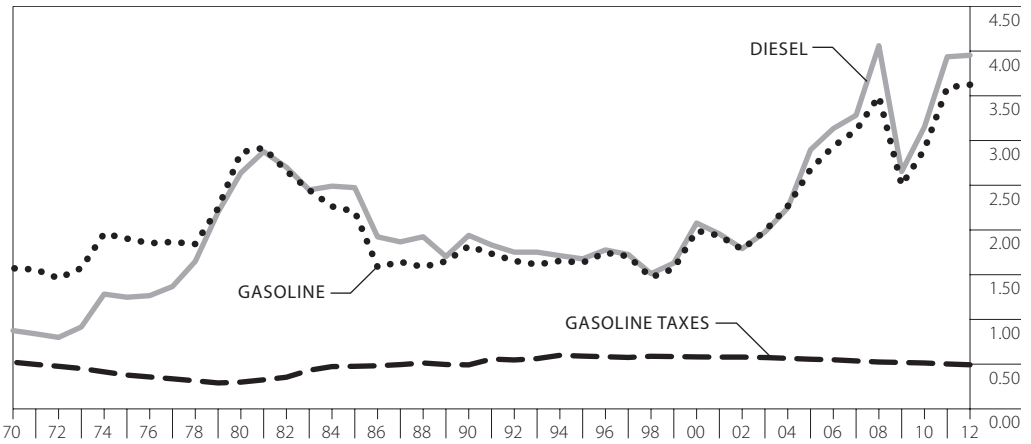
DIESEL FUEL
0.4%

FROM 2011

The real price of gasoline in 2012 was 0.9 percent higher than in 2011. Real gasoline prices in 2012 were the highest on record since data for this book were compiled in 1970. The real price of diesel fuel increased 0.4 percent since 2011.

Starting on January 1, 1995, only reformulated gasoline could be sold in Wisconsin's Nonattainment Area—10 eastern and southeastern Wisconsin counties[d]—in order to improve air quality.

1970-2012 DOLLARS PER GALLON (2012 DOLLARS)



1970-2012 DOLLARS PER GALLON

	Current Dollars				2012 Dollars[e]		
Year	Regular Unleaded Gasoline (Self-Service)[a]	Regular Reformulated Gasoline	Diesel Fuel[b]	Federal and State Taxes on Gasoline[c]	Regular Unleaded Gasoline (Self-Service)[a]	Diesel Fuel[b]	Federal and State Taxes on Gasoline[c]
1970	0.332		0.185	0.110	1.572	0.875	0.522
1975	0.554		0.363	0.110	1.903	1.248	0.378
1980	1.188		1.093	0.124	2.868	2.639	0.299
1985	1.178		1.321	0.254	2.206	2.473	0.476
1990	1.139		1.215	0.308	1.819	1.940	0.492
1995	1.156	1.181	1.186	0.417	1.635	1.677	0.590
2000	1.532	1.556	1.598	0.447	1.992	2.078	0.581
2005	2.321	2.338	2.510	0.481	2.678	2.896	0.555
2006	2.626	2.639	2.804	0.491	2.935	3.134	0.549
2007	2.867	2.849	3.021	0.493	3.114	3.282	0.536
2008	3.289	3.085	3.821	0.493	3.495	4.060	0.524
2009	2.374	2.384	2.518	0.493	2.501	2.653	0.519
2010	2.791	2.784	3.032	0.493	2.902	3.152	0.513
2011	3.529	3.517	3.867	0.493	3.593	3.936	0.502
2012	**3.624**	**3.624**	**3.953**	**0.493**	**3.624**	**3.953**	**0.493**

a Since 1991, more than 99 percent of the gasoline sold in Wisconsin has been unleaded. The price is for full service gasoline until 1979 when the price is changed to represent self-service gasoline.

b From 1970 to 1988, the price is the full service price. Beginning in 1989 the price is the self-service price.

c A state petroleum inspection fee is also charged. In 2011, this fee was 3 cents per gallon.

d Nonattainment Areas are a designation of the federal Environmental Protection Agency. See http://www.epa.gov/oaqps001/greenbk/ancl.html for additional information.

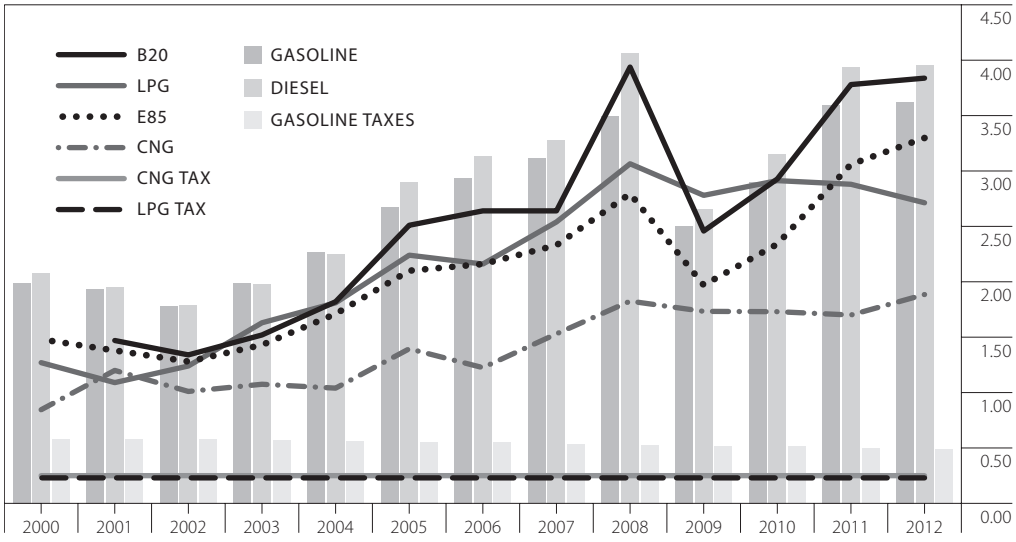
e 2012 dollar values computer with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.

Source: Wisconsin Division of the American Automobile Association, *Fuel Gauge Report* (1993-2012); Wisconsin Department of Revenue, Excise Tax Section (1993-2012).

Wisconsin Alternative Vehicle Fuels Retail Prices

The gray bars on this graph show the prices of conventional gasoline and diesel, and the state and federal gasoline taxes, as a point of reference to the prices of alternative vehicle fuels.

2000-2012 DOLLARS PER GALLON AND PER GASOLINE GALLON EQUIVALENT



	Current Dollars						2012 Dollars[c]					
Year	B20	E85	LPG	CNG	CNG Tax[b]	LPG Tax[b]	B20	E85	LPG	CNG	CNG Tax[b]	LPG Tax[b]
2000		1.48	1.27	0.85	0.25	0.23		1.92	1.65	1.10	0.32	0.29
2001	1.47	1.38	1.09	1.20	0.25	0.23	1.87	1.76	1.38	1.53	0.31	0.29
2002	1.34	1.28	1.24	1.01	0.25	0.23	1.67	1.60	1.56	1.26	0.31	0.28
2003	1.52	1.43	1.63	1.08	0.25	0.23	1.86	1.75	2.00	1.32	0.30	0.28
2004	1.82	1.71	1.81	1.04	0.25	0.23	2.17	2.04	2.16	1.24	0.29	0.27
2005	2.51	2.10	2.24	1.40	0.25	0.23	2.90	2.42	2.58	1.61	0.29	0.26
2006	2.64	2.16	2.16	1.23	0.25	0.23	2.95	2.41	2.41	1.37	0.28	0.25
2007	2.64	2.33	2.54	1.53	0.25	0.23	2.87	2.53	2.76	1.66	0.27	0.25
2008	3.94	2.80	3.07	1.83	0.25	0.23	4.18	2.97	3.26	1.94	0.26	0.24
2009	2.46	1.97	2.78	1.73	0.25	0.23	2.59	2.08	2.93	1.83	0.26	0.24
2010	2.93	2.34	2.91	1.73	0.25	0.23	3.04	2.43	3.03	1.80	0.26	0.23
2011	3.78	3.06	2.88	1.70	0.25	0.23	3.85	3.11	2.93	1.73	0.25	0.23
2012	**3.84**	**3.30**	**2.71**	**1.89**	**0.25**	**0.23**	**3.84**	**3.30**	**2.71**	**1.89**	**0.25**	**0.23**

a More information regarding alternative fuels can be found on the Wisconsin State Energy Office webiste at: www.stateenergyoffice.wi.gov.

b The state tax for LPG per GGE is $0.226, while the state tax for CNG is $0.247.

c 2012 dollar values computer with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.

Source: U.S. Department of Energy, Alternative Fuels Data Center
http://www.afdc.energy.gov/publications/#search/keyword/?q=alternative%20fuel%20price%20report (2000-2012);
Wisconsin Department of Revenue, Excise Tax Section (1993-2012).

Alternative vehicle fuels are becoming more prevalent in Wisconsin. Since 2000, Wisconsin has increased refueling locations for alternative fuels and encouraged the use of cleaner burning and biologically sources fuels – often from Wisconsin's farms.

B20 is a blend of biodiesel (20 percent) and conventional diesel fuel (80 percent). Biodiesel is produced from domestic feedstocks such as vegetable oil, animal fat and soybeans.

E85 is a blend of ethanol (85 percent) and conventional unleaded gasoline (15 percent). Ethanol is produced from biological feedstocks such as corn. Most unleaded gasoline in Wisconsin is E10, a blend of ethanol and gasoline that can be burned in any vehicle engine.

LPG, also known as propane, and compressed natural gas (CNG) are also used in on-road vehicles in Wisconsin.

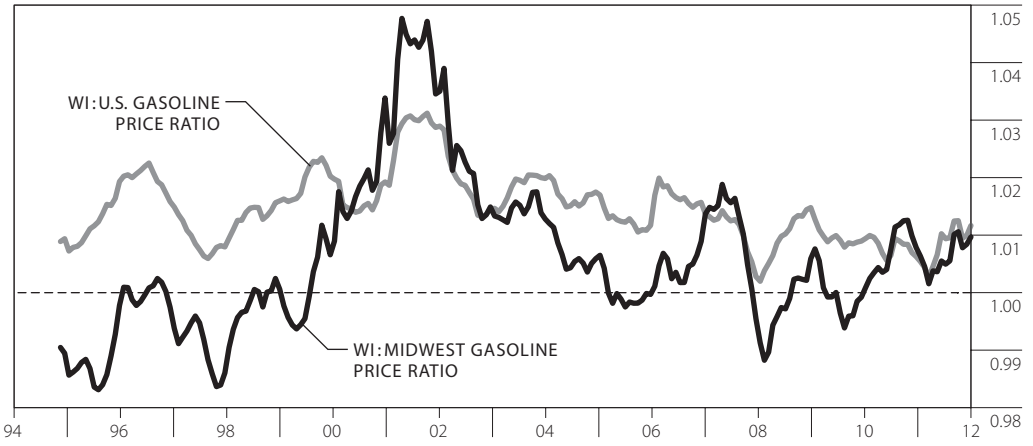
Wisconsin Gasoline Prices Relative to the United States and the Midwest

IN 2012 WISCONSIN GAS PRICES WERE 1.2% HIGHER THAN THE MIDWEST AVERAGE, AND 1.0% HIGHER THAN THE U.S. NATIONAL AVERAGE

Since 2000, the retail price of conventional gasoline in Wisconsin averages 1.1 percent higher than the national average, and 1.4 percent higher than the Midwest[a]. The difference in cost between Wisconsin and the U.S., and Wisconsin and the Midwest, is highly dependent on the variable cost of gasoline. These price averages do not include local or national taxes.

This graph shows the relationship of Wisconsin gasoline prices to the U.S. average gasoline prices, and also to gasoline prices in the Midwest. A value above 1 means that the Wisconsin price is more than the U.S. or the Midwest average price, and value below 1 means that the Wisconsin price is less than the U.S. or Midwest average price. A value of 1 means that the WI price is equal to the national or Midwest average price. These data are presented in a 12-point moving average.

1994-2012 RATIO OF WI TO U.S., AND TO MIDWEST, CONVENTIONAL RETAIL GAS PRICES



1994-2012 RETAIL SALES OF CONVENTIONAL GASOLINE, DOLLARS PER GALLON[b]

Year	U.S.	Midwest[a]	Wisconsin
1994	0.722	0.709	0.715
1995	0.748	0.729	0.740
2000	1.066	1.072	1.088
2001	0.992	1.009	1.039
2002	0.922	0.926	0.943
2003	1.107	1.103	1.124
2004	1.389	1.374	1.395
2005	1.803	1.779	1.799
2006	2.083	2.058	2.096
2007	2.310	2.317	2.349
2008	2.746	2.711	2.716
2009	1.858	1.846	1.865
2010	2.287	2.270	2.293
2011	3.015	3.019	3.039
2012	**3.099**	**3.093**	**3.131**

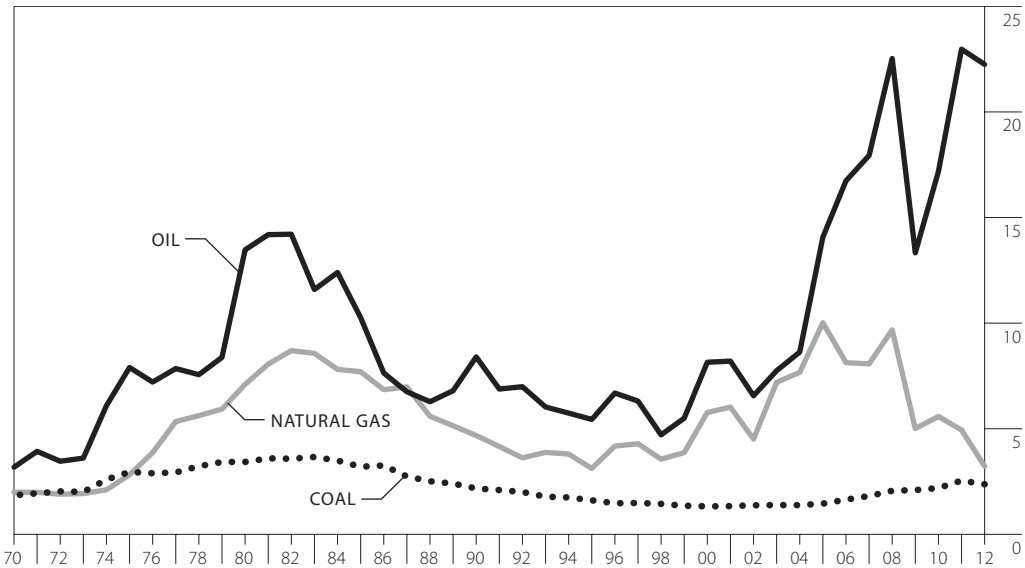
a Midwestern states in this dataset include all states in the PADD 2 district: Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin.

b Figures in the table represent averages calculated from monthly prices. The graph plots monthly data. The background dataset is available on request.

Source: U.S. Department of Energy, Energy Information Administration, *Gasoline Prices by Formulation, Grade, Sales Type* (1994-2010), http://www.eia.gov/dnav/pet/pet_pri_allmg_a_EPM0U_PTA_dpgal_m.htm; Energy Information Administration, *Gasoline and Diesel Fuel Update* (2011-2012) http://www.eia.gov/petroleum/gasdiesel/ .

Wisconsin Electric Utility Average Costs of Fuel

1970-2012 DOLLARS PER MILLION BTU (2012 DOLLARS)



1970-2012 DOLLARS PER MILLION BTU

	Current Dollars			2012 Dollars[a]		
Year	Oil	Natural Gas	Coal	Oil	Natural Gas	Coal
1970[r]	0.67	0.42	0.39	3.18	1.99	1.85
1975[r]	2.30	0.82	0.86	7.90	2.82	2.95
1980[r]	5.58	2.94	1.42	13.47	7.10	3.43
1982[r]	6.83	4.18	1.72	14.21	8.70	3.58
1985[r]	5.48	4.11	1.71	10.26	7.70	3.20
1990[r]	5.26	2.93	1.36	8.40	4.68	2.17
1995[r]	3.85	2.21	1.14	5.44	3.12	1.61
2000[r]	6.27	4.44	1.02	8.15	5.77	1.33
2005[r]	12.19	8.68	1.26	14.07	10.02	1.45
2006[r]	14.98	7.27	1.47	16.74	8.13	1.64
2007[r]	16.52	7.43	1.67	17.94	8.07	1.81
2008[r]	21.20	9.11	1.94	22.53	9.68	2.06
2009[r]	12.65	4.76	1.99	13.33	5.01	2.10
2010[r]	16.53	5.37	2.11	17.18	5.58	2.19
2011[r]	22.57	4.85	2.50	22.97	4.94	2.54
2012[p]	**22.25**	**3.22**	**2.37**	**22.25**	**3.22**	**2.37**

a 2012 dollar values computed with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.

p Preliminary estimates.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, State Energy Data System, Wisconsin prices (1970-2012), http://www.eia.gov/state/seds/seds-data-complete.cfm.

REAL COST IN 2012 DOLLARS

COAL **6.9%**

NATURAL GAS **34.8%**

OIL **3.2%**

In 2012, the real cost (2012 dollars) of fuels used to generate electricity all decreased. Coal decreased 6.9 percent, natural gas 34.8 percent, and oil by 3.2 percent.

Adjusted for inflation, coal prices are 33.8 percent down from their peak in 1982. Natural gas prices are 67.9 percent below their 2005 peak. Oil prices peaked in 2011. Coal remains the lowest cost electric utility fossil fuel.

The prices in this table have been historically revised to align with federal Energy Information Administration data.

Wisconsin Electric Utility Coal Costs and Sulfur Content of Coal, by Utility Plant

WISCONSIN UTILITY COAL HAS 70.3% LESS SULFUR AND COSTS 2.9% MORE IN CENTS PER MMBTU THAN THE AVERAGE COAL USED IN THE U.S.

Wisconsin utility coal has 70.3 percent less sulfur and costs 2.9 percent more, in cents per MMBtu, than the average coal used in the United States.

Wisconsin utilities have been very successful in meeting and maintaining the 1993 goals of Wisconsin's acid rain control law through increased use of low sulfur coal.

In 2012, the average Wisconsin coal cost, in cents per million Btu, increased .06 percent, while sulphur content decreased 16.7 percent.

2012

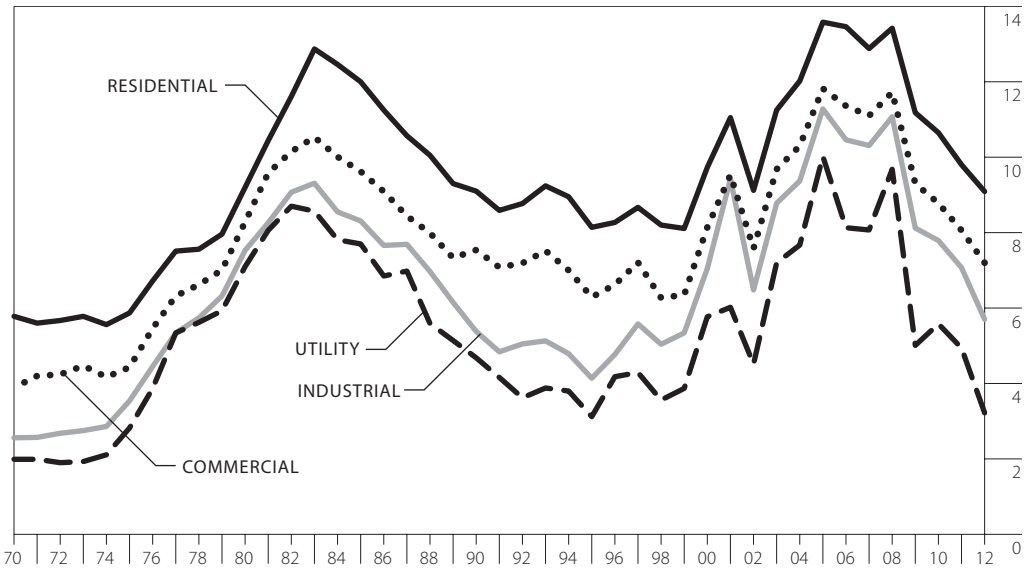
Plant	Consumption Thousand Tons	Average Btu Per Pound	Average Cents Per Million Btu	Average Dollars Per Ton	Average Percent Sulfur[a]
Dairyland Power Cooperative	1,847	8,668	285.4	49.47	0.57%
Alma - Madgett	1,251	8,762	273.6	47.94	0.53%
Genoa 3	596	8,469	311.0	52.67	0.65%
Manitowoc Public Utilities	48	13,178	229.4	60.46	1.40%
Manitowoc	48	13,178	229.4	60.46	1.40%
Northern States Power Co.	3	8,531	432.4	73.78	0.25%
Bay Front	3	8,531	432.4	73.78	0.25%
Wisconsin Electric Power Co.	8,049	9,055	260.1	47.11	0.42%
Elm Road	627	12,986	382.6	99.38	2.08%
Oak Creek	2,298	8,757	242.3	42.44	0.21%
Pleasant Prairie	3,534	8,361	224.7	37.57	0.31%
Presque Isle	1,257	9,018	249.3	44.97	0.26%
Valley	332	11,201	403.1	90.30	0.43%
Wisconsin Power and Light Co.	7,151	8,611	205.7	35.42	0.26%
Columbia	4,528	8,604	170.7	29.37	0.26%
Edgewater	2,170	8,527	263.2	44.88	0.26%
Nelson Dewey	453	9,082	278.7	50.63	0.33%
Wisconsin Public Services Corp.	3,068	8,717	300.3	52.35	0.26%
Pulliam	376	8,587	355.5	61.05	0.25%
Weston	2,692	8,735	292.7	51.14	0.26%
Wisconsin	**20,165**	**8,820**	**249.5**	**44.02**	**0.35%**
United States	**609,445**	**9,795**	**242.5**	**47.51**	**1.18%**

a Percent by weight.

Source: U.S. Department of Energy, EIA, *Electric Power Monthly*, [DOE/EIA-0226(2014/02)] (February 2014), Tables 2.5 and 4.2, http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html; Annual reports of Wisconsin electric generating utilities (2012), http://psc.wi.gov/apps/annlreport/default.aspx; Dairyland Power Cooperative, Rural Utility Service (RUS) report for 2012 (April 2013).

Wisconsin Natural Gas Prices, by Economic Sector

1970-2012 DOLLARS PER MILLION BTU (2012 DOLLARS)



IN 2012 NATURAL GAS PRICES DECREASED IN **ALL SECTORS**

In 2012, natural gas prices decreased in all sectors. On average, the price decreased 19.4 percent.

1970-2012 DOLLARS PER MILLION BTU

	Current Dollars					2012 Dollars[a]				
Year	Residential	Commercial	Industrial	Utility	Average	Residential	Commercial	Industrial	Utility	Average
1970[r]	1.22	0.82	0.54	0.42	0.79	5.78	3.89	2.56	1.99	3.75
1975[r]	1.71	1.29	1.03	0.82	1.30	5.87	4.43	3.54	2.82	4.47
1980[r]	3.81	3.43	3.12	2.94	3.43	9.20	8.28	7.53	7.10	8.28
1985[r]	6.41	5.14	4.44	4.11	5.37	12.00	9.62	8.31	7.70	10.05
1990[r]	5.70	4.72	3.37	2.93	4.55	9.10	7.54	5.38	4.68	7.27
1995[r]	5.76	4.45	2.93	2.21	4.30	8.14	6.29	4.14	3.12	6.08
2000[r]	7.48	6.26	5.42	4.44	6.27	9.73	8.14	7.05	5.77	8.15
2005[r]	11.77	10.24	9.78	8.68	10.37	13.58	11.82	11.28	10.02	11.97
2006[r]	12.04	10.16	9.36	7.27	10.19	13.46	11.36	10.46	8.13	11.39
2007[r]	11.86	10.22	9.49	7.43	10.17	12.88	11.10	10.31	8.07	11.05
2008[r]	12.63	11.03	10.42	9.11	11.22	13.42	11.72	11.07	9.68	11.92
2009[r]	10.61	8.83	7.71	4.76	8.69	11.18	9.30	8.12	5.01	9.15
2010[r]	10.24	8.45	7.49	5.37	8.40	10.65	8.78	7.79	5.58	8.73
2011[r]	9.63	7.92	6.95	4.85	7.82	9.80	8.06	7.07	4.94	7.96
2012[p]	**9.09**	**7.20**	**5.70**	**3.22**	**6.42**	**9.09**	**7.20**	**5.70**	**3.22**	**6.42**

a 2012 dollar values computer with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.
p Preliminary estimates.
r Revised.
Source: Sector-specific pages in this chapter of this publication.

Wisconsin Natural Gas Prices, by Public Service Commission of Wisconsin Sector

AVERAGE PRICE OF NATURAL GAS 9.0%

The prices of utility gas for all customer classes decreased in 2012. The average price of natural gas in 2012 decreased by 9.0 percent from 2011. Prices for commercial and industrial gas do not include the price of transport gas but represent the cost of gas purchased directly from the utility.

1970-2012 DOLLARS PER MILLION BTU

	Residential		Commercial and Industrial			
Year	General	Space Heating	Firm	Interruptible	Space Heating	Average
1970r	1.55	1.18	0.73	0.49	0.92	0.81
1975r	2.13	1.68	1.16	1.00	1.40	1.31
1980r	4.34	3.77	3.22	3.07	3.49	3.44
1985r	7.53	6.36	4.98	4.23	5.28	5.36
1990r	6.78	5.67	4.28	3.00	4.49	4.85
1995r	7.01	5.77	4.14	2.47	4.63	4.72
1996r	7.00	5.95	4.26	3.30	4.75	5.08
1997r	7.47	6.39	4.68	3.63	5.17	5.56
1998	7.48	6.08	4.16	3.15	4.74	5.25
1999	7.61	6.10	4.93	2.84	4.71	5.33
2000	8.86	7.48	7.32	4.63	6.05	6.78
2001r	10.01	8.63	7.11	5.17	7.27	7.86
2002	8.79	7.29	6.19	3.91	5.92	6.50
2003	10.09	9.14	8.00	5.59	7.75	8.37
2004	11.20	10.03	8.80	6.94	8.56	9.27
2005r	13.34	11.70	11.24	8.92	10.18	10.83
2006r	13.71	11.95	10.44	8.17	10.09	10.97
2007r	13.57	11.79	9.64	7.96	10.12	10.86
2008r	14.35	12.57	10.69	9.27	10.95	11.76
2009	11.94	10.55	7.90	5.87	8.78	9.64
2010	11.85	10.20	7.98	5.69	8.32	9.24
2011r	11.07	9.55	7.61	5.47	7.70	8.62
2012p	**10.61**	**9.11**	**6.82**	**4.11**	**7.04**	**7.84**

p Preliminary estimates.

r Revised.

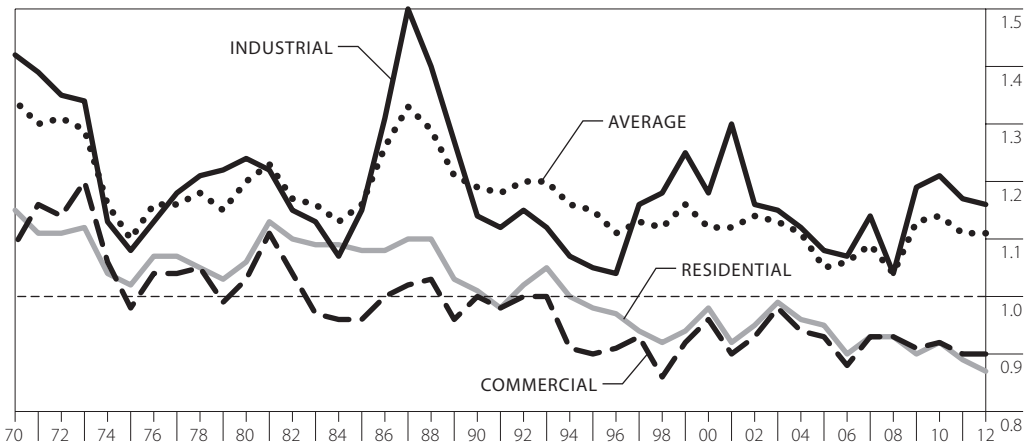
Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1971-1993), and from the PSC-AF 2, Docket 05-GF-159 (1994-2012).

Wisconsin Natural Gas Prices Relative to United States Natural Gas Prices, by Sector

The price of natural gas in Wisconsin is lower than the U.S. average price in the Residential and Commercial sectors, but it was 16.1 percent higher than the U.S. average in the Industrial sector in 2012.

The table shows the Wisconsin and United States prices by sector, while the graph shows the relationship (ratio) between these prices (Wisconsin:U.S.). A value above 1 means that the WI price is more than the U.S. average price, and value below 1 means that the WI price is less than the U.S. average price. A value of 1 means that the WI price is equal to the national average price.

1970-2012 RATIO OF WI TO U.S. NATURAL GAS PRICES



1970-2012 WI AND U.S. NATURAL GAS PRICES (DOLLARS PER MILLION BTU)

	WI Natural Gas Price (Dollars Per Million Btu)				U.S. Natural Gas Price (Dollars Per Million Btu)			
Year	Average	Residential	Commercial	Industrial	Average	Residential	Commercial	Industrial
1970r	0.79	1.22	0.82	0.54	0.59	1.06	0.75	0.38
1975r	1.30	1.71	1.29	1.03	1.18	1.67	1.32	0.95
1980r	3.43	3.81	3.43	3.12	2.86	3.60	3.32	2.52
1985r	5.37	6.41	5.14	4.44	4.61	5.94	5.34	3.87
1990r	4.55	5.70	4.72	3.37	3.82	5.63	4.70	2.95
1995r	4.30	5.76	4.45	2.93	3.73	5.89	4.94	2.80
2000r	6.27	7.48	6.26	5.42	5.61	7.63	6.54	4.60
2005r	10.37	11.77	10.24	9.78	9.92	12.34	10.98	9.08
2006r	10.19	12.04	10.16	9.36	9.62	13.35	11.60	8.77
2007r	10.17	11.86	10.22	9.49	9.31	12.70	10.99	8.29
2008r	11.22	12.63	11.03	10.42	10.83	13.52	11.89	10.06
2009r	8.69	10.61	8.83	7.71	7.67	11.81	9.70	6.46
2010r	8.40	10.24	8.45	7.49	7.37	11.13	9.20	6.17
2011r	7.82	9.63	7.92	6.95	7.03	10.78	8.79	5.96
2012	**6.42**	**9.09**	**7.20**	**5.70**	**5.76**	**10.44**	**8.03**	**4.91**

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, State Energy Data System, Wisconsin prices (1970-2012), http://www.eia.gov/state/seds/seds-data-complete.cfm.

Wisconsin's industrial natural gas prices are 16.1 percent higher than the national average. Smaller sized industrial customers pay the industrial rate, while larger industrial customers purchase natural gas—as transport gas—directly from the natural gas pipeline companies with a pass-through charge from the utilities.

Commerical customers, such as schools, businesss and governmental facilities, pay 10.3 percent less than the national average, while Wisconsin's residential customers using natural gas for appliances and space heating pay 87.1 percent of the national average. The rates paid by customers vary from month-to-month and can be found on the State Energy Office website.

The prices in this table have been historically revised to align with federal Energy Information Administration data.

Wisconsin Electricity Prices, by Economic Sector

IN 2012 ELECTRICITY DECREASED IN **ALL SECTORS**

Electricity prices in 2012 dollars saw a slight decrease across all sectors in 2012. The average price and commercial sector price of electricity dropped by 1.0 percent, while the residential sector dropped by half the average at 0.5 percent, and the industrial sector saw the biggest drop at 1.5 percent.

The Public Service Commission of Wisconsin and the federal Department of Energy, Energy Information Administration (EIA) both report electricity prices for Wisconsin economic sectors. Because of differences in sector definitions, accounting methods and inclusion of cooperative utilities, their prices do not match.

Prices for electricity have been historically revised with federal Energy Information Administration/State Energy Data System data.

1970-2012 CENTS PER kWh

	Current Dollars				2012 Dollars[a]			
Year	Residential	Commercial	Industrial	Average	Residential	Commercial	Industrial	Average
1970[r]	2.30	2.48	1.44	2.05	10.92	11.78	6.84	9.72
1975[r]	3.43	3.46	2.26	3.03	11.77	11.88	7.77	10.41
1980[r]	5.13	5.20	3.45	4.55	12.39	12.57	8.32	10.99
1985[r]	6.73	6.45	4.31	5.76	12.61	12.08	8.08	10.78
1990[r]	6.64	5.82	3.99	5.38	10.60	9.29	6.37	8.59
1995[r]	6.97	5.83	3.79	5.38	9.85	8.25	5.35	7.60
1996[r]	6.88	5.73	3.66	5.27	9.54	7.95	5.07	7.31
1997[r]	6.88	5.66	3.72	5.24	9.38	7.71	5.07	7.14
1998[r]	7.17	5.92	3.86	5.46	9.67	7.99	5.20	7.36
1999[r]	7.31	5.93	3.89	5.55	9.72	7.88	5.17	7.37
2000[r]	7.54	6.08	4.04	5.72	9.80	7.91	5.26	7.44
2001[r]	7.90	6.40	4.37	6.10	10.04	8.14	5.55	7.75
2002[r]	8.18	6.60	4.43	6.30	10.24	8.27	5.54	7.89
2003[r]	8.68	6.97	4.72	6.67	10.63	8.54	5.78	8.17
2004[r]	9.07	7.25	4.93	6.90	10.82	8.64	5.88	8.23
2005[r]	9.67	7.67	5.39	7.51	11.16	8.85	6.22	8.66
2006[r]	10.51	8.38	5.86	8.15	11.75	9.36	6.55	9.11
2007[r]	10.87	8.72	6.16	8.51	11.80	9.47	6.70	9.24
2008[r]	11.52	9.28	6.51	9.03	12.24	9.86	6.92	9.60
2009[r]	11.94	9.57	6.74	9.41	12.58	10.08	7.10	9.91
2010[r]	12.65	9.99	6.85	9.82	13.15	10.38	7.12	10.20
2011[r]	13.03	10.43	7.33	10.24	13.26	10.61	7.46	10.43
2012[p]	**13.19**	**10.51**	**7.35**	**10.32**	**13.19**	**10.51**	**7.35**	**10.32**

a 2012 dollar values computer with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.

p Preliminary estimates.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, State Energy Data System, Wisconsin prices (1970-2012), http://www.eia.gov/state/seds/seds-data-complete.cfm.

Wisconsin Electricity Prices, by Public Service Commission of Wisconsin Sector

1970-2012 CENTS PER kWh

Year	Residential	Commercial & Industrial	Rural[a]	Average[b]
1970	2.13	1.69	2.41	1.89
1975	3.22	2.60	3.42	2.85
1980	4.80	3.91	4.80	4.24
1985	6.70	5.15	6.38	5.67
1990	6.55	4.68	6.29	5.27
1995	6.91	4.55	6.61	5.27
1996	6.81	4.43	6.40	5.15
1997	6.81	4.40	6.27	5.11
1998	7.16	4.61	6.42	5.35
1999	7.31	4.69	6.56	5.46
2000	7.55	4.83	6.84	5.65
2001	7.93	5.18	7.23	6.01
2002	8.19	5.34	7.59	6.26
2003	8.73	5.63	8.27	6.60
2004	9.11	5.84	8.73	6.81
2005	9.72	6.36	9.23	7.38
2006	10.57	7.01	10.22	8.08
2007	10.90	7.30	10.56	8.38
2008	11.56	7.67	10.90	8.84
2009	11.92	8.03	11.04	9.24
2010	12.67	8.30	12.10	9.66
2011	13.06	8.76	12.41	10.09
2012[p]	**13.19**	**8.84**	**12.38**	**10.18**

a Rural, as listed by utilities.

b Utilities' average revenue per kWh.

p Preliminary estimates.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1971-1994); PSC-AF 1, Docket 05-GF-159 (1994-2012).

AVERAGE PRICE OF ELECTRICITY
0.9%

The prices of electricity for all customers classes, except rural, increased slightly in 2012. The average price of electricity increased by 0.9 percent over 2011. The residential sector increased by 1.0 percent, the commercial and industrial sectors showed a slight increase of 0.9 percent.

These data only include data from the Class A Investor Owned Utilities which comprise approximately 83 percent of all utility sales in the state.

The Public Service Commission of Wisconsin and the federal Department of Energy, Energy Information Administration (EIA) both report electricity prices for Wisconsin economic sectors. Because of differences in sector definitions, accounting methods and inclusion of cooperative utilities, their prices do not match.

Average Utility Electricity and Natural Gas Prices, by Economic Sector, for Selected Midwestern States

WISCONSIN'S AVERAGE ELECTRICITY PRICE WAS 4.3% GREATER THAN THE NATIONAL AVERAGE AND 2nd HIGHEST IN THE MIDWEST

In 2012, Wisconsin's average electricity price was 4.3 percent greater than the national average and the second highest in the Midwest for all three sectors. Wisconsin's commercial and industrial electricity prices were higher than the national averages for the same sectors by 4.2 and 9.9 percent respectively.

Illinois and Michigan lead the Midwest with the highest natural gas prices across all three economic sectors. Wisconsin and Ohio have the third highest prices in the Midwest.

2012 ELECTRICITY (CENTS PER kWh)

State	Average	Residential	Commercial	Industrial
Wisconsin	**10.32**	**13.19**	**10.51**	**7.35**
Illinois	8.40	11.37	7.99	5.80
Indiana	8.29	10.53	9.14	6.34
Iowa	7.71	10.82	8.01	5.30
Michigan	10.98	14.13	10.93	7.62
Minnesota	8.86	11.35	8.84	6.54
Ohio	9.12	11.76	9.47	6.24
U.S. Average	**9.89**	**11.88**	**10.09**	**6.69**

2012 NATURAL GAS (DOLLARS PER 1,000 CUBIC FEET)

State	City Gate[a]	Residential	Commercial	Industrial
Wisconsin	**6.42**	**9.09**	**7.20**	**5.70**
Illinois	6.84	8.17	7.69	5.58
Indiana	6.20	8.83	7.59	6.12
Iowa	5.87	9.33	7.03	4.64
Michigan	7.71	10.68	8.21	7.26
Minnesota	5.65	7.85	6.26	4.40
Ohio	6.42	9.59	6.88	5.30
U.S. Average	**5.76**	**10.44**	**8.03**	**4.91**

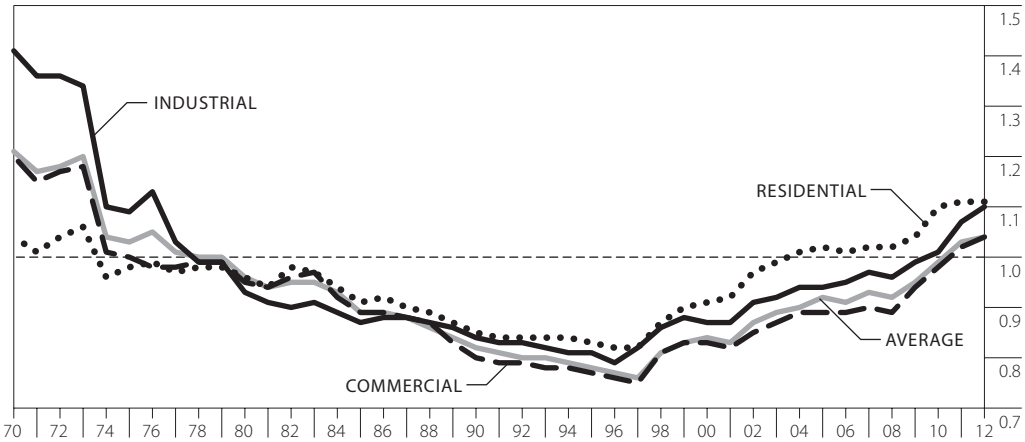
a City Gate is the point where a pipeline or distribution company delivers natural gas to the natural gas utility serving the city and the surrounding area.

Source: U.S. Department of Energy, EIA, *Electric Power Monthly*, Table 5.6.B [DOE/EIA-0226 (2014/02)] (February 2014) www.eia.doe.gov/electricity/monthly/index.cfm and *Natural Gas Monthly*, Tables 17, 18, 19 and 20 [DOE/EIA-0130 (2014/02)] (February 2014) http://www.eia.gov/naturalgas/monthly/

Wisconsin Electricity Prices Relative to United States Electricity Prices, by Sector

This graph shows the relationship between Wisconsin electric prices and U.S. average electric prices, by sector. A value above 1 means that the WI price is more than the U.S. average price, and value below 1 means that the WI price is less than the U.S. average price. A value of 1 means that the WI price is equal to the national average price.

1970-2012 RATIO OF WI TO U.S. ELECTRICITY PRICES



1970-2012 WI AND U.S. ELECTRICITY PRICES (CENTS PER kWh)

	WI Electricity Prices (Cents Per kWh)				U.S. Electricity Prices (Cents Per kWh)			
Year	Residential	Commercial	Industrial	Average (All Sectors)	Residential	Commercial	Industrial	Average (All Sectors)
1970r	2.30	2.48	1.44	2.05	2.22	2.08	1.02	1.70
1975r	3.43	3.46	2.26	3.03	3.51	3.45	2.07	2.94
1980r	5.13	5.20	3.45	4.55	5.36	5.48	3.69	4.76
1985r	6.73	6.45	4.31	5.76	7.39	7.27	4.97	6.50
1990r	6.64	5.82	3.99	5.38	7.84	7.24	4.75	6.59
1995r	6.97	5.83	3.79	5.38	8.41	7.61	4.67	6.92
2000r	7.54	6.08	4.04	5.72	8.24	7.34	4.64	6.84
2005r	9.67	7.67	5.39	7.51	9.45	8.67	5.72	8.16
2006r	10.51	8.38	5.86	8.15	10.41	9.46	6.15	8.92
2007r	10.87	8.72	6.16	8.51	10.66	9.65	6.39	9.16
2008r	11.52	9.28	6.51	9.03	11.27	10.37	6.81	9.77
2009r	11.94	9.57	6.74	9.41	11.51	10.17	6.83	9.86
2010r	12.65	9.99	6.85	9.82	11.54	10.19	6.79	9.87
2011r	13.03	10.43	7.33	10.24	11.72	10.24	6.83	9.94
2012	**13.19**	**10.51**	**7.35**	**10.32**	**11.88**	**10.09**	**6.69**	**9.89**

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, State Energy Data System, Wisconsin prices (1970-2012), http://www.eia.gov/state/seds/seds-data-complete.cfm.

WISCONSIN ELECTRIC PRICES EXCEED NATIONAL ELECTRIC PRICES

11.0% FOR RESIDENTIAL CUSTOMERS

4.2% FOR COMMERCIAL CUSTOMERS

9.9% FOR INDUSTRIAL CUSTOMERS

The price of electricity in Wisconsin continues to rise, and is now more than the U.S. average price for electricity, in all sectors. Overall, in 2012, Wisconsin customers paid 4.4 percent more for electricity than the national customer.

In 2012, residential sector prices were 11.0 percent above the national residential price, commercial sector prices were 4.2 percent higher, and industrial prices were 9.9 percent higher.

U.S. Energy Prices

REAL COST IN 2012 DOLLARS

CRUDE OIL
2.7%

NATURAL GAS
33.8%

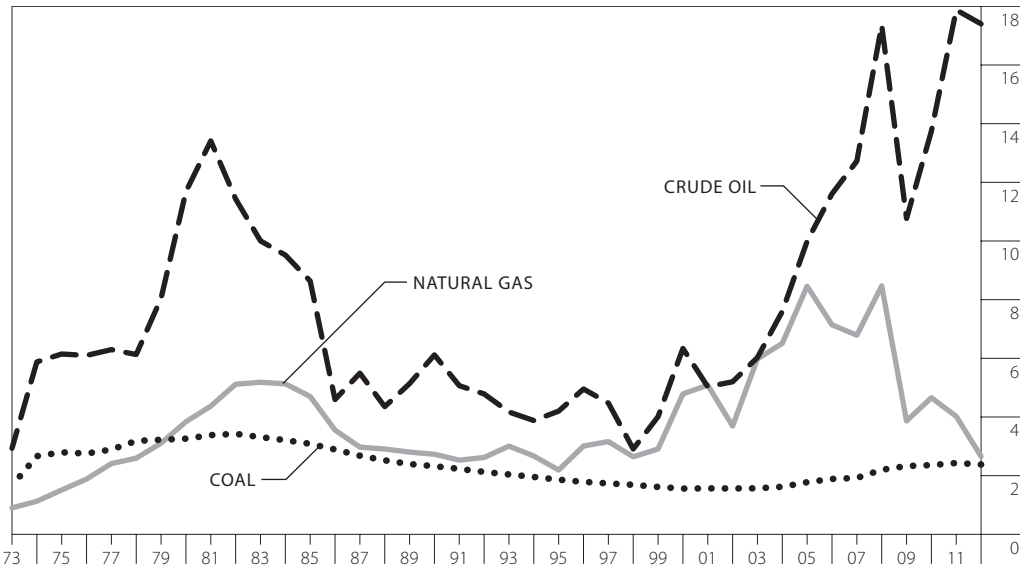
COAL
2.2%

In 2012, the real cost (2012 dollars) of crude oil decreased 2.7 percent and decreased 33.8 percent for natural gas. The cost of coal decreased slightly by 2.2 percent.

COST OF CRUDE OIL
174.6%
SINCE 2000

Since 2000, the cost of crude oil has increased by 174.6 percent.

1973-2012 DOLLARS PER MILLION BTU (2012 DOLLARS)



1973-2012 DOLLARS PER MILLION BTU

	Current Dollars				2012 Dollars[e]		
Year	Crude Oil Refiners Cost[a] $/Barrel	Crude Oil Refiners Cost[d] $/MMBtu	Natural Gas Wellhead[b] $/MMBtu	Coal Utility Cost[c] $/MMBtu	Crude Oil Refiners Cost $/MMBtu	Natural Gas Wellhead $/MMBtu	Coal Utility Cost $/MMBtu
1973	4.15	0.72	0.22	0.41	2.93	0.90	1.66
1975	10.38	1.79	0.44	0.81	6.15	1.51	2.80
1980	28.07	4.84	1.59	1.35	11.69	3.84	3.26
1985	26.75	4.61	2.51	1.65	8.64	4.70	3.09
1990	22.22	3.83	1.71	1.46	6.12	2.73	2.32
1995	17.23	2.97	1.55	1.32	4.20	2.19	1.86
2000	28.26	4.87	3.68	1.20	6.34	4.79	1.56
2005	50.24	8.66	7.33	1.54	9.99	8.46	1.78
2010	76.69	13.22	4.48	2.27	13.75	4.66	2.36
2011	101.87	17.56	3.95	2.39	17.88	4.02	2.43
2012[p]	**100.93**	**17.40**	**2.66**	**2.38**	**17.40**	**2.66**	**2.38**

a Refiners cost of crude oil is the composite price for domestic and imported crude oil. Most of this crude oil is purchased under contract as opposed to the spot market.

b Assumes 1,000 cubic feet = 1 MMBtu.

c Includes cost of delivery to utilities.

d Assumes 5.8 MMBtu/Barrel.

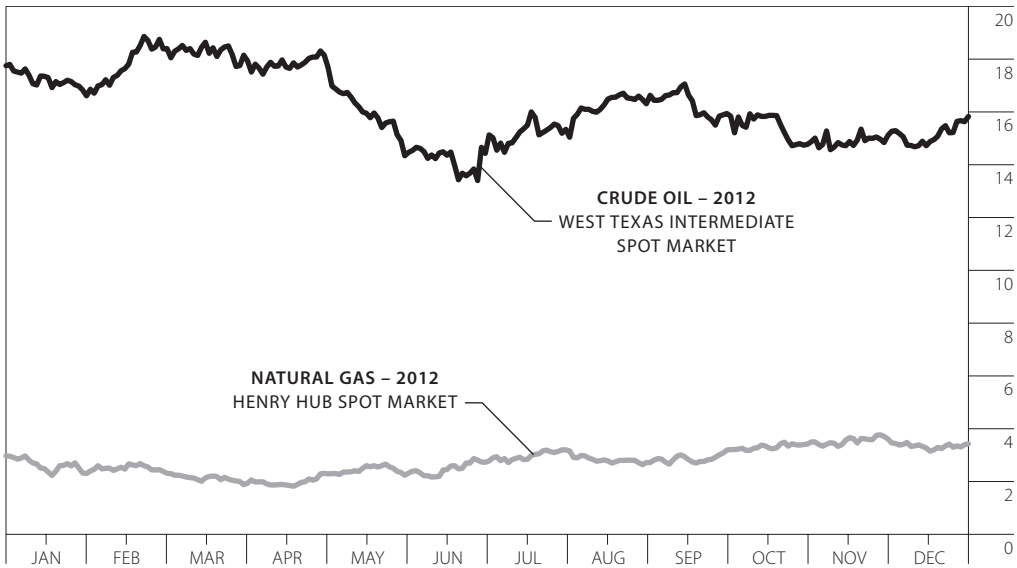
e 2012 dollar values computer with Gross National Product Implicit Price Deflator. See the last page in this chapter with the table on price indices.

p Preliminary estimates.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* Tables 9.1, 9.10 and 9.11 [DOE/EIA-0035(2013/05)] (May 2013); http://www.eia.gov/totalenergy/data/monthly/

U.S. Spot Market Prices of Crude Oil & Natural Gas

2012 DOLLARS PER MILLION BTU (2012 DOLLARS)[a]



WEST TEXAS INTERMEDIATE
1.1%
HENRY HUB
31.0%

In 2012, the average West Texas Intermediate crude oil spot market price decreased 1.1 percent, while the Henry Hub[b] spot market price of natural gas decreased 31.0 percent.

2009-2012 DOLLARS PER MILLION BTU

	Crude Oil West Texas Intermediate				Natural Gas Henry Hub			
Month	2009	2010	2011	2012	2009	2010	2011	2012
Jan.	7.19	13.62	15.44	17.29	5.24	5.81	4.47	2.67
Feb.	6.74	13.21	15.53	17.62	4.51	5.12	4.11	2.5
Mar.	8.27	13.96	17.77	18.30	3.96	4.33	3.98	2.17
Apr.	8.56	14.52	18.89	17.81	3.49	4.03	4.20	1.95
May	10.18	12.88	17.53	16.32	3.83	4.10	4.34	2.43
Jun.	12.01	12.97	16.91	14.19	3.80	4.76	4.60	2.46
Jul.	11.06	13.12	16.77	15.15	3.38	4.61	4.37	2.95
Aug.	12.25	13.04	14.78	16.23	3.14	4.20	4.03	2.84
Sep.	11.97	12.95	14.89	16.30	2.99	3.93	3.93	2.85
Oct.	13.05	14.11	14.76	15.43	4.01	3.48	3.55	3.32
Nov.	13.48	14.49	16.75	14.92	3.70	3.75	3.18	3.54
Dec.	12.82	15.40	16.93	15.15	5.30	4.22	3.12	3.34
Average $/MMBtu	**10.63**	**13.69**	**16.41**	**16.23**	**3.95**	**4.36**	**3.99**	**2.75**
Average $/Barrel	**61.66**	**79.39**	**95.18**	**94.05**				

a Graph is plotted with daily 2012 data.

b Henry Hub is a natural gas pipeline hub in Louisiana.

Source: Oil Daily, electronically received data (2006-2008); U.S. Department of Energy, Energy Information Administration http://tonto.eia.doe.gov/dnav/pet/pet_pri_spt_s1_d.htm (2009-2012); Henry Hub data also from http://www.neo.ne.gov/statshtml/124_20081203.htm (2008); Bloomberg.com Energy Prices (2009-2011); U.S. Department of Energy, Energy Information Administration http://www.eia.gov/dnav/ng/hist/rngwhhdm.htm (2012).

National Indices of Price Inflation

PRODUCER PRICE INDEX
1.8%

Price inflation indices are a measure of how much prices have changed from year to year. Each index is the ratio of prices in a given year to the base year. Each different index is normalized to 100 in different years. See footnotes for specific years. The percentage figure is the percent change from the previous year.

The broadest measure of price inflation is the Gross Domestic Product (GDP) price index. In 2012, the GDP index increased 1.8 percent compared to the 23 year average from 1990 to 2012 of 2.2 percent.

1970-2012 ANNUAL RATE OF INFLATION

Year	Gross Domestic Product[a,r]		Producer Price Index[b]		Personal Consumption Expenditures[c,r]		Consumer Price Index[d]	
1970	24.34	5.3%	36.9	3.7%	23.67	4.7%	38.8	5.7%
1975	33.59	9.4%	58.4	9.2%	32.18	8.4%	53.8	9.1%
1980	47.79	9.1%	89.8	14.1%	46.64	10.7%	82.4	13.5%
1985	61.63	3.0%	103.2	-0.5%	59.88	3.3%	107.6	3.6%
1990	72.26	3.9%	116.3	3.7%	72.18	4.6%	130.7	5.4%
1995	81.61	2.1%	124.7	3.6%	82.08	2.2%	152.4	2.8%
1996	83.16	1.9%	127.7	2.4%	83.86	2.2%	156.9	3.0%
1997	84.63	1.8%	127.6	-0.1%	85.43	1.9%	160.5	2.3%
1998	85.58	1.1%	124.4	-2.5%	86.25	1.0%	163.0	1.6%
1999	86.84	1.5%	125.5	0.9%	87.64	1.6%	166.6	2.2%
2000	88.72	2.2%	132.7	5.7%	89.82	2.5%	172.2	3.4%
2001	90.73	2.3%	134.2	1.1%	91.53	1.9%	177.1	2.8%
2002	92.20	1.6%	131.1	-2.3%	92.78	1.4%	179.9	1.6%
2003	94.14	2.1%	138.1	5.3%	94.66	2.0%	184.0	2.3%
2004	96.79	2.8%	146.7	6.2%	97.12	2.6%	188.9	2.7%
2005	100.00	3.3%	157.4	7.3%	100.00	3.0%	195.3	3.4%
2006	103.23	3.2%	164.7	4.6%	102.72	2.7%	201.6	3.2%
2007	106.23	2.9%	172.6	4.8%	105.50	2.7%	207.3	2.8%
2008	108.58	2.2%	189.6	9.8%	108.94	3.3%	215.3	3.9%
2009[r]	109.53	0.9%	172.9	-8.8%	109.00	0.1%	214.5	-0.4%
2010	110.99	1.3%	184.7	6.8%	111.09	1.9%	218.1	1.7%
2011[r]	113.36	2.1%	201.0	8.8%	113.79	2.4%	224.9	3.1%
2012[p]	**115.39**	**1.8%**	**202.2**	**0.6%**	**115.79**	**1.8%**	**229.6**	**2.1%**

a Gross Domestic Product Implicit Price Deflator, 2005 = 100, used in other tables to deflate residential, commercial, industrial, motor fuel and electric utility prices. http://www.bea.gov/national/

b All commodities, 1982 = 100, BLS series ID: WPU00000000.

c Implicit Price Deflator, 2005 = 100.

d All items, all urban consumers, 1982-1984 = 100, BLS series ID: CUUR0000SA0.

p Preliminary estimates.

r Revised.

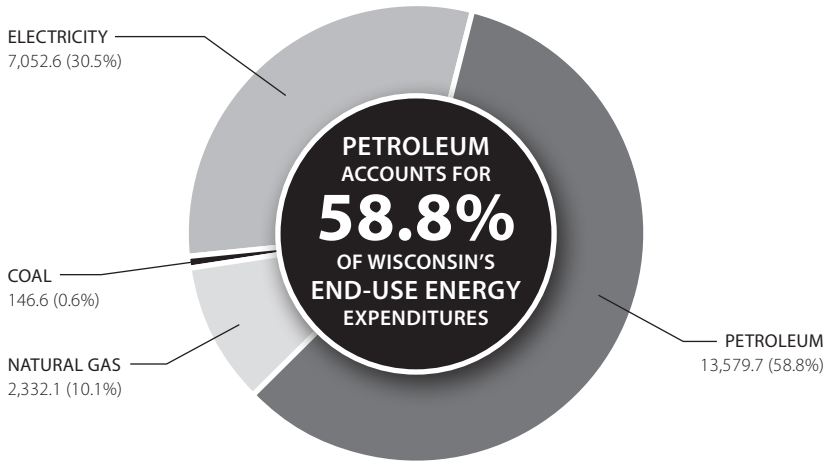
Source: U.S. Department of Commerce, Bureau of Economic Analysis, *Economic Indicators* (March 2013) http://www.bea.gov/national/nipaweb/TableView.asp, *Survey of Current Business* (March 2013); Bureau of Labor Statistics, (March 2013), http://data.bls.gov/cgi-bin/surveymost?cu.

CHAPTER 7

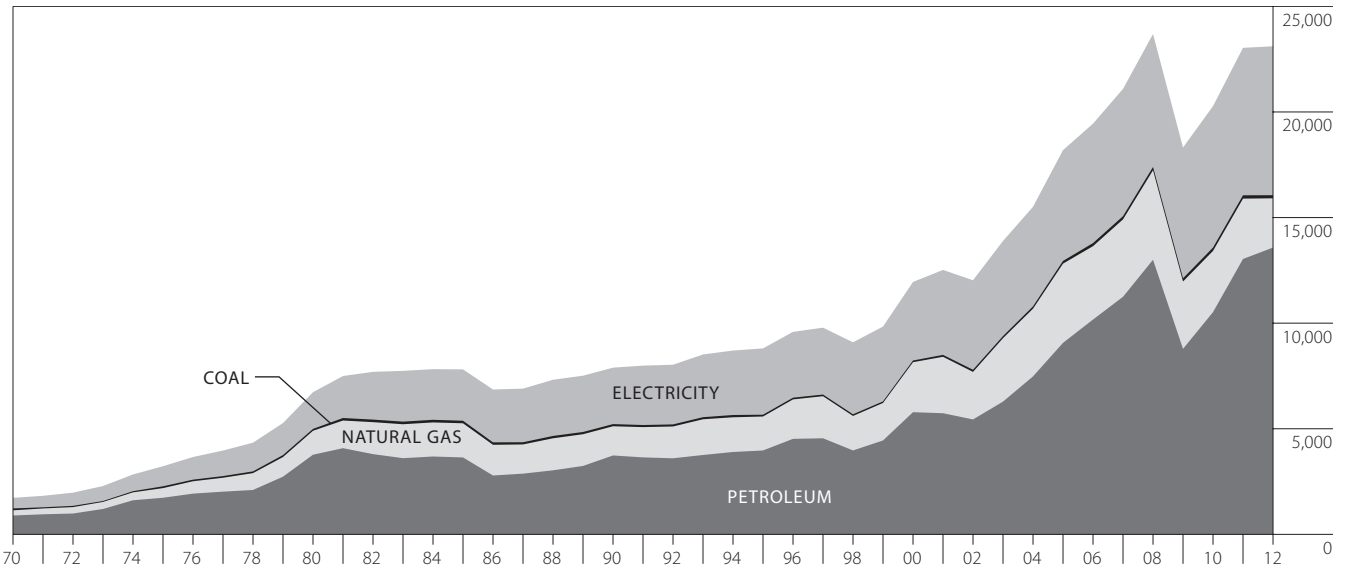
Wisconsin Expenditures for Energy

Wisconsin End-Use Energy Expenditures, by Type of Fuel

2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL



1970-2012 MILLIONS OF DOLLARS



Source: Wisconsin State Energy Office.

Wisconsin End-Use Energy Expenditures, by Type of Fuel

The tables in this chapter show annual expenditures for the major energy resources used by Wisconsin's residential, commercial, industrial, agricultural and transportation sectors since 1970. Because consistent and reliable historic prices of wood, waste fuels and biogas are not available, expenditures for these fuels are excluded from the tables.

1970-2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Electricity		Total
1970r	893.1	*51.6%*	244.6	*14.1%*	90.1	*5.2%*	502.6	*29.0%*	1,730.3
1975r	1,732.9	*53.7%*	457.1	*14.2%*	86.2	*2.7%*	949.9	*29.4%*	3,226.1
1980r	3,770.7	*56.0%*	1,133.8	*16.8%*	89.0	*1.3%*	1,736.8	*25.8%*	6,730.2
1985r	3,642.1	*46.6%*	1,616.8	*20.7%*	121.6	*1.6%*	2,431.2	*31.1%*	7,811.8
1990r	3,736.2	*47.3%*	1,381.9	*17.5%*	102.9	*1.3%*	2,672.0	*33.9%*	7,893.0
1995r	3,972.6	*45.1%*	1,607.3	*18.3%*	85.6	*1.0%*	3,138.8	*35.7%*	8,804.4
1996r	4,522.5	*47.2%*	1,867.5	*19.5%*	81.3	*0.8%*	3,116.1	*32.5%*	9,587.4
1997r	4,549.0	*46.5%*	1,992.1	*20.4%*	80.3	*0.8%*	3,165.3	*32.3%*	9,786.8
1998r	3,974.2	*43.7%*	1,632.4	*18.0%*	78.3	*0.9%*	3,407.0	*37.5%*	9,091.9
1999r	4,445.4	*45.2%*	1,776.4	*18.1%*	74.3	*0.8%*	3,543.5	*36.0%*	9,839.5
2000r	5,785.5	*48.4%*	2,366.3	*19.8%*	80.1	*0.7%*	3,719.6	*31.1%*	11,951.4
2001r	5,735.5	*45.8%*	2,671.9	*21.3%*	90.9	*0.7%*	4,022.0	*32.1%*	12,520.4
2002r	5,441.5	*45.2%*	2,250.7	*18.7%*	101.5	*0.8%*	4,237.6	*35.2%*	12,031.2
2003r	6,285.6	*45.2%*	3,003.6	*21.6%*	98.8	*0.7%*	4,505.1	*32.4%*	13,893.1
2004r	7,479.0	*48.2%*	3,206.3	*20.7%*	109.2	*0.7%*	4,714.5	*30.4%*	15,508.9
2005r	9,067.0	*49.9%*	3,751.3	*20.6%*	128.3	*0.7%*	5,244.8	*28.9%*	18,191.5
2006r	10,170.9	*52.3%*	3,475.1	*17.8%*	146.2	*0.8%*	5,653.8	*29.1%*	19,446.0
2007r	11,248.2	*53.4%*	3,665.6	*17.3%*	151.7	*0.7%*	6,027.1	*28.6%*	21,092.6
2008r	13,001.5	*55.0%*	4,237.6	*17.7%*	155.8	*0.7%*	6,292.6	*26.6%*	23,687.5
2009r	8,783.8	*48.0%*	3,187.9	*17.3%*	151.7	*0.8%*	6,193.9	*33.9%*	18,317.3
2010r	10,521.3	*51.9%*	2,899.0	*14.2%*	158.3	*0.8%*	6,698.6	*33.1%*	20,277.3
2011r	13,038.4	*56.6%*	2,857.9	*12.3%*	158.8	*0.7%*	6,981.2	*30.3%*	23,036.4
2012p	**13,579.7**	***58.8%***	**2,332.1**	***10.0%***	**146.6**	***0.6%***	**7,052.6**	***30.5%***	**23,111.0**

p Preliminary estimates.

r Revised due to revisions in price and consumption data.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal and electricity use and prices, by economic sector.

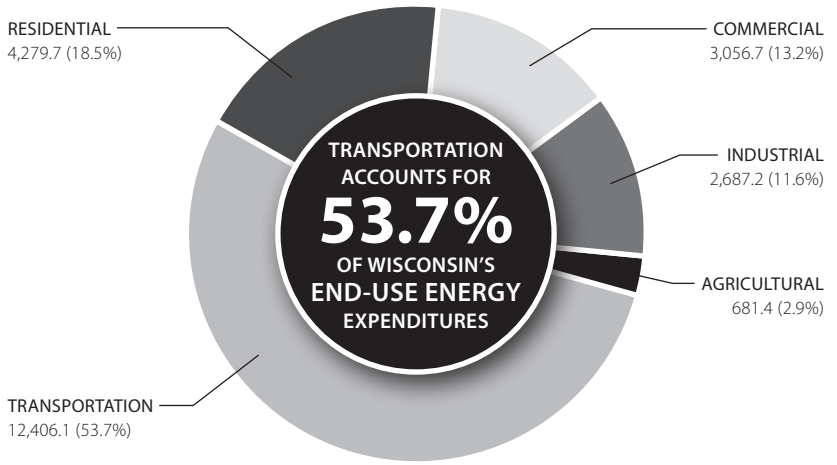
WISCONSIN'S
OVERALL
ENERGY BILL
0.3%

In 2012, Wisconsin's overall energy bill increased 0.3 percent—from $23.0 billion in 2011 to $23.1 billion. This increase of $74.7 million means 2012 expenditures were the highest since 2008.

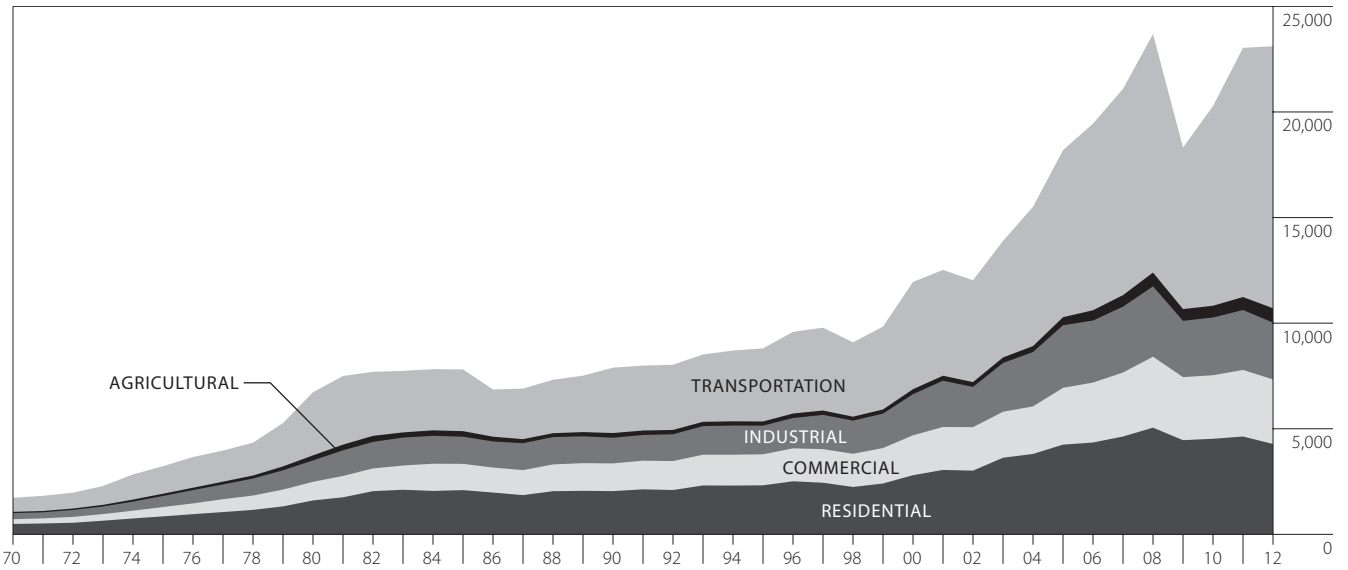
Expenditures increased for petroleum ($541.4 million or 4.2 percent) and electricity ($71.4 million, 1.0 percent), and fell for natural gas ($525.8 million, 18.4 percent) and coal ($12.3 million, 7.7 percent). Since 2000, Wisconsin's total energy expenditures have almost doubled—a 93.4 percent increase—by $11.2 billion.

Wisconsin End-Use Energy Expenditures, by Economic Sector

2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL



1970-2012 MILLIONS OF DOLLARS



Source: Wisconsin State Energy Office.

Wisconsin End-Use Energy Expenditures, by Economic Sector

1970-2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Agricultural		Transportation		Total
1970r	494.7	*28.6%*	221.0	*12.8%*	290.7	*16.8%*	59.6	*3.4%*	664.3	*38.4%*	1,730.3
1975r	851.4	*26.4%*	443.0	*13.7%*	523.1	*16.2%*	106.9	*3.3%*	1,301.7	*40.3%*	3,226.1
1980r	1,606.0	*23.9%*	881.4	*13.1%*	1,015.4	*15.1%*	236.8	*3.5%*	2,990.6	*44.4%*	6,730.2
1985r	2,095.3	*26.8%*	1,242.5	*15.9%*	1,287.0	*16.5%*	261.8	*3.4%*	2,925.1	*37.4%*	7,811.8
1990r	2,047.2	*25.9%*	1,313.3	*16.6%*	1,214.6	*15.4%*	222.6	*2.8%*	3,095.3	*39.2%*	7,893.0
1995r	2,320.9	*26.4%*	1,469.6	*16.7%*	1,357.7	*15.4%*	196.0	*2.2%*	3,460.0	*39.3%*	8,804.4
1996r	2,512.6	*26.2%*	1,560.1	*16.3%*	1,435.8	*15.0%*	212.8	*2.2%*	3,866.1	*40.3%*	9,587.4
1997r	2,444.6	*25.0%*	1,590.6	*16.3%*	1,622.2	*16.6%*	206.6	*2.1%*	3,922.8	*40.1%*	9,786.8
1998r	2,243.1	*24.7%*	1,573.1	*17.3%*	1,569.7	*17.3%*	185.8	*2.0%*	3,520.4	*38.7%*	9,091.9
1999r	2,408.1	*24.5%*	1,679.3	*17.1%*	1,629.8	*16.6%*	196.0	*2.0%*	3,926.4	*39.9%*	9,839.5
2000r	2,801.9	*23.4%*	1,888.3	*15.8%*	1,948.3	*16.3%*	234.5	*2.0%*	5,078.4	*42.5%*	11,951.4
2001r	3,050.3	*24.4%*	2,034.4	*16.2%*	2,190.8	*17.5%*	235.3	*1.9%*	5,009.6	*40.0%*	12,520.4
2002r	3,017.1	*25.1%*	2,060.2	*17.1%*	1,904.0	*15.8%*	227.5	*1.9%*	4,822.4	*40.1%*	12,031.2
2003r	3,627.7	*26.1%*	2,177.7	*15.7%*	2,308.4	*16.6%*	261.3	*1.9%*	5,517.9	*39.7%*	13,893.1
2004r	3,807.1	*24.5%*	2,252.4	*14.5%*	2,574.0	*16.6%*	282.1	*1.8%*	6,593.3	*42.5%*	15,508.9
2005r	4,249.2	*23.4%*	2,690.5	*14.8%*	2,961.5	*16.3%*	379.9	*2.0%*	7,910.3	*43.5%*	18,191.5
2006r	4,349.1	*22.4%*	2,838.1	*14.6%*	2,937.3	*15.1%*	487.3	*2.4%*	8,834.2	*45.5%*	19,446.0
2007r	4,632.9	*22.0%*	3,031.3	*14.4%*	3,118.0	*14.8%*	544.6	*2.5%*	9,765.8	*46.3%*	21,092.6
2008r	5,051.7	*21.4%*	3,360.0	*14.2%*	3,330.9	*14.1%*	653.1	*2.6%*	11,291.9	*47.8%*	23,687.5
2009r	4,460.3	*24.4%*	2,985.9	*16.3%*	2,664.8	*14.6%*	555.5	*2.9%*	7,650.8	*41.8%*	18,317.3
2010r	4,525.0	*22.3%*	3,008.6	*14.8%*	2,734.0	*13.5%*	557.0	*2.7%*	9,452.7	*46.6%*	20,277.3
2011r	4,631.8	*20.1%*	3,154.4	*13.7%*	2,834.8	*12.3%*	615.9	*2.6%*	11,799.5	*51.3%*	23,036.4
2012p	**4,279.7**	***18.5%***	**3,056.7**	***13.2%***	**2,687.2**	***11.6%***	**681.4**	***2.9%***	**12,406.1**	***53.7%***	**23,111.0**

p Preliminary estimates.

r Revised due to revisions in price and consumption data.

Source: Compiled from tables in this publication for Wisconsin residential, commercial, industrial, agricultural and transportation energy use and prices, by type of fuel.

WISCONSIN'S **END-USE** ENERGY EXPENDITURES **0.3%** OVERALL

In 2012, energy expenditures increased overall by 0.3 percent, or $74.7 million.

The agriculture ($65.5 million, 10.6 percent) and transportation sectors ($606.0 million, 5.1 percent) saw increases in expenditures.

The remaining sectors saw decreases of $352.1 million (7.6 percent) in the residential sector, $97.8 million (3.1 percent) in the commercial sector, and $147.7 million (5.2 percent) in the industrial sector.

Wisconsin Resource Use Energy Expenditures, Estimated Dollars Leaving Wisconsin

This page estimates the amount of money spent on energy in Wisconsin that leaves the state. In 2012, $15.7 billion — a 1.3 percent increase over 2011 — left the state, comprising 68.1 percent of Wisconsin's $23.1 billion in end-use energy expenditures.

Like the other tables in this chapter, these dollar amounts do not include specific expenditures on renewable energy. The exception is where imported electricity is generated by renewable sources.

Of all petroleum energy expenditures, 85 percent are estimated to leave the state because petroleum refining operations are not located in Wisconsin, with the exception of Murphy Oil in Superior. The 15 percent estimated to stay in the state is due to Wisconsin-based gasoline and diesel blenders and retailers, LP and heating oil businesses, and utility revenues. Natural Gas production occurs out-of-state and natural gas pipelines are owned by out-of-state companies. The 15 percent estimated to stay in Wisconsin is attributed to in-state natural gas distribution businesses, LP businesses, and utility revenues.

Ninety-five percent of all expenditures on coal leave Wisconsin because this is an out-of-state resource. The five percent of expenditures estimated to stay in-state are attributed to utility revenues. All of the expenditures on imported electricity are necessarily attributed to out-of-state expenditures because this electricity is purchased from generation sources not based in Wisconsin.

1970-2012 MILLIONS OF DOLLARS

	Petroleum		Natural Gas		Coal		Imported Electricity		Total
Year	Expenditures	Expenditure Leaving State	Expenditures	Expenditure Leaving State	Expenditures	Expenditure Leaving State	Expenditures	Expenditure Leaving State	Expenditure Leaving State
1970[r]	898.9	764.1	257.6	219.0	177.1	168.2	-51.2	-51.2	1,100.2
1975[r]	1,753.6	1,490.6	473.3	402.3	267.2	253.8	-54.7	-54.7	2,092.1
1980[r]	3,798.3	3,228.5	1,175.3	999.0	471.5	447.9	-26.0	-26.0	4,649.5
1985[r]	3,651.8	3,104.0	1,622.6	1,379.2	664.9	631.6	-9.2	-9.2	5,105.7
1990[r]	3,742.9	3,181.5	1,388.9	1,180.6	585.4	556.1	417.6	417.6	5,335.7
1995[r]	3,975.8	3,379.5	1,629.6	1,385.2	555.8	528.0	585.1	585.1	5,877.8
1996[r]	4,527.1	3,848.0	1,889.8	1,606.3	546.4	519.1	373.8	373.8	6,347.2
1997[r]	4,556.1	3,872.7	2,042.5	1,736.2	583.9	554.7	604.3	604.3	6,767.8
1998[r]	3,980.5	3,383.4	1,697.3	1,442.7	558.6	530.7	520.2	520.2	5,877.1
1999[r]	4,453.6	3,785.5	1,838.9	1,563.1	543.1	516.0	490.7	490.7	6,355.3
2000[r]	5,795.4	4,926.1	2,461.3	2,092.1	560.9	532.8	497.1	497.1	8,048.1
2001[r]	5,749.4	4,887.0	2,778.8	2,362.0	586.1	556.8	655.9	655.9	8,461.7
2002[r]	5,449.4	4,632.0	2,325.2	1,976.4	604.3	574.1	560.0	560.0	7,742.5
2003[r]	6,296.8	5,352.3	3,146.2	2,674.3	637.3	605.4	512.6	512.6	9,144.6
2004[r]	7,492.0	6,368.2	3,343.9	2,842.3	672.2	638.6	574.2	574.2	10,423.3
2005[r]	9,090.0	7,726.5	4,266.9	3,626.9	735.3	698.5	833.3	833.3	12,885.2
2006[r]	10,194.1	8,665.0	3,798.6	3,228.8	828.4	787.0	408.6	408.6	13,089.4
2007[r]	11,279.3	9,587.4	4,073.5	3,462.5	928.9	882.5	665.0	665.0	14,597.3
2008[r]	13,024.1	11,070.5	4,617.5	3,924.8	1,111.4	1,055.9	577.8	577.8	16,629.0
2009[r]	8,791.0	7,472.3	3,385.9	2,878.0	1,030.0	978.5	567.7	567.7	11,896.5
2010[r]	10,529.7	8,950.2	3,130.5	2,660.9	1,168.3	1,109.9	422.4	422.4	13,143.5
2011[r]	13,049.5	11,092.1	3,092.7	2,628.8	1,278.9	1,214.9	603.2	603.2	15,539.0
2012[p]	**13,592.7**	**11,553.8**	**2,617.4**	**2,224.8**	**1,041.1**	**989.1**	**972.4**	**972.4**	**15,740.1**

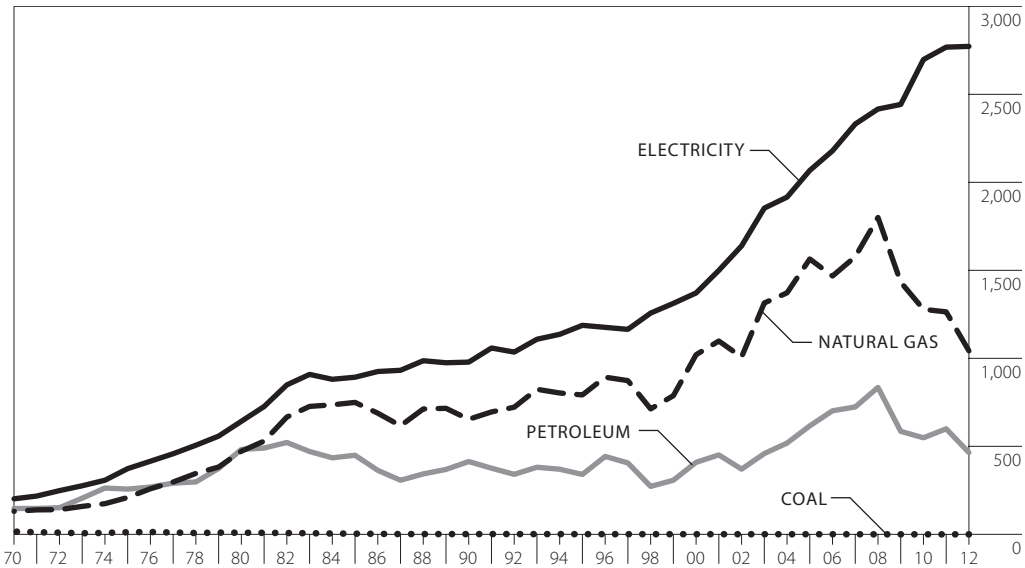
p Preliminary estimates.

r Revised due to revisions in price and consumption data.

Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal and electricity use and prices, by economic sector.

Wisconsin Expenditures for Residential Energy, by Type of Fuel

1970-2012 MILLIONS OF DOLLARS



1970-2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Electricity		Total[a]
1970[r]	146.8	*29.7%*	130.5	*26.4%*	15.5	*3.1%*	201.8	*40.8%*	494.7
1975[r]	257.0	*30.2%*	209.4	*24.6%*	11.8	*1.4%*	373.3	*43.8%*	851.4
1980[r]	482.3	*30.0%*	472.4	*29.4%*	9.0	*0.6%*	642.3	*40.0%*	1,606.0
1985[r]	449.2	*21.4%*	749.6	*35.8%*	3.8	*0.2%*	892.7	*42.6%*	2,095.3
1990[r]	413.7	*20.2%*	653.6	*31.9%*	1.3	*0.1%*	978.5	*47.8%*	2,047.2
1995[r]	340.2	*14.7%*	792.0	*34.1%*	1.1	*0.0%*	1,187.6	*51.2%*	2,320.9
2000[r]	409.1	*14.6%*	1,020.6	*36.4%*	0.7	*0.0%*	1,371.5	*48.9%*	2,801.9
2005[r]	616.4	*14.5%*	1,564.5	*36.8%*	0.6	*0.0%*	2,067.7	*48.7%*	4,249.2
2006[r]	702.0	*16.1%*	1,467.6	*33.7%*	0.5	*0.0%*	2,179.0	*50.1%*	4,349.1
2007[r]	723.8	*15.6%*	1,577.3	*34.0%*	0.4	*0.0%*	2,331.4	*50.3%*	4,632.9
2008[r]	834.8	*16.5%*	1,800.3	*35.6%*	0.0	*0.0%*	2,416.5	*47.8%*	5,051.7
2009[r]	585.1	*13.1%*	1,432.8	*32.1%*	0.0	*0.0%*	2,442.4	*54.8%*	4,460.3
2010[r]	548.7	*12.1%*	1,278.5	*28.3%*	0.0	*0.0%*	2,697.8	*59.6%*	4,525.0
2011[r]	599.6	*12.9%*	1,264.0	*27.3%*	0.0	*0.0%*	2,768.2	*59.8%*	4,631.8
2012[p]	**464.7**	***10.9%***	**1,042.6**	***24.4%***	**0.0**	***0.0%***	**2,772.5**	***64.8%***	**4,279.7**

a Does not include renewable energy, except those renewable fuels used in electricity production.
p Preliminary estimates.
r Revised due to revisions in price and consumption data.
Source: Compiled from tables in this publication for Wisconsin residential energy use and prices.

WISCONSIN'S **OVERALL** RESIDENTIAL ENERGY EXPENDITURES **7.6%**

In 2012, overall residential energy expenditures decreased by 7.6 percent ($352.1 million) from 2011. Expenditures increased for electricity (0.2 percent, $4.3 million) while petroleum and natural gas saw decreases of 22.5 percent ($134.9 million) and 17.5 percent ($221.4 million), respectively.

Increases in natural gas expenditures are primarily due to the use of natural gas as a space heating fuel, while petroleum expenditures are due primarily to transportation expenses.

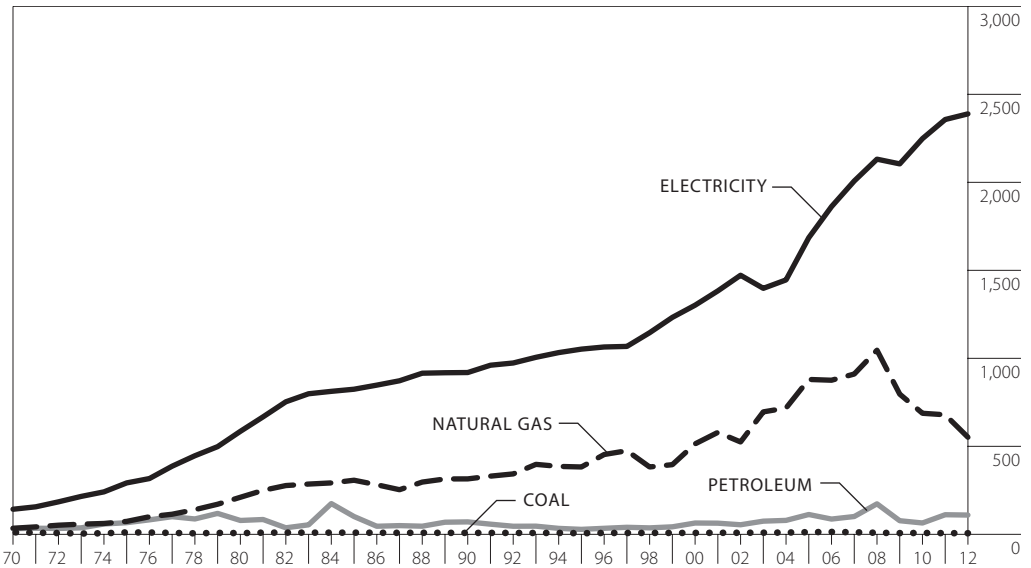
Wisconsin Expenditures for Commercial Energy, by Type of Fuel

WISCONSIN EXPENDITURES FOR **COMMERCIAL** ENERGY

3.1%

Commercial energy expenditures decreased 3.1 percent ($97.8 million) in 2012. Commercial energy expenditures are dominated (78.2 percent) by electricity used for lighting, cooling, ventilation and office equipment.

1970-2012 MILLIONS OF DOLLARS



1970-2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Electricity		Total[a]
1970[r]	32.3	*14.6%*	34.6	*15.7%*	11.5	*5.2%*	142.6	*64.5%*	221.0
1975[r]	66.2	*14.9%*	73.5	*16.6%*	11.0	*2.5%*	292.2	*66.0%*	443.0
1980[r]	78.8	*8.9%*	210.6	*23.9%*	6.8	*0.8%*	585.2	*66.4%*	881.4
1985[r]	101.2	*8.1%*	307.4	*24.7%*	9.3	*0.8%*	824.6	*66.4%*	1,242.5
1990[r]	70.7	*5.4%*	315.1	*24.0%*	8.2	*0.6%*	919.4	*70.0%*	1,313.3
1995[r]	28.3	*1.9%*	382.8	*26.0%*	6.2	*0.4%*	1,052.4	*71.6%*	1,469.6
2000[r]	64.3	*3.4%*	514.0	*27.2%*	8.0	*0.4%*	1,302.0	*68.9%*	1,888.3
2005[r]	112.7	*4.2%*	880.1	*32.7%*	12.2	*0.5%*	1,685.5	*62.6%*	2,690.5
2006[r]	86.8	*3.1%*	875.6	*30.9%*	13.6	*0.5%*	1,862.0	*65.6%*	2,838.1
2007[r]	101.2	*3.3%*	910.8	*30.0%*	11.6	*0.4%*	2,007.7	*66.2%*	3,031.3
2008[r]	173.3	*5.2%*	1,046.2	*31.1%*	8.9	*0.3%*	2,131.6	*63.4%*	3,360.0
2009[r]	77.4	*2.6%*	796.6	*26.7%*	6.9	*0.2%*	2,104.9	*70.5%*	2,985.9
2010[r]	64.5	*2.1%*	687.9	*22.9%*	7.9	*0.3%*	2,248.3	*74.7%*	3,008.6
2011[r]	111.4	*3.5%*	679.3	*21.5%*	6.8	*0.2%*	2,357.0	*74.7%*	3,154.4
2012[p]	**109.6**	***3.6%***	**551.8**	***18.1%***	**6.2**	***0.2%***	**2,389.1**	***78.2%***	**3,056.7**

a Does not include renewable energy, except those renewable fuels used in electricity production.

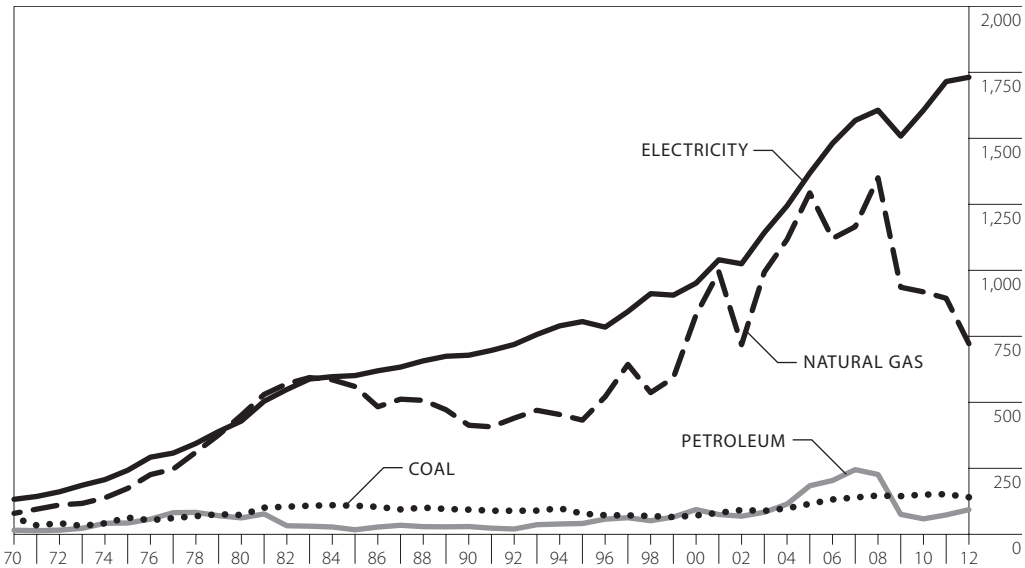
p Preliminary estimates.

r Revised due to revisions in price and consumption data.

Source: Compiled from tables in this publication for Wisconsin commercial energy use and prices.

Wisconsin Expenditures for Industrial Energy, by Type of Fuel

1970-2012 MILLIONS OF DOLLARS



1970-2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL

Year	Petroleum		Natural Gas		Coal		Electricity		Total[a]
1970[r]	15.5	*5.3%*	79.4	*27.3%*	63.1	*21.7%*	132.6	*45.6%*	290.7
1975[r]	42.9	*8.2%*	174.2	*33.3%*	63.4	*12.1%*	242.6	*46.4%*	523.1
1980[r]	62.2	*6.1%*	450.8	*44.4%*	73.2	*7.2%*	429.2	*42.3%*	1,015.4
1985[r]	17.3	*1.3%*	559.9	*43.5%*	108.5	*8.4%*	601.4	*46.7%*	1,287.0
1990[r]	29.5	*2.4%*	413.2	*34.0%*	93.5	*7.7%*	678.5	*55.9%*	1,214.6
1995[r]	41.1	*3.0%*	432.5	*31.9%*	78.3	*5.8%*	805.8	*59.4%*	1,357.7
2000[r]	93.8	*4.8%*	831.7	*42.7%*	71.3	*3.7%*	951.6	*48.8%*	1,948.3
2005[r]	184.0	*6.2%*	1,293.6	*43.7%*	115.5	*3.9%*	1,368.4	*46.2%*	2,961.5
2006[r]	203.9	*6.9%*	1,120.4	*38.1%*	132.0	*4.5%*	1,480.9	*50.4%*	2,937.3
2007[r]	245.0	*7.9%*	1,165.4	*37.4%*	139.7	*4.5%*	1,567.8	*50.3%*	3,118.0
2008[r]	226.8	*6.8%*	1,350.5	*40.5%*	147.0	*4.4%*	1,606.6	*48.2%*	3,330.9
2009[r]	75.7	*2.8%*	935.9	*35.1%*	144.8	*5.4%*	1,508.5	*56.6%*	2,664.8
2010[r]	58.6	*2.1%*	918.4	*33.6%*	150.5	*5.5%*	1,606.4	*58.8%*	2,734.0
2011[r]	73.6	*2.6%*	894.0	*31.5%*	152.1	*5.4%*	1,715.2	*60.5%*	2,834.8
2012[p]	**93.3**	***3.5%***	**722.2**	***26.9%***	**140.4**	***5.2%***	**1,731.3**	***64.4%***	**2,687.2**

a Does not include renewable energy, except those renewable fuels used in electricity production.
p Preliminary estimates.
r Revised due to revisions in price and consumption data.
Source: Compiled from tables in this publication for Wisconsin industrial energy use and prices.

WISCONSIN EXPENDITURES FOR **INDUSTRIAL** ENERGY **5.2%**

In 2012, industrial energy expenditures decreased 5.2 percent ($147.7 million). Industrial energy use is dominated by electricity (64.4 percent) and natural gas (26.9 percent).

Expenditures increased for petroleum ($19.7 million, 26.8 percent) and electricity ($16.1 million, 0.9 percent), while expenditures fell for natural gas ($171.8, 19.2 percent) and coal ($11.7 million, 7.7 percent).

Wisconsin Expenditures for Agricultural Energy, by Type of Fuel

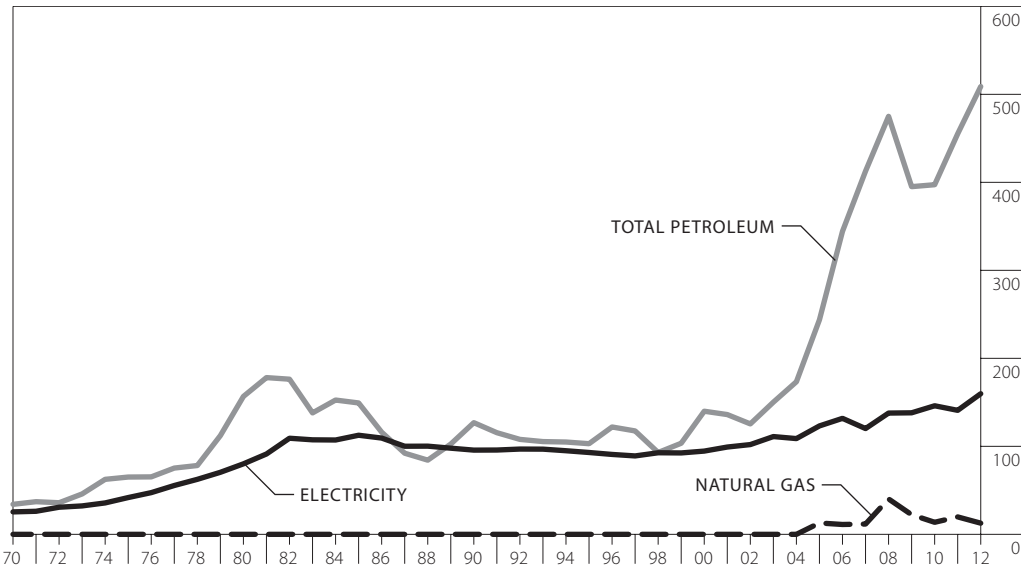
WISCONSIN'S **AGRICULTURAL** ENERGY BILL

10.6%

Wisconsin's agricultural energy bill is 10.6 percent more than 2011, an increase of $65.5 million

Natural gas data, which was not available prior to 2005, is now part of the overall calculation of agricultural energy expenditures. The agriculture sector uses natural gas primarily for space heating and crop drying.

1970-2012 MILLIONS OF DOLLARS



1970-2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL

Year	Motor Gasoline	Diesel Fuel[a]	LPG	Other Fuel[b]	Total Petroleum		Electricity		Natural Gas		Total[c]
1970	19.1	9.8	5.2		34.1	*57.2%*	25.5	*42.8%*			59.6
1975	30.1	24.1	10.8		65.1	*60.9%*	41.8	*39.1%*			106.9
1980	39.0	94.8	22.9		156.7	*66.2%*	80.1	*33.8%*			236.8
1985	22.4	99.0	27.8		149.3	*57.0%*	112.6	*43.0%*			261.8
1990	11.5	93.7	21.7		126.9	*57.0%*	95.7	*43.0%*			222.6
1995	8.0	71.9	23.1		103.0	*52.5%*	93.0	*47.5%*			196.0
2000	8.8	103.9	27.2		139.9	*59.7%*	94.6	*40.3%*			234.5
2005	72.6	130.7	36.5	4.0	243.8	*64.2%*	123.2	*32.4%*	12.9	*3.4%*	379.9
2006	68.1	224.0	47.1	5.1	344.3	*70.7%*	131.8	*27.0%*	11.2	*2.3%*	487.3
2007	84.9	269.0	53.7	5.1	412.7	*75.8%*	120.2	*22.1%*	11.7	*2.1%*	544.6
2008[d]	77.6	320.4	71.2	5.8	475.0	*72.7%*	137.8	*21.1%*	40.2	*6.2%*	653.1
2009	70.1	247.1	67.4	10.5	395.1	*71.1%*	138.1	*24.9%*	22.3	*4.0%*	555.5
2010	69.2	270.6	53.0	4.3	397.3	*71.3%*	146.1	*26.2%*	13.7	*2.5%*	557.0
2011	77.4	327.3	45.3	5.2	455.2	*73.9%*	140.9	*22.9%*	19.8	*3.2%*	615.9
2012[p]	**81.2**	**384.2**	**40.1**	**3.4**	**508.9**	***74.7%***	**159.8**	***23.5%***	**12.7**	***1.9%***	**681.4**

a Includes fuel oil and kerosene.

b The fuel is primarily distillate and kerosene, but may include small amounts of coal and wood.

c Does not include renewable energy, except those renewable fuels used in electricity production.

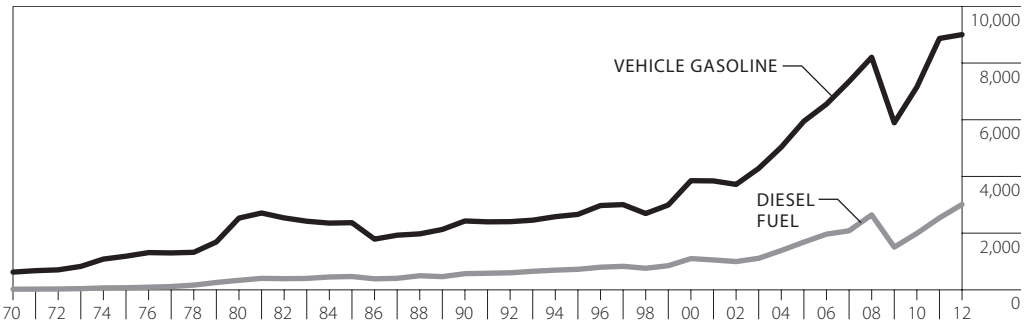
d The increase in expenditures in 2008 reflects the relatively high price of natural gas in that year, as well as the inclusion of nurseries and greenhouses in the sample.

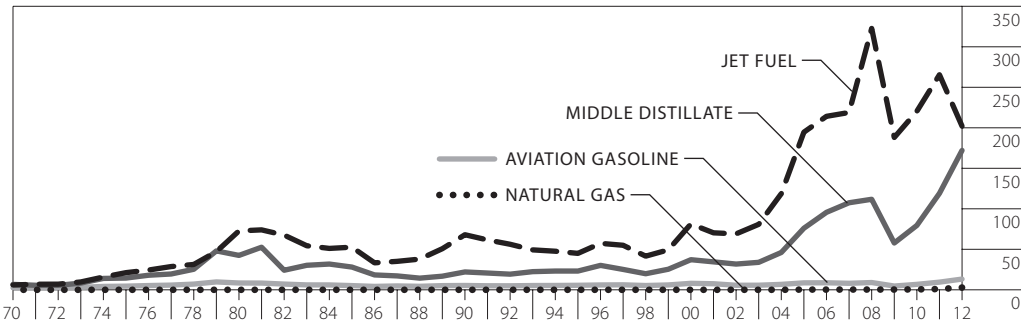
p Preliminary estimates.

Source: Compiled from tables in this publication for Wisconsin agricultural energy use and prices.

Wisconsin Expenditures for Transportation Energy, by Type of Fuel

1970-2012 MILLIONS OF DOLLARS





1970-2012 MILLIONS OF DOLLARS AND PERCENT OF TOTAL

Year	Vehicle Gasoline[a]		Diesel Fuel		Aviation Gasoline		Jet Fuel		Middle Distillate		Natural Gas		Total
1970	626.2	*94.3%*	23.0	*3.5%*	2.4	*0.4%*	5.9	*0.9%*	6.7	*1.0%*			664.3
1975	1,187.1	*91.2%*	74.4	*5.7%*	4.5	*0.3%*	21.2	*1.6%*	14.5	*1.1%*			1,301.7
1980	2,531.3	*84.6%*	335.7	*11.2%*	8.4	*0.3%*	72.7	*2.4%*	42.5	*1.4%*			2,990.6
1985	2,369.2	*81.0%*	470.0	*16.1%*	5.2	*0.2%*	52.6	*1.8%*	28.1	*1.0%*			2,925.1
1990	2,429.2	*78.5%*	570.8	*18.4%*	5.3	*0.2%*	68.0	*2.2%*	22.0	*0.7%*			3,095.3
1995	2,661.8	*76.9%*	724.6	*20.9%*	5.6	*0.2%*	45.0	*1.3%*	23.1	*0.7%*			3,460.0
2000	3,850.2	*75.8%*	1,101.7	*21.7%*	8.0	*0.2%*	81.3	*1.6%*	37.2	*0.7%*			5,078.4
2005	5,946.8	*75.2%*	1,684.1	*21.3%*	8.6	*0.1%*	194.6	*2.5%*	76.0	*1.0%*	0.289	*0.004%*	7,910.3
2006	6,550.7	*74.2%*	1,964.8	*22.2%*	8.7	*0.1%*	214.2	*2.4%*	95.6	*1.1%*	0.264	*0.003%*	8,834.2
2007	7,348.0	*75.2%*	2,083.1	*21.3%*	8.0	*0.1%*	218.9	*2.2%*	107.5	*1.1%*	0.316	*0.003%*	9,765.8
2008	8,203.7	*72.7%*	2,644.5	*23.4%*	9.0	*0.1%*	322.7	*2.9%*	111.8	*1.0%*	0.316	*0.003%*	11,291.9
2009	5,892.2	*77.0%*	1,507.8	*19.7%*	4.7	*0.1%*	188.1	*2.5%*	57.8	*0.8%*	0.308	*0.004%*	7,650.8
2010	7,153.1	*75.7%*	1,992.5	*21.1%*	6.7	*0.1%*	220.4	*2.3%*	79.5	*0.8%*	0.521	*0.006%*	9,452.7
2011	8,866.9	*75.2%*	2,537.6	*21.5%*	9.5	*0.1%*	265.5	*2.3%*	119.1	*1.0%*	0.933	*0.008%*	11,799.5
2012[p]	**9,003.5**	***72.6%***	**3,012.4**	***24.3%***	**13.3**	***0.1%***	**202.0**	***1.6%***	**172.1**	***1.4%***	**2.787**	***0.022%***	**12,406.1**

a Includes ethanol.

p Preliminary estimates.

Source: Compiled from tables in this publication for Wisconsin transportation energy use and prices.

WISCONSIN'S TRANSPORTATION ENERGY BILL

5.1%

Wisconsin's transportation energy bill increased 5.1 percent ($606.6 million dollars) in 2012. Vehicle gasoline accounts for 72.6 percent of all transportation expenditures, costing motorists $9 billion.

2011 was the first year that compressed natural gas vehicle fuel is included in the calculation of overall transportation expenditures.

Information about natural gas as a vehicle fuel, as well as a refueling station map locator, can be found on the Wisconsin State Energy Office website at www.stateenergyoffice.wi.gov.

CHAPTER 8

Miscellaneous

United States Energy Use and Gross Domestic Product

The federal Bureau of Economic Analysis (BEA) periodically adjusts the base year for economic data. These data represent the most recent revision of BEA data to 2005 as the base year.

1970-2012

Year	Resident Population (Thousands)[a,r]	Gross Domestic Product (Bil. of 2005$)	Resource Energy Consumption (Quad. Btu)[c]	Electric Sales to Ultimate Customers (Bil. of kWh)[d]	Resource Energy Per GDP (Thous. Btu/2005$)	Electric Sales Per GDP (kWh/2005$)
1970	205,052	4,266.3	67.84	1,392.0	15.90	0.3263
1975	215,973	4,875.4	71.96	1,747.1	14.76	0.3584
1980	227,225	5,834.0	78.07	2,094.4	13.38	0.3590
1985	237,924	6,843.4	76.39	2,324.0	11.16	0.3396
1990	249,623	8,027.1	84.49	2,712.6	10.52	0.3379
1995	266,278	9,086.0	91.03	3,013.3	10.02	0.3316
1996	269,394	9,425.8	94.02	3,101.1	9.97	0.3290
1997	272,647	9,845.9	94.60	3,145.6	9.61	0.3195
1998	275,854	10,274.7	95.02	3,264.2	9.25	0.3177
1999	279,040	10,770.7	96.65	3,312.1	8.97	0.3075
2000	282,162	11,216.4	98.81	3,421.4	8.81	0.3050
2001[r]	284,969	11,337.5	96.17	3,394.5	8.48	0.2994
2002[r]	287,625	11,543.1	97.65	3,465.5	8.46	0.3002
2003[r]	290,108	11,836.4	97.94	3,493.7	8.27	0.2952
2004[r]	292,805	12,246.9	100.16	3,547.5	8.18	0.2897
2005[r]	295,517	12,623.0	100.28	3,661.0	7.94	0.2900
2006[r]	298,380	12,958.5	99.63	3,669.9	7.69	0.2832
2007[r]	301,231	13,206.4	101.30	3,764.6	7.67	0.2851
2008[r]	304,094	13,161.9	99.28	3,733.0	7.54	0.2836
2009[r]	306,772	12,757.9	94.56	3,596.9	7.41	0.2819
2010[r]	309,326	13,063.0	97.98	3,754.5	7.50	0.2874
2011[r]	311,588	13,299.1	97.47	3,749.8	7.33	0.2820
2012[p]	**313,914**	**13,593.2**	**95.14**	**3,686.8**	**7.00**	**0.2712**

a As of July 1.

c Quadrillions of Btu.

d Beginning in 1975, the DOE data source has been used.

p Preliminary.

r Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* (March 2013), http://www.eia.doe.gov/mer/; Tables 1.3 and 7.1 (1970-2012); Wisconsin Department of Administration Demographic Services resident, national population estimates as of July 1 (1970-2012). Bureau of Economic Analysis, Regional Economic Accounts, http://www.bea.gov/bea/regional/ (1970-2012).

ENERGY USE PER DOLLAR OF GDP
47.7%
SINCE 1980

Until the early 1970s, energy use kept pace with the growth in the nation's economy. Economic growth during the 1970s and early 1980s was accompanied by slower growth in energy use due to increases in efficiency and a shift away from energy intensive industries.

Efficiency, in terms of decreasing energy required to produce a dollar of Gross Domestic Product, continues to increase slowly.

The ratio between electric sales and Gross Domestic Product has fallen 3.8 percent since 2011, and 24.5 percent since 1980. Energy use per dollar of Gross Domestic Product declined 4.5 percent since 2011 and 47.7 percent since 1980.

Wisconsin Population, Households, Gross State Product and Personal Income

HOUSEHOLD INCOME
IN 2012 DOLLARS
1.2%
ANNUALLY
SINCE 1990

Wisconsin's population and number of households continue to grow slowly, with increases over 2011 of 0.1 and 0.3 percent respectively.

After growing at an annual rate of 2.4 percent over the 10-year period from 1990 to 2000, 2012 household income (in constant 2012 dollars) has slowed to an annual rate of 1.2 percent since 1990.

Household income growth, in constant 2012 dollars, averaged 1.2 percent annually over the 22-year period since 1990, while 2012 represents a 0.6 percent increase in household income. Gross State Product in 2012 dollars increased 1.4 percent in 2012 compared to 2011.

Data in this table are provided as a reference point for making per capita comparisons. To explain recent increases in residential energy use, personal income per capita and per household are shown in current and constant 2012 dollars.

1970-2012

				Gross State Product	Personal Income[b] (Current Dollars)			Personal Income[b] (2012 Dollars)		
Year	GDP Deflator	Population (Thousands)	No. of Households[a] (Thousands)	(Million 2012 Dollars)	Total (Million Dollars)	Dollars Per Capita	Dollars Per Household	Total (Million Dollars)	Dollars Per Capita	Dollars Per Household
1970[r]	24.34	4,417.8	1,328.8	95,738	17,621	3,989	13,261	83,546	18,911	62,874
1975[r]	33.59	4,565.8	1,486.8	111,278	27,830	6,095	18,718	95,597	20,938	64,297
1980[r]	47.79	4,705.6	1,652.3	127,721	47,519	10,098	28,760	114,731	24,382	69,439
1985[r]	61.63	4,744.7	1,720.4	138,212	65,132	13,727	37,860	121,947	25,702	70,885
1990[r]	72.26	4,891.8	1,822.1	160,056	88,213	18,033	48,412	140,858	28,795	77,304
1995[r]	81.61	5,101.6	1,946.3	191,323	116,074	22,753	59,639	164,124	32,171	84,326
1996[r]	83.16	5,143.0	1,971.6	199,032	122,953	23,907	62,362	170,601	33,171	86,530
1997[r]	84.63	5,192.3	1,998.4	206,235	130,478	25,129	65,292	177,902	34,263	89,023
1998[r]	85.58	5,234.4	2,024.5	216,153	141,019	26,941	69,658	190,126	36,323	93,914
1999[r]	86.84	5,274.8	2,053.9	225,550	147,462	27,956	71,795	195,932	37,145	95,393
2000[r]	88.72	5,363.7	2,084.6	230,656	156,603	29,197	75,125	203,667	37,971	97,703
2001[r]	90.73	5,400.4	2,115.7	233,427	162,773	30,141	76,935	207,014	38,333	97,846
2002[r]	92.20	5,453.9	2,147.3	238,093	167,708	30,750	78,103	209,892	38,485	97,748
2003[r]	94.14	5,490.7	2,170.9	242,819	173,248	31,553	79,804	212,360	38,676	97,821
2004[r]	96.79	5,533.0	2,197.4	249,052	180,303	32,587	82,055	214,954	38,850	97,824
2005[r]	100.00	5,580.8	2,223.5	252,338	186,545	33,426	83,897	215,248	38,570	96,806
2006[r]	103.23	5,617.7	2,242.5	255,620	198,556	35,344	88,543	221,936	39,506	98,970
2007[r]	106.23	5,648.1	2,254.8	256,918	206,648	36,587	91,647	224,468	39,742	99,550
2008[r]	108.58	5,675.2	2,265.7	250,889	215,330	37,943	95,041	228,824	40,320	100,997
2009[r]	109.53	5,688.0	2,275.5	249,923	208,963	36,737	91,832	220,137	38,702	96,743
2010[r]	110.99	5,696.0	2,279.8	255,132	216,339	37,981	94,895	224,904	39,485	98,652
2011[r]	113.36	5,687.0	2,287.8	257,882	226,042	39,747	98,803	230,086	40,458	100,571
2012[p]	**115.39**	**5,694.2**	**2,295.0**	**261,548**	**232,129**	**40,766**	**101,148**	**232,129**	**40,766**	**101,148**

a Household numbers for intercensal years estimated on basis of Public Service Commission of Wisconsin reports of electric utility residential customers. Starting in 2000, estimates are from the Department of Administration, Wisconsin Demographic Services Center.

b Personal Income data are annually revised based on federal BEA adjustments (2012).

p Preliminary estimates.

r Revised.

Source: U.S. Department of Commerce, Bureau of Census, Population Division, *2000 Census of Population and Housing*, CPH-1-51 (August 2001) and Preliminary Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2012 (NST-PEST2010-01) (February 2012); Final Official Population Estimates and Census Counts for Wisconsin Counties: 1970 – 2008; Department of Administration, Wisconsin Demographic Services Center (1970-2012) and Intercensally Revised Annual Estimates of Residents Housing Units and Households in Wisconsin, 1990-2012 (May 2012); U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, http://www.bea.gov/bea/regional/ (1970-2012).

Wisconsin Employment, by Type

1970-2012 THOUSANDS

Year	Working Age 18-64	Total Employment[a]	Percent Working Age Employed	Total NonFarm[b,e]	Goods Producing[b,c]	Services Producing[b,d]
1970	2,362.6			1,530.5	565.7	964.8
1975	2,572.5			1,677.0	570.5	1,106.5
1980	2,783.7			1,938.1	630.6	1,307.5
1985	2,858.3			1,983.1	580.4	1,402.7
1990	2,949.3	2,486.1	84.3%	2,291.5	614.8	1,676.7
1995	3,122.9	2,773.6	88.8%	2,558.6	672.5	1,886.1
1996	3,157.5	2,815.6	89.2%	2,600.6	679.2	1,921.4
1997	3,194.8	2,855.8	89.4%	2,655.8	694.9	1,960.9
1998	3,228.6	2,870.0	88.9%	2,718.0	713.5	2,004.6
1999	3,261.0	2,879.0	88.3%	2,784.0	720.5	2,063.5
2000	3,292.4	2,894.9	87.9%	2,833.8	723.0	2,110.8
2001	3,332.7	2,897.9	87.0%	2,813.9	689.5	2,124.3
2002	3,372.3	2,860.9	84.8%	2,782.4	656.2	2,125.8
2003	3,406.3	2,862.6	84.0%	2,773.8	631.9	2,142.0
2004	3,443.8	2,868.4	83.3%	2,804.5	633.3	2,171.2
2005	3,487.5	2,890.1	82.9%	2,838.3	636.4	2,201.9
2006	3,516.8	2,932.5	83.4%	2,861.5	637.2	2,224.4
2007	3,538.8	2,948.7	83.3%	2,878.3	630.9	2,247.5
2008[r]	3,554.9	2,941.3	82.7%	2,871.0	614.7	2,256.3
2009[r]	3,564.8	2,845.2	79.8%	2,744.1	541.1	2,203.0
2010[r]	3,570.2	2,823.3	79.1%	2,728.7	528.0	2,200.7
2011[r]	3,588.2	2,838.0	79.1%	2,758.6	540.7	2,217.9
2012[p]	**3,584.3**	**2,850.4**	**79.5%**	**2,789.4**	**552.7**	**2,236.8**

WISCONSIN LABOR FORCE 0.1%

WISCONSIN EMPLOYMENT 0.4%

In 2012, Wisconsin's working age labor force decreased 0.1 percent. Employment in the state increased 0.4 percent (12,357 jobs). Employment in all sectors increased. In the goods producing sector, by 2.2 percent, in the services-producing sector by 0.9 percent, and by 1.1 percent in the nonfarm sector. Most Wisconsin jobs are classified as services producing.

a Nonfarm wage and salary employment.

b These data categories represent numbers of jobs, not numbers of individuals.

c Goods Producing is a compilation of the Mining, Natural Resources, and Construction industries.

d Services Producing is a compilation of all non-farm jobs that do not produce goods.

e Total Non-Farm job is a compilation of many non-farm job categories, which includes Goods Producing and Services Producing.

p Preliminary.

r Revised.

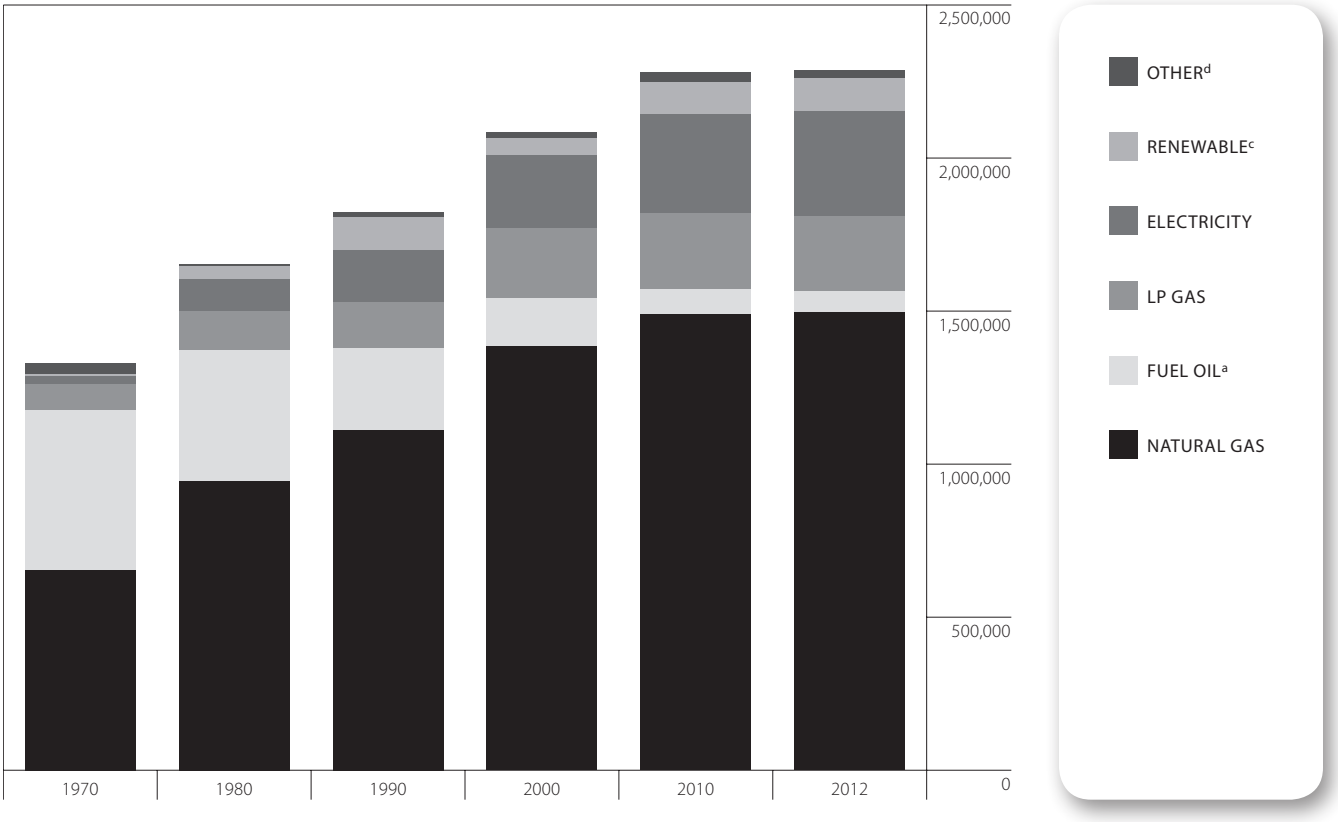
Source: Wisconsin Department of Administration, Demographic Services Center, *Single Year of Age Projections, 2000-2012, Broad Age Groups, Intercensal Revision Controlled to State Estimates (May 2012)*; Wisconsin Department of Workforce Development, Labor Market information Section, Current Employment Statistics (CES) http://worknet.wisconsin.gov/worknet/daces.aspx?menuselection=da (1990-2012) and Local Area Unemployment Statistics (LAUS) http://worknet.wisconsin.gov/worknet/dalaus.aspx?menuselection=da (1980-2012).

Wisconsin Occupied Dwelling Units, by Type of Fuel for Space Heating

1970, 1980, 1990, 2000, 2010 AND 2012 NUMBER OF UNITS AND PERCENT OF TOTAL

Fuel	1970		1980		1990		2000		2010		2012	
Natural Gas	654,851	*49.3%*	945,092	*57.2%*	1,111,733	*61.0%*	1,384,230	*66.4%*	1,488,259	*65.3%*	1,495,819	*65.4%*
Fuel Oil[a]	521,256	*39.2%*	425,622	*25.8%*	265,600	*14.6%*	158,499	*7.6%*	81,908	*3.6%*	68,459	*3.0%*
LP Gas	85,549	*6.4%*	130,476	*7.9%*	152,823	*8.4%*	228,408	*11.0%*	250,022	*11.0%*	245,071	*10.7%*
Electricity	24,763	*1.9%*	101,489	*6.1%*	168,615	*9.3%*	236,755	*11.4%*	320,964	*14.1%*	343,453	*15.0%*
Wood	6,795	*0.5%*	42,783	*2.6%*	107,239	*5.9%*	56,862	*2.7%*	106,608	*4.7%*	106,058	*4.6%*
Coal or Coke	29,708	*2.2%*	2,591	*0.2%*	787	*0.0%*	330	*0.0%*	308	*0.0%*	205	*0.0%*
Solar Energy	NA		NA		NA		NA		345	*0.0%*	584	*0.0%*
Other	5,334	*0.4%*	3,578	*0.2%*	11,294	*0.6%*	13,839	*0.7%*	22,028	*1.0%*	20,485	*0.9%*
None	548	*0.0%*	630	*0.0%*	4,027	*0.2%*	5,621	*0.3%*	9,090	*0.4%*	8,228	*0.4%*
Total[b]	**1,328,804**		**1,652,261**		**1,822,118**		**2,084,544**		**2,279,532**		**2,288,362**	

1970-2012 NUMBER OF UNITS



a Includes kerosene.

b Number of households data may not match due to different data sources.

c Includes wood and solar energy.

d Includes coal/coke, no fuel or other fuel as defined by the American Community Survey.

Source: U.S. Department of Commerce, Bureau of the Census, *Census of Housing* (1970, 1980, 1990, 2000-2012) and American Community Survey (2005-2012).

Wisconsin Motor Vehicle Registrations, by Type of Vehicle

1970-2012

Year	Autos	Trucks	Buses	Motorcycles	Trailers	Total[a,b]
1970	1,762,681	317,096	8,178	53,642	64,065	2,210,492
1975	2,023,427	426,756	11,422	96,629	81,378	2,644,681
1980	2,248,951	665,012	13,375	169,329	93,288	3,215,302
1985	2,310,024	771,264	10,325	176,037	101,030	3,406,196
1990	2,456,175	1,053,280	14,518	149,281	152,712	3,825,966
1995	2,419,389	1,399,236	14,940	161,773	240,841	4,281,803
1996	2,398,351	1,464,366	15,413	136,794	205,177	4,260,959
1997	2,370,453	1,537,241	12,497	161,509	213,415	4,339,088
1998	2,402,019	1,668,241	17,061	151,391	231,934	4,513,250
1999	2,396,072	1,735,326	14,546	171,839	242,849	4,605,088
2000	2,405,408	1,822,078	15,587	160,927	256,890	4,703,294
2001	2,413,001	1,922,916	16,259	192,312	269,931	4,860,457
2002	2,404,081	2,012,847	17,061	183,890	285,471	4,948,282
2003	2,401,816	2,103,643	17,555	215,231	303,852	5,091,716
2004	2,387,459	2,176,903	14,099	207,592	334,898	5,170,728
2005	2,384,717	2,280,170	12,418	278,055	365,435	5,320,795
2006	2,427,905	2,354,954	13,222	266,195	396,374	5,458,650
2007	2,427,882	2,404,895	14,110	324,833	419,816	5,591,536
2008	2,391,300	2,400,680	10,736	307,808	411,871	5,522,395
2009	2,340,991	2,429,194	12,738	345,737	417,031	5,545,691
2010	2,333,029	2,449,286	13,410	317,387	426,092	5,539,204
2011	2,282,310	2,451,634	14,411	361,893	416,550	5,526,798
2012	**2,274,596**	**2,490,523**	**15,253**	**323,844**	**447,195**	**5,551,411**

a As of June 30.

b Total includes motor homes, mopeds and municipal vehicles; it does not equal sum of registration types shown before 2005. From 2005 on, motor homes, mopeds and municipal vehicles are included in trucks, motorcycles and autos, respectively.

Source: Wisconsin Department of Transportation (January 2013).

TOTAL VEHICLE REGISTRATIONS

2.2%

In 2012, total vehicle registrations increased by 2.2 percent; auto registrations increased slightly, by 0.1 percent. The truck category includes vans, sports utility vehicles and light trucks.

These data are provided as a factor to help compare the use of motor vehicle fuels across the years.

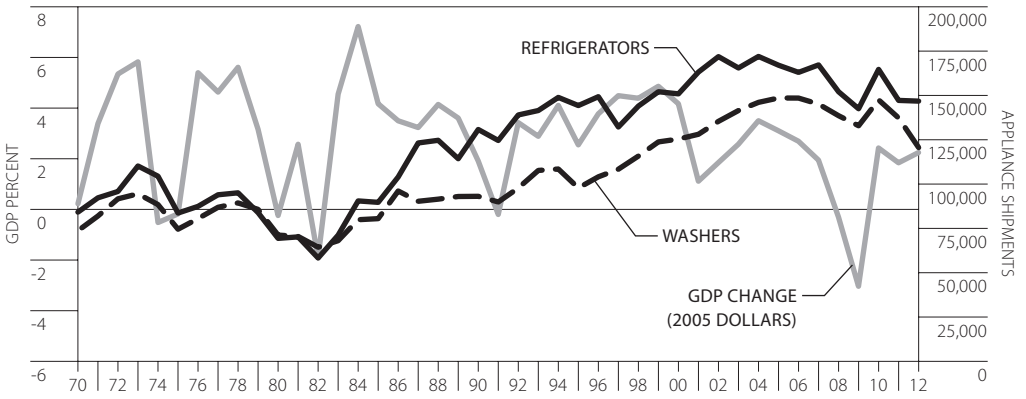
Wisconsin Appliance Shipments, by Type, Cooling Degree Days and Gross National Product

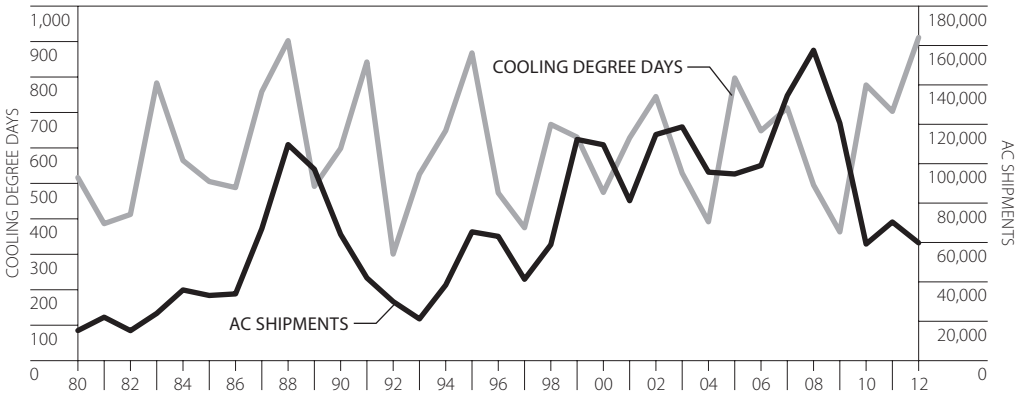
The first graph plots shipments of refrigerators and washing machines against the annual percent change in the U.S. Gross Domestic Product (GDP) in constant 2005 U.S. dollars. This graph illustrates the relationship between large appliance purchases, the national economy and energy consumption.

The second graph plots appliance shipments of room air conditioners (RACs) against Wisconsin's Cooling Degree Days (CDDs)[a] to demonstrate the relationship between appliance purchases, energy consumption and the weather.

1970-2012

Year	Cooling Degree Days	Percent Change in GDP	Refrigerators	Room Air Conditioners	Washers
1970		0.19%	84,180	62,715	73,666
1975		-0.21%	83,658	31,297	74,547
1980	516	-0.28%	69,380	15,290	71,230
1985	505	4.14%	89,700	33,100	80,500
1990	599	1.88%	130,800	64,100	93,100
1995	868	2.51%	144,300	65,400	97,800
2000	474	4.14%	150,900	109,600	125,400
2005	797	3.07%	167,062	94,773	148,563
2006	648	2.66%	163,019	99,097	148,519
2007	713	1.91%	167,234	134,569	145,139
2008	495	-0.34%	152,087	157,601	138,575
2009	363	-3.07%	142,502	120,597	132,900
2010	778	2.39%	164,700	59,200	147,500
2011	703	1.81%	147,200	70,400	137,300
2012	**912**	**2.21%**	**146,800**	**59,800**	**120,600**

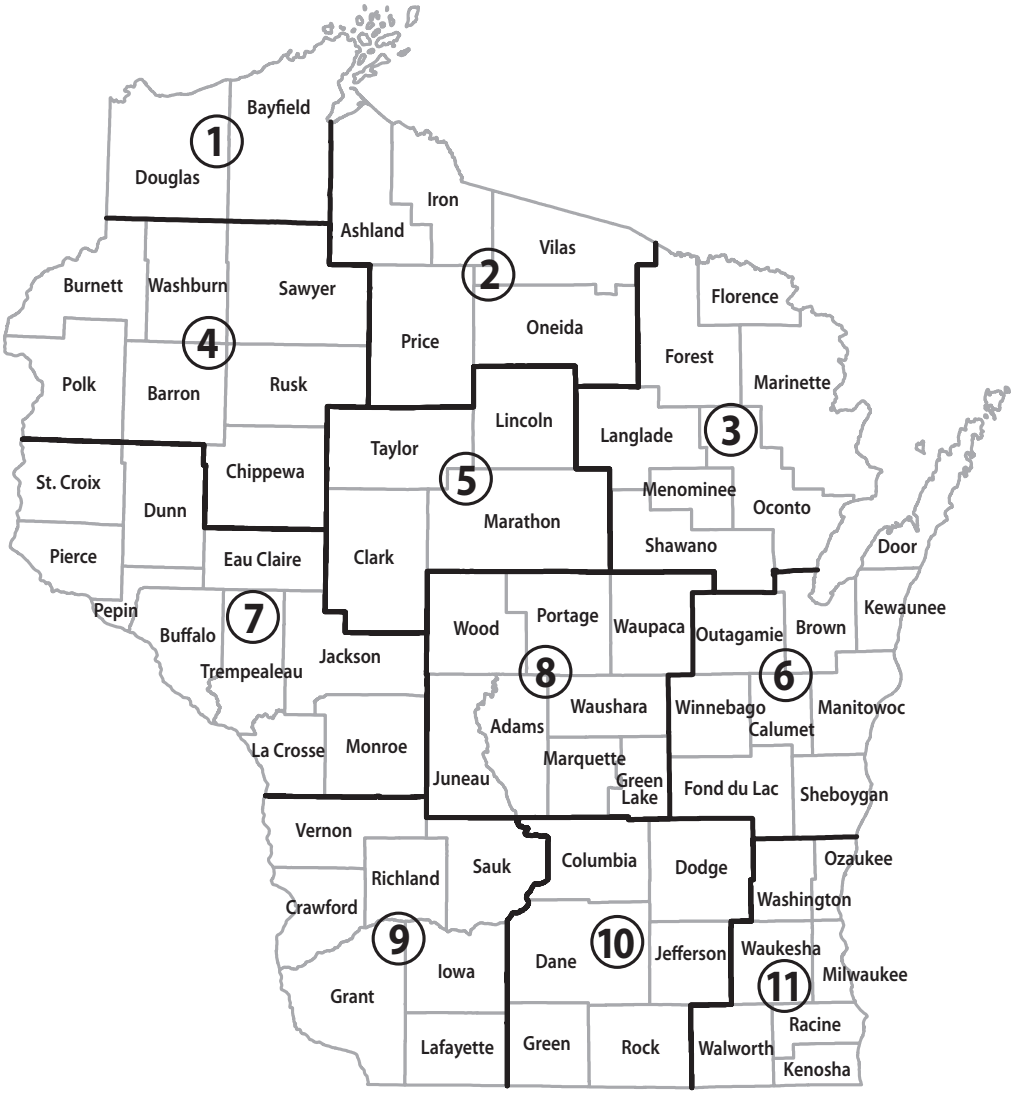




a Additional information about degree days can be found at the end of this chapter.

Source: Association of Home Appliance Manufacturers, *Distributor Sales by State—2012*. Association of Home Appliance Manufacturers, *Trends in Energy Efficiency—2012*. Compiled from tables in this chapter on Cooling Degree Days and the Gross Domestic Product.

Wisconsin Degree Day Zones



The energy needed to heat and cool homes and other buildings strongly depends on the outdoor temperature. The next few pages provide a set of tables listing typical and historic degree day figures throughout Wisconsin in eleven degree day zones—shown in the map.

Heating and cooling degree days are relative measures of outdoor air temperature, and are defined as deviations of the mean daily temperature below or above a base temperature of 65 degrees Fahrenheit. Data for this section are collected through a partnership with the Wisconsin State Climatology Office.

Heating and cooling degree days are provided as population-weighted averages for the state, to provide a point of reference for comparing the severity of winters and summers to statewide energy use.

Source: Wisconsin State Energy Office.

Wisconsin Normal Heating Degree Days, by Zone and Month

Heating degree days are relative measurements of outdoor air temperature and are defined as deviations of the mean daily temperature below a base temperature (65 degrees Fahrenheit, by convention). For example, a weather station recording a mean daily temperature of 40 degrees Fahrenheit would report 25 heating degree days. The normal heating degree days for each zone and month are the 30-year averages, from 1981 through 2010.

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
January	1,647	1,635	1,567	1,682	1,562	1,499	1,568	1,547	1,506	1,434	1,325	**1,451**
February	1,365	1,372	1,312	1,361	1,289	1,251	1,277	1,263	1,219	1,173	1,095	**1,195**
March	1,186	1,173	1,117	1,108	1,072	1,060	1,043	1,043	981	963	929	**1,000**
April	762	697	667	632	604	637	576	586	557	558	588	**597**
May	435	343	335	306	295	326	257	278	262	266	313	**300**
June	157	112	102	86	73	92	62	69	57	60	84	**79**
July	47	36	30	24	15	23	11	18	13	10	11	**15**
August	66	56	48	47	34	40	28	36	28	27	15	**28**
September	253	256	232	232	210	207	194	194	175	171	126	**172**
October	627	631	594	588	556	556	551	534	513	505	433	**505**
November	1,002	1,031	973	1,028	963	914	962	942	899	866	780	**875**
December	1,486	1,486	1,418	1,534	1,433	1,350	1,430	1,407	1,364	1,300	1,195	**1,313**
Total	**9,033**	**8,828**	**8,392**	**8,628**	**8,106**	**7,955**	**7,959**	**7,917**	**7,574**	**7,333**	**6,894**	**7,531**

a Population-weighted statewide average, based on 2010 census.

Source: National Climatic Data Center, 1981-2010 U.S. Climate Normals, http://ggweather.com/normals

Wisconsin Normal Cooling Degree Days, by Zone and Month

Cooling degree days are relative measurements of outdoor air temperature and are defined as deviations of the mean daily temperature above a base temperature (65 degrees Fahrenheit, by convention). For example, a weather station recording a mean daily temperature of 90 degrees Fahrenheit would report 25 cooling degree days. The normal cooling degree days for each zone and month are the 30-year averages, from 1981 through 2010.

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
April	1	1	2	2	1	2	4	4	3	4	5	**4**
May	9	14	15	17	18	16	28	26	22	26	25	**23**
June	48	67	75	85	97	83	120	112	113	120	120	**108**
July	118	127	139	157	172	150	214	184	193	206	222	**194**
August	89	96	103	116	130	111	161	136	152	157	193	**155**
September	22	25	29	31	35	33	48	44	48	51	69	**51**
October	1	1	2	2	3	3	4	4	5	4	7	**5**
Total	**288**	**331**	**365**	**410**	**456**	**398**	**579**	**510**	**536**	**568**	**641**	**538**

a Population-weighted statewide average, based on 2010 census.

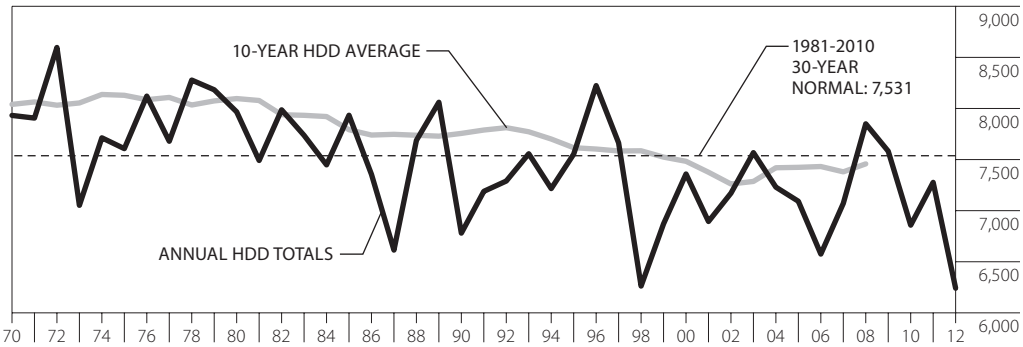
Source: National Climatic Data Center, 1981-2010 U.S. Climate Normals, http://ggweather.com/normals

Wisconsin Population-Weighted Heating Degree Days

1970-2012

What significance does the number of HDDs have on energy use? Increased HDDs means that space heating is used more because the temperature is cooler. Fewer HDDs means that space heating is used less because the temperature is warmer. Fluctuations in HDDs can also influence such variables as price and volume of winter heating fuels (e.g., propane, heating oil, natural gas).

The 10-year average and 30-year normal[b] are presented here as a point of reference for the variation in HDDs. The 10-year average is plotted in the middle of an 11-year period, averaging the five years previous to, and five years after, the plotted year. For example, the number plotted on the graph at 2003 is the average of 1998 through 2008. The 10-year average is not plotted for 2009 through 2012 because these averages cannot yet be calculated.



Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Normal	**1,451**	**1,195**	**1,000**	**597**	**300**	**79**	**15**	**28**	**172**	**505**	**875**	**1,313**	**7,531**
1970	1,715	1,292	1,116	565	295	81	15	15	179	430	888	1,343	7,934
1975	1,375	1,246	1,212	790	221	74	23	17	258	412	713	1,268	7,609
1980	1,465	1,378	1,141	582	240	117	8	14	177	634	867	1,345	7,968
1985	1,614	1,296	883	474	189	107	7	32	194	486	993	1,660	7,935
1990	1,141	1,119	880	532	361	52	19	19	131	497	708	1,321	6,780
1995	1,344	1,197	890	682	254	38	8	1	213	455	1,097	1,375	7,554
2000	1,428	1,057	759	626	245	86	26	15	189	384	909	1,636	7,360
2005	1,436	1,043	1,073	491	331	20	9	12	75	425	811	1,369	7,095
2010	1,447	1,161	811	421	232	37	1	5	176	396	795	1,375	6,858
2011	1,516	1,211	1,059	636	330	70	1	4	211	404	748	1,088	7,277
2012	**1,242**	**1,036**	**541**	**550**	**166**	**36**	**0**	**17**	**194**	**530**	**826**	**1,103**	**6,241**

a Population-weighted heating degree days are derived by multiplying the number of heating degree days in each degree day zone by the population in that degree day zone, adding the products, then dividing by the total state population (based on 2010 census data).

b The 30-year normal runs from 1981 to 2010 and is developed by the National Oceanographic and Atmospheric Agency (NOAA).

Source: Wisconsin State Energy Office, degree day data based on daily data from the University of Wisconsin-Madison, Wisconsin State Climatology Office (http://www.aos.wisc.edu/~sco/) (1970-2012) and from the National Oceanographic and Atmospheric Administration (http://www.nws.noaa.gov/climate/) (1970-2012).

2012 HDD
17.1%
BELOW THE 30-YEAR NORMAL

Using population-weighted[a] heating degree days (HDDs) as an index, the winter for 2012 was warmer than the winter of 2011, with 14.2 percent fewer HDDs. In 2012, the number of HDDs (6,241) was 17.1 percent below the 30-year normal (7,531).

The 10-year average is plotted using HDD data from the National Climate Data Center. The NCDC revised its method of calculating HDDs, so the average is slightly different than shown in previous editions of this book.

The HDD data in this publication is weighted by population to better illustrate the connection between degree days and energy consumption.

2011 Wisconsin Heating Degree Days, by Zone and Month

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
January	1,688	1,689	1,642	1,780	1,635	1,578	1,689	1,649	1,559	1,485	1,369	**1,516**
February	1,335	1,349	1,306	1,392	1,316	1,253	1,323	1,298	1,230	1,193	1,108	**1,211**
March	1,228	1,241	1,192	1,224	1,157	1,126	1,156	1,171	996	998	967	**1,059**
April	746	797	747	671	703	679	636	693	565	572	613	**636**
May	524	383	365	346	323	335	284	311	271	300	350	**330**
June	194	106	94	77	77	73	72	87	44	40	74	**70**
July	16	5	3	2	1	0	1	2	0	0	0	**1**
August	19	49	29	12	3	3	3	6	1	0	0	**4**
September	275	335	298	247	262	246	240	235	222	215	156	**211**
October	497	571	501	458	462	419	450	432	390	396	356	**404**
November	908	956	869	878	860	766	814	795	772	740	666	**748**
December	1,263	1,362	1,237	1,299	1,266	1,106	1,245	1,161	1,083	1,052	974	**1,088**
Total	**8,693**	**8,843**	**8,283**	**8,386**	**8,065**	**7,584**	**7,913**	**7,840**	**7,133**	**6,991**	**6,633**	**7,277**

a Population-weighted statewide average, based on 2010 census.

Source: Wisconsin State Energy Office, degree day data based on daily data from the University of Wisconsin-Madison, State Climatology Office (http://www.aos.wisc.edu/~sco/) and from the National Oceanographic and Atmospheric Administration (http://www.nws.noaa.gov/climate/) (1970-2012).

2012 Wisconsin Heating Degree Days, by Zone and Month

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
January	1,419	1,516	1,401	1,441	1,405	1,273	1,370	1,311	1,245	1,217	1,128	**1,242**
February	1,156	1,285	1,162	1,167	1,154	1,031	1,108	1,054	1,025	1,021	974	**1,036**
March	753	730	664	659	625	582	549	552	463	479	507	**541**
April	706	703	638	588	584	556	524	568	466	509	551	**550**
May	314	286	233	191	200	163	152	158	99	121	177	**166**
June	96	101	68	50	48	29	28	45	30	22	37	**36**
July	3	5	3	0	1	0	0	3	0	0	0	**0**
August	56	105	67	42	36	13	25	32	16	17	0	**17**
September	287	365	305	259	243	229	216	227	173	195	138	**194**
October	703	689	626	667	618	550	612	575	504	503	464	**530**
November	965	1,038	947	967	912	841	868	867	803	800	770	**826**
December	1,323	1,318	1,224	1,370	1,268	1,118	1,306	1,227	1,172	1,080	957	**1,103**
Total	**7,781**	**8,141**	**7,338**	**7,401**	**7,094**	**6,385**	**6,758**	**6,619**	**5,996**	**5,964**	**5,703**	**6,241**

a Population-weighted statewide average, based on 2010 census.

Source: Wisconsin State Energy Office, degree day data based on daily data from the University of Wisconsin-Madison, State Climatology Office (http://www.aos.wisc.edu/~sco/) and from the National Oceanographic and Atmospheric Administration (http://www.nws.noaa.gov/climate/) (1970-2012).

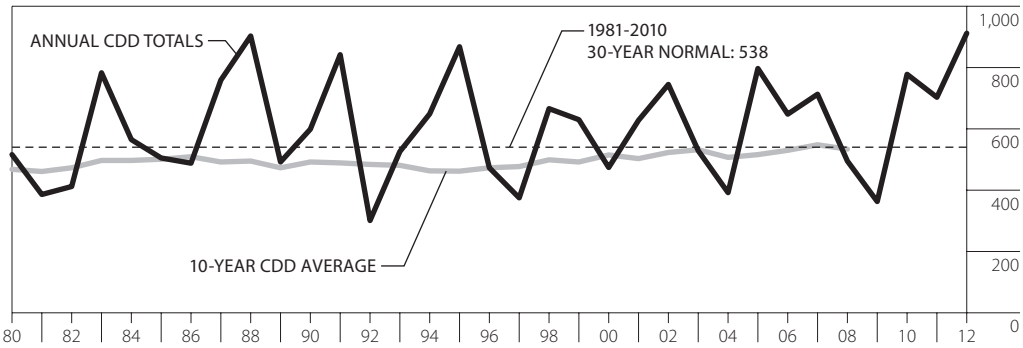
Wisconsin Population-Weighted Cooling Degree Days

1980-2012

What significance does the number of CDDs have on energy use? Increased CDDs means that air conditioning may be used more because the temperature is warmer. Fewer CDDs means that air conditioning may be used less because the temperature is cooler. Fluctuations in CDDs can also influence such variables as peak electric demand and the wholesale price of electricity.

The 10-year average and 30-year normal[c] are presented here as a point of reference for the variation in CDDs. The 10-year average is plotted in the middle of an 11-year period, averaging the five years previous to, and five years after, the plotted year. For example, the number plotted on the graph at 2003 is the average of 1998 through 2008. The 10-year average is not plotted for 2009 through 2012 because these averages cannot yet be calculated.

The 10-year average is plotted using CDD data from the National Climate Data Center. The NCDC revised its method of calculating CDDs, so the average is slightly different than shown in previous editions of this book.



Month	April[b]	May	June	July	August	September	October[b]	Total
Normal	**4**	**23**	**108**	**194**	**155**	**51**	**5**	**538**
1980	9	34	71	218	156	27	0	515
1985	31	28	60	185	98	103	0	505
1990	32	3	120	176	164	99	4	598
1995	0	8	223	273	310	47	5	866
2000	0	37	88	136	154	53	5	473
2005	3	4	211	228	200	119	32	797
2010	8	59	110	285	278	36	2	778
2011	1	27	94	336	188	48	9	703
2012	**15**	**59**	**200**	**393**	**185**	**59**	**1**	**912**

a Population-weighted cooling degree days are derived by multiplying the number of cooling degree days in each degree day zone by the population in that degree day zone, adding the products, then dividing by the total state population (based on 2010 census data).

b Includes March for the years 2001 and 2007. For 1990, the October column also includes November.

c The 30-year normal runs from 1981 to 2010 and is developed by the National Oceanographic and Atmospheric Agency (NOAA).

Source: Wisconsin State Energy Office, degree day data based on daily data from the University of Wisconsin-Madison, State Climatology Office (http://www.aos.wisc.edu/~sco/) (1970-2012) and from the National Oceanographic and Atmospheric Administration (http://www.nws.noaa.gov/climate/) (1970-2012).

2012 CDD
69.4%
ABOVE THE 30-YEAR NORMAL

Using population-weighted[a] cooling degree days (CDD) as an index, the summer of 2012 was warmer than the summer of 2011, with 29.7 percent more cooling degree days. In 2012, the number of cooling degree days (912) was 69.4 percent above the 30-year normal (538).

The CDD data in this publication is weighted by population to better illustrate the connection between degree days and energy consumption.

In 2012, the number of CDDs increased because the summer was warmer than 2011. 2008 and 2009 represented a slight departure from a trend since 2005 of hotter summers with more CDDs.

2011 Wisconsin Cooling Degree Days, by Zone and Month

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
January	0	0	0	0	0	0	0	0	0	0	0	**0**
February	0	0	0	0	0	0	0	0	0	0	0	**0**
March	0	0	0	0	0	0	0	0	0	0	0	**0**
April	0	0	0	0	0	0	0	0	0	1	1	**1**
May	0	6	15	9	14	22	16	18	51	46	28	**27**
June	16	55	69	63	87	71	115	89	139	145	84	**94**
July	221	256	297	271	277	320	306	301	355	368	364	**336**
August	112	46	98	112	151	139	150	159	199	200	247	**188**
September	20	16	25	40	42	33	50	44	46	44	62	**48**
October	16	4	7	21	6	6	18	15	13	10	7	**9**
November	0	0	0	0	0	0	0	0	0	0	0	**0**
December	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**385**	**383**	**511**	**516**	**577**	**591**	**655**	**626**	**803**	**814**	**793**	**703**

a Population-weighted statewide average, based on 2010 census.

Source: Wisconsin State Energy Office, degree day data based on daily data from the University of Wisconsin-Madison, State Climatology Office (http://www.aos.wisc.edu/~sco/) and from the National Oceanographic and Atmospheric Administration (http://www.nws.noaa.gov/climate/) (1970-2012).

2012 Wisconsin Cooling Degree Days, by Zone and Month

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
January	0	0	0	0	0	0	0	0	0	0	0	**0**
February	0	0	0	0	0	0	0	0	0	0	0	**0**
March	17	2	8	7	4	12	14	20	27	26	11	**14**
April	0	0	0	0	0	0	0	0	0	1	1	**1**
May	22	12	36	42	33	51	56	67	86	81	59	**59**
June	74	73	143	98	118	199	166	160	207	228	235	**200**
July	199	170	270	298	312	352	378	391	441	455	428	**393**
August	96	48	96	131	120	131	159	176	212	202	237	**185**
September	26	20	35	47	37	41	57	59	75	72	70	**59**
October	0	0	0	0	0	0	0	1	5	3	0	**1**
November	0	0	0	0	0	0	0	0	0	0	0	**0**
December	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**434**	**325**	**588**	**623**	**624**	**786**	**830**	**874**	**1,053**	**1,068**	**1,041**	**912**

a Population-weighted statewide average, based on 2010 census.

Source: Wisconsin State Energy Office, degree day data based on daily data from the University of Wisconsin-Madison, State Climatology Office (http://www.aos.wisc.edu/~sco/) and from the National Oceanographic and Atmospheric Administration (http://www.nws.noaa.gov/climate/) (1970-2012).

Energy Definitions

DEFINITIONS

Energy is the ability to do work. It is stored in various forms including chemical energy in biomass, coal and oil, nuclear energy in uranium, gravitational energy in water used in hydroelectric plants, the wind and the sun.

There are two common ways to account for energy use; **resource energy** consumption and **end-use** energy consumption. End-use refers to the energy content of electricity and other fuels at the point of use by customers. Resource energy includes all energy resources used to generate electricity, including the energy content of the coal, petroleum, nuclear and renewable fuels.

One **British thermal unit (Btu)** is the amount of energy in the form of heat which will raise the temperature of one pound of water one degree Fahrenheit.

One **calorie** is the amount of energy in the form of heat which will raise the temperature of one gram of water one degree Centigrade.

One **Btu** is equal to 252 calories.

One **watt** is a unit of power, or rate of energy delivery, of one joule per second, or equivalently, one ampere of electric current delivered across a potential of one volt. One kilowatt (kW) is 1,000 watts. Ten 100-watt light bulbs require 1,000 watts or 1 kW of power to stay lit at any point in time.

One **kilowatt-hour (kWh)** is one kilowatt of electric power delivered for one hour (or the equivalent). One kilowatt-hour is 1,000 watt-hours. Ten 100-watt light bulbs burning for one hour consume 1,000 watt-hours or 1 kWh.

Heating degree days are relative measurements of outdoor air temperature and are obtained by subtracting the mean daily temperature from an established base temperature of 65 degrees Fahrenheit.

Cooling degree days are relative measurements of outdoor air temperature and are obtained by subtracting an established base temperature of 65 degrees Fahrenheit from the mean daily temperature.

MEASUREMENT OF ENERGY SUPPLIES

Petroleum products are measured in either gallons or barrels. A barrel contains 42 gallons. Petroleum is refined from crude oil into various products such as kerosene, diesel fuel, home heating oil (No. 1 and No. 2 oils), and other heating oils (No. 3 - No. 6), gasoline and liquefied petroleum gas (propane). The energy content of a gallon of each product is listed in the conversion table.

Natural Gas is measured in either Mcf (1,000 cubic feet) or in therms. One Mcf contains approximately ten therms or one million Btu.

Coal is measured in tons. The three broad classifications of coal, in order of greatest energy content, are bituminous, sub-bituminous and lignite.

Wood is usually measured in either tons or cords. A cord is an amount of stacked wood measuring 8 feet x 4 feet x 4 feet. The weight of a cord of wood varies according to the type of wood and its moisture content, but is estimated at 1.5 to 2 tons. A face cord is the 8 feet x 4 feet face of a stacked cord but of shorter width. Common usage is three face cords to a full cord.

Conversion Factors

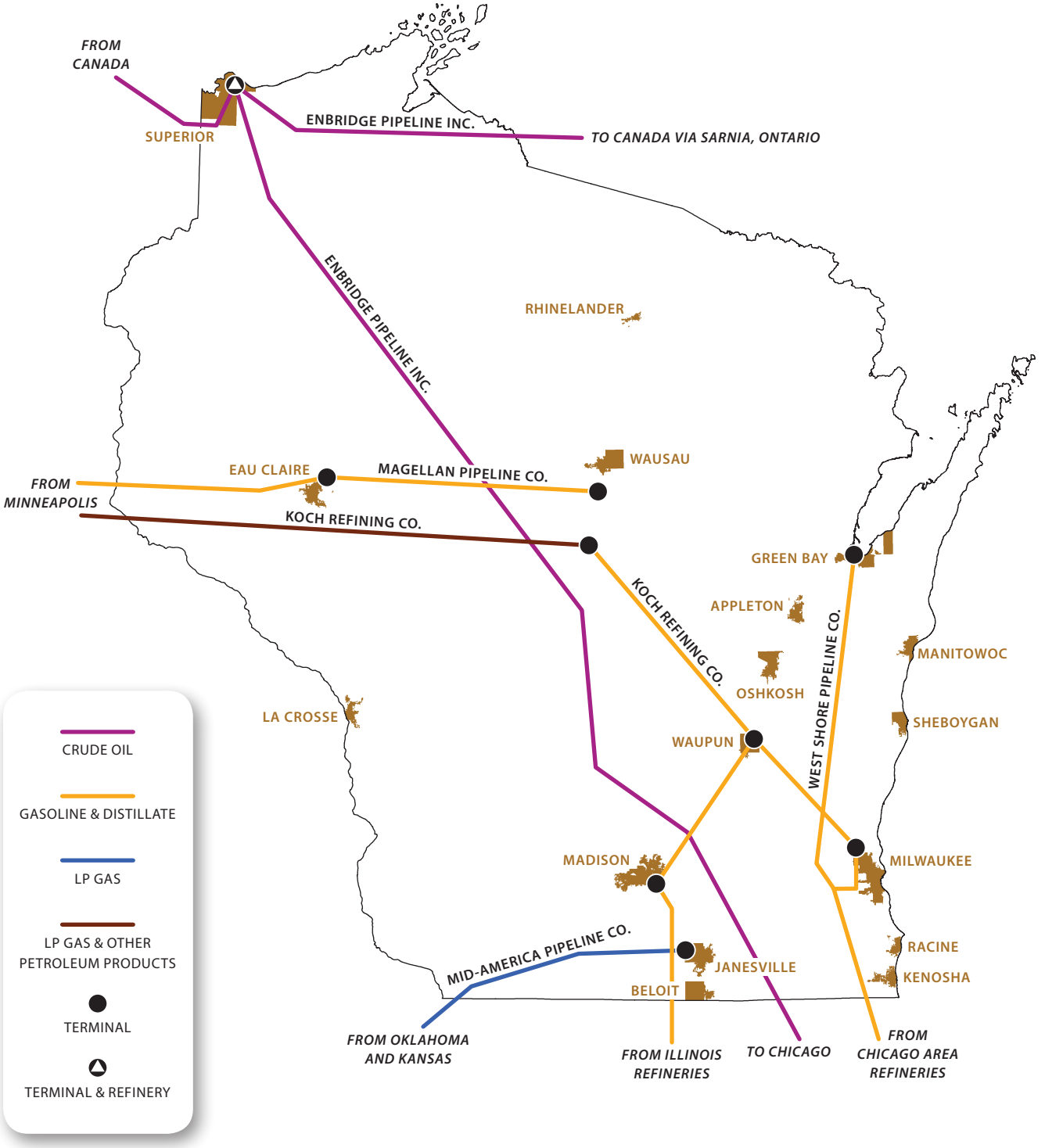
AVERAGE ENERGY CONTENT OF VARIOUS FUELS

1 kilowatt-hour of electricity	3,413 Btu
1 cubic foot of natural gas	1,008 to 1,034 Btu
1 therm of natural gas	100,000 Btu
1 gallon of liquefied petroleum gas (LPG)	95,475 Btu
1 gallon of crude oil	138,095 Btu
1 barrel of crude oil	5,800,000 Btu
1 gallon of kerosene or light distillate oil	135,000 Btu
1 gallon of middle distillate or diesel fuel oil	138,690 Btu
1 gallon of residual fuel oil	149,690 Btu
1 gallon of gasoline	125,000 Btu
1 gallon of ethanol	84,400 Btu
1 gallon of methanol	62,800 Btu
1 gallon of gasohol (10% ethanol, 90% gasoline)	120,900 Btu
1 pound of coal	8,100 to 13,000 Btu
1 ton of coal	16,200,000 to 26,000,000 Btu
1 ton of coke	26,000,000 Btu
1 ton of wood	9,000,000 to 12,000,000 Btu
1 standard cord of wood	18,000,000 to 24,000,000 Btu
1 face cord of wood	6,000,000 to 8,000,000 Btu
1 pound of low pressure steam (recoverable heat)	1,000 Btu

MEASUREMENT CONVERSIONS

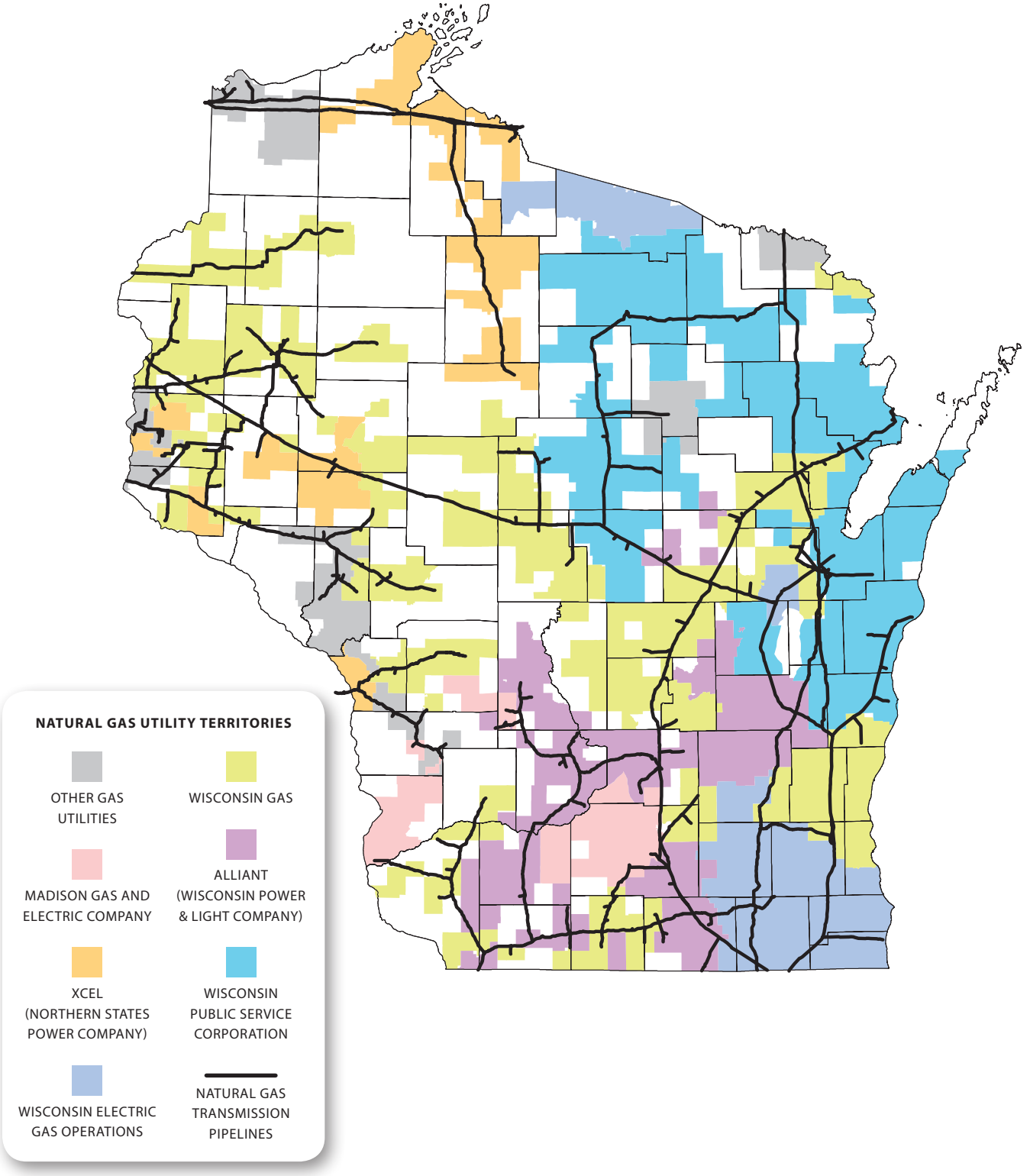
1 short ton (ton) = 2,000 pounds = 6.65 barrels (crude oil)
1 metric ton (tonn) = 2,200 pounds
1 barrel (bbl) = 42 gallons = 5.615 cubic feet = 159.0 liters
1 Mcf = 1,000 cubic feet
1 therm = 10^5 Btu = 100,000 Btu
1 thousand Btu (KBtu) = 1,000 Btu
1 million Btu (MMBtu) = 1,000,000 Btu
1 quad = 10^{15} (quadrillion) Btu or 1,000,000,000 MMBtu
1 kilowatt-hour (kWh) = 1,000 watt-hours
1 megawatt-hour (MWh) = 1,000 kWh or 1,000,000 watt-hours
1 gigawatt-hour (GWh) = 1,000 MWh or 1,000,000,000 watt-hours
1 gallon = 4.524 pounds liquefied petroleum gas
1 standard cord of wood = 8 feet x 4 feet x 4 feet = 128 cubic feet = approx. 3,000-4,000 lbs.
1 face cord of wood = 8 feet x 4 feet x 16 inches = 42.7 cubic feet = approx. 1,333 lbs.

Wisconsin Petroleum Pipelines



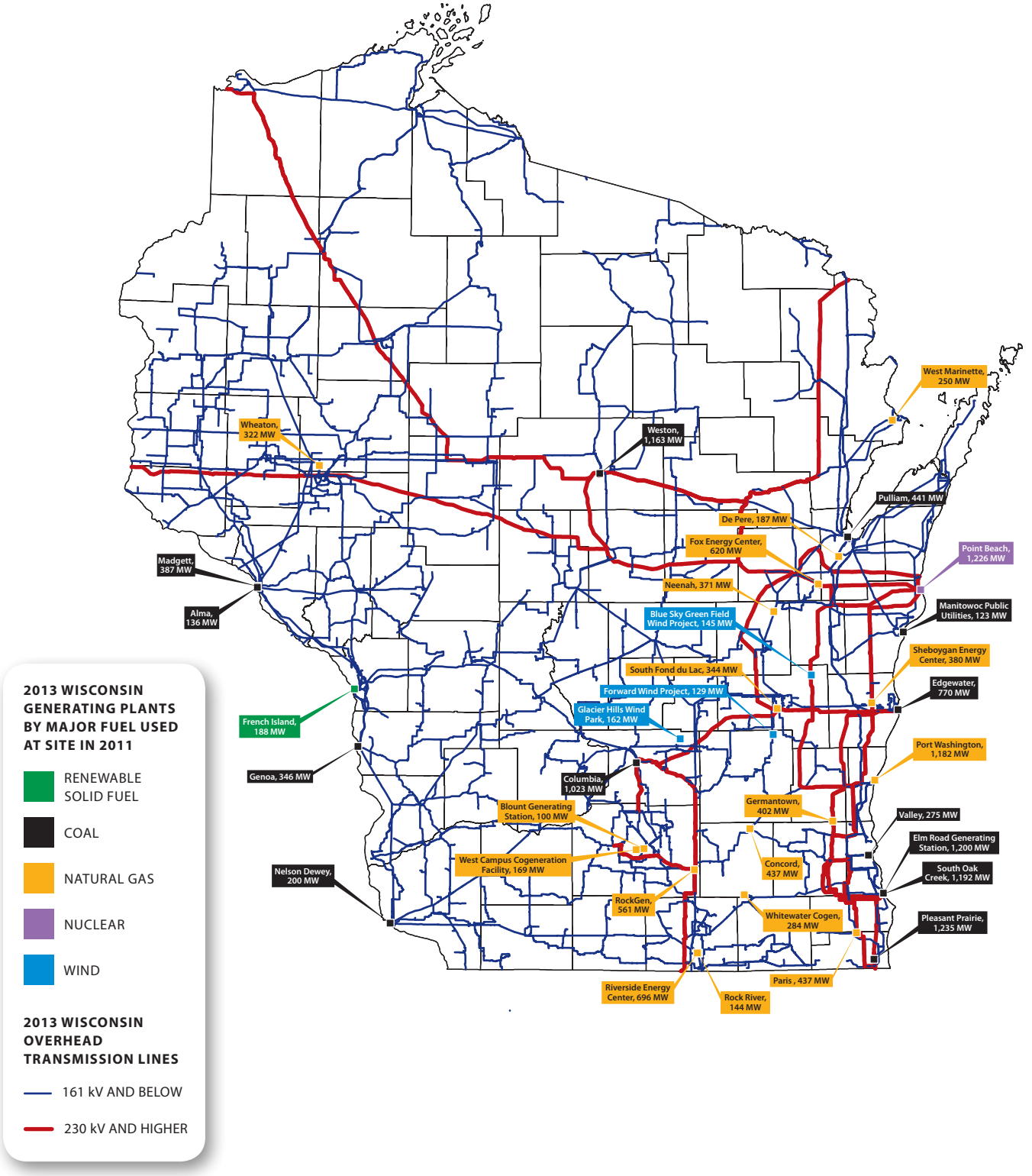
Source: Wisconsin State Energy Office.

Wisconsin Natural Gas Utility Service Territories and Major Pipelines



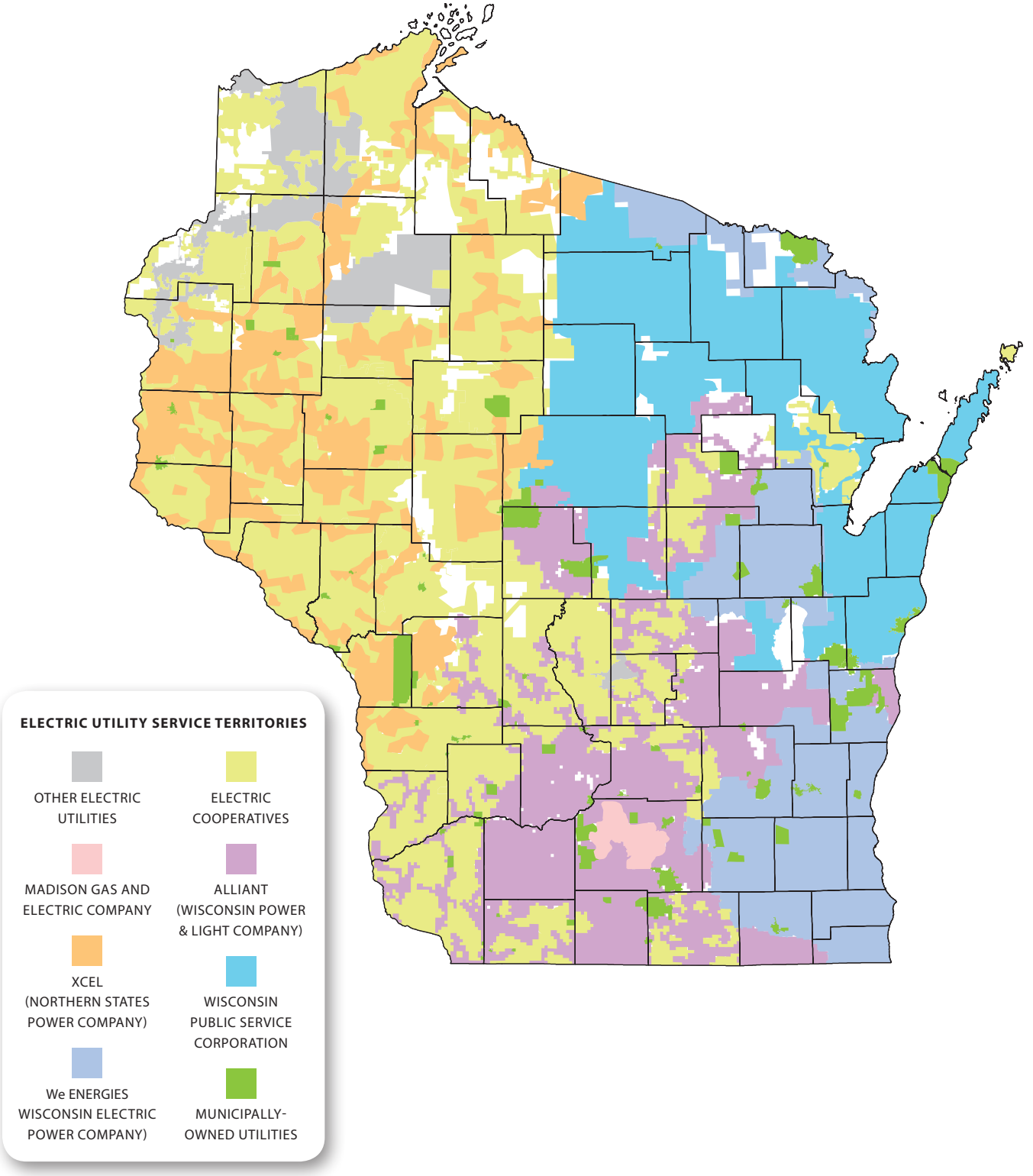
Source: Public Service Commission of Wisconsin.

Wisconsin Electric Generating Facilities Over 100 Megawatts and Electric Transmission Lines



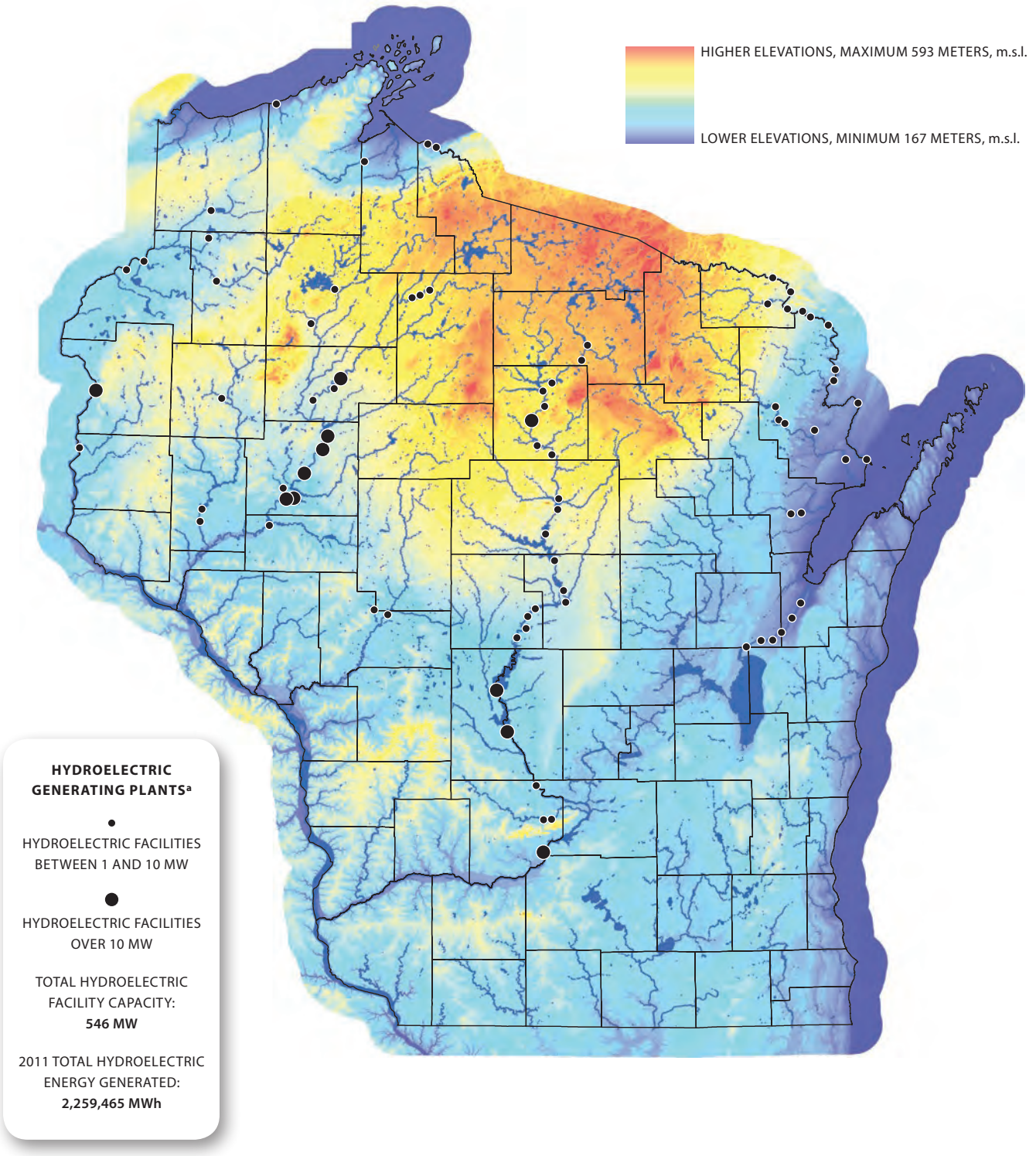
Source: Public Service Commission of Wisconsin.

Major Electric Service Territories



Source: Public Service Commission of Wisconsin.

Hydroelectric Generation Sites in Wisconsin, 2013



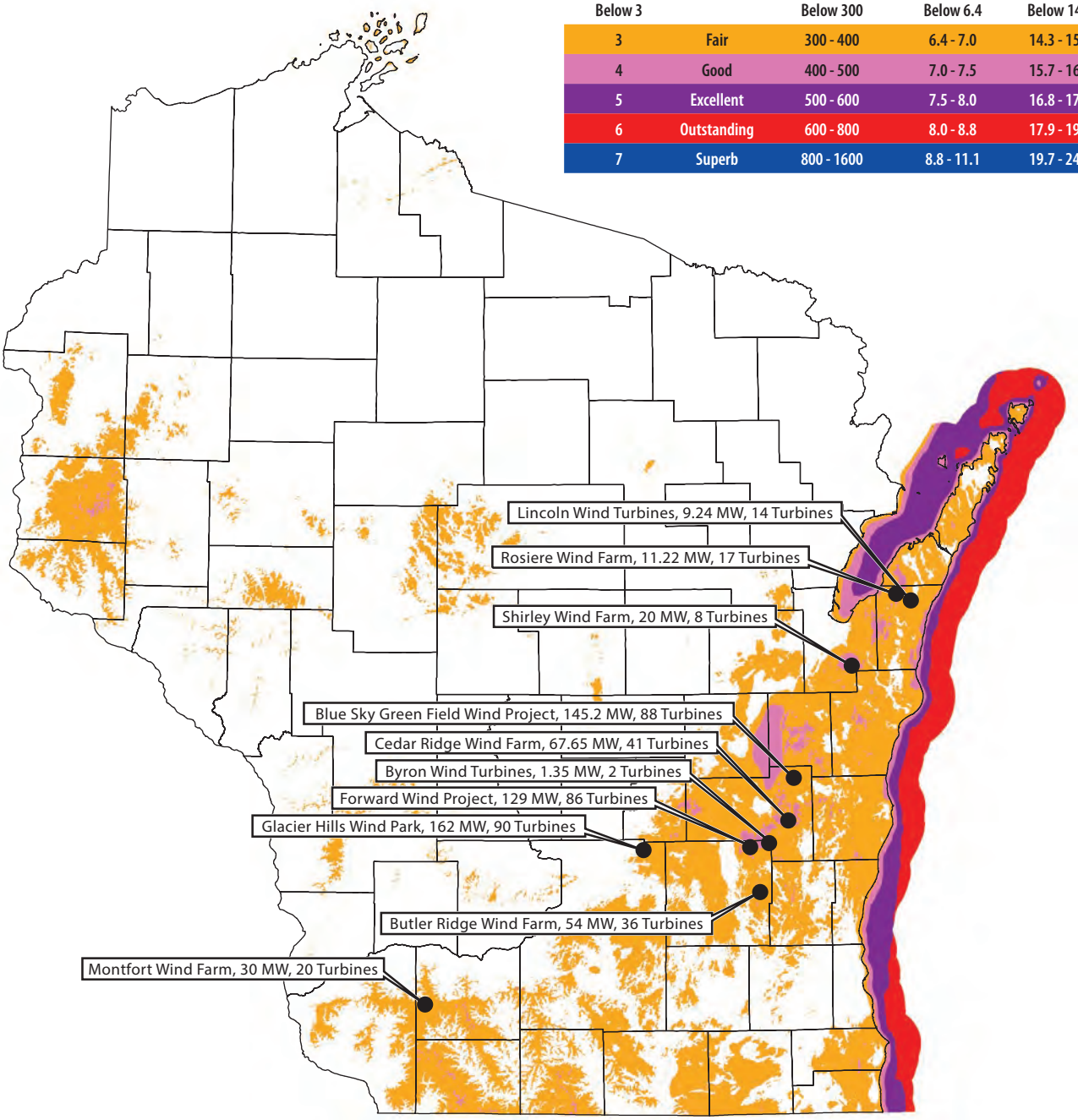
a Capacity and energy generated include hydroelectric facilities owned by utilities, merchants, cooperatives, and other nonutilities.

Capacity and Energy Data Source: Public Service Commission of Wisconsin.

Hydroelectric Facility GIS Data Source: Public Service Commission of Wisconsin, Department of Administration.

Estimated Wind Power Energy Potential (at 70 meters) and Existing Wind Development Locations, 2013

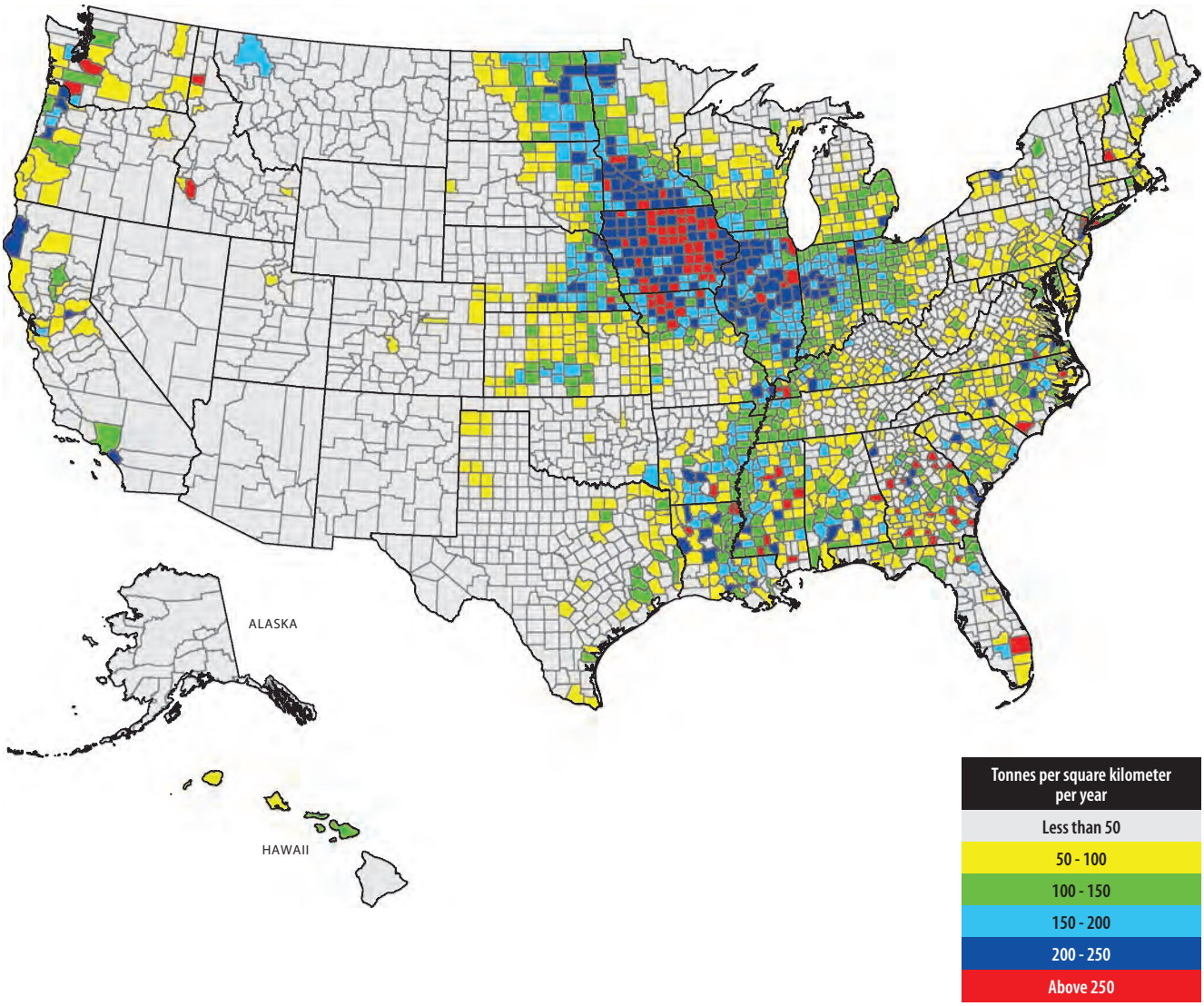
Wind Power Classification	Resource Potential	Wind Power Density at 70 m (watts/square meter)	Wind Speed at 70 m (m/s)	Wind Speed at 70 m (mph)
Below 3		Below 300	Below 6.4	Below 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8



Wind Data Source: AWS Truewind, 2008.

Wind Development Data Source: Public Service Commission of Wisconsin.

Biomass Resources Available in the United States



Based on the map titled "Biomass Resources Available in the United States," distributed by the National Renewable Energy Laboratory (NREL), http://www.nrel.gov/.

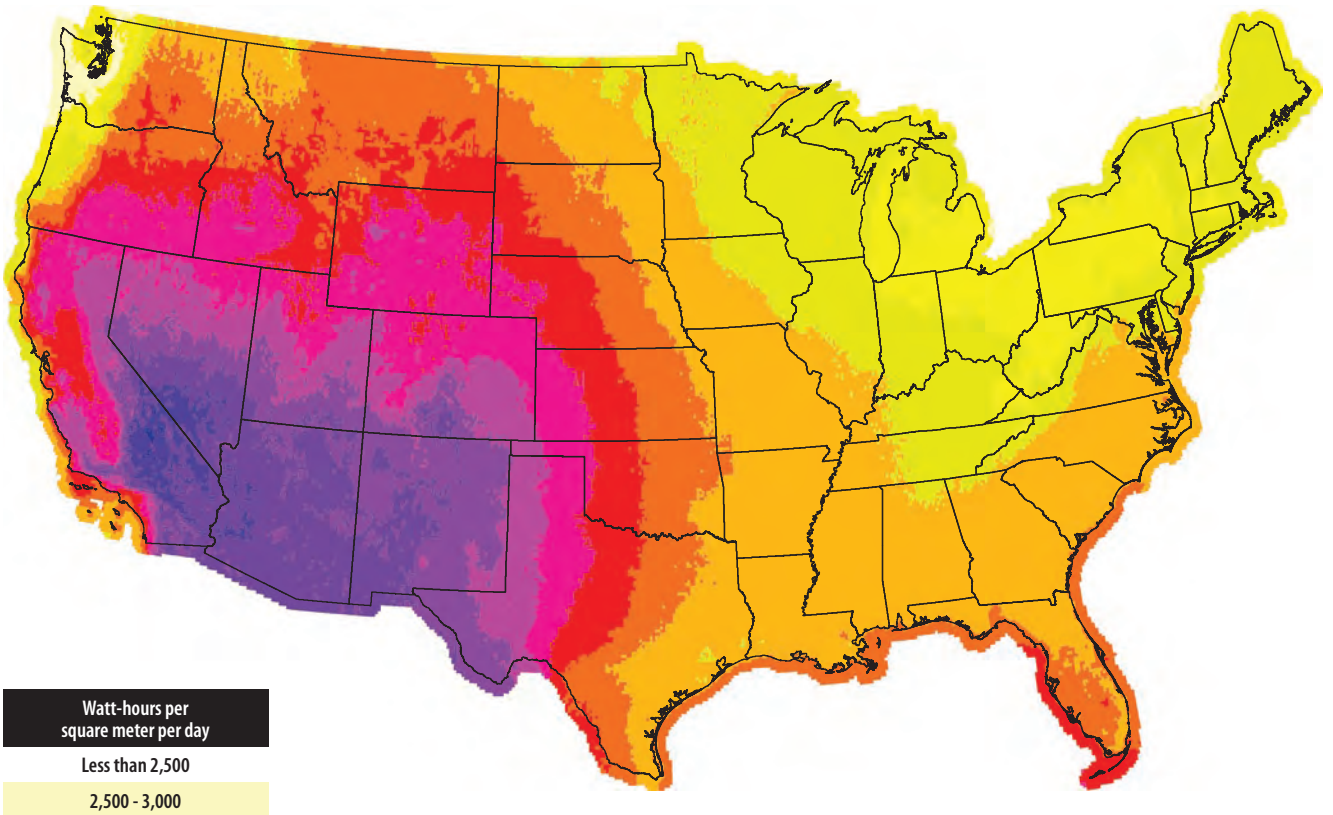
GIS Data Source: http://www.nrel.gov/.

GIS Data Metadata: None available.

Notes from the original NREL map: This study estimates the technical biomass resources currently available in the United States by county. It includes the following feedstock categories:

- Agricultural residues (crops and animal manure).
- Wood residues (forest, primary mill, secondary mill, and urban wood).
- Municipal discards (methane emissions from landfills and domestic wastewater treatment).
- Dedicated energy crops (on Conservation Reserve Program and Abandoned Mine Lands).

Estimated Solar Insulation for the United States, Two-Axis Tracker



Watt-hours per square meter per day
Less than 2,500
2,500 - 3,000
3,000 - 3,500
3,500 - 4,000
4,000 - 4,500
4,500 - 5,000
5,000 - 5,500
5,500 - 6,000
6,000 - 6,500
6,500 - 7,000
7,000 - 7,500
7,500 - 8,000
Above 8,000

GIS Data Source: http://www.nrel.gov/

Purpose: Provide information on the solar resource potential for the 48 contiguous states. The insolation values represent the average solar energy available to a concentrating collector on a 2-axis tracker, such as a dish or a power tower.