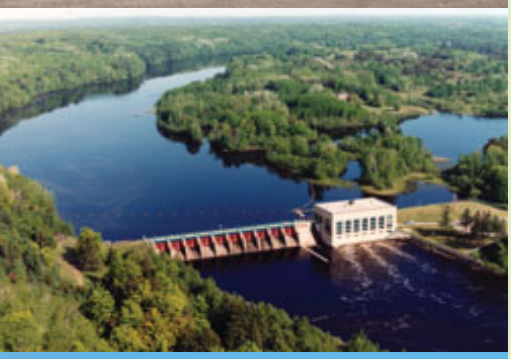

2007

Wisconsin Energy Statistics

Wisconsin Office of Energy Independence
Achieving 25x25

Picture 1 – 1998
The wind turbines on the cover are jointly owned and operated by several Wisconsin utilities. They are the largest in Wisconsin and the first of a new, serious effort to make wind energy a significant contributor to the state's energy mix. Dan Moran, the Wisconsin Energy Bureau's renewable energy specialist, who died earlier this year, was a driving force in making these wind machines a reality. With this cover, Dan's friends and colleagues dedicate this 1998 edition of the Wisconsin Energy Statistics to Dan's memory.

Picture 2 – 2000
The lightening storm on the cover is a photograph by Michael Bath. The photography is part of his collection displayed on the internet at www.gepcities.com/CapeCanaveral/1801.html.

Picture 3 – 2001
The cover illustration is of Mary Ann Cofrin Hall, a new "green" classroom building on the University of Wisconsin – Green Bay campus. The building, dedicated on September 28, 2001, is designed to use 50 percent less energy than a standard building. Cofrin Hall includes daylighting, solar wall and two types of building-integrated photovoltaic arrays, including the first application of the "vision glass" photovoltaic technology in the United States. Courtesy of UW - Green Bay.

Picture 4 – 2004
The cover photo is from the Wisconsin Historical Society's collection and shows a gasoline station in Hayward, Wisconsin. The picture was taken in 1946. In Wisconsin, in 1930 and 1940 gasoline prices averaged 17.4 cents a gallon and 19.2 cents a gallon respectively. However, in today's dollars that would be equal to $1.63 a gallon and $2.11 a gallon respectively. In 2003, Wisconsin's statewide average price of gasoline was $1.62 a gallon; it jumped to $1.90 a gallon, which in real dollars was still less than its 1940 price.

Picture 5 – 2005
The cover 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 6 – 2006
The cover photo shows a Wisconsin barn, originally built in 1856, with an 11.6 kilowatt solar array, which was added in 2004.
The 10 kilowatt wind tower was completed in 2005. The picture was taken by owner, Tim Leitschuh, TDL Electronics in October 2005.
The farm site is located in Franksville, Town of Raymond, Racine County.

2007 Wisconsin Energy Statistics

Jim Doyle

Governor

State of Wisconsin

Judy Ziewacz

Executive Director

Office of Energy Independence

Office of Energy Independence

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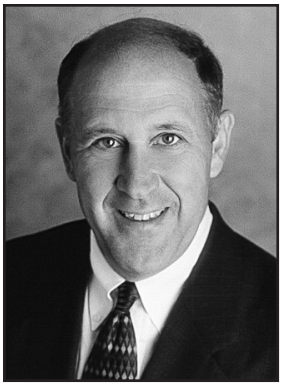

In April, I created the Wisconsin Office of Energy Independence – the first in the nation. With our vast agricultural and forestry resources, our strong research institutions, and our strong manufacturing base, Wisconsin can lead the nation – and the world – in energy independence. The fact is, if an oilfield in Iran has to compete against a farm field in Wisconsin, that's a very good thing for the environment, for our economy, and for the world.

Last year, I launched Wisconsin's "Declaration of Energy Independence," setting three broad goals for the state: (1) to generate 25 percent of our electricity and 25 percent of our transportation fuel from renewable fuels by 2025; (2) to capture 10 percent of the market share for the production of renewable energy sources by 2030, helping America kick its addiction to foreign fossil fuels and bringing tens of thousands of new jobs to our citizens. Achieving this goal would bring $13.5 billion annually to Wisconsin's economy by 2030; and, (3) to become a national leader in groundbreaking research that will make alternative energies more affordable and available to all – and to turn those discoveries into new, high paying jobs right here in Wisconsin.

Governor Jim Doyle

Last year, Wisconsin spent almost $19.5 billion on energy, an increase of $1.1 billion and a new record. To reduce Wisconsin's dependence on imported energy, Governor Doyle has set a goal of 25x25 to promote our Wisconsin energy resources. The Wisconsin Office of Energy Independence is working to make the 25x25 goals a reality, and the Wisconsin Energy Statistics will document our progress.

Judy Ziewacz, Executive Director

Office of Energy Independence

Acknowledgements

The annual ***Wisconsin Energy Statistics*** publication has been produced by the State Energy Office since 1976. The purpose of the publication is to serve as a foundation for evaluating energy activities and trends in Wisconsin.

Overall leadership and guidance were provided by the Executive Director, Judy Ziewacz. Jim O'Neal was responsible for natural gas, petroleum and transportation data, U.S. data, and energy efficiency indices and expenditures. He coordinated production of the report. Jim Mapp prepared electricity and coal data. Jim O'Neal and Jim Mapp worked together on renewable energy use. Jerry Kotek provided data on low income building weatherization.

The Wisconsin Office of Energy Independence relies on many organizations and agencies for the information needed to compile the statistics in this report. They include the American Gas Association, the American Petroleum Institute, the Edison Electric Institute, the Wisconsin Division of the American Automobile Association, the U.S. Department of Agriculture, the U.S. Department of Commerce, and the U.S. Department of Energy, as well as Wisconsin electric and gas utilities and the Public Service Commission of Wisconsin, the Wisconsin Departments of Agriculture Trade and Consumer Protection; Commerce; Health and Family Services; Workforce Development; Natural Resources; Revenue; and Transportation. They also include the Department of Administration's Energy Services Division, which formerly was the Division of Energy with responsibility for preparing this publication. However, in April 2007, the Governor transferred the State Energy Office functions and the responsibility for preparing this publication from the Division of Energy to the Wisconsin Office of Energy Independence. The Division of Energy was transformed into the Division of Energy Services, which will focus on low income energy issues.

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1 Executive Summary

Resource energy consumption in Wisconsin decreased 2.1 percent in 2006 after increasing 0.6 percent in 2005. The use of all fuels, except nuclear, decreased due to milder winter and summer weather, higher energy prices and increased energy efficency. Petroleum use decreased 1.4 percent, driven primarily by a decrease in the use of gasoline. Coal, which is used primarily for electricity generation, decreased 3.5 percent, while electricity imports decreased 1.6 percent. At Wisconsin's three nuclear units, nuclear energy used for electricity generation increased 23.3 percent because maintenance work was completed in 2005. Milder summer weather decreased the demand for electricity to run air conditioners, and the demand for natural gas to generate electricity. Energy use was boosted by the Wisconsin economy, which experienced a 1 percent increase in total employment in 2006 and a 1.7 percent increase in the gross state product.

Sector Energy Use

The industrial sector consumed 24.8 percent of all the end use energy used in Wisconsin in 2006. Industrial users are primarily dependent on natural gas (40.8 percent) and electricity (29.1 percent) to fuel manufacturing activities such as papermaking, printing and food processing. The commercial sector used slightly less energy in 2006. End use energy for commercial activities has increased over 50 percent since 1980, with electricity use more than doubled over the same period. Residential energy use decreased 5.9 percent. Natural gas is the dominant fuel used in households, accounting for almost 48 percent of all energy consumed. Because of higher motor fuel prices, transportation energy use decreased 0.4 percent in 2006.

Expenditures

Total Wisconsin expenditures for energy increased (6 percent) in 2006, setting a new record of almost $19.5 billion. It is estimated that about two-thirds of Wisconsin's energy expenditures leave the state's economy, a significant drain of $13 billion, or about $5,800 per household. This exported state wealth was magnified by higher prices for all fuels, except natural gas, in 2006.

Weather

Wisconsin climate is showing a warming trend. Winter weather has been warmer than the 30-year normal 16 out of the last 17 years. In 2006, there were 14.6 percent fewer heating degree days than the 30-year normal and 7.3 percent fewer heating degree days than 2005. The summers are also getting warmer, which places a burden on the electrical system through increased cooling for space conditioning and food storage. In the past six years, starting with 2001 and ending in 2006, the number of cooling degree days has increased, on average, 16.4 percent over the 1971-2000 normal. In 2006, the summer was hotter than normal with 21 percent more cooling degree days, but with 19 percent fewer cooling degree days than in the very hot summer of 2005.

Natural Gas

Natural gas prices, on average, decreased 5.2 percent in 2006, and natural gas use decreased 8.2 percent. Milder winter weather led to a 7.8 percent decrease in the residential sector in 2006. Also, milder summer weather led to a 19.4 percent decrease in natural gas use to generate electricity. Overall, natural gas use has increased over 23.4 percent since 1990 as access to natural gas increased, and equipment to use natural gas became more pervasive and efficient. The major markets for natural gas in Wisconsin are space heating, industrial processes and electricity generation. Over two-thirds of all Wisconsin households use natural gas, as do more than 157,000 businesses.

Petroleum

Petroleum use in Wisconsin decreased 1.4 percent as use decreased in all sectors except agriculture where it remained constant. Over 83 percent of all petroleum products were used for transportation purposes. Petroleum provides over 29 percent of Wisconsin's resource energy needs. The United States imported over 66 percent of the petroleum it used in 2006, setting a new record high. Over 40 percent of these imports came from OPEC countries. World oil production decreased 0.3 percent in 2006, falling just short of the record high set in 2005.

Coal and Nuclear

Coal use decreased 3.5 percent in 2006, to 25.8 million tons, and has been the most heavily relied upon fuel in Wisconsin since 1996. Coal accounted for 29.5 percent of all the energy used in 2006 and 70 percent of the energy used by Wisconsin utilities and independent power producers to produce electricity. Over 80 percent of the coal used in Wisconsin comes from the vast reserves of low sulfur coal in Wyoming. Utility coal prices increased 18.3 percent in 2006. Because maintenance at Wisconsin's nuclear power plants was completed in 2005, nuclear power use in Wisconsin increased over 23 percent this year and was only 1.7 percent below the record high set in 2002. In 2006, nuclear power accounted for 20 percent of the energy used by Wisconsin's utilities to produce electricity.

Electricity

There has been a gradual shift in Wisconsin from a steam and heat based manufacturing economy to an electronic, service sector economy, which is increasing electricity usage. Wisconsin has an annual growth of 1.7 percent in electrical use over the past decade. Electricity sales decreased 0.7 percent in 2006. In 2006, the industrial sector was the largest electricity user in Wisconsin, using 36 percent. However, the commercial and residential sectors are not far behind, using 32.6 percent and 28.4 percent respectively.

Renewable Energy, Energy Efficiency and the Environment

Renewable energy use decreased 0.8 percent in 2006, primarily because of decreased use of wood and hydro. However, wood is still Wisconsin's most-used renewable energy resource, but other biomass resources, landfill gas and ethanol, have increased recently. Wisconsin's first two large ethanol facilities were completed in 2002 in Monroe and Stanley, a third one began operation in Oshkosh in 2003, a fourth in Friesland in 2005 and a fifth in Wheeler became operational in 2006. Wisconsin's consumption of ethanol increased 6.1 percent In 2006. However, with the addition of the Wheeler plant , Wisconsin's production of ethanol of 210.4 million gallons exceeded, for the third year in a row, the state's ethanol use of 130.4 million gallons. In 2006 renewable energy produced over 2.3 billion kWh of electricity in Wisconsin. Production of electricity from renewable energy sources should increase in the future as Wisconsin utilities comply with the state's renewable energy portfolio standard.

In 2006, two key indices of Wisconsin energy efficiency showed a decrease in energy use. These indices were total energy use per $1,000 of gross state product and electric energy use per $1,000 gross state product. In the transportation sector, the long-term trend of driving more miles per vehicle was broken in **2005**, while fuel efficiency increased slightly for the third year in a row. When comparing Wisconsin's 2003 per capita energy use to the other 49 states and the District of Columbia, Wisconsin is in the middle (25th largest user of 51), with its per capita energy consumption 1.2 percent above the U.S. average.

Carbon dioxide emissions from energy use decreased (3.7 percent) as in-state resource use of fossil fuels decreased 4.1 percent. Emissions of carbon dioxide have now increased almost 21 percent since the 1990 base year and are at an all time high.

Wisconsin Energy Statistics 2007 presents the most current information available on Wisconsin's energy supply system and use patterns. The current edition builds on over 23 years of continuous energy data collection and analysis by the Wisconsin State Energy Office, which in 2007 was transformed by Executive Order into the Wisconsin Office of Energy Independence (OEI).

2 Total Energy Use

The following pages present an overview of Wisconsin's annual energy use from 1970 to 2006. 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.

The chapter begins by presenting resource energy use by type of fuel: petroleum, natural gas, coal, renewable energy resources, nuclear power and imported electricity. (Most renewable resource information, including solar and wind energy, is presented in Chapter 4.) The second table shows resource energy use by economic sector: residential, commercial*, industrial, agricultural and transportation. In the next two tables, annual consumption of end use energy also is presented by fuel type and by economic sector. Several tables follow which detail energy use information for each economic sector.

In 2006, total resource energy consumption in Wisconsin decreased 2.1 percent, following a 0.6 percent increase in 2005. The 2006 decrease in resource energy use was due to milder summer and winter weather, increased energy efficiency and higher fuel prices, which more than off-set the effects of an increasing state population and an expanding economy. At Wisconsin's three nuclear power plans, nuclear energy use for electricity generation increased over 23 percent because maintenance work was completed in 2005.

Despite the milder 2006 summer and completion in 2005 of the maintenance at the nuclear plants, electricity imported into Wisconsin decreased only 1.6 percent. However, natural gas used for electricity generation decreased over 8 percent. Electricity imports represented 7.1 percent of all resource energy used.

Petroleum use decreased 1.4 percent in 2006, after decreasing 1.7 percent in 2005. Prior to 1996, petroleum was Wisconsin's leading energy source, but its share of resource energy use has fallen from a peak of 40 percent in 1977 to 29.4 percent in 2006. While petroleum continues to be the leading end use energy source, it ranks behind coal in resource energy use in Wisconsin.

In 2006, coal use by Wisconsin industry and electric utilities decreased 3.5 percent because electricity demand was lower, Wisconsin's three nuclear plants were fully operational and utilities wanted to rebuild their coal stock piles after experiencing problems in 2005 with rail coal deliveries from the Powder River Basin in Montana and Wyoming. Coal now accounts for 29.5 percent of Wisconsin's resource energy use. Coal surpassed natural gas as the state's second largest energy source in 1981, and in 1996 coal surpassed petroleum as the state's leading

*In this report, commercial is defined broadly to include enterprises selling goods and services, as well as establishments such as religious and government institutions that provide other kinds of services.

source of resource energy, a lead it continues to hold. In 2006, natural gas resource use decreased 8.2 percent due to milder summer weather, and less need to use natural gas to generate electricity to operate air conditioners.

Because of milder summer and winter weather, end use electricity consumption decreased 0.8 percent in 2006. Electricity accounted for 20 percent of end use energy in 2006, compared to 8.6 percent in 1970. Two significant factors help explain this. First, a series of warm summers during the past several years have dramatically increased the use of air conditioning in Wisconsin. Second, the state's economy and population has grown, and electricity is used to run equipment in all aspects of our society.

In general, the residential and transportation sectors each accounted for about one-quarter of Wisconsin's resource energy consumption in 2006, 23.7 percent and 25.1 percent, respectively. The industrial sector used 28.3 percent of the state's resource energy while the commercial and agricultural sectors accounted for 20.7 percent and 2.1 percent, respectively. In 2006, residential energy use decreased 4.9 percent, commercial energy use increased 0.4 percent, industrial energy use decreased 3.2 percent, agricultural energy use increased 0.5 percent and transportation energy use decreased 0.4 percent.

End Use Energy Consumption by Sector

In the **residential sector**, end use energy consumption decreased 5.9 percent in 2006. Electricity consumption decreased 2.9 percent from its 2005 level because of a decreased summer cooling load. Residential petroleum use decreased 6.6 percent in 2006 due to a warmer winter. Between 1970 and 2006, petroleum use in the residential sector declined 67.5 percent. Natural gas use decreased 7.8 percent from 2005 and is 18.2 percent below the record level established in 1996. Natural gas continues to be the dominant energy source in this sector. The natural gas share of residential end use energy consumption has increased from 40.5 percent in 1970 to 47.9 percent in 2006.

Commercial sector end use energy consumption increased 0.4 percent in 2006. There was a 1.1 percent increase in electricity use and a 7.8 percent decrease in petroleum use, while natural gas use remained constant. Natural gas remains the major energy source, providing 48 percent of commercial sector energy in 2006. Electricity use in this sector increased almost 300 percent between 1970 and 2006, for an annual growth rate of about 3.9 percent over the 36-year period. Electricity's share of total commercial energy use has increased from 18.8 percent in 1970 to 42.6 percent in 2006. Petroleum's importance in this sector has declined from providing 28.1 percent of the energy used in 1970, to presently accounting for only 5.8 percent of total commercial energy consumption.

Industrial sector end use energy consumption decreased 3.2 percent in 2006. The availability of less expensive "direct purchase" natural gas led to the substitution of natural gas for petroleum during the past decade. In 2006, natural gas use decreased 9.1 percent, and electricity use decreased 0.8 percent, while petroleum use decreased 5.5 percent and renewable energy use increased 1 percent. Natural gas accounts for 40.8 percent of industrial end use energy needs, with coal at 15.4 percent and electricity

at 29.1 percent. The remaining 14.7 percent is split between petroleum and renewable energy. Petroleum contributes slightly more to Wisconsin's industrial energy needs than renewables. However, renewable energy use may exceed petroleum in the future as renewable energy technologies continue to mature.

In the **electricity generation sector**, since the early 1980s, the generation of electricity from coal and nuclear power has dominated. Because maintenance activities were completed in 2005, 2006 nuclear energy use increased 23.3 percent and was only 1.7 percent below the record high set in 2002. Coal use decreased 3.9 percent and imports of electricity (and associated losses) from other states and Canada decreased 1.6 percent. Petroleum use decreased 21.2 percent and natural gas use decreased 19.4 percent. In 2006, of the electricity produced in Wisconsin by utilities and independent power producers, coal provided 70 percent and nuclear generation provided 20 percent of the needed energy. In 2006, the proportion provided by petroleum, natural gas, wood and hydropower was only 10 percent. Independent power producers are beginning to become a factor in generating electricity in Wisconsin with their percentage of the electric power sold in the state increasing from 2.6 percent in 2004 to 4.7 percent in 2006. Natural gas is their fuel of choice, and this is reflected in the almost 124 percent jump in natural gas use between 2004 and 2006. However, because the summer of 2006 was milder than last year, natural gas, which is primarily used as a fuel to meet peak electricity demands, decreased over 19 percent in 2006.

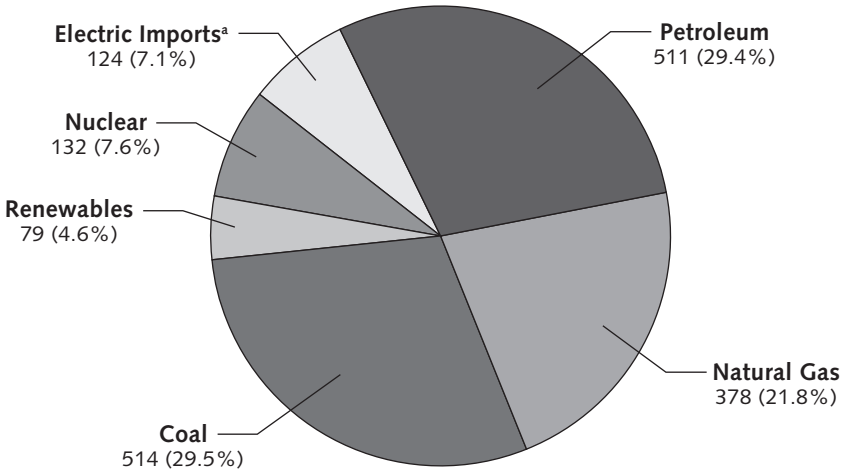
End use energy consumption in the **agricultural sector** remained constant from 2005 to 2006. Agricultural use of energy accounted for 1.8 percent of total Wisconsin end use energy. Electricity's share of energy used by agriculture was almost 33 percent.

In the **transportation sector**, since 2004, the average statewide price of gasoline has increased 72.5 cents a gallon or over 38 percent. In 2006, the average statewide price of gasoline increased by 30.5 cents a gallon, to $2.626 a gallon. This resulted in a decrease in state gasoline usage (including the ethanol component) of 3 percent in 2006. Ethanol, a renewable energy resource primarily distilled from corn, is used as an oxygenate in reformulated gasoline sold in southeastern Wisconsin and to increase octane levels in a portion of the conventional gasoline sold throughout Wisconsin. Because of its use in reformulated gasoline, which was introduced in southeastern Wisconsin in 1995, ethanol use in gasoline sold in Wisconsin has increased significantly and now provides 3.6 percent of the energy content of gasoline sold in the state. Diesel fuel is used primarily for trucking freight. In 2006, despite a price increase of 11.7 percent or 29.4 cents a gallon, diesel fuel use increased 8 percent demonstrating the importance of trucking to an expanding state economy. Overall, transportation's use of energy declined 0.4 percent. Transportation activities consume 35.8 percent of Wisconsin's total end use energy, accounting for 83.3 percent of petroleum use and 13.9 percent of renewable energy end use.

Wisconsin Resource Energy Consumption, by Type of Fuel

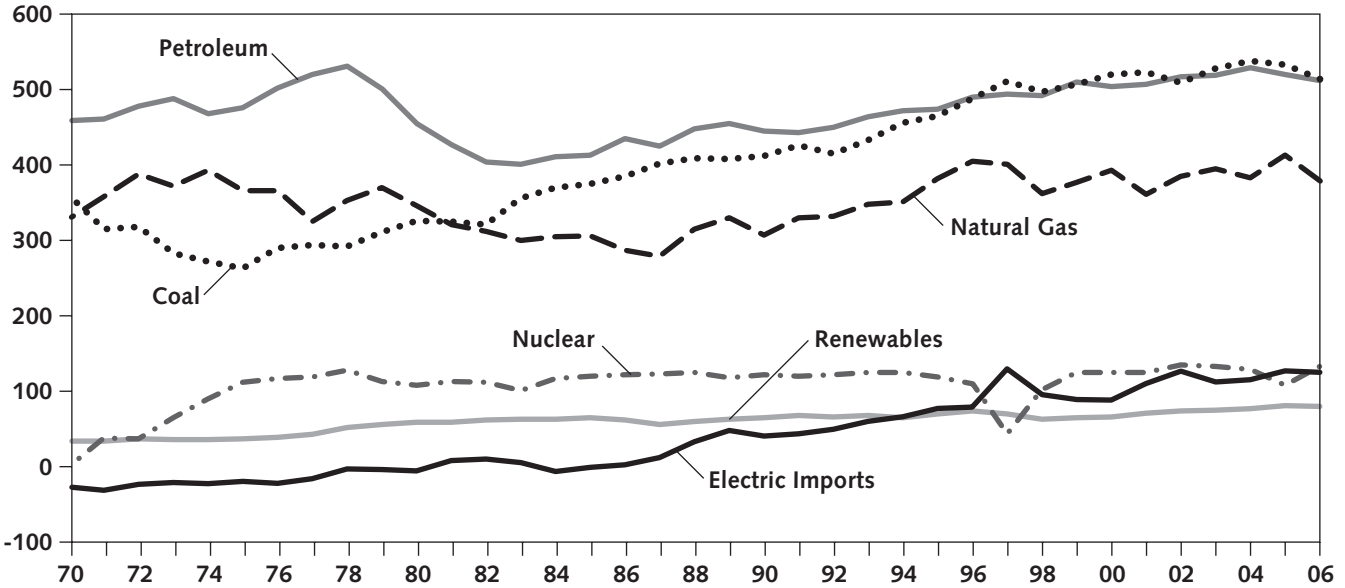
2006

(Trillions of Btu and Percent of Total)



1970-2006

(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 Office of Energy Independence.

Wisconsin Resource Energy Consumption, by Type of Fuel 1970-2006

(Trillions of Btu and Percent of Total)

Resource energy consumption decreased 2.1 percent in 2006. The 2006 summer was cooler which decreased the summer demand for electricity to run air conditioners. At Wisconsin's three nuclear units, nuclear energy use for electricity generation increased over 23 percent because maintenance work was completed in 2005. A decrease in electricity use, along with increased nuclear generation of electricity, helped reduce the use of coal, natural gas and the need to import electricity. Petroleum use decreased 1.4 percent, because of higher prices for gasoline.

Year	Petroleum		Natural Gas		Coal[a]		Renewables[b]		Nuclear		Electric Imports[c]		Total
1970	457.7	(39.8%)	329.8	(28.7%)	355.4	(30.9%)	32.6	(2.8%)	1.7	(0.1%)	(28.2)	-(2.5)	1,149.0
1975	475.0	(38.6)	365.1	(29.7)	262.3	(21.3)	36.1	(2.9)	111.2	(9.0)	(20.4)	-(1.7)	1,229.3
1980	454.4	(35.4)	344.5	(26.9)	324.6	(25.3)	57.8	(4.5)	107.0	(8.4)	(6.5)	-(0.5)	1,281.9
1985	412.0	(32.4)	305.0	(24.0)	374.4	(29.4)	64.1	(5.0)	118.6	(9.3)	(1.8)	-(0.1)	1,272.3
1990	444.4	(32.0)	306.4	(22.1)	411.4	(29.7)	63.9	(4.6)	121.2	(8.7)	39.7	(2.9)	1,387.0
1995	473.3	(29.9)	381.1	(24.1)	463.7	(29.3)	69.0	(4.4)	118.5	(7.5)	76.3	(4.8)	1,581.9
1996	488.6	(29.8)	403.7	(24.6)	486.9	(29.7)	72.8	(4.4)	109.3	(6.7)	78.1	(4.8)	1,639.4
1997	492.7	(30.0)	400.4	(24.4)	510.1	(31.0)	69.3	(4.2)	42.3	(2.6)	128.5	(7.8)	1,643.3
1998	491.4	(30.6)	361.0	(22.5)	495.8	(30.9)	62.0	(3.9)	101.5	(6.3)	94.6	(5.9)	1,606.3
1999	508.6	(30.5)	375.5	(22.5)	505.5	(30.4)	63.8	(3.8)	124.1	(7.5)	88.1	(5.3)	1,665.6
2000	503.4	(29.8)	392.0	(23.2)	519.4	(30.7)	65.3	(3.9)	124.3	(7.3)	87.4	(5.2)	1,691.9
2001	506.0	(29.9)	360.1	(21.3)	521.9	(30.9)	70.0	(4.1)	124.3	(7.3)	109.3	(6.5)	1,691.5
2002	515.6	(29.6)	384.3	(22.1)	508.5	(29.2)	73.4	(4.2)	134.4	(7.7)	125.7	(7.2)	1,741.9
2003	518.3	(29.5)	394.0	(22.4)	527.0	(30.0)	74.3	(4.2)	131.9	(7.5)	111.4	(6.3)	1,757.0
2004	528.0	(29.9)	381.6	(21.6)	537.0	(30.4)	76.5	(4.3)	128.4	(7.3)	114.4	(6.5)	1,765.9
2005	518.8	(29.2)	412.1	(23.2)	531.7	(29.9)	79.9	(4.5)	107.1	(6.0)	126.1	(7.1)	1,775.8
2006[p]	**511.4**	**(29.4)**	**378.2**	**(21.8)**	**513.4**	**(29.5)**	**79.2**	**(4.6)**	**132.1**	**(7.6)**	**124.2**	**(7.1)**	**1,738.5**

[a] Including petroleum coke.

[b] Renewables includes solar, wind, wood, biogas, bio solid waste 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.

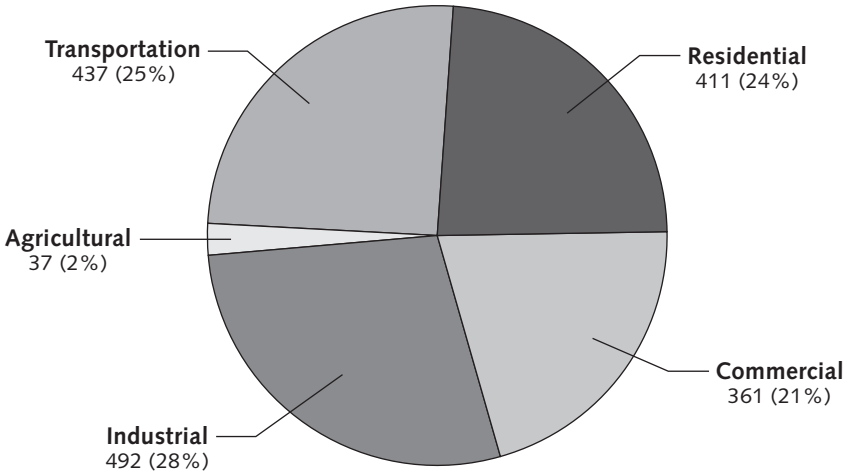
[p] Preliminary estimates.

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

Wisconsin Resource Energy Consumption, by Economic Sector

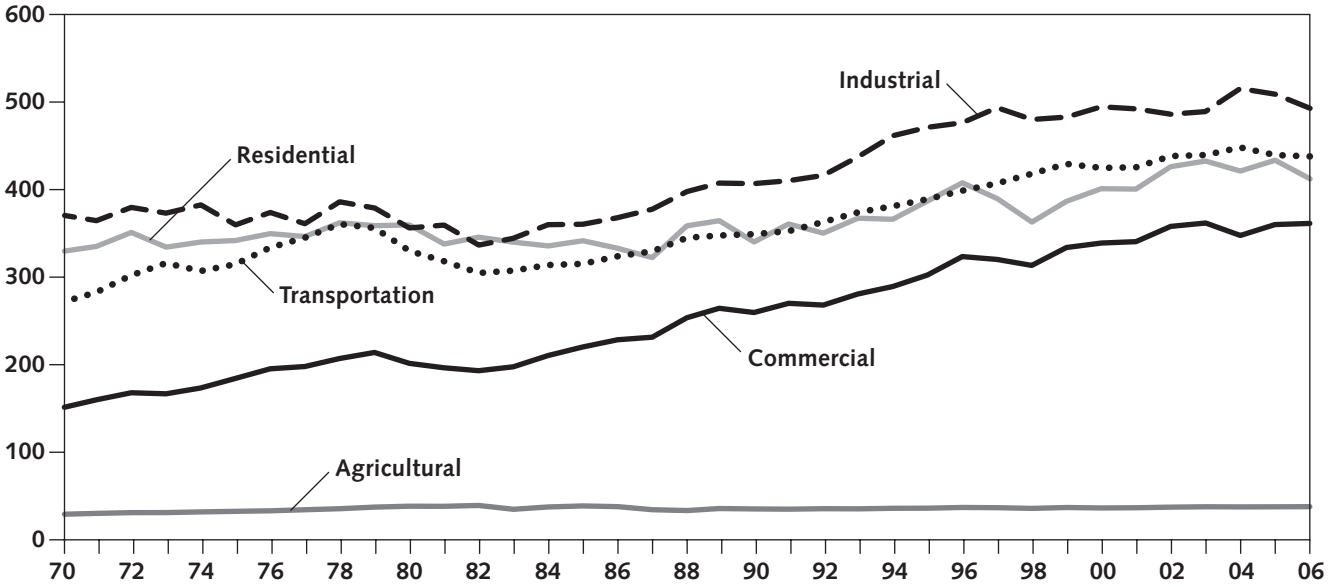
2006

(Trillions of Btu and Percent of Total)



1970-2006

(Trillions of Btu)



Source: Wisconsin Office of Energy Independence.

Wisconsin Resource Energy Consumption, by Economic Sector[r] 1970-2006

(Trillions of Btu and Percent of Total)

Total resource energy consumption decreased 2.1 percent in 2006. The largest decrease was in the residential sector and was caused by milder winter and summer weather.

Year	Residential		Commercial		Industrial		Agricultural		Transportation		Total
1970	329.0	(28.6%)	150.6	(13.1%)	369.7	(32.2%)	28.5	(2.5%)	271.2	(23.6%)	1,149.0
1975	341.1	(27.7)	183.6	(14.9)	358.9	(29.2)	31.8	(2.6)	314.0	(25.5)	1,229.3
1980	358.8	(28.0)	200.8	(15.7)	355.4	(27.7)	37.6	(2.9)	329.2	(25.7)	1,281.8
1985	340.8	(26.8)	219.5	(17.3)	359.6	(28.3)	37.9	(3.0)	314.4	(24.7)	1,272.3
1990	339.3	(24.5)	258.8	(18.7)	406.0	(29.3)	34.5	(2.5)	348.4	(25.1)	1,387.0
1991	359.9	(25.3)	269.3	(18.9)	409.4	(28.7)	34.2	(2.4)	351.8	(24.7)	1,424.6
1992	349.4	(24.4)	267.3	(18.7)	415.5	(29.1)	34.7	(2.4)	362.3	(25.3)	1,429.2
1993	366.6	(24.6)	280.1	(18.8)	436.6	(29.3)	34.6	(2.3)	373.3	(25.0)	1,491.2
1994	365.3	(23.9)	288.5	(18.9)	460.8	(30.1)	35.2	(2.3)	380.3	(24.9)	1,530.1
1995	386.1	(24.4)	301.7	(19.1)	470.4	(29.7)	35.4	(2.2)	388.3	(24.5)	1,581.9
1996	406.9	(24.8)	322.7	(19.7)	475.6	(29.0)	36.2	(2.2)	398.0	(24.3)	1,639.4
1997	388.9	(23.7)	319.4	(19.4)	492.7	(30.0)	35.9	(2.2)	406.4	(24.7)	1,643.3
1998	362.0	(22.5)	312.6	(19.5)	479.3	(29.8)	35.1	(2.2)	417.3	(26.0)	1,606.3
1999	385.8	(23.2)	333.1	(20.0)	482.1	(28.9)	36.1	(2.2)	428.5	(25.7)	1,665.6
2000	400.3	(23.7)	338.2	(20.0)	493.8	(29.2)	35.6	(2.1)	424.0	(25.1)	1,691.9
2001	399.8	(23.6)	339.8	(20.1)	491.4	(29.1)	35.9	(2.1)	424.7	(25.1)	1,691.5
2002	425.4	(24.4)	357.2	(20.5)	485.3	(27.9)	36.5	(2.1)	437.5	(25.1)	1,741.9
2003	431.8	(24.6)	361.0	(20.6)	488.3	(27.8)	37.0	(2.1)	438.7	(25.0)	1,756.9
2004	420.4	(23.8)	346.8	(19.6)	514.6	(29.1)	36.8	(2.1)	447.3	(25.3)	1,765.9
2005	432.7	(24.4)	359.3	(20.2)	508.2	(28.6)	36.9	(2.1)	438.7	(24.7)	1,775.8
2006[p]	**411.6**	**(23.7)**	**360.6**	**(20.7)**	**492.1**	**(28.3)**	**37.1**	**(2.1)**	**437.1**	**(25.1)**	**1,738.5**

[p] Preliminary estimates.

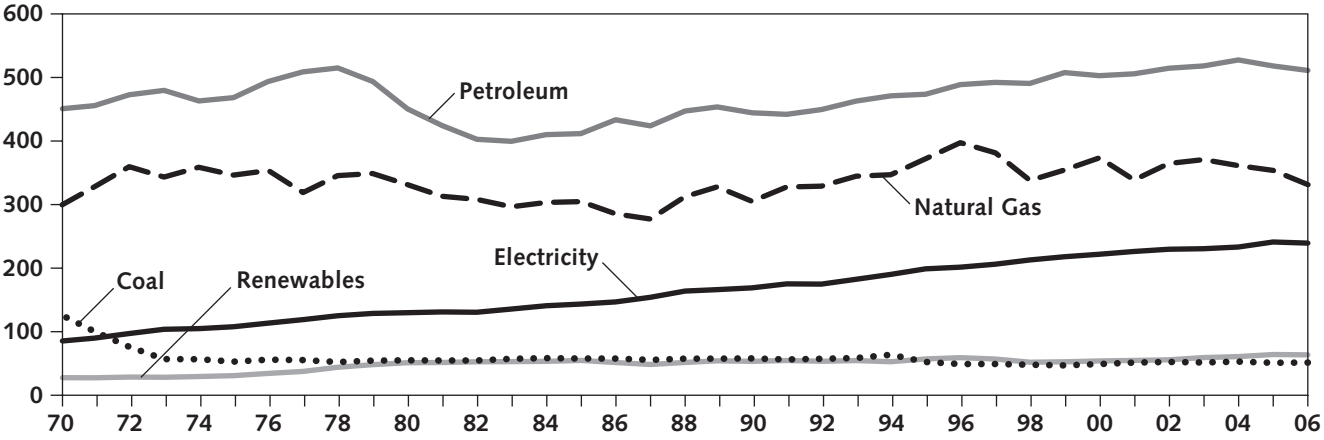
[r] Revised due to revisions in contributing tables.

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[r] 1970-2006

(Trillions of Btu and Percent of Total)

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 for all fuels, except coal, in 2006. Overall, end use growth in 2006 decreased 2.6 percent after decreasing 0.6 percent in 2005. Petroleum continued to be the most used end use energy source in Wisconsin.



Year	Petroleum		Natural Gas		Coal		Renewables		Electricity		Total
1970	449.8	(45.7%)	298.7	(30.4%)	124.3	(12.6%)	26.6	(2.7%)	84.4	(8.6%)	983.7
1975	467.2	(46.7)	345.3	(34.5)	51.8	(5.2)	29.8	(3.0)	106.7	(10.7)	1,000.8
1980	449.6	(44.4)	330.4	(32.6)	53.9	(5.3)	50.1	(4.9)	128.8	(12.7)	1,012.8
1985	410.6	(42.5)	303.6	(31.4)	56.7	(5.9)	53.7	(5.6)	142.4	(14.7)	967.0
1990	443.4	(43.3)	304.0	(29.7)	56.9	(5.6)	52.3	(5.1)	167.9	(16.4)	1,024.5
1995	472.5	(41.1)	371.0	(32.3)	51.3	(4.5)	56.0	(4.9)	197.8	(17.5)	1,148.7
2000	501.8	(42.0)	372.4	(31.1)	48.0	(4.0)	52.9	(4.4)	220.8	(18.5)	1,195.9
2001	504.7	(43.1)	337.5	(28.8)	50.3	(4.3)	53.7	(4.6)	225.2	(19.2)	1,171.4
2002	513.5	(42.4)	363.6	(30.0)	51.3	(4.2)	54.7	(4.5)	228.7	(18.9)	1,211.8
2003	517.1	(42.2)	369.7	(30.2)	50.5	(4.1)	58.2	(4.8)	229.5	(18.7)	1,225.0
2004	526.5	(42.8)	360.2	(29.3)	51.9	(4.2)	59.8	(4.9)	232.2	(18.9)	1,230.4
2005	517.0	(42.3)	352.7	(28.8)	50.0	(4.1)	63.0	(5.2)	240.1	(19.6)	1,222.8
2006[p]	**510.0**	**(42.8)**	**330.3**	**(27.7)**	**50.4**	**(4.2)**	**62.5**	**(5.2)**	**238.3**	**(20.0)**	**1,191.5**

[p] Preliminary estimates.

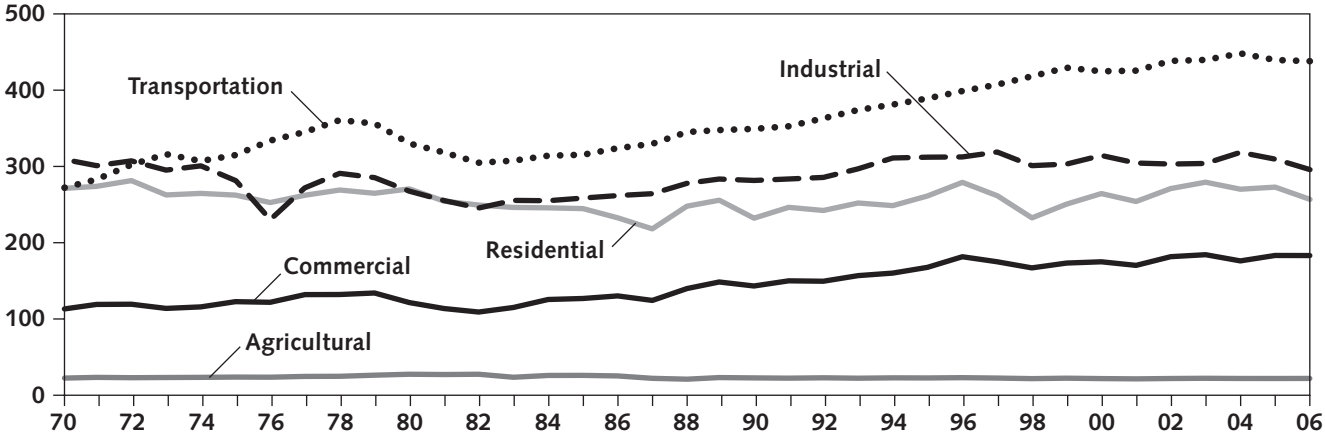
[r] Revised due to revisions in contributing tables.

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.

Wisconsin End Use Energy Consumption, by Economic Sector[r] 1970-2006

(Trillions of Btu and Percent of Total)

End use energy consumption decreased 2.6 percent in 2006, after increasing 0.6 percent in 2005. Milder winter and summer weather helped decrease energy use in the residential sector, which drove the overall decrease in energy use. In 2006, energy use in the transportation sector dropped 0.4 percent because of the higher prices; however, transportation continues to be the largest user of energy.



Year	Residential		Commercial		Industrial		Agricultural		Transportation		Total
1970	270.4	(27.5%)	112.3	(11.4%)	308.2	(31.3%)	21.6	(2.2%)	271.2	(27.6%)	983.7
1975	261.5	(26.1%)	121.8	(12.2%)	280.6	(28.0%)	22.9	(2.3%)	314.0	(31.4%)	1,000.8
1980	269.7	(26.6%)	120.6	(11.9%)	266.7	(26.3%)	26.7	(2.6%)	329.2	(32.5%)	1,012.8
1985	243.8	(25.2%)	126.0	(13.0%)	257.6	(26.6%)	25.2	(2.6%)	314.4	(32.5%)	967.0
1990	231.2	(22.6%)	142.3	(13.9%)	280.8	(27.4%)	21.9	(2.1%)	348.4	(33.9%)	1,024.5
1995	260.4	(22.7%)	166.9	(14.5%)	311.3	(27.1%)	21.8	(1.9%)	388.3	(33.5%)	1,148.7
2000	263.5	(22.0%)	174.1	(14.6%)	313.5	(26.2%)	20.9	(1.8%)	423.9	(34.8%)	1,195.9
2001	253.1	(21.6%)	169.4	(14.5%)	303.6	(25.9%)	20.6	(1.8%)	424.7	(35.6%)	1,171.4
2002	270.1	(22.3%)	180.8	(14.9%)	302.2	(24.9%)	21.1	(1.7%)	437.5	(35.5%)	1,211.8
2003	278.4	(22.7%)	183.4	(15.0%)	303.0	(24.7%)	21.3	(1.7%)	438.8	(35.1%)	1,225.0
2004	269.3	(21.9%)	175.2	(14.2%)	317.5	(25.8%)	21.1	(1.7%)	447.3	(35.7%)	1,230.4
2005	272.0	(22.2%)	182.4	(14.9%)	308.7	(25.2%)	21.1	(1.7%)	438.7	(35.0%)	1,222.8
2006[p]	**256.0**	**(21.5%)**	**182.3**	**(15.3%)**	**295.0**	**(24.8%)**	**21.1**	**(1.8%)**	**437.1**	**(35.8%)**	**1,191.5**

[p] Preliminary estimates.

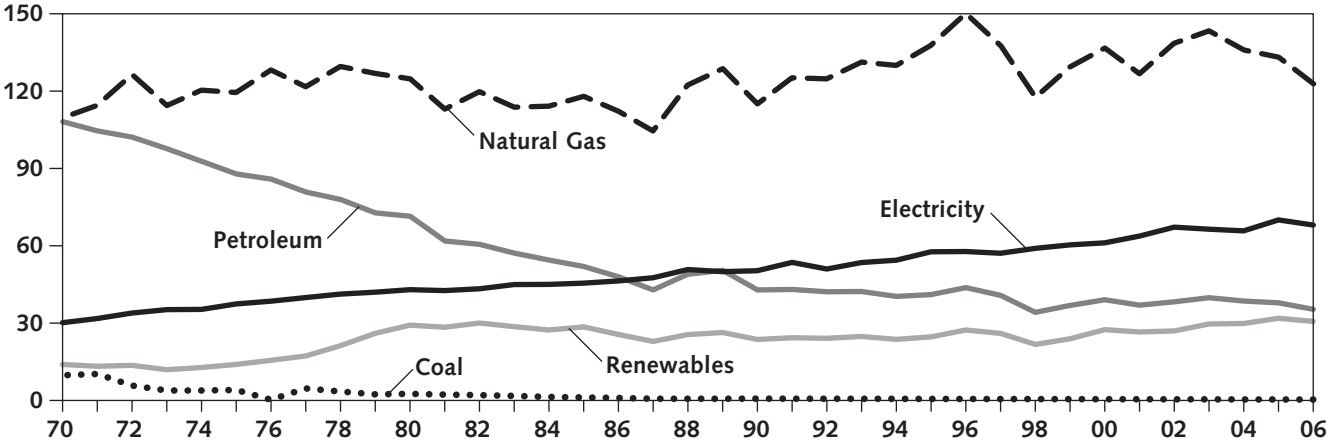
[r] Revised due to revisions in contributing tables.

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[r] 1970-2006

(Trillions of Btu and Percent of Total)

Residential end use energy decreased 5.9 percent in 2006, mainly because of decreased space heating and cooling needs caused by a warmer winter and cooler summer weather. Cooling degree days decreased 19 percent compared to 2005, while heating degree days decreased 7.3 percent. Natural gas continues to be the dominant fuel used in Wisconsin homes, providing almost half of the end use energy used.



Year	Petroleum		Natural Gas		Coal		Renewables[a]		Electricity		Total End Use	Total Resource[b]
1970	107.9	(39.9%)	109.4	(40.5%)	9.5	(3.5%)	13.7	(5.1%)	29.9	(11.1%)	270.4	329.0
1975	87.6	(33.5)	119.2	(45.6)	3.8	(1.5)	13.7	(5.2)	37.2	(14.2)	261.5	341.1
1980	71.2	(26.4)	124.5	(46.2)	2.3	(0.9)	28.9	(10.7)	42.7	(15.8)	269.7	358.8
1985	51.7	(21.2)	117.7	(48.3)	0.9	(0.4)	28.3	(11.6)	45.2	(18.6)	243.8	340.8
1990	42.6	(18.4)	114.7	(49.6)	0.4	(0.2)	23.4	(10.1)	50.1	(21.7)	231.2	339.3
1995	40.8	(15.7)	137.5	(52.8)	0.3	(0.1)	24.4	(9.4)	57.4	(22.0)	260.4	386.1
2000	38.8	(14.7)	136.4	(51.8)	0.2	(0.1)	27.2	(10.3)	60.9	(23.1)	263.5	400.3
2001	36.7	(14.5)	126.4	(49.9)	0.2	(0.1)	26.3	(10.4)	63.5	(25.1)	253.1	399.8
2002	38.0	(14.1)	138.3	(51.2)	0.2	(0.1)	26.7	(9.9)	67.0	(24.8)	270.1	425.4
2003	39.6	(14.2)	143.1	(51.4)	0.2	(0.1)	29.4	(10.6)	66.2	(23.8)	278.4	431.8
2004	38.3	(14.2)	135.7	(50.4)	0.1	(0.0)	29.6	(11.0)	65.5	(24.3)	269.3	420.4
2005	37.6	(13.8)	132.9	(48.9)	0.1	(0.0)	31.6	(11.6)	69.8	(25.7)	272.0	432.7
2006[p]	**35.1**	**(13.7)**	**122.6**	**(47.9)**	**0.1**	**(0.0)**	**30.4**	**(11.9)**	**67.8**	**(26.5)**	**256.0**	**411.6**

[a] Renewables includes wood and solar.

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

[p] Preliminary estimates.

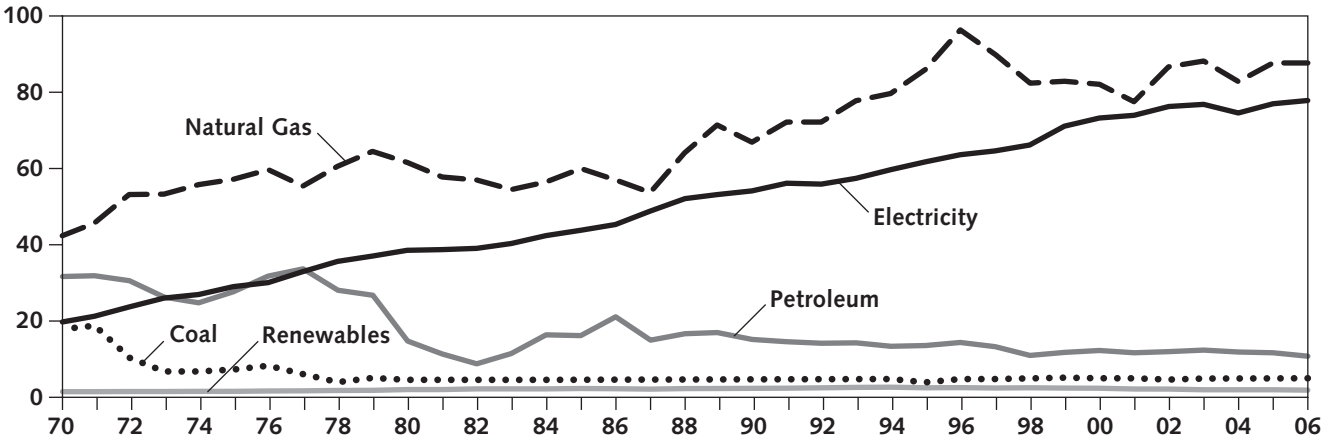
[r] Revised due to revisions in contributing tables.

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 Commercial Energy Use, by Type of Fuel[r] 1970-2006

(Trillions of Btu and Percent of Total)

In 2006, despite milder winter and summer weather than in 2005, an expanding economy caused commercial sector energy use to increase 0.4 percent. Since 1980, commercial end use energy has increased over 50 percent. Electricity energy use has increased over 100 percent over the same period.



Year	Petroleum		Natural Gas		Coal		Renewables[a]		Electricity		Total End Use	Total Resource[b]
1970	31.5	(28.1%)	42.2	(37.6%)	17.7	(15.8%)	1.3	(1.2%)	19.6	(18.8%)	112.3	150.6
1975	27.5	(22.6)	57.0	(46.8)	7.1	(5.8)	1.4	(1.1)	28.8	(24.5)	121.8	183.6
1980	14.6	(12.1)	61.4	(50.9)	4.4	(3.6)	1.9	(1.5)	38.4	(32.0)	120.6	200.8
1985	16.0	(12.7)	59.8	(47.5)	4.4	(3.5)	2.1	(1.7)	43.6	(35.8)	126.0	219.5
1990	15.0	(10.5)	66.7	(46.9)	4.5	(3.2)	2.2	(1.5)	54.0	(39.3)	142.3	258.8
1995	13.4	(8.0)	85.8	(51.4)	3.8	(2.2)	2.3	(1.4)	61.6	(36.9)	166.9	301.7
2000	12.1	(7.0)	81.9	(47.0)	4.8	(2.8)	2.2	(1.3)	73.1	(42.0)	174.1	338.2
2001	11.5	(6.8)	77.3	(45.6)	4.8	(2.8)	2.0	(1.2)	73.8	(43.6)	169.4	339.8
2002	11.8	(6.5)	86.5	(47.8)	4.5	(2.5)	2.0	(1.1)	76.1	(42.1)	180.8	357.2
2003	12.2	(6.7)	88.0	(48.0)	4.7	(2.6)	1.8	(1.0)	76.6	(41.8)	183.4	361.0
2004	11.7	(6.7)	82.6	(47.1)	4.8	(2.7)	1.8	(1.0)	74.4	(42.4)	175.2	346.8
2005	11.5	(6.3)	87.5	(48.0)	4.8	(2.6)	1.8	(1.0)	76.8	(42.1)	182.4	359.3
2006[p]	**10.6**	**(5.8)**	**87.5**	**(48.0)**	**4.8**	**(2.6)**	**1.7**	**(0.9)**	**77.7**	**(42.6)**	**182.3**	**360.6**

[a] Renewables includes solar, wood and bio solid waste.

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

[p] Preliminary estimates.

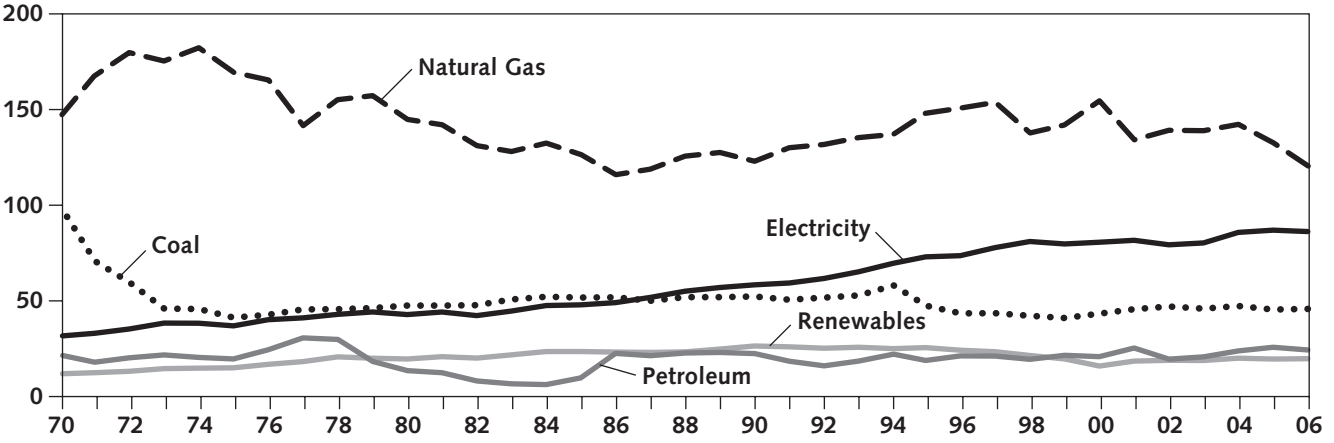
[r] Revised due to revisions in contributing tables.

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[r] 1970-2006

(Trillions of Btu and Percent of Total)

End use energy consumption in the industrial sector decreased 3.2 percent in 2006. The major industrial energy sources are natural gas and electricity, trailed by coal, petroleum and renewables. While petroleum continues to be the largest end use energy source in Wisconsin, in the industrial sector petroleum use only exceeds renewables.



Year	Petroleum		Natural Gas		Coal		Renewables[a]		Electricity		Total End Use	Total Resource[b]
1970	21.1	(6.8%)	147.1	(47.7%)	97.1	(31.5%)	11.6	(3.8%)	31.4	(10.2%)	308.2	369.7
1975	19.3	(6.9)	169.1	(60.3)	40.9	(14.6)	14.7	(5.2)	36.6	(13.0)	280.6	358.9
1980	13.2	(4.9)	144.5	(54.2)	47.2	(17.7)	19.3	(7.2)	42.5	(15.9)	266.7	355.4
1985	9.4	(3.6)	126.1	(48.9)	51.4	(20.0)	23.2	(8.9)	47.6	(18.5)	257.6	359.6
1990	22.1	(7.9)	122.6	(43.7)	51.9	(18.5)	26.1	(9.1)	58.0	(20.7)	280.8	406.0
1995	18.5	(5.9)	147.7	(47.5)	47.2	(15.2)	25.2	(8.1)	72.7	(23.3)	311.3	470.4
2000	20.5	(6.5)	154.1	(49.2)	43.0	(13.7)	15.6	(5.0)	80.3	(25.6)	313.5	493.8
2001	25.0	(8.2)	133.8	(44.1)	45.3	(14.9)	18.2	(6.0)	81.3	(26.8)	303.6	491.4
2002	19.2	(6.4)	138.8	(45.9)	46.7	(15.5)	18.6	(6.2)	79.0	(26.1)	302.2	485.3
2003	20.4	(6.7)	138.6	(45.7)	45.6	(15.0)	18.5	(6.1)	79.9	(26.4)	303.0	488.3
2004	23.5	(7.4)	141.9	(44.7)	47.0	(14.8)	19.7	(6.2)	85.4	(26.9)	317.5	514.6
2005	25.4	(8.2)	132.3	(42.9)	45.1	(14.6)	19.2	(6.2)	86.6	(28.1)	308.7	508.2
2006[p]	**24.0**	**(8.1)**	**120.2**	**(40.8)**	**45.4**	**(15.4)**	**19.4**	**(6.6)**	**85.9**	**(29.1)**	**295.0**	**492.1**

[a] Renewables includes hydro, wood, biogas and bio solid waste.

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

[p] Preliminary estimates.

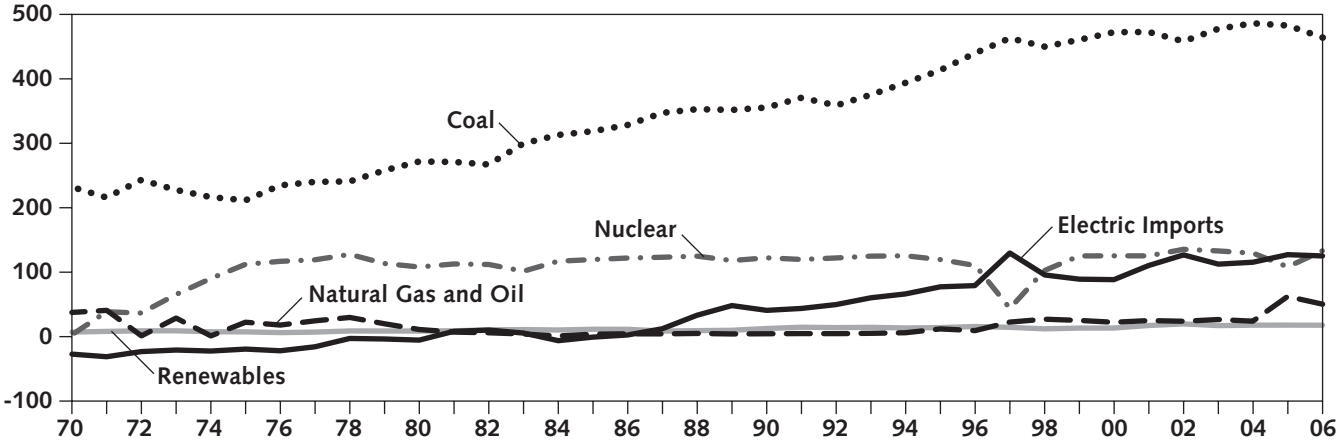
[r] Revised due to revisions in contributing tables.

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 Energy Use for Electricity Generation, in Btu, by Type of Fuel, 1970-2006

(Trillions of Btu and Percent of Total)

A cooler summer decreased energy use for electricity generation 1.8 percent in 2006. With maintenance at Wisconsin's nuclear plants completed in 2005, nuclear fuel use in 2006 increased over 23 percent, and this allowed a reduction in the use of all other fuels for electricity generation, along with a reduction in electricity imports. Nuclear fuel use was only 1.7 percent below the record set in 2002. Energy used by independent power producers is included in this category.



Year	Petroleum		Natural Gas		Coal[a]		Renewables		Nuclear[b]		Electric Imports[c]		Total
1970	7.9	(3.2%)	31.1	(12.5%)	231.1	(92.6%)	6.0	(2.4%)	1.7	(0.7%)	(28.2)	-(11.3%)	249.6
1975	7.8	(2.3)	19.8	(5.9)	210.5	(62.8)	6.3	(1.9)	111.2	(33.2)	(20.4)	-(6.1)	335.2
1980	4.8	(1.2)	14.1	(3.5)	270.7	(68.0)	7.7	(1.9)	107.0	(26.9)	(6.5)	-(1.6)	397.8
1985	1.4	(0.3)	1.4	(0.3)	317.7	(71.0)	10.4	(2.3)	118.6	(26.5)	(1.8)	-(0.4)	447.7
1990	1.0	(0.2)	2.4	(0.5)	354.5	(66.8)	11.6	(2.2)	121.2	(22.9)	39.7	(7.5)	530.4
1995	0.8	(0.1)	10.1	(1.6)	412.4	(65.4)	13.0	(2.1)	118.5	(18.8)	76.3	(12.1)	631.0
2000	1.6	(0.2)	19.6	(2.7)	471.4	(65.8)	12.3	(1.7)	124.3	(17.3)	87.4	(12.2)	716.7
2005	1.8	(0.2)	59.4	(7.5)	481.7	(60.7)	16.8	(2.1)	107.1	(13.5)	126.1	(15.9)	793.0
2006[p]	**1.4**	**(0.2)**	**47.9**	**(6.1)**	**463.0**	**(59.0)**	**16.7**	**(2.1)**	**132.1**	**(16.8)**	**124.2**	**(15.8)**	**785.3**

[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.

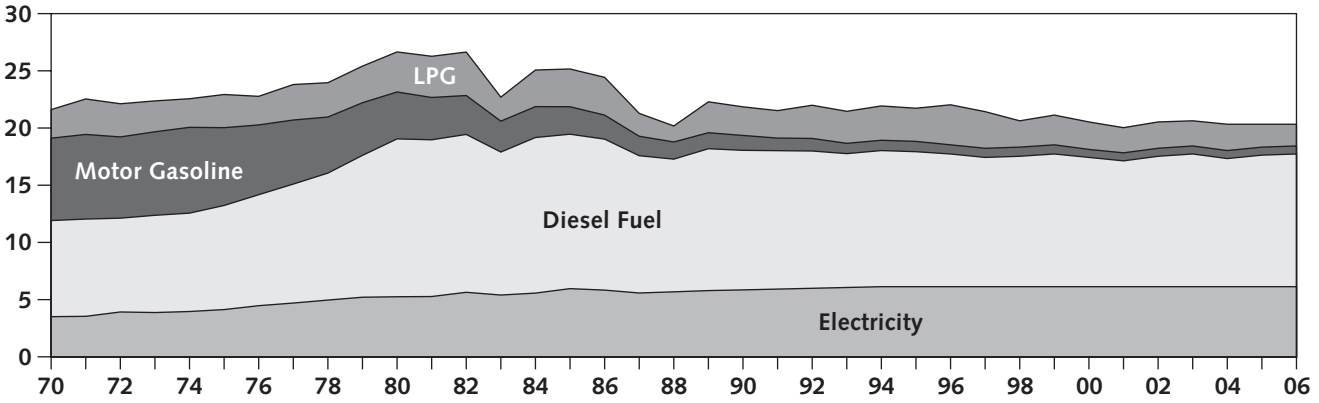
[p] Preliminary estimates.

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 (1971-1995); American Gas Association, *Gas Facts* (1970-1995); U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly*, [DOE/EIA-0226(05/06)] (May 2006).

Wisconsin Agricultural Energy Use, in Btu, by Type of Fuel 1970-2006

(Trillions of Btu and Percent of Total)

Agricultural energy use has been nearly constant since the late 1980s due to offsetting increases in mechanization and automation and land taken out of production. End use energy used in Wisconsin agriculture is now almost 21 percent below the peak reached in 1980.



Year	Motor Gasoline	Diesel Fuel[a]	LPG	Total Petroleum		Electricity		Total End Use	Total Resource Use[b]
1970	7.2	8.4	2.5	18.1	(83.8%)	3.5	(16.2%)	21.6	28.5
1975	6.8	9.1	2.9	18.8	(82.0)	4.1	(18.0)	22.9	31.8
1980	4.1	13.8	3.5	21.4	(80.3)	5.3	(19.7)	26.7	37.6
1985	2.4	13.5	3.3	19.2	(76.3)	6.0	(23.7)	25.2	37.9
1990	1.3	12.2	2.5	16.0	(73.2)	5.9	(26.8)	21.9	34.5
1995	0.9	11.8	2.9	15.6	(71.6)	6.2	(28.4)	21.8	35.4
2000	0.7	11.3	2.4	14.4	(68.8)	6.5	(31.2)	20.9	35.6
2001	0.7	11.0	2.2	14.0	(67.9)	6.6	(32.1)	20.6	35.8
2002	0.7	11.4	2.3	14.4	(68.3)	6.7	(31.7)	21.1	36.4
2003	0.7	11.6	2.2	14.6	(68.4)	6.7	(31.6)	21.3	36.9
2004	0.7	11.2	2.3	14.3	(67.7)	6.8	(32.3)	21.1	36.7
2005	0.7	11.5	2.0	14.2	(67.4)	6.9	(32.6)	21.1	36.9
2006[p]	**0.7**	**11.6**	**1.9**	**14.2**	**(67.2)**	**6.9**	**(32.8)**	**21.1**	**37.6**

[a] Includes other light distillates.

[b] Includes energy resources (and losses) attributed to electricity generation.

[p] Preliminary estimates.

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* (1974-2006) and *Wisconsin Dairy Facts* (1982-2006). Also, see table in this publication on Wisconsin electricity sales by economic sector.

Wisconsin Agricultural Energy Use, in Gallons and kWh, by Type of Fuel, 1970-2006

(Millions of Gallons and Millions of kWh)

Since 1980, petroleum use in the agricultural sector has fallen over 35 percent, while electricity use has increased over 32 percent.

Year	Motor Gasoline	Diesel Fuel[a]	LPG	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	1,715
1995	6.9	85.0	30.9	122.8	1,815
1996	6.3	84.0	36.8	127.1	1,835
1997	6.1	81.9	33.1	121.1	1,855
1998	6.0	82.2	24.2	112.4	1,875
1999	6.1	83.7	27.6	117.4	1,895
2000	5.8	81.4	25.3	112.5	1,915
2001	5.7	79.5	23.5	108.7	1,935
2002	5.8	82.1	24.0	111.9	1,955
2003	6.0	84.1	22.8	112.9	1,975
2004	5.8	81.2	24.1	111.1	1,995
2005	5.9	83.0	20.5	109.4	2,015
2006[p]	**5.9**	**83.7**	**19.7**	**109.3**	**2,035**

[a] Fuel oil and kerosene.

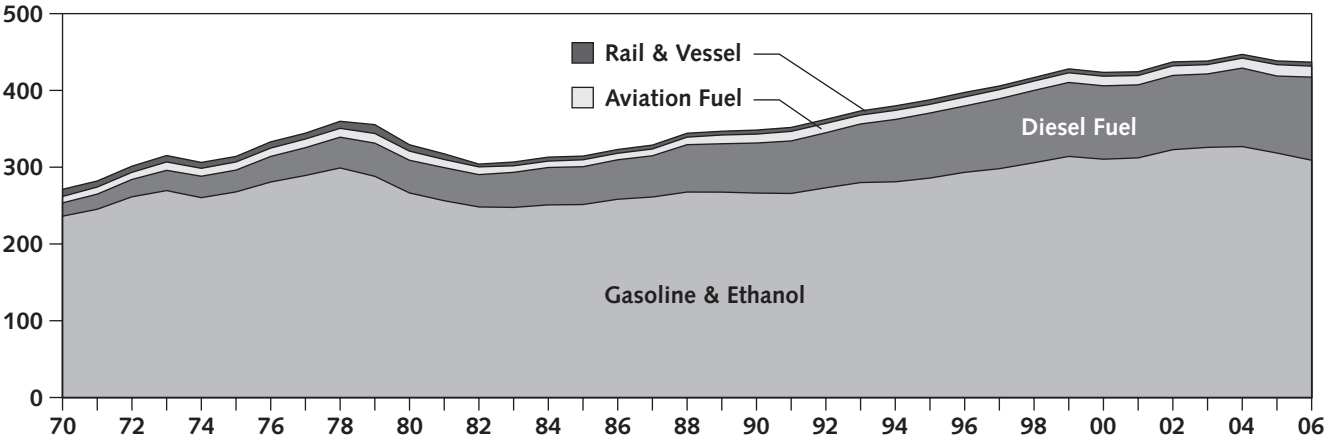
[p] Preliminary estimates.

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* (1974-2005) and *Wisconsin Dairy Facts* (1982-2005); and Wisconsin Department of Revenue, *Motor Vehicle Fuel Tax Statistics* (1991-2005). Also, see table in this publication on Wisconsin electricity sales by economic sector.

Wisconsin Transportation Energy Use, in Btu, by Type of Fuel 1970-2006

(Trillions of Btu)

Transportation energy use decreased 0.4 percent in 2006. Motor gasoline use decreased 3.3 percent, while ethanol use in gasoline increased 6.1 percent. Diesel fuel use increased 8 percent, and since 1980, use of diesel has increased over 154 percent. Higher motor fuel prices resulted in the decrease in motor gasoline, but helped increase the use of ethanol blended into gasoline.



Year	Motor Gasoline[a]	Ethanol	Diesel Fuel	Aviation Gasoline	Aviation Jet Fuel	Rail & Vessel Distillate & Residual	LPG	Total[b]
1970	236.2		17.3	0.7	7.7	9.3	NA	271.2
1975	267.8		28.4	0.8	9.8	7.2	NA	314.0
1980	266.4		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	314.4
1990	265.6	0.7	65.2	0.6	11.0	5.3	NA	348.4
1995	281.7	4.1	84.7	0.7	10.6	5.9	0.6	388.3
2000	302.5	7.9	95.6	0.8	11.7	5.0	0.5	424.0
2001	304.9	7.3	95.1	0.7	11.5	4.9	0.4	424.7
2002	315.4	7.4	96.7	0.6	11.9	5.1	0.4	437.5
2003	317.3	8.5	95.7	0.5	11.6	4.7	0.4	438.7
2004	318.2	8.7	102.2	0.5	12.5	4.9	0.4	447.3
2005	308.0	10.4	100.3	0.5	14.3	4.9	0.3	438.7
2006[p]	**298.0**	**11.0**	**108.3**	**0.4**	**13.9**	**5.2**	**0.3**	**437.1**

[a] Excludes ethanol.

[b] In addition, in each year, from 1994 through 2006, less than .05 trillion Btu of CNG were used for highway transportation.

NA – Not available.

[p] Preliminary estimate.

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* (1970-2006) and *Petroleum Supply Annual*, DOE/EIA-3340 (1982-2006).

Wisconsin Transportation Energy Use, in Gallons, by Type of Fuel, 1970-2006

(Millions of Gallons)

Despite an increasing state population and stagnant motor vehicle fuel efficiencies, higher gasoline and diesel fuel prices resulted in a decrease in transportation fuel use in 2006.

Year	Motor Gasoline[a]	Ethanol	Diesel Fuel	Aviation Gasoline	Aviation Jet Fuel	Distillate & Residual Rail	Distillate & Residual Vessel	LPG	Total[b]
1970	1,889.1		124.8	5.9	56.7	49.2	17.0	NA	2,142.7
1975	2,142.8		205.1	6.7	72.4	36.6	14.1	NA	2,477.7
1980	2,130.7		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	2,124.4	8.3	471.1	5.0	81.6	28.6	9.0	NA	2,728.0
1991	2,112.0	20.5	494.8	4.9	87.9	29.0	7.7	NA	2,756.8
1992	2,174.4	16.0	518.7	4.9	85.9	28.5	7.8	NA	2,836.2
1993	2,231.3	12.7	552.1	5.3	80.4	31.4	6.8	NA	2,920.0
1994	2,239.0	13.3	587.4	5.5	83.0	34.8	6.8	3.7	2,973.5
1995	2,254.1	48.5	612.5	5.6	78.6	35.1	6.9	6.1	3,047.4
1996	2,307.8	56.8	624.6	5.7	82.0	38.4	3.7	6.0	3,125.0
1997	2,345.5	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	3,279.9
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	2,464.5	123.0	724.8	4.1	105.7	35.1	0.0	3.0	3,460.3
2006[p]	**2,384.1**	**130.4**	**782.5**	**3.5**	**102.9**	**37.2**	**0.0**	**3.2**	**3,443.8**

[a] Excludes ethanol. See adjacent column for amounts of ethanol mixed with gasoline to form RFG and gasohol.

[b] In addition, in each year from 1994 through 2006, less than 0.4 million gasoline gallon equivalents of compressed natural gas were used for highway transportation in Wisconsin. These amounts are included on page 29 as natural gas sales to the commercial sector.

NA – Not available.

[p] Preliminary estimate.

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* (1970-2006) and *Petroleum Supply Annual*, DOE/EIA-3340 (1982-2006).

3 Energy Use by Type of Fuel

This chapter is divided into four sections, presenting energy use data by fuel type: petroleum, natural gas, coal and electricity. Sections on each fuel begin with a table showing the amount of fuel used in each economic sector. These tables illustrate various trends, such as a declining share of petroleum used for residential purposes—mostly space heating—and an increasing share used for transportation.*

Tables in this chapter provide more specific information than those in Chapter 2. Petroleum use, for example, is broken out by product type to show the differing consumption levels of gasoline (excluding ethanol, a renewable fuel), heating oil and liquefied petroleum gas, over time. Also shown is the distribution of specific petroleum products among the economic sectors. More extensive information is provided here in terms of Wisconsin's energy supply sources.

Recently, nationally and in Wisconsin, increasing amounts of natural gas have been used by independent power producers (IPP) to generate electricity. Natural gas used by the IPPs is shown in the electric sector. The industrial sector continues to be the largest user of natural gas in Wisconsin.

In 2005, maintenance at the Point Beach II and Kewanee nuclear power plants was completed. Therefore, in 2006, Wisconsin's nuclear-fueled electricity generation increased 23.3 percent and was only 1.7 percent below the record set in 2002. Maintenance at the Kewanee plant was undertaken prior to and in preparation for the transfer of ownership of the plant to Dominion, a major utility based outside of Wisconsin; however, the electric power generated after the sale continues to be sold in Wisconsin. In Wisconsin, coal is primarily used by electric utilities to generate electricity (90.2 percent) and by industry to fuel industrial processes (8.9 percent).

*Petroleum used for transportation is allocated to the transportation sector and is not included in other sectors.

Wisconsin Petroleum Use, by Economic Sector 1970-2006

(Trillions of Btu and Percent of Total)

Petroleum use decreased 1.4 percent in 2006, primarily because of a warmer winter with 7.3 percent fewer heating degree days than 2005 and decreased use in the transportation sector because of higher gasoline prices. In 2006, 83.3 percent of the petroleum used in Wisconsin was for transportation.

Year	Residential		Commercial		Industrial		Agricultural		Transportation		Electric Utility		Total
1970	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
1975	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
1980	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
1985	51.7	(12.5)	16.0	(3.9)	9.4	(2.3)	19.2	(4.7)	314.3	(76.3)	1.4	(0.3)	412.0
1990	42.6	(9.6)	15.0	(3.4)	22.1	(5.0)	16.0	(3.6)	347.7	(78.2)	1.0	(0.2)	444.4
1991	42.8	(9.7)	14.4	(3.3)	18.1	(4.1)	15.6	(3.5)	350.0	(79.2)	1.0	(0.2)	441.9
1992	41.9	(9.3)	14.0	(3.1)	15.7	(3.5)	16.0	(3.6)	360.8	(80.3)	1.0	(0.2)	449.4
1993	42.0	(9.1)	14.1	(3.0)	18.2	(3.9)	15.4	(3.3)	372.1	(80.4)	1.0	(0.2)	462.8
1994	40.1	(8.5)	13.2	(2.8)	21.8	(4.6)	15.8	(3.4)	379.1	(80.5)	1.0	(0.2)	471.0
1995	40.8	(8.6)	13.4	(2.8)	18.5	(3.9)	15.6	(3.3)	384.2	(81.2)	0.8	(0.2)	473.3
1996	43.5	(8.9)	14.2	(2.9)	20.9	(4.3)	15.9	(3.3)	393.2	(80.5)	0.9	(0.2)	488.6
1997	40.5	(8.2)	13.1	(2.7)	20.8	(4.2)	15.3	(3.1)	401.5	(81.5)	1.5	(0.3)	492.7
1998	33.9	(6.9)	10.8	(2.2)	19.1	(3.9)	14.5	(3.0)	411.3	(83.7)	1.8	(0.4)	491.4
1999	36.6	(7.2)	11.6	(2.3)	21.2	(4.2)	15.0	(2.9)	422.2	(83.0)	2.0	(0.4)	508.6
2000	38.8	(7.7)	12.1	(2.4)	20.5	(4.1)	14.4	(2.9)	416.0	(82.6)	1.6	(0.3)	503.4
2001	36.7	(7.3)	11.5	(2.3)	25.0	(4.9)	14.0	(2.8)	417.5	(82.5)	1.3	(0.3)	506.0
2002	38.0	(7.4)	11.8	(2.3)	19.2	(3.7)	14.4	(2.8)	430.1	(83.4)	2.1	(0.4)	515.6
2003	39.6	(7.6)	12.2	(2.4)	20.4	(3.9)	14.6	(2.8)	430.3	(83.0)	1.2	(0.2)	518.3
2004	38.3	(7.3)	11.7	(2.2)	23.5	(4.5)	14.3	(2.7)	438.7	(83.1)	1.5	(0.3)	528.0
2005	37.6	(7.2)	11.5	(2.2)	25.4	(4.9)	14.2	(2.7)	428.3	(82.6)	1.8	(0.3)	518.8
2006P	**35.1**	**(6.9)**	**10.6**	**(2.1)**	**24.0**	**(4.7)**	**14.2**	**(2.8)**	**426.1**	**(83.3)**	**1.4**	**(0.3)**	**511.4**

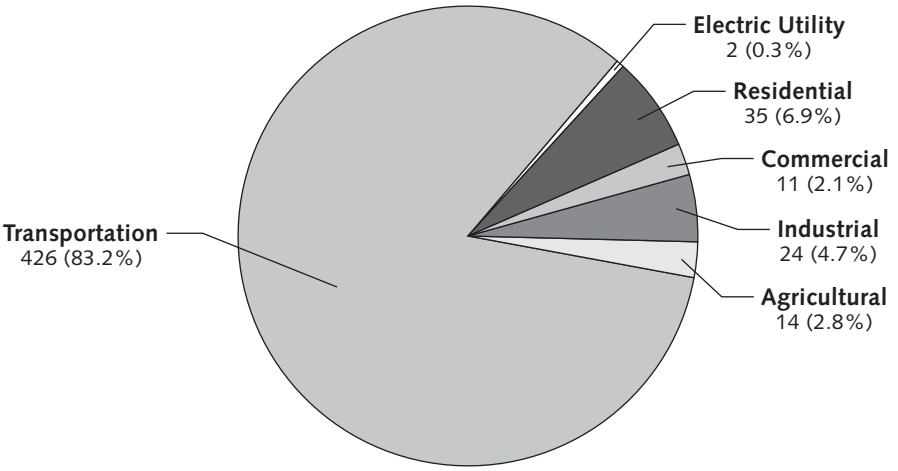
P Preliminary estimates.

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* (1996-2006).

Wisconsin Petroleum Use, by Economic Sector

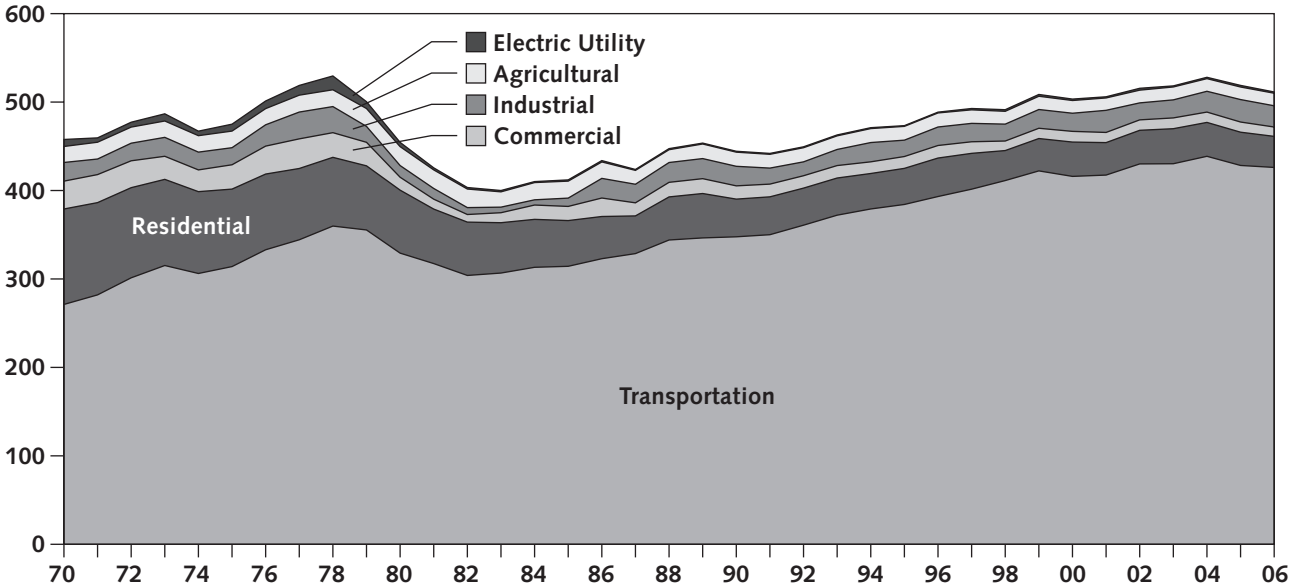
2006

(Trillions of Btu and Percent of Total)



1970-2006

(Trillions of Btu)



Source: Wisconsin Office of Energy Independence.

Wisconsin Petroleum Use, in Btu, by Type of Product 1970-2006

(Trillions of Btu)

Middle distillate is used both as a heating fuel in furnaces and boilers, and as diesel fuel in trucks. Light distillate is primarily used as a thinner during periods of cold weather.

Year	Gasoline[a,b]	Jet Fuel	Light Distillate	Middle Distillate	Residual Fuel Oil	LPG[c]	Total
1970	244.1	7.7	35.1	123.4	21.9	25.7	457.9
1975	275.4	9.8	16.9	133.5	13.3	26.0	474.9
1980	271.3	11.0	11.3	124.7	11.0	25.2	454.5
1985	254.2	8.4	13.4	110.7	2.3	23.1	412.1
1990	267.5	11.0	10.8	122.3	7.9	24.8	444.3
1991	265.6	11.9	11.4	119.3	7.9	25.9	442.0
1992	273.5	11.6	9.8	120.4	6.8	27.3	449.4
1993	280.5	10.9	10.1	125.8	6.9	28.8	463.0
1994	281.4	11.2	10.5	129.5	8.3	30.1	471.0
1995	283.3	10.6	9.6	131.3	7.6	30.9	473.3
1996	289.9	11.1	10.4	136.2	6.8	34.2	488.6
1997	294.7	11.3	10.7	137.4	6.8	31.8	492.7
1998	301.3	11.5	10.9	135.5	4.9	27.3	491.4
1999	309.2	11.8	11.2	142.0	5.0	29.4	508.6
2000	303.9	11.7	11.1	141.1	5.3	30.3	503.4
2001	306.3	11.5	11.2	142.2	5.6	29.2	506.0
2002	316.7	11.9	11.2	141.4	4.3	30.1	515.6
2003	318.6	11.6	11.1	142.3	3.9	30.8	518.3
2004	319.4	12.5	11.6	146.9	6.8	30.7	527.9
2005	309.3	14.3	11.4	144.6	9.2	30.2	519.0
2006[p]	**299.2**	**13.9**	**12.1**	**149.2**	**8.1**	**28.9**	**511.4**

[a] Includes both vehicle and aviation gasoline.

[b] Does not include ethanol. Ethanol use in motor gasoline is shown in the Renewable Energy chapter.

[c] Liquefied petroleum gas (propane).

[p] Preliminary estimates.

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* (1996-2006); U.S. Department of Energy, Form EIA-782C, "Monthly Report of Petroleum Products Sold into States for Consumption" (1983-2006).

Wisconsin Petroleum Use, in Gallons, by Type of Product 1970-2006

(Millions of Gallons)

In 2006, the use of all petroleum products except light and middle distillate decreased. In 2006, increased use of middle and light distillate as a transportation fuel (diesel) more than offset its decreased use as a heating fuel, which resulted from 7.3 percent fewer heating degree days in 2006. During the winter light distillate is blended with middle distillate to keep the fuel from jelling because of cold temperatures.

Year	Gasoline[a,b]	Jet Fuel	Light Distillate	Middle Distillate	Residual Fuel Oil	LPG[c]	Total
1970	1,953.0	56.7	260.2	889.7	146.2	269.0	3,574.8
1975	2,203.5	72.4	125.0	962.8	88.8	272.6	3,725.1
1980	2,170.5	81.4	83.4	899.4	73.5	264.1	3,572.3
1985	2,033.3	62.2	99.2	798.2	15.5	241.5	3,249.9
1990	2,139.5	81.6	80.1	882.2	52.7	260.2	3,496.3
1995	2,266.6	78.6	72.3	946.4	50.5	323.8	3,738.2
1996	2,319.8	82.0	77.3	982.2	45.2	357.9	3,864.4
1997	2,357.3	84.0	79.4	990.5	45.6	332.9	3,889.7
1998	2,410.3	85.0	80.8	976.6	32.8	285.9	3,871.4
1999	2,473.7	87.4	82.9	1,024.3	33.1	307.7	4,009.1
2000	2,431.2	87.0	82.2	1,017.4	35.4	317.5	3,970.7
2001	2,450.1	85.0	82.9	1,025.6	37.2	306.1	3,986.9
2002	2,533.7	88.2	82.3	1,020.3	28.8	314.7	4,068.0
2003	2,549.0	86.1	82.0	1,025.8	26.4	322.6	4,091.9
2004	2,555.6	92.5	86.1	1,059.4	45.5	321.6	4,160.7
2005	2,474.5	105.7	84.5	1,041.6	61.6	316.5	4,084.4
2006[p]	**2,393.6**	**102.9**	**89.5**	**1,076.0**	**54.1**	**303.0**	**4,019.1**

[a] Includes both vehicle and aviation gasoline.

[b] Does not include the ethanol component of reformulated gasoline or gasohol; refer to page 27 of this chapter and the Renewable Energy chapter.

[c] Liquefied petroleum gas (propane).

[p] Preliminary estimates.

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* (1996-2006); U.S. Department of Energy Form EIA-782C, "Monthly Report of Petroleum Products Sold into States for Consumption" (1983-2006).

Petroleum Product Deliveries to Wisconsin, by Month 2006

(Thousands of Gallons)

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

Month	Residual	Off-Road Distillate[a]	On-Road Distillate[b]	LPG[c]	Gasoline[d,e]
January	8,287	38,473	65,348	37,583	179,140
February	5,140	50,944	56,884	40,617	171,010
March	5,846	41,142	68,746	36,641	213,649
April	3,597	32,289	61,099	16,339	193,197
May	3,577	34,888	67,345	11,617	187,428
June	5,005	38,719	51,991	11,272	197,921
July	1,473	34,474	84,078	12,974	216,050
August	5,783	40,800	73,537	13,687	217,727
September	1,275	35,813	66,463	17,206	199,963
October	3,037	49,094	47,574	27,709	211,434
November	6,821	48,520	80,474	36,061	194,018
December	4,245	44,296	58,994	41,249	208,506
Total	**54,085**	**489,452**	**782,534**	**302,955**	**2,390,045**

[a] Kerosene, No. 1 and No. 2 fuel oil used for heating and processing, and kero jet and aviation gasoline used for flying.

[b] No. 2 and No. 1 oil used as an on-road diesel fuel.

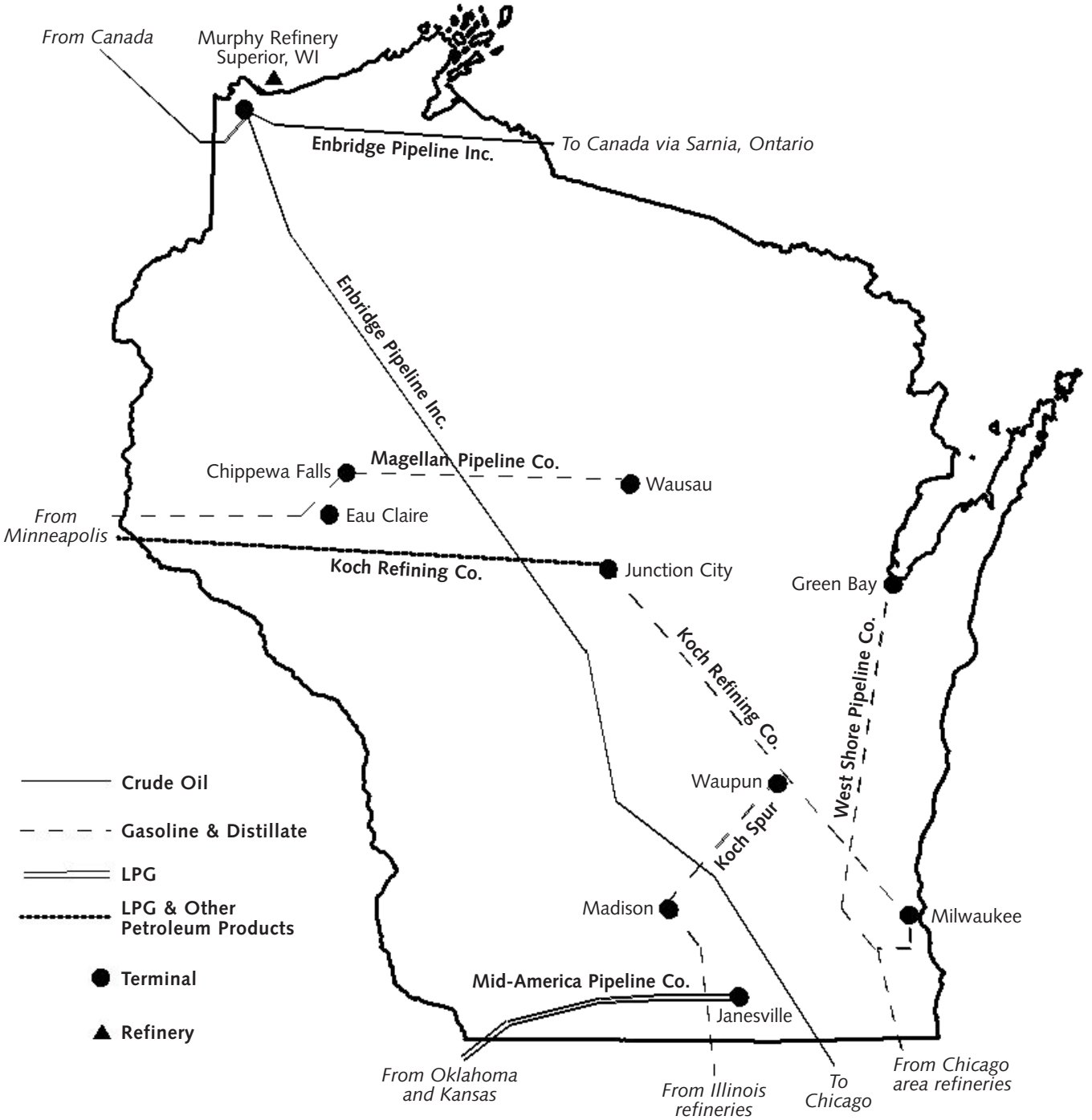
[c] Liquefied petroleum gas (propane).

[d] Vehicle gasoline only; does not include aviation gasoline.

[e] Does not include the ethanol component of reformulated gasoline or gasohol; refer to page 27 of this chapter and the Renewable Energy chapter.

Source: Wisconsin Department of Revenue, *Collection of Petroleum Inspection Fees* (2006) and *Fuel Tax Statistical Report* (2006); U.S. Department of Energy, Form EIA-782C, "Monthly Report of Petroleum Products Sold into States for Consumption" (2006).

Wisconsin Petroleum Pipelines



Source: Wisconsin Office of Energy Independence.

Wisconsin Production and Use of Ethanol in RFG, Gasohol and E-85, 1994-2006

(Thousands of Gallons)

In 2006, Wisconsin ethanol production jumped 22.5 percent with the ethanol plant in Wheeler becoming operational in late 2006, the plant in Friesland becoming operational for the full year and increased production at the other three Wisconsin plants located in Oshkosh, Monroe and Stanley. Ethanol use in Wisconsin increased 6.1 percent with increased consumption of RFG, Gasohol and E-85.

Year	Production	Consumption			
		RFG[a]	Gasohol[b]	E-85[c]	Total
1994	NA	NA	13,331	9	13,340
1995	NA	38,048	10,461	17	48,526
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	49,186	723	122,955
2006	**210,386**	**77,614**	**50,487**	**2,302**	**130,403**

[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 can be used to provide the oxygenate required in RFG.

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

[c] E-85 is a motor fuel consisting of 85 percent ethanol and 15 percent gasoline.

NA – Not Available.

Source: Wisconsin Department of Revenue; Wisconsin Office of Energy Independence; West Shore Pipeline.

Sales of Reformulated Gasoline and Gasohol 1985-2006

(Thousands of Gallons and Percent of Total Motor Fuel Sold)

Year	Reformulated		Gasohol	
1985	NA	NA	15,069	(0.8%)
1990	NA	NA	82,961	(4.0)
1995	565,922	(24.4%)	104,614	(4.5)
2000	707,240	(28.1)	230,799	(9.2)
2005	730,457	(28.2)	491,860	(19.0)
2006	**776,137**	**(30.8)**	**504,867**	**(20.0)**

NA – Not available.

Source: Wisconsin Department of Commerce, Bureau of Petroleum Inspection, Report on Petroleum Products Inspected and Delivered to Wisconsin (1985-1995); Department of Revenue, "Motor Vehicle and General Aviation Fuel Tax Statistical Report" (1985-2006).

Wisconsin Liquefied Petroleum Gas Use, by Economic Sector 1970-2006

(Millions of Gallons and Percent of Total)

Liquefied petroleum gas (LPG) use decreased 4.3 percent in 20056. This decrease was the result of warmer winter weather and good crop drying weather. From its low point in 1987, LPG use is up 33.7 percent.

Year	Residential		Commercial		Industrial		Agricultural		Transportation		Total
1970	190.9	(70.9%)	23.8	(8.8%)	28.2	(10.5%)	26.2	(9.7%)	NA	(0.0%)	269.1
1975	176.5	(64.7)	36.5	(13.4)	29.5	(10.8)	30.1	(11.0)	NA	(0.0)	272.6
1980	176.3	(66.7)	33.5	(12.7)	17.5	(6.6)	36.9	(14.0)	NA	(0.0)	264.2
1985	158.2	(65.5)	29.4	(12.2)	19.3	(8.0)	34.6	(14.3)	NA	(0.0)	241.5
1990	162.1	(62.3)	36.5	(14.0)	35.7	(13.7)	25.9	(10.0)	NA	(0.0)	260.2
1991	173.8	(64.0)	39.1	(14.4)	33.3	(12.3)	25.3	(9.3)	NA	(0.0)	271.5
1992	180.7	(63.2)	40.6	(14.2)	34.5	(12.1)	30.3	(10.6)	NA	(0.0)	286.1
1993	190.7	(63.3)	44.9	(14.9)	36.0	(11.9)	29.7	(9.9)	NA	(0.0)	301.3
1994	193.1	(61.3)	45.5	(14.4)	41.0	(13.0)	31.8	(10.1)	3.7	(1.2)	315.1
1995	203.8	(62.9)	48.0	(14.8)	35.0	(10.8)	30.9	(9.5)	6.1	(1.9)	323.8
1996	219.5	(61.3)	51.7	(14.4)	43.9	(12.3)	36.8	(10.3)	6.0	(1.7)	357.9
1997	210.3	(63.2)	48.7	(14.6)	35.0	(10.5)	33.1	(9.9)	5.8	(1.7)	332.9
1998	183.5	(64.2)	42.4	(14.8)	30.1	(10.5)	24.2	(8.5)	5.7	(2.0)	285.9
1999	197.9	(64.3)	45.8	(14.9)	31.3	(10.2)	27.6	(9.0)	5.1	(1.7)	307.7
2000	211.0	(66.5)	47.2	(14.9)	28.7	(9.0)	25.3	(8.0)	5.3	(1.7)	317.5
2001	204.0	(66.6)	45.8	(15.0)	28.3	(9.2)	23.4	(7.6)	4.6	(1.5)	306.1
2002	213.1	(67.7)	47.6	(15.1)	26.0	(8.3)	24.0	(7.6)	4.0	(1.3)	314.7
2003	224.0	(69.4)	50.0	(15.5)	22.0	(6.8)	22.8	(7.1)	3.8	(1.2)	322.6
2004	221.3	(68.8)	49.5	(15.4)	23.1	(7.2)	24.1	(7.5)	3.6	(1.1)	321.6
2005	220.4	(69.6)	49.3	(15.6)	23.3	(7.4)	20.5	(6.5)	3.0	(0.9)	316.5
2006p	**210.7**	**(69.5)**	**46.6**	**(15.4)**	**22.8**	**(7.5)**	**19.7**	**(6.5)**	**3.2**	**(1.1)**	**303.0**

NA – Not available.

p Preliminary estimates.

Source: U.S. Department of Energy, Form EIA-25, "Prime Supplier's Monthly Report" (1974-1982) and Form EIA-782C, "Monthly Report of Petroleum Products Sold Into States For Consumption" (1983-2006).

Wisconsin Natural Gas Use, by Economic Sector 1970-2006

(Trillions of Btu and Percent of Total)

In 2006, warmer winter weather led to decreased natural gas use in the residential sector. In the electric sector, because the summer of 2006 had 19 percent fewer cooling degree days than last summer, natural gas used to generate electricity dropped by 19.4 percent. The electric sector includes natural gas used by utilities and independent power producers who generate and sell electricity to other companies. Overall, natural gas use decreased 8.2 percent from 2005. Natural gas use is up over 23 percent from 1990.

Year	Residential		Commercial[a]		Industrial		Electric[b]		Total	Total End Use
1970	109.4	(33.2%)	42.2	(12.8%)	147.1	(44.6%)	31.1	(9.4%)	329.8	298.7
1975	119.2	(32.6)	57.0	(15.6)	169.1	(46.3)	19.8	(5.4)	365.1	345.3
1980	124.5	(36.1)	61.4	(17.8)	144.5	(41.9)	14.1	(4.1)	344.5	330.4
1985	117.7	(38.6)	59.8	(19.6)	126.1	(41.3)	1.4	(0.5)	305.0	303.6
1990	114.7	(37.4)	66.7	(21.8)	122.6	(40.0)	2.4	(0.8)	306.4	304.0
1995	137.5	(36.1)	85.8	(22.5)	147.7	(38.8)	10.1	(2.7)	381.1	371.0
1996	149.8	(37.1)	96.1	(23.8)	150.4	(37.3)	7.4	(1.8)	403.7	396.3
1997	137.3	(34.3)	89.7	(22.4)	153.4	(38.3)	20.0	(5.0)	400.4	380.4
1998	117.2	(32.5)	82.2	(22.8)	137.4	(38.1)	24.2	(6.7)	361.0	336.8
1999	129.1	(34.4)	82.7	(22.0)	141.6	(37.7)	22.1	(5.9)	375.5	353.4
2000	136.4	(34.8)	81.9	(20.9)	154.1	(39.3)	19.6	(5.0)	392.0	372.4
2001	126.4	(35.1)	77.3	(21.5)	133.8	(37.2)	22.6	(6.3)	360.1	337.5
2002	138.3	(36.0)	86.5	(22.5)	138.8	(36.1)	20.7	(5.4)	384.3	363.6
2003	143.1	(36.3)	88.0	(22.3)	138.6	(35.2)	24.3	(6.2)	394.0	369.7
2004	135.7	(35.6)	82.6	(21.6)	141.9	(37.2)	21.4	(5.6)	381.6	360.2
2005	132.9	(32.2)	87.5	(21.2)	132.3	(32.1)	59.4	(14.4)	412.1	352.7
2006[p]	**122.6**	**(32.4)**	**87.5**	**(23.1)**	**120.2**	**(31.8)**	**47.9**	**(12.7)**	**378.2**	**330.3**

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

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

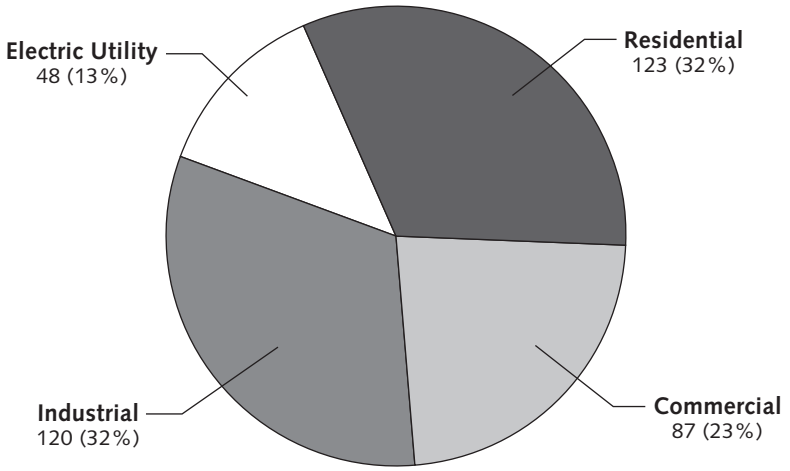
[p] Preliminary estimates.

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* (1994-2006) and discussions with Public Service Commission staff; U.S. Department of Energy, *Natural Gas Annual, 1991-2005* [DOE/EIA-0131(06)] (November 2006) and *Natural Gas Monthly* [DOE/EIA-0130 (2006/03)] (March 2007).

Wisconsin Natural Gas Use, by Economic Sector

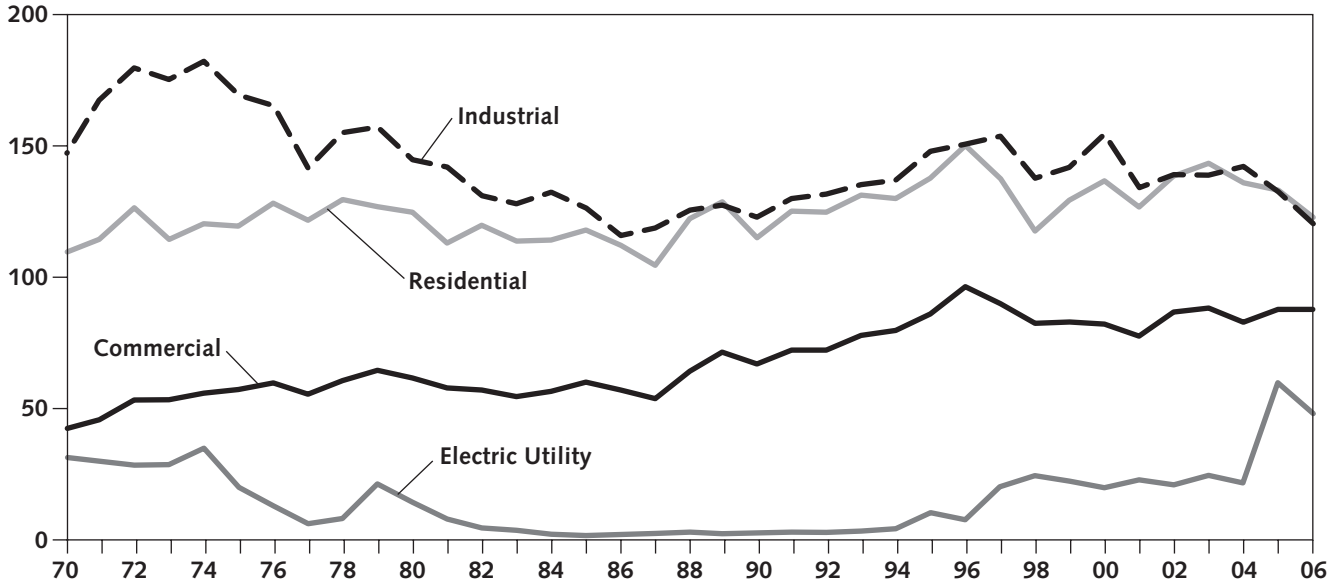
2006

(Trillions of Btu and Percent of Total)



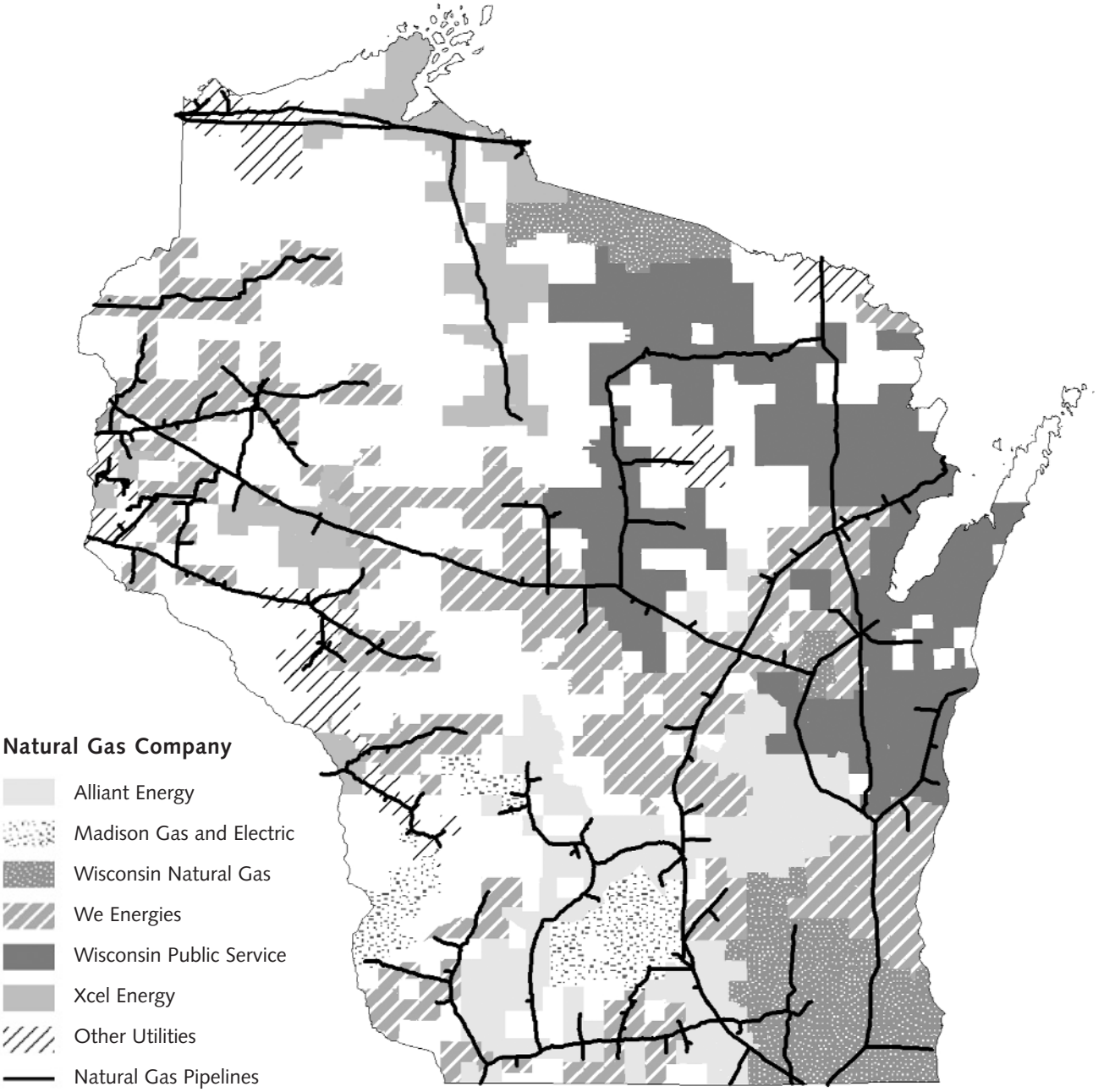
1970-2006

(Trillions of Btu)



Source: Wisconsin Office of Energy Independence.

Wisconsin Natural Gas Company Territories & Major Pipelines



Source: Public Service Commission of Wisconsin.

Wisconsin Natural Gas Sales, by Public Service Commission of Wisconsin Sector, 1970-2006

(Trillions of Btu)

In 2006, due to a warmer winter, natural gas use for residential and non-residential space heating fell. Because of its lower cost, transport gas continues to be the preferred method of large commercial and industrial users for purchasing natural gas. 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.

Year	Residential General	Residential Heating	Commercial, Industrial & Electric Firm[a]	Commercial, Industrial & Electric Interruptible[b]	Commercial, Industrial & Electric Heating	Inter-departmental[c]	Total to Ultimate Utility Customers	Commercial, Industrial & Electric Transport Gas	Total Sold and Used[d]
1970	7.6	101.3	27.4	121.9	47.6	15.3	324.0	0.0	324.7
1975	6.8	112.4	36.6	135.2	60.6	11.3	362.9	0.0	363.7
1980	4.8	119.4	51.9	94.6	67.7	5.0	343.5	0.0	344.1
1985	2.8	115.1	35.3	85.3	67.1	1.2	306.7	0.0	307.3
1990	2.1	111.9	18.4	33.3	61.2	1.5	228.4	75.1	303.5
1995	1.8	135.7	20.4	50.8	79.2	NA	287.9	93.2	381.1
1996	1.9	147.9	20.1	39.5	87.6	NA	297.0	106.7	403.7
1997	1.8	137.3	12.9	32.5	79.3	NA	263.8	138.4	402.2
1998	1.6	115.6	8.9	25.9	67.7	NA	219.7	141.3	361.0
1999	1.6	127.5	9.7	24.6	71.0	NA	234.4	141.1	375.5
2000	1.6	134.7	6.4	24.1	77.3	NA	244.1	147.9	392.0
2001	1.4	125.0	7.0	23.4	70.0	NA	226.8	133.3	360.1
2002	1.4	136.9	9.1	25.4	73.3	NA	246.1	138.2	384.3
2003	1.5	141.6	9.9	25.3	79.6	NA	257.9	136.1	394.0
2004	1.5	134.3	10.1	24.0	73.5	NA	243.4	138.2	381.6
2005	1.4	131.5	9.2	39.4	73.3	NA	254.8	157.3	412.1
2006[p]	**1.4**	**121.2**	**8.0**	**32.1**	**70.5**	**NA**	**233.2**	**145.0**	**378.2**

[a] Firm service guarantees no interruptions.

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

[c] Interdepartmental refers to sales from one utility to another utility owned by the same parent company. Data series discontinued in 1995.

[d] Includes gas used by the gas utility and transport gas.

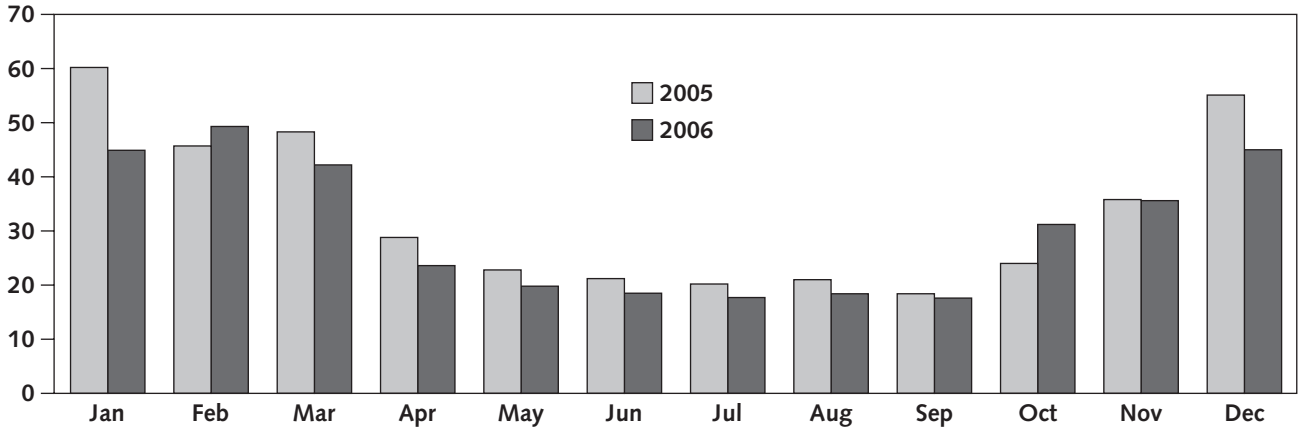
[p] Preliminary estimates.

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 (1994-2006); U.S. Department of Energy, *Natural Gas Annual, 1991-2005* [DOE/EIA-0131(05)] (November 2006), and *Natural Gas Monthly* [DOE/EIA-0130 (2006/03)] (March 2007).

Wisconsin Natural Gas Sales, by Month 2005-2006

(Trillions of Btu)

In 2006, mild weather during winter heating season months led to a 9.4 percent decrease in natural gas use compared to 2005.



1976-2006

(Trillions of Btu)

Month	1976	1980	1985	1990	1995	2000	2001	2002	2003	2004	2005	2006
January	50.9	52.8	51.3	40.6	52.7	60.1	53.0	50.2	63.5	65.4	60.2	44.9
February	40.3	47.3	42.3	39.3	48.7	47.1	51.8	44.1	56.0	48.9	45.7	49.3
March	38.5	42.9	32.2	34.3	39.1	37.7	45.8	49.2	45.3	41.2	48.3	42.2
April	26.5	27.4	21.2	25.2	32.9	32.0	26.4	31.8	32.2	27.6	28.8	23.6
May	22.3	17.6	14.4	18.9	20.0	21.6	18.4	24.2	20.7	21.3	22.8	19.8
June	16.0	14.1	11.2	12.7	15.5	15.9	16.1	16.0	15.6	14.8	21.2	18.5
July	14.6	13.4	11.1	11.5	15.2	15.6	15.7	16.7	15.5	15.1	20.2	17.7
August	15.8	13.5	11.7	12.8	17.6	18.0	16.7	16.3	17.3	14.8	21.0	18.4
September	16.3	14.8	13.1	14.1	16.9	17.6	17.7	17.5	16.7	15.5	18.4	17.6
October	27.4	25.9	18.7	22.7	25.2	24.2	27.4	29.8	25.4	23.1	24.0	31.2
November	38.9	32.2	31.2	30.3	44.7	40.6	28.9	40.7	38.0	33.4	35.8	35.6
December	51.3	46.3	48.6	44.3	54.5	63.7	44.6	50.5	48.6	56.6	55.1	45.0
Total[a]	**358.8**	**348.2**	**306.9**	**306.9**	**383.0**	**394.1**	**362.5**	**387.0**	**394.8**	**377.7**	**401.5**	**363.8**

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

Source: Wisconsin natural gas utility monthly reports submitted to the Public Service Commission of Wisconsin (1976-2006).

Annual Average Number of Natural Gas Customers in Wisconsin, by Public Service Commission of Wisconsin Sector 1970-2006[a]

Wisconsin gas utilities added 24,866 new customers in 2006 due to new construction and conversion from other fuels such as oil and LPG. The number of residential customers using gas for space heating and perhaps cooking or water heating ("Space Heating") continues to increase, while the number using gas for cooking or water heating but not space heating ("General") continues to decline. Overall, the number of gas customers has grown 25 percent since 1995.

	Residential		Commercial, Industrial & Electric			
Year	General	Space Heating	Firm	Interruptible	Space Heating	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	119,492	830,709	10,781	1,478	76,673	1,039,133
1985	90,433	920,308	8,599	1,935	86,978	1,108,253
1990	77,687	1,041,103	8,193	1,394	102,336	1,230,713
1991	74,646	1,077,103	8,083	1,417	106,456	1,267,705
1992	71,100	1,106,980	7,750	1,456	110,100	1,297,386
1993	64,100	1,150,800	7,100	1,326	114,600	1,337,926
1994	62,300	1,191,033	7,115	1,390	118,125	1,379,963
1995	61,900	1,229,524	7,722	1,426	122,276	1,422,848
1996	61,000	1,263,570	7,215	1,339	125,650	1,458,774
1997	59,300	1,302,048	6,933	1,426	129,500	1,499,207
1998	58,000	1,332,068	7,180	1,273	133,000	1,531,521
1999	56,000	1,370,909	7,200	1,140	137,246	1,572,495
2000	54,700	1,403,301	7,100	1,021	139,000	1,605,122
2001	51,500	1,433,036	7,500	1,240	142,848	1,636,124
2002	49,200	1,465,500	8,200	1,370	147,404	1,671,674
2003	48,900	1,492,555	8,290	1,400	148,167	1,699,312
2004	48,300	1,521,419	8,950	1,400	149,500	1,729,569
2005	45,560	1,547,061	7,665	1,290	152,129	1,753,705
2006[p]	**45,550**	**1,570,000**	**6,781**	**1,260**	**155,000**	**1,778,591**

[a] Because the number of customers varies from month to month, these averages are the total of all monthly customers for the year, divided by twelve.

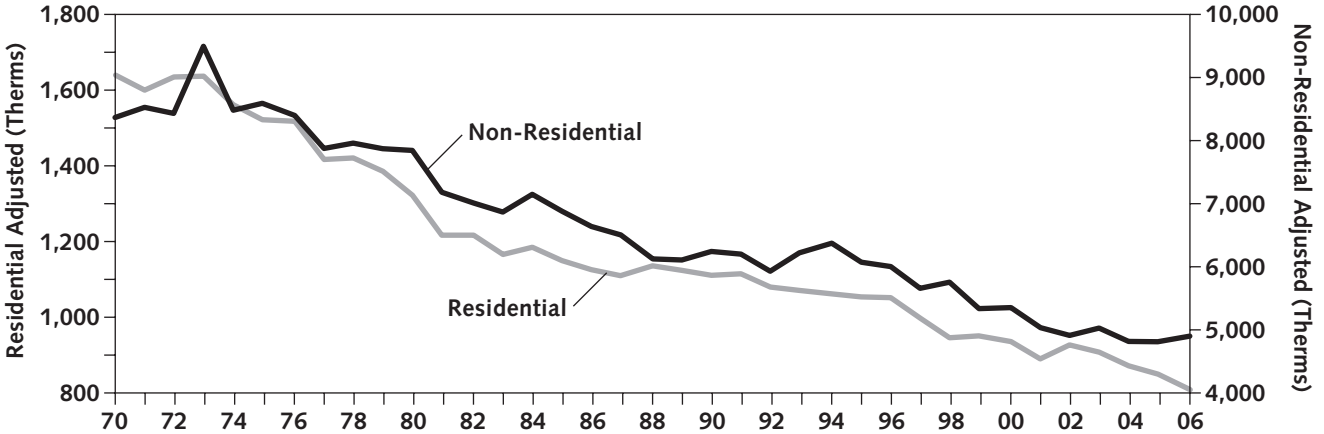
[p] Preliminary estimates.

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* (1994-2006); U.S. Department of Energy, *Natural Gas Annual, 1991-2005* [DOE/EIA-0131(05)] (November 2006).

Wisconsin Natural Gas Sales Per Customer, by Public Service Commission of Wisconsin Sector, 1970-2006

(Therms Per Customer)

Natural gas use for residential space heating, adjusted for weather conditions, decreased 4.9 percent in 2006. The amount of gas per residential customer has declined over 50 percent since 1970, indicating adoption of efficiency measures in Wisconsin's homes. Adjusted use per non-residential space heating customer of utility gas increased 1.8 percent in 2006 but unadjusted use decreased 5.6 percent.



	Residential			Commercial, Industrial & Electric			
		Space Heating				Space Heating	
Year	General	Actual	Adjusted[a]	Firm	Interruptible	Actual	Adjusted[a]
1970	412	1,788	1,638	19,852	393,886	9,377	8,356
1975	432	1,603	1,520	31,297	364,846	9,234	8,580
1980	406	1,437	1,321	48,158	644,076	8,829	7,834
1985	311	1,250	1,148	41,035	442,442	7,712	6,871
1990	274	1,075	1,109	22,429	240,166	5,976	6,232
1995	291	1,104	1,052	26,418	356,241	6,477	6,062
2000	293	960	934	9,014	236,043	5,561	5,342
2005	307	850	848	12,003	305,426	4,818	4,801
2006[p]	**307**	**772**	**807**	**11,798**	**254,762**	**4,548**	**4,890**

[a] Space heating categories adjusted to reflect demand under average 1996-2005 weather conditions of 7,235 heating degree days. In the residential category, an estimate of non-space heating gas use (general) was subtracted from each annual figure before adjusting. In the commercial category, the space heating use was adjusted without a non-space heating adjustment.

[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 (1991-1993), and form PSC-AF 2 (1994-2006).

Wisconsin Natural Gas Deliveries, by Pipeline Company 1970-2006

(Trillions of Btu and Percent of Total)

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.

Year	ANR Pipeline Co.[a]		Viking Gas Trans. Co.[b]		Natural Gas Pipeline Co.		Northern Natural Gas Co.		Midcon Corp.		Guardian Pipeline		Total[e,f]
1970	289.4	(88.2%)	6.0	(1.8%)	6.3	(1.9%)	26.6	(8.1%)	0.0	(0.0%)	d		328.3
1975	323.0	(88.5)	5.7	(1.6)	7.1	(1.9)	29.2	(8.0)	0.0	(0.0)	d		365.0
1980	305.5	(88.8)	3.9	(1.1)	7.8	(2.3)	26.8	(7.8)	0.0	(0.0)	d		344.0
1985	265.8	(87.4)	1.2	(0.4)	7.7	(2.5)	29.4	(9.7)	0.0	(0.0)	d		304.1
1990	218.2	(72.0)	6.0	(2.0)	7.4	(2.4)	53.8	(17.7)	17.8	(5.9)	d		303.2
1995	264.3	(69.6)	9.1	(2.4)	23.5	(6.2)	83.1	(21.9)	c		d		380.0
1996	269.5	(67.7)	9.9	(2.5)	26.1	(6.6)	92.3	(23.2)	c		d		397.8
1997	265.8	(68.1)	10.4	(2.7)	23.1	(5.9)	90.8	(23.3)	c		d		390.1
1998	241.0	(67.6)	10.2	(2.9)	19.7	(5.5)	85.5	(24.0)	c		d		356.4
1999	256.3	(68.8)	11.4	(3.1)	16.3	(4.4)	88.3	(23.7)	c		d		372.3
2000	272.1	(69.0)	11.1	(2.8)	21.0	(5.3)	90.0	(22.8)	c		d		394.2
2001	236.4	(66.0)	14.1	(3.9)	23.7	(6.6)	84.1	(23.5)	c		d		358.3
2002	267.2	(68.7)	15.1	(3.9)	22.3	(5.7)	82.5	(21.2)	c		1.9	(0.5)	389.0
2003	257.0	(64.6)	16.0	(4.0)	19.9	(5.0)	84.8	(21.3)	c		20.3	(5.1)	398.0
2004	241.8	(60.5)	14.8	(3.7)	19.8	(5.0)	82.3	(20.6)	c		40.8	(10.2)	399.5
2005	253.2	(61.2)	16.1	(3.9)	19.6	(4.7)	82.3	(19.9)	c		42.9	(10.4)	414.0
2006[p]	**219.0**	**(57.5)**	**14.6**	**(3.8)**	**19.9**	**(5.2)**	**86.8**	**(22.8)**	**c**		**40.6**	**(10.6)**	**380.9**

[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.

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

[e] 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.

[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.

[p] Preliminary.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1970-1993). Telephone conversations with pipeline representatives 1991-2007.

Wisconsin Coal Use, in Btu, by Economic Sector 1970-2006[r]

(Trillions of Btu and Percent of Total)

Wisconsin coal consumption decreased 3.4 percent in 2006. Over 90 percent of Wisconsin coal imports are used by electric utilities. Wisconsin coal use has now more than doubled since 1975. Industrial coal consumption increased 0.7 percent in 2006. Commercial sector use of coal is limited primarily to state facilities and large institutions. Residential coal use is limited to less than 350 residences and some older residential facilities, such as apartments.

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)	485.2	(90.3)	537.0	51.9
2005	0.1	(0.0)	4.8	(0.9)	45.1	(8.5)	481.7	(90.6)	531.7	50.0
2006[p]	**0.1**	**(0.0)**	**4.8**	**(0.9)**	**45.4**	**(8.9)**	**463.0**	**(90.2)**	**513.4**	**50.4**

[a] Includes petroleum coke co-fired with coal.

[p] Preliminary estimates.

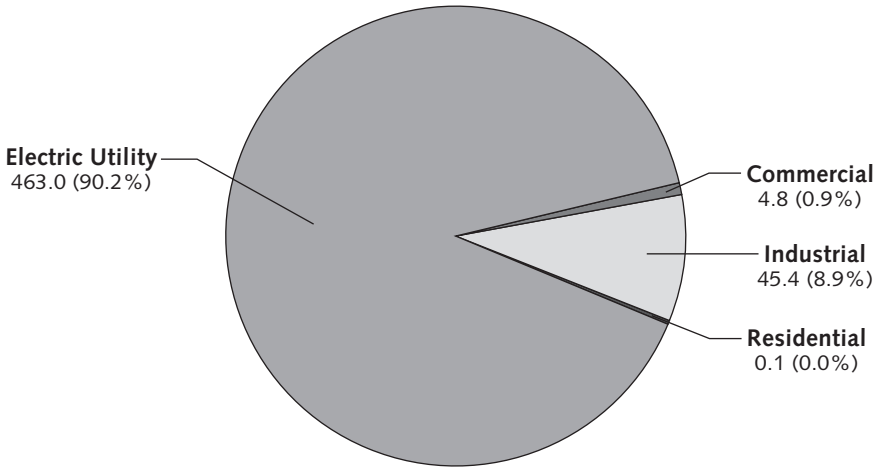
[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data Report*, [DOE/EIA-0214(94)] (October 1996), and *Coal Distribution* [DOE/EIA-0125 (95/4Q)] (1980-1995); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1971-2005); annual reports of various Wisconsin electric generating utilities (1995-2006); U.S. Department of Commerce, Bureau of the Census of Housing (1970, 1980, 1990 and 2000).

Wisconsin Coal Use, by Economic Sector

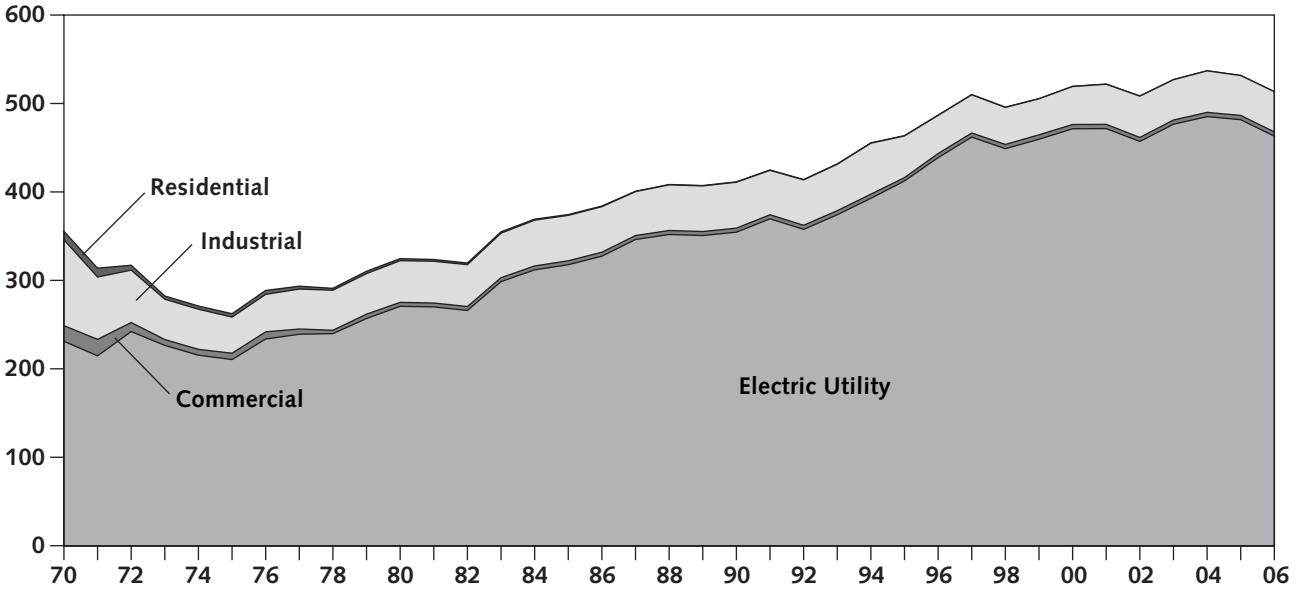
2006

(Trillions of Btu and Percent of Total)



1970-2006

(Trillions of Btu)



Source: Wisconsin Office of Energy Independence.

Wisconsin Coal Use, in Tons, by Economic Sector 1970-2006[r]

(Thousands of Tons and Percent of Total)

The total weight of coal used in Wisconsin decreased 939,000 tons (3.5 percent) in 2006.

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
1991	19	(0.1)	217	(1.0)	2,128	(10.0)	18,855	(88.9)	21,219
1992	18	(0.1)	218	(1.1)	2,175	(10.5)	18,248	(88.3)	20,659
1993	17	(0.1)	219	(1.0)	2,224	(10.3)	19,093	(88.6)	21,553
1994	16	(0.1)	220	(1.0)	2,443	(10.8)	20,040	(88.2)	22,719
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	(91.8)	26,478
2004	6	(0.0)	227	(0.8)	1,989	(7.4)	24,753	(91.8)	26,975
2005	5	(0.0)	228	(0.9)	1,911	(7.2)	24,577	(92.0)	26,721
2006[p]	**4**	**(0.0)**	**230**	**(0.9)**	**1,925**	**(7.5)**	**23,623**	**(91.6)**	**25,782**

[a] Includes petroleum coke co-fired with coal.

[p] Preliminary estimates.

[r] Revised.

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 (1971-2005); annual reports of various Wisconsin electric generating utilities (1995-2006); 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 1975-2006

(Thousands of Tons)

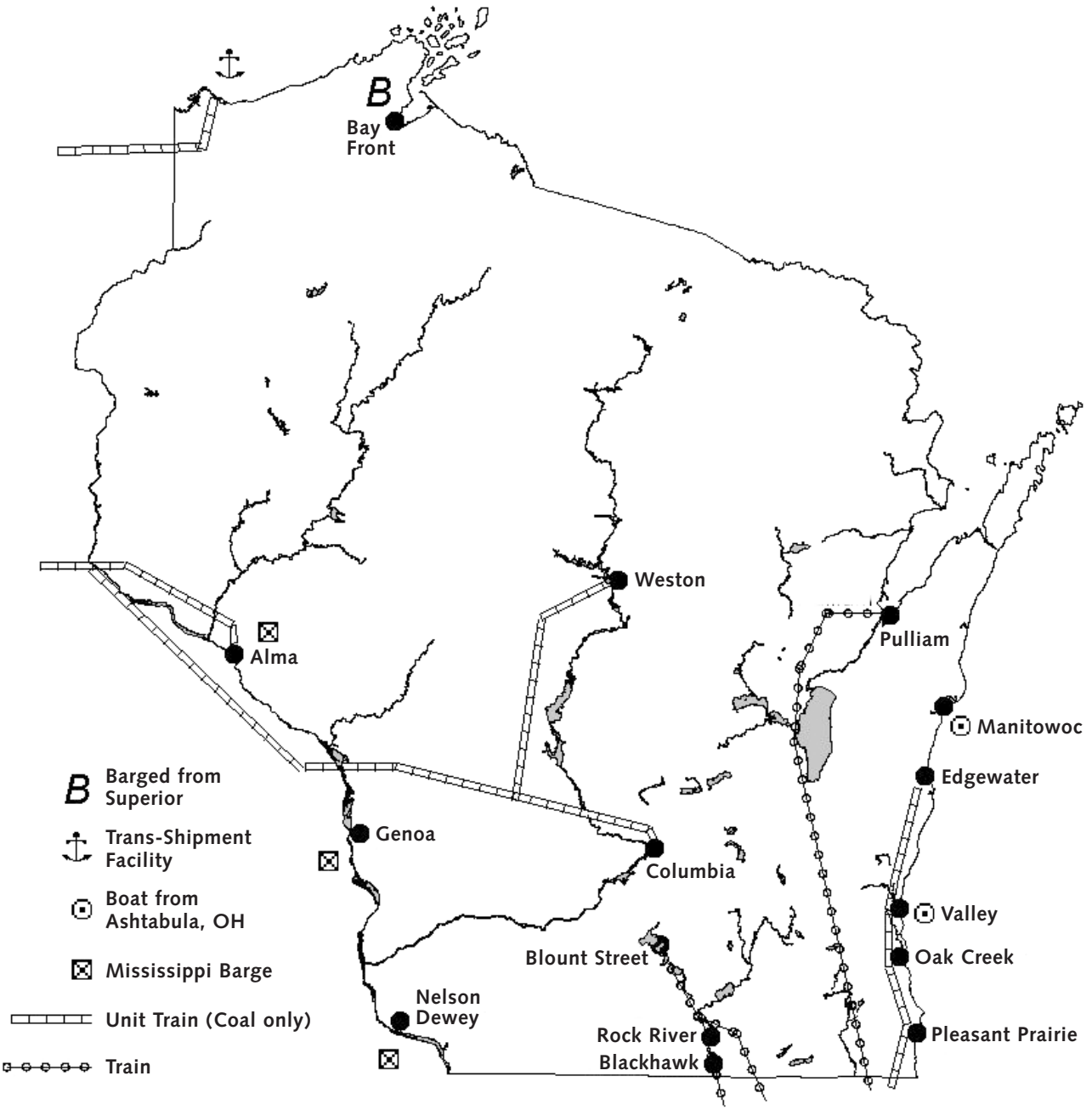
Coal use by Wisconsin's electric utilities decreased 3.9 percent in 2006 requiring additional imports of electricity to supply Wisconsin's increased sales of electricity. The two largest power plants, Pleasant Prairie and Columbia, used nearly 41 percent of the utility coal burned in Wisconsin.

Utility/Plant Name	1975	1980	1985	1990	1995	2000	2002	2003	2004	2005	2006
Dairyland Power Cooperative											
Alma	502	1,188	1,268	1,506	1,231	1,754	1,787	2,008	1,794	2,031	1,750
Genoa	801	915	914	680	788	928	942	1,064	935	1,172	1,200
Stoneman	111	74	44	30	0	0	0	0	24	38	35
Madison Gas and Electric Co.											
Blount Street	77	144	61	95	137	215	218	232	276	228	250
Northern States Power Co.											
Bay Front	52	100	36	45	30	115	142	135	131	152	150
Wisconsin Public Service Corp.											
Pulliam	753	744	489	674	1,130	1,444	1,403	1,541	1,672	1,627	1,650
Weston	239	329	1,275	1,555	1,702	1,972	1,887	2,023	2,141	2,143	1,900
Wisconsin Electric Power Co.											
Oak Creek	2,873	2,542	2,528	1,522	2,093	3,410	3,137	3,268	3,692	3,255	3,300
Pleasant Prairie	0	581	2,564	4,703	5,073	5,295	5,136	5,033	5,206	5,373	5,200
Port Washington	691	683	348	126	430	641	545	361	281	0	0
Valley	536	774	528	463	458	690	715	722	720	780	800
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	4,153	4,418	4,308	4,370	4,200
Edgewater	976	1,056	2,112	2,180	2,702	2,531	2,589	2,746	2,783	2,533	2,400
Nelson Dewey	512	552	541	497	615	580	576	628	653	729	700
Rock River	293	245	317	198	253	2	5	6	4	0	0
Municipal Utilities											
Manitowoc[a]	142	67	91	116	160	108	80	123	127	140	83
Marshfield	90	40	48	7	0	0	0	0	0	0	0
Menasha	58	28	25	25	2	10	8	6	6	6	5
Richland Center	21	20	20	0	0	0	0	0	0	0	0
Total	**9,776**	**13,715**	**16,208**	**18,087**	**21,042**	**24,050**	**23,323**	**24,314**	**24,753**	**24,577**	**23,623**

[a] Includes petroleum coke co-fired with coal.

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1975-1994); annual reports of various Wisconsin electric generating utilities (1995-2006); U.S. Department of Energy, *Electric Power Monthly* [DOE/EIA-0226 (2007/03)](March 2007).

Coal Transportation Routes in Wisconsin and Major Coal-Fired Power Plants, 2006



Source: Wisconsin Office of Energy Independence.

Wisconsin Manufacturing Industry Coal Purchases, by Industry Group, 1971-2006

(Thousands of Tons)

Wisconsin's industrial coal use continues to be dominated by paper and allied products, which consumed nearly 94 percent of the industrial coal used in 2006.

SIC Industry Group	1971	1975	1980	1985	1990	1995[r]	2000[r]	2002[r]	2003[r]	2004[r]	2005[r]	2006[b]
20 Food and Kindred	213	56	64	72	43	10	15	19	20	21	21	20
24 Lumber	17	3	2	2	---	---	---	---	---	---	---	---
25 Furniture	2	---[a]	---	---	---	---	---	---	---	---	---	---
26 Paper and Allied	1,940	1,469	1,737	1,878	1,863	1,825	1,700	1,870	1,819	1,865	1,765	1,800
28 Chemicals	174	6	---	---	---	---	---	---	---	---	---	---
30 Rubber	48	39	31	27	22	---	---	---	---	---	---	---
31 Leather	3	1	2	---	---	---	---	---	---	---	---	---
32 Stone, Clay and Glass	79	13	8	49	116	120	80	78	83	93	121	100
33 Primary Metals	114	50	80	66	95	---	---	---	---	---	---	---
34 Fabricated Metals	27	---	---	---	---	---	---	---	---	---	---	---
35 Machinery	67	31	38	37	23	14	---	---	---	---	---	---
36 Electrical Equipment	17	1	---	---	---	---	---	---	---	---	---	---
37 Transport Equipment	107	35	30	37	32	22	12	11	9	10	4	5
39 Miscellaneous	3	2	8	8	6	8	---	---	---	---	---	---
Total Manufacturing	**2,810**	**1,716**	**2,001**	**2,176**	**2,200**	**1,998**	**1,820**	**1,978**	**1,931**	**1,989**	**1,911**	**1,925**

[a] Less than 500 tons.

[b] Estimated.

[r] Revised.

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 (1972-2005).

Coal Deliveries to Wisconsin, by Transportation Mode and Type of Receiving Facility, 1975-2006[a]

(Thousands of Tons)

Coal shipped by rail increased 3.1 percent in 2006 as total coal deliveries increased 4.5 percent. Nearly 85 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. Increases in Wisconsin coal deliveries will be concentrated in rail deliveries of western coal for electric utilities.

Transportation Mode and Type of Receiving Facility	1975	1980	1985	1990	1995	2002	2003	2004	2005	2006[p]
Rail										
Electric Utilities	7,631	11,140	13,194	17,237	18,815	26,189	22,766	23,467	21,722	22,250
Coke Plants	29	11	0	0	0	0	0	0	0	0
Other Industrial	850	1,047	846	811	772	1,006	1,177	928	1,177	1,280
Residential/Commercial	170	3	5	1	3	20	46	62	417	510
Subtotal	8,680	12,201	14,045	18,049	19,590	27,215	23,989	24,457	23,316	24,040
Great Lakes Shipping										
Electric Utilities	2,211	1,713	1,118	429	1,005	1,649	1,235	1,391	1,572	1,900
Coke Plants	224	167	0	0	0	0	0	0	0	0
Other Industrial	992	981	1,024	822	788	458	248	249	46	75
Residential/Commercial	212	46	11	1	0	0	0	0	0	0
Subtotal	3,639	2,907	2,153	1,252	1,793	2,107	1,483	1,640	1,618	1,975
River Barge										
Electric Utilities	1,756	1,487	1,042	855	1,083	806	784	1,048	1,508	1,700
Other Industrial	0	62	246	55	120	353	0	0	22	50
Residential/Commercial	0	1	10	2	126	107	109	90	0	0
Subtotal	1,756	1,550	1,298	912	1,329	1,266	893	1,138	1,530	1,750
Truck										
Electric Utilities	0	0	2	31	0	0	0	0	0	0
Other Industrial	0	1	45	1	53	10	17	13	488	406
Residential/Commercial	0	0	0	0	0	0	0	0	1	0
Subtotal	0	1	47	32	53	10	17	13	489	406
Total[a]	**14,075**	**16,658**	**17,544**	**20,245**	**22,766**	**30,598**	**26,382**	**27,248**	**26,953**	**28,171**

[a] Total data reported in this table may differ from other tables because of different sources.

[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 (2003/4Q)] (May 2004), http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/coal_distributions.html.

Coal Deliveries to Wisconsin Industries, by Region of Origin[a] 1975-2006

(Thousands of Tons)

Coal currently used by Wisconsin industry comes primarily from the western part of the country (36 percent); 29 percent comes from the Midwest and 35 percent from eastern sources. There has been a gradual decline in industrial coal use. Industrial coal from Illinois has declined 82 percent since 1985.

Origin	1975	1980	1985	1990	1995	1999	2001	2002	2003	2004	2005	2006[p]
Eastern Pennsylvania	39	136	24	4	5	8	8	10	8	7	137	150
Western Pennsylvania	11	125	192	38	33	17	0	28	0	0	0	0
Northern West Virginia	93	339	150	230	384	72	292	93	37	103	175	180
Ohio	91	129	43	0	10	0	5	14	0	59	36	40
Southern No. 1 (West Virginia and Virginia)	35	88	2	1	15	40	230	265	85	24	13	15
Southern No. 2 (West Virginia and Kentucky)	1,210	497	757	628	529	372	262	315	169	158	243	250
Western Kentucky	111	127	147	98	196	221	99	210	189	0	192	200
Illinois	515	520	624	300	228	125	192	148	159	94	101	110
Indiana	55	114	89	43	67	65	201	372	206	142	207	210
Southwestern U.S.	11	3	0	0	0	0	0	0	0	0	0	0
Colorado and New Mexico	0	0	0	0	0	0	0	10	0	208	190	200
Wyoming	24	16	0	346	250	929	548	356	462	373	368	380
Utah	1	0	0	0	0	0	4	0	127	22	71	76
Montana and Washington	281	220	158	0	15	0	18	6	0	0	0	0
Total	**2,477**	**2,314**	**2,186**	**1,688**	**1,733**	**1,849**	**1,859**	**1,827**	**1,442**	**1,190**	**1,733**	**1,811**

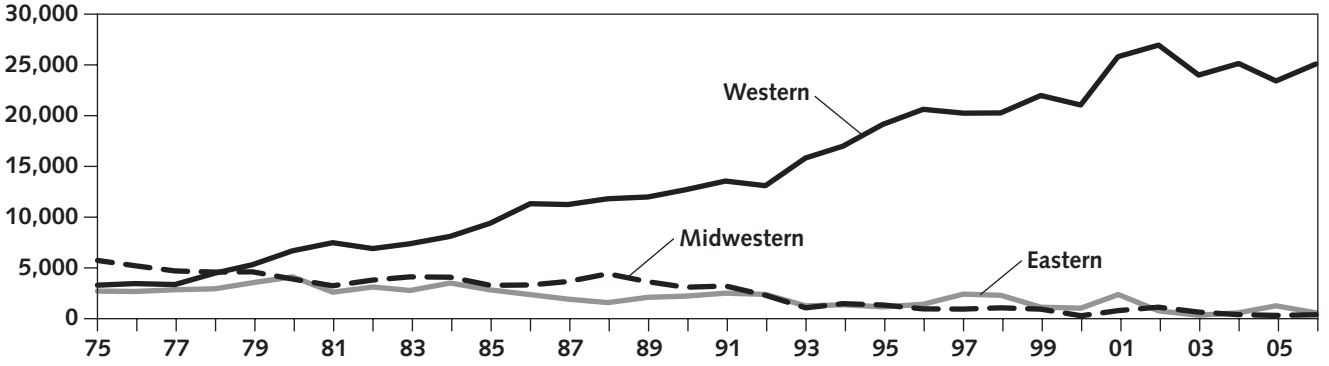
[a] Includes shipments to Wisconsin end users and dealers. Does not include deliveries to Superior Midwest Energy Terminal for transshipment from Wisconsin.

[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(2003/4Q)] (May 2004), http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/coal_distributions.html.

Coal Deliveries to Wisconsin Power Plants, by Region of Origin 1975-2006

(Thousands of Tons)



Coal Deliveries to Wisconsin Power Plants, by State of Origin 1975-2006[r]

(Thousands of Tons)

Although utility power plant coal use increased 4.2 percent in 2006, coal deliveries to Wisconsin power plants increased 4.2 percent. This resulted in a increase in coal stockpiled at Wisconsin utilities for future use due to an increase in deliveries.

State	1975	1980	1985	1990	1995	1998	1999	2001	2002	2003	2004	2005	2006[p]
Eastern													
Kentucky	2,073	2,816	2,122	196	95	55	58	278	89	66	249	758	250
Pennsylvania	572	1,007	639	1,760	941	2,173	992	1,880	596	137	131	0	130
West Virginia	5	233	0	136	57	7	12	106	18	72	54	252	50
Other States	1	0	9	59	0	0	0	42	0	0	76	191	75
Subtotal	2,651	4,056	2,770	2,151	1,093	2,235	1,062	2,306	703	275	510	1,201	505
Midwestern													
Illinois	4,857	3,364	1,478	1,136	1,232	828	714	506	663	358	8	97	10
Indiana	785	205	1,731	1,893	46	173	157	223	385	223	315	159	300
Ohio	27	272	0	0	0	0	0	0	16	1	6	0	10
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	1,001	871	729	1,064	582	329	256	320
Western													
Montana	2,161	2,575	2,235	1,983	2,102	1,509	642	493	2,915	698	924	591	925
Wyoming	1,053	4,042	7,101	10,605	15,223	18,171	20,283	23,278	21,798	21,321	21,832	20,581	21,800
Other States	20	0	0	43	1,758	522	991	1,979	2,164	1,908	2,310	2,174	2,300
Subtotal	3,234	6,617	9,336	12,631	19,083	20,202	21,916	25,750	26,877	23,927	25,066	23,346	25,025
Total	**11,554**	**14,515**	**15,324**	**17,811**	**21,454**	**23,438**	**23,850**	**28,785**	**28,644**	**24,784**	**25,905**	**24,803**	**25,850**

[p] Preliminary

[r] Revised

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 (2003/4Q)] (May 2004) and http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/coal_distributions.html.

Wisconsin Electric Utility Sales, by Economic Sector 1970-2006

(Millions of kWh and Percent of Total)

Total electricity sales fell 0.7 percent in 2006 but have grown 18.8 percent over the past ten years. In 2006, electricity sales decreased in the residential and the industrial sector. Over the past ten years electric sales have had an annual average growth rate of nearly 1.7 percent per year.

Year	Residential		Commercial[a]		Industrial		Agricultural		Total
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]	14,670	(29.8)	15,808	(32.1)	17,005	(34.6)	1,715	(3.5)	49,198
1991	15,614	(30.6)	16,397	(32.1)	17,286	(33.9)	1,735	(3.4)	51,032
1992	14,860	(29.2)	16,328	(32.1)	17,982	(35.3)	1,755	(3.4)	50,925
1993	15,598	(29.3)	16,773	(31.6)	19,010	(35.8)	1,775	(3.3)	53,156
1994	15,865	(28.6)	17,438	(31.5)	20,314	(36.7)	1,795	(3.2)	55,412
1995	16,820	(29.0)	18,042	(31.1)	21,290	(36.7)	1,815	(3.1)	57,967
1996	16,850	(28.7)	18,588	(31.6)	21,471	(36.6)	1,835	(3.1)	58,744
1997	16,655	(27.7)	18,881	(31.4)	22,703	(37.8)	1,855	(3.1)	60,094
1998	17,212	(27.7)	19,334	(31.2)	23,640	(38.1)	1,875	(3.0)	62,061
1999	17,607	(27.7)	20,781	(32.7)	23,264	(36.6)	1,895	(3.0)	63,547
2000	17,839	(27.6)	21,407	(33.1)	23,528	(36.4)	1,915	(3.0)	64,689
2001	18,605	(28.2)	21,614	(32.8)	23,823	(36.1)	1,935	(2.9)	65,977
2002	19,620	(29.3)	22,290	(33.3)	23,134	(34.5)	1,955	(2.9)	66,999
2003	19,389	(28.8)	22,456	(33.4)	23,421	(34.8)	1,975	(2.9)	67,241
2004	19,197	(28.2)	21,794	(32.0)	25,035	(36.8)	1,995	(2.9)	68,021
2005	20,443	(29.1)	22,501	(32.0)	25,377	(36.1)	2,015	(2.9)	70,336
2006[p]	**19,858**	**(28.4)**	**22,754**	**(32.6)**	**25,162**	**(36.0)**	**2,035**	**(2.9)**	**69,809**

[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.

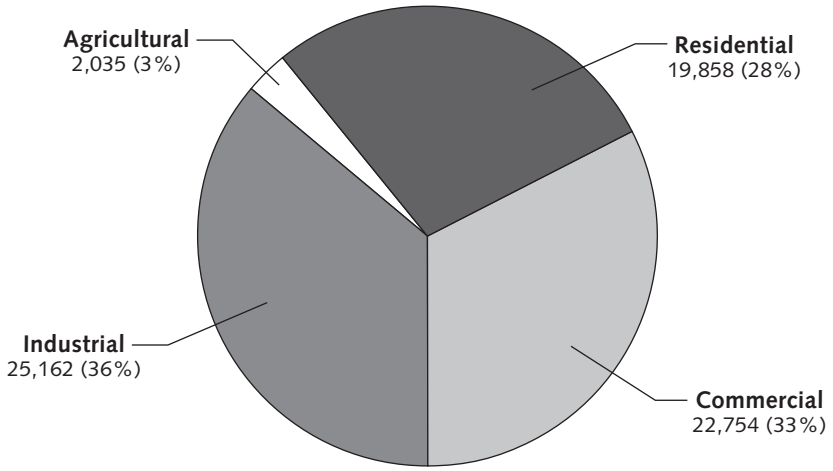
[p] Preliminary estimates.

Source: Sectoral disaggregation by Wisconsin Office of Energy Independence, 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), and *Electric Power Monthly* [DOE/EIA-0226 (2007/03)] (March 2007). http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html

Wisconsin Electric Utility Sales, by Economic Sector

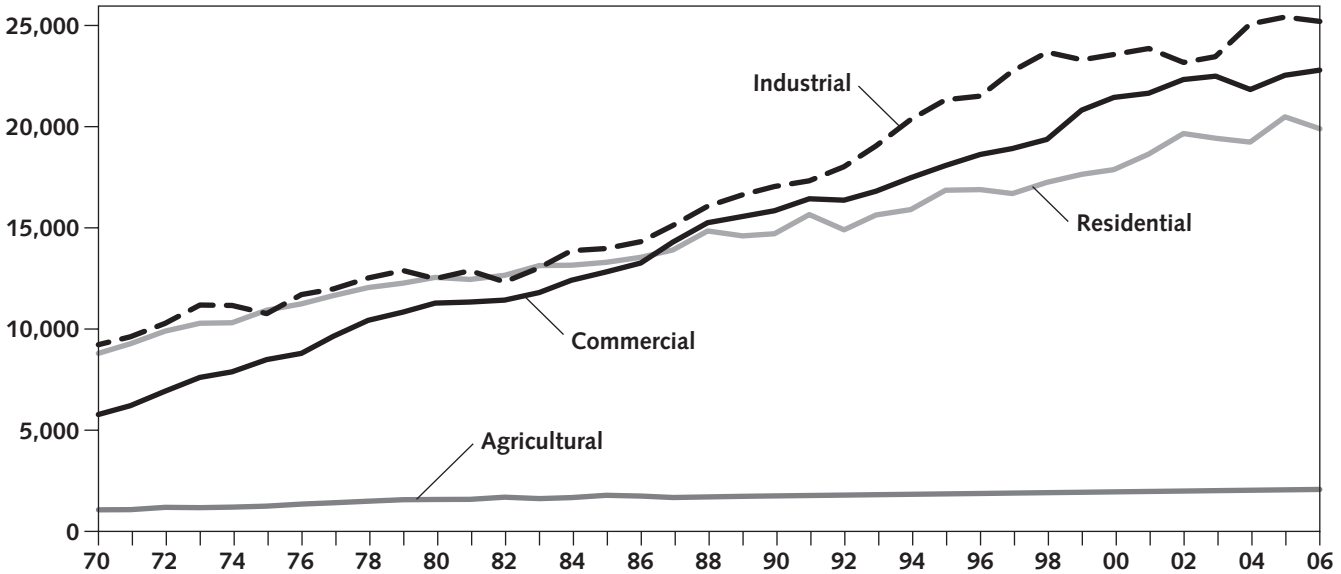
2006

(Millions of kWh and Percent of Total)



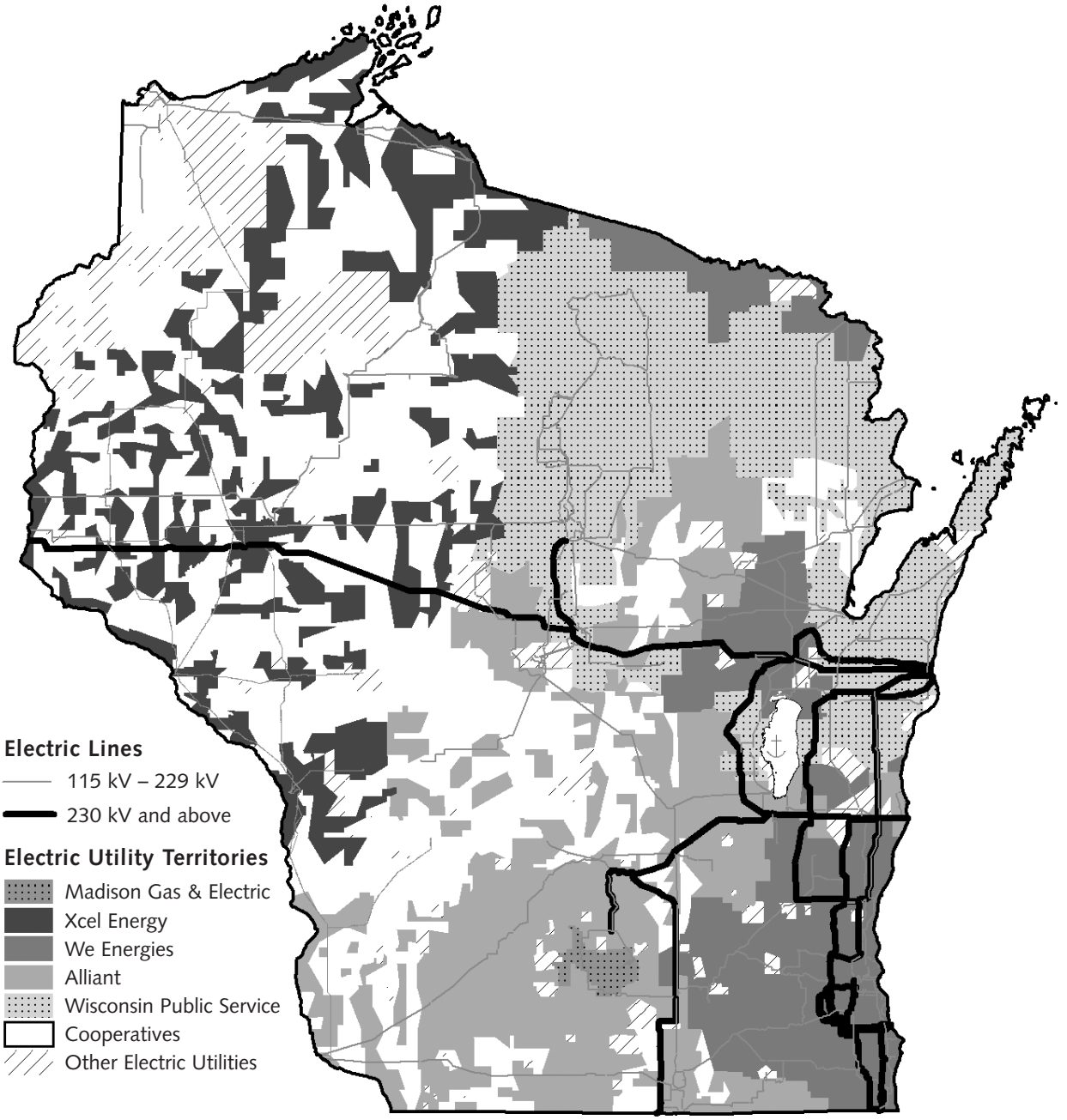
1970-2006

(Millions of kWh)



Source: Wisconsin Office of Energy Independence.

Major Electric Lines and Service Territory Areas



Source: Wisconsin Department of Natural Resources, with permission from the Wisconsin Electric Power Company; and Wisconsin Office of Energy Independence.

Wisconsin Electricity Sales to Ultimate Customers, by Private and Municipal Utilities and Power Cooperatives, 1970-2006

(Millions of kWh and Percent of Total)

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

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
1991	43,108	(84.5)	5,513	(10.8)	2,411	(4.7)	51,032
1992	43,038	(84.5)	5,495	(10.8)	2,393	(4.7)	50,926
1993	44,872	(84.4)	5,817	(10.9)	2,467	(4.6)	53,156
1994	46,677	(84.2)	6,180	(11.2)	2,555	(4.6)	55,412
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[p]	**58,429**	**(83.7)**	**7,890**	**(11.3)**	**3,490**	**(5.0)**	**69,809**

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

[p] Preliminary estimates.

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 (2007/03)] (March 2007). www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html

Eastern Wisconsin Electric Utility Power Load and Non-Coincident Peak Demand,[a,b] 1970-2006

Wisconsin's 2006 summer peak electricity demand for the eastern Wisconsin utilities increased 1.5 percent due to warmer weather in July. The increase compared to 2005 was 183 megawatts. Winter peak demand decreased in 2006 due to warmer December weather. Summer peak demand in 2006 exceeded winter peak demand by 3,129 megawatts.

Year	Load (Millions of kWh)	Peak Demand[b] Summer (MW)	Peak Demand[b] Winter (MW)	Load Factor[c] (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[d]	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[p]	**67,216**	**12,129**	**9,000**	**63.3**

[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.

[c] Load Factor = $\frac{\text{Annual Energy Demand (kWh)}}{\text{Peak Demand (kW) x 8,760 (hours/year)}}$

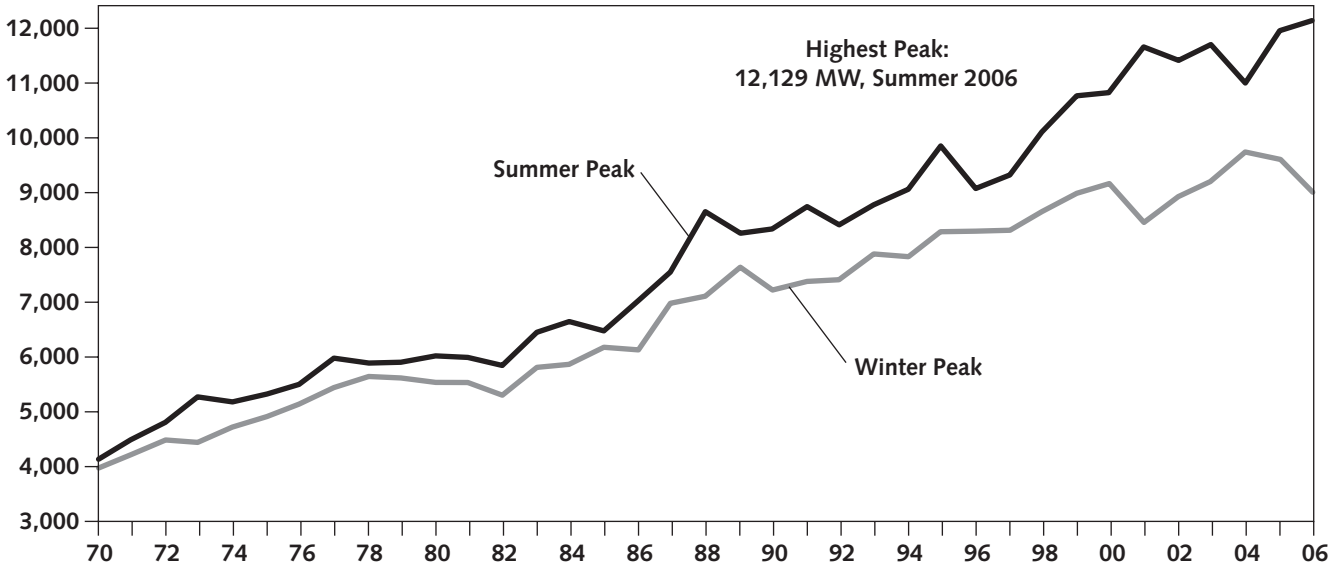
[d] Beginning in January 1988, data includes Wisconsin Electric Power Co. generation from Presque Isle, Michigan.

[p] Preliminary estimates.

Source: Wisconsin electric utility annual reports submitted to the Public Service Commission of Wisconsin (1970-2006); http://psc.wi.gov/apps/annlreport/content/munilist.aspx.

Eastern Wisconsin Electric Utility Non-Coincident Peak Demand,[a,b] 1970-2006

(Megawatts)



Eastern Wisconsin Electric Utility Power Load and Non-Coincident Peak Demand, by Month,[a,b] 2006

Month	Load (Millions of kWh)	Non-Coincident Peak Demand (MW)[b]
January	5,549	8,419
February	5,292	8,352
March	5,191	8,144
April	4,952	7,637
May	5,495	9,209
June	5,788	10,125
July	6,871	12,129
August	6,492	11,722
September	5,092	8,790
October	5,522	8,332
November	5,270	8,690
December	5,702	9,000
Total	**67,216**	

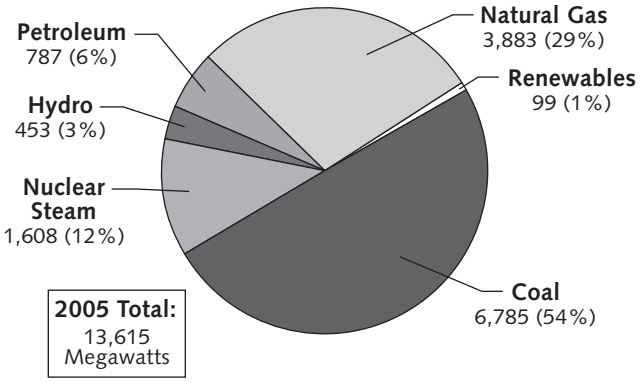
[a] Wisconsin Electric Power Co., Wisconsin Power and Light Co., Wisconsin Public Service Corp., and Madison Gas and Electric Co.

[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 (2006).

Wisconsin Electric Utility Generating Capacity, by Type of Plant 2005

(Megawatts and Percent of Total)



In 2005, Wisconsin's electric utility generating capacity increased 1,170 MW, or 9.4 percent. In all, 42 mw of petroleum capacity was added by electric utilities, along with small changes in hydro and nuclear capacity. Over the past five years, 1902 megawatts of natural gas capacity have been added. Coal fired generating capacity decreased in 2004 because of conversion of a major coal generating plant to natural gas. Conversion was completed in 2005. The Wisconsin system provides about 2.4 kW of capacity per capita.

1990-2005

(Megawatts and Percent of Total)

Year	Coal[b] (MW)		Nuclear Steam (MW)		Hydro (MW)		Petroleum (MW)		Natural Gas (MW)		Renewables (MW)		Total[a] (MW)
1990	7,455	(67.4)	1,583	(14.3)	447	(4.0)	836	(7.6)	648	(5.9)	97	(0.9)	11,066
1995	7,169	(60.5)	1,583	(13.4)	445	(3.8)	844	(7.1)	1702	(14.4)	97	(0.8)	11,840
1996	7,209	(60.1)	1,583	(13.2)	495	(4.1)	854	(7.1)	1785	(14.9)	61	(0.5)	11,987
1997	7,194	(60.2)	1,583	(13.2)	452	(3.8)	890	(7.4)	1773	(14.8)	61	(0.5)	11,953
1998	7,053	(59.0)	1,583	(13.2)	433	(3.6)	894	(7.5)	1934	(16.2)	61	(0.5)	11,958
1999	7,053	(58.6)	1,583	(13.2)	455	(3.8)	898	(7.5)	1965	(16.3)	81	(0.7)	12,035
2000	7,053	(57.8)	1,583	(13.0)	453	(3.7)	1,058	(8.7)	1981	(16.2)	82	(0.7)	12,210
2001	7,132	(57.8)	1,583	(12.8)	441	(3.6)	1,045	(8.5)	2064	(16.7)	82	(0.7)	12,347
2002	7,132	(56.5)	1,583	(12.5)	440	(3.5)	1,134	(9.0)	2245	(17.8)	84	(0.7)	12,618
2003	7,065	(55.9)	1,583	(12.5)	447	(3.5)	806	(6.4)	2672	(21.2)	56	(0.4)	12,629
2004	6,785	(54.5)	1,583	(12.7)	447	(3.6)	776	(6.2)	2755	(22.1)	99	(0.8)	12,445
2005[p]	**6,785**	**(49.8)**	**1,608**	**(11.8)**	**453**	**(3.3)**	**787**	**(5.8)**	**3883**	**(28.5)**	**99**	**(0.7)**	**13,615**

[a] Does not include industrial generating capacity or non-utility generators. Capacity is as of December 31 of each year.

[b] Generating capacity designed to use coal, but in some cases the coal may be supplemented by wood, RDF and tires.

[p] Preliminary estimates.

Sources: Energy Information Administration, *Electric Power Annual*, [DOE/EIA-0348(2007)](March 2007), http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html.

Wisconsin Electric Power Generation, by Type of Plant 1970-2006

(Millions of kWh and Percent of Total)

Total electric generation by Wisconsin utilities increased 0.6 percent in 2006. However, electric generation by independent power producers (IPP) and imports of electricity were still needed to satisfy the difference in demand for electricity between total sales and utility generation. In 2005, ownership of the Kewanee nuclear plant was transferred to Dominion, a major utility which is based outside of Wisconsin. The electric power generated by the Kewanee plant under Dominion's ownership continues to be counted as utility electric generation and the power was sold in Wisconsin. Nuclear generation of electricity in Wisconsin increased 23.3 percent because of the return to normal operations at the Point Beach II and Kewanee plants. Rail delivery problems resulted in a decrease in generation from coal fired plants and increased reliance on natural gas turbine generation.

	Utility Electric Generation											
Year	Coal		Nuclear		Hydro		Oil & Natural Gas		Total	IPP[b] Total	Imports & Losses[c]	Total Sales
1970	25,253	(92.8%)	155	(0.6%)	1,413	(5.2%)	390	(1.4%)	27,211	0	-2,496	24,715
1975	20,615	(62.3)	10,292	(31.1)	1,483	(4.5)	691	(2.1)	33,081	0	-1,805	31,276
1980	26,383	(68.9)	9,912	(25.9)	1,628	(4.2)	393	(1.0)	38,316	0	-571	37,745
1985	28,840	(68.9)	10,978	(26.2)	2,046	(4.9)	20	(0.0)	41,884	0	-159	41,725
1990[a]	32,145	(70.6)	11,226	(24.6)	1,791	(3.9)	389	(0.9)	45,551	133	3,514	49,198
1995	36,864	(72.3)	10,970	(21.5)	2,097	(4.1)	1,081	(2.1)	51,012	207	6,748	57,967
2000	41,058	(73.8)	11,512	(20.7)	1,749	(3.1)	1,347	(2.4)	55,666	1,290	7,733	64,689
2001	40,186	(73.1)	11,507	(20.9)	1,888	(3.4)	1,378	(2.5)	54,959	1,343	9,675	65,977
2002	38,584	(70.4)	12,449	(22.7)	2,283	(4.2)	1,458	(2.7)	54,774	1,098	11,127	66,999
2003	40,580	(72.4)	12,216	(21.8)	1,623	(2.9)	1,650	(2.9)	56,069	1,311	9,861	67,241
2004	40,982	(73.0)	11,888	(21.2)	1,748	(3.1)	1,524	(2.7)	56,142	1,755	10,124	68,021
2005	40,506	(73.4)	9,921	(18.0)	1,499	(2.7)	3,243	(5.9)	55,169	4,005	11,162	70,336
2006[p]	**38,725**	**(69.7)**	**12,234**	**(22.0)**	**1,218**	**(2.2)**	**3,347**	**(6.0)**	**55,524**	**3,298**	**10,987**	**69,809**

[a] Beginning in 1990, the U.S. DOE data source has been used.

[b] IPPs are independent power producers. Currently, these IPPs have contracted to sell almost all the power they produce to Wisconsin utilities, for end-use sale in Wisconsin. The primary fuel used by IPPs is natural gas; however, small amounts of coal, oil, wind and biogas are also used.

[c] A negative sign indicates Wisconsin utilities exported electric power to other states.

[p] Preliminary estimates.

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 Annual*, [DOE/EIA-0348(99)/1] (August 2001), and *Electric Power Monthly*, [DOE/EIA-0226 (2007/03)] (March 2007]. http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html

Wisconsin Electric Utility Fuel Costs of Power Generation, by Type of Plant, 1970-2006

(Cents Per kWh)

In this table only the cost of fuel per kilowatt-hour of generation is reported. The table on the next page includes all costs of generation. Hydroelectric plants are not included here because they have no associated fuel costs. Costs for Fossil Fuel generation increased in 2006 because of increased cost for coal. Costs for Internal Combustion decreased because of lower costs for natural gas. The fuel costs for all plants are only 1 percent below the peak of 1.77 cents per kWh in 1983.

Year	Fossil Fuel Steam	Nuclear Steam	Internal Combustion[a]	All Plants
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[e]	1.61	0.52	4.50	1.27
1995[e]	1.33	0.48	3.62	1.12
1996[e]	1.26	0.49	3.15	1.07
1997[e]	1.28	0.50	4.30	1.22
1998[e]	1.25	0.52	3.76	1.13
1999[e]	1.21	0.53	3.70	1.07
2000[e]	1.24	0.52	6.41	1.14
2001[e]	1.27	0.54	6.36	1.15
2002[e]	1.31	0.50	4.61	1.12
2003[e]	1.37	0.48	6.49	1.21
2004[e]	1.44	0.47	6.19	1.24
2005[e]	1.58	0.52	10.29	1.74
2006[e]	**1.78**	**0.54**	**8.28**	**1.76**

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

[e] Estimate by Wisconsin Office of Energy Independence 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 (2006). http://psc.wi.gov/apps/annlreport/content/munilist.aspx

Wisconsin Electric Utility Total Costs of Power Generation, by Type of Plant and Cost of Purchased Power, 1970-2006

(Cents Per kWh)

This table shows the total cost of generating one kWh of electricity by various technologies in Wisconsin's electric utility plants. The average cost of power at all plants is nearly 36 percent above the previous peak in 1983 of 2.21 cents per KWh. In 2005, the total cost of nuclear power per kWh generated was high because of maintenance work at the Point Beach II and Kewanee nuclear plants which resulted in the fixed costs being spread over fewer kWh of electricity generation. In 2006, nuclear generation set a new record and increased by 23.3 over 2005, which lowered the total cost per kWh of nuclear generation. The cost of purchased power has risen in recent years and is nearly twice as expensive as electricity generated in Wisconsin.

Year	Fossil Fuel Steam	Nuclear Steam	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
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
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	3.16	16.02	1.21	2.82	4.92	3.53
2006[e]	**2.68**	**2.10**	**14.81**	**1.40**	**3.01**	**5.55**	**3.88**

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

[e] Estimate by Wisconsin Office of Energy Independence 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 (2006). http://psc.wi.gov/apps/annlreport/content/munilist.aspx

Electric Utility Sulfur Dioxide Emissions and Emission Rates 1980-2006

(Tons and Pounds Per Million Btu)

Utility sulfur dioxide emissions increased nearly 0.8 percent from 2005 to 2006, due to increased generation by coal. The utility emission rate has fallen 81.6 percent since 1980. Wisconsin's acid rain law set a goal for 1993 emissions: 250,000 tons for major electric utilities and 75,000 tons for all other large sources. In 1993, major utilities were directed to reach an emission rate goal of 1.2 pounds of SO_2 per million Btu. The dramatic decline in emissions since 1992 is a direct result of Wisconsin utilities' efforts to comply with that legislation. Continued 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.

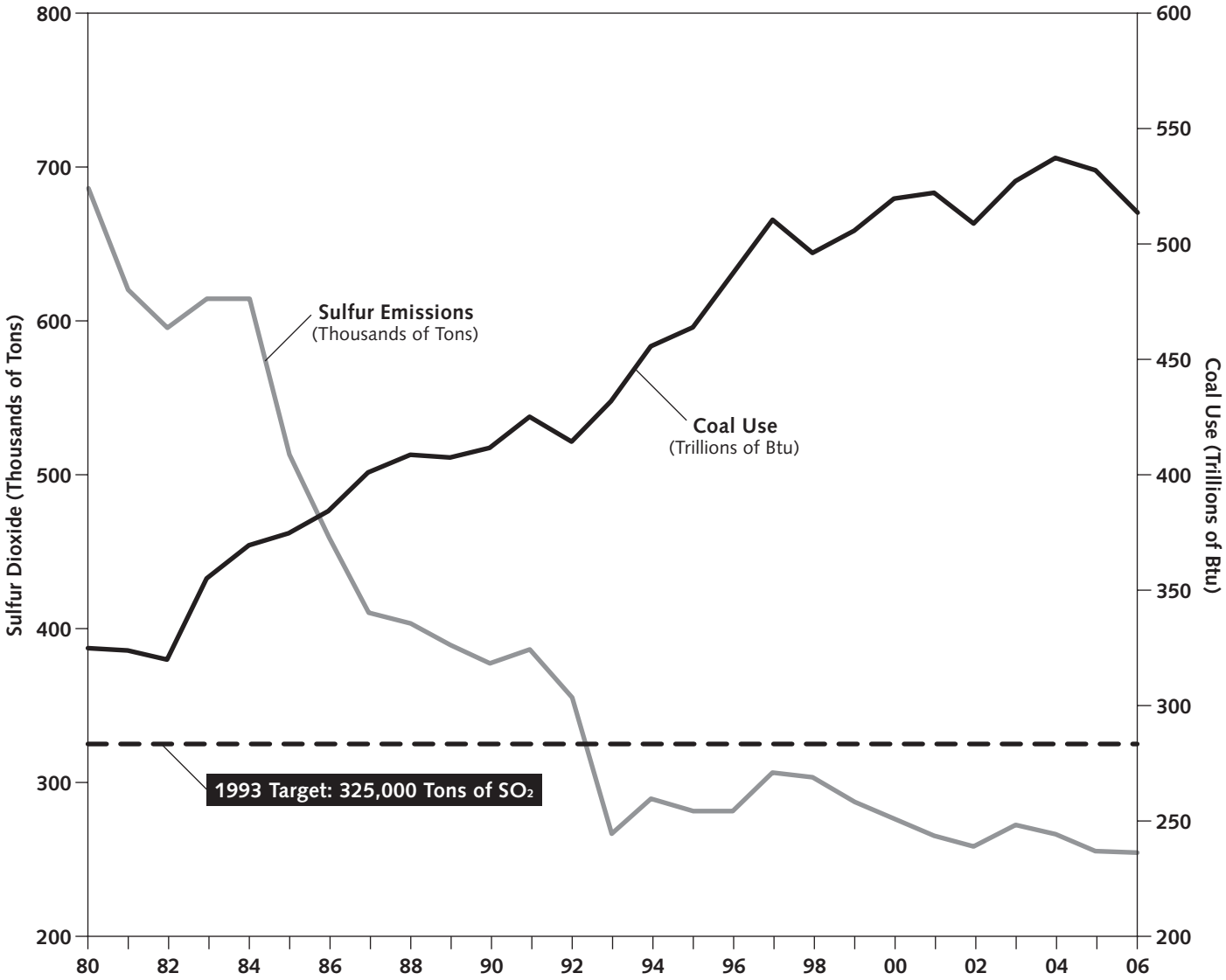
Utility	1980		1990		1995		2000		2005		2006[P]	
Dairyland Power Cooperative												
Alma	23,641	(5.9)	6,510	(2.0)	2,973	(1.6)	3,445	(0.8)	8,816	(1.1)	7,457	(1.1)
J.P. Madgett	4,088	(1.0)	7,330	(0.7)	5,693	(0.6)	5,378	(0.4)	7,762	(0.4)	6,345	(0.4)
Genoa	43,516	(6.4)	28,130	(4.0)	13,414	(1.5)	8,165	(0.8)	13,074	(0.8)	13,947	(0.8)
Stoneman	4,663	(6.6)	790	(2.1)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Madison Gas and Electric Co.												
Blount Street	8,436	(5.0)	3,851	(1.5)	4,392	(2.1)	6,923	(2.0)	5,969	(1.9)	6,987	(1.9)
Northern States Power Co.												
Bay Front	2,708	(NA)	393	(1.8)	317	(1.8)	786	(1.1)	1,196	(1.1)	923	(1.1)
Wisconsin Electric Power Co.												
Oak Creek	122,472	(4.1)	45,650	(2.6)	23,858	(0.9)	22,831	(0.7)	12,903	(0.6)	15,137	(0.6)
Port Washington	42,295	(5.1)	4,009	(2.4)	11,517	(2.1)	15,572	(1.9)	2	(1.6)	3	(1.6)
Valley	41,761	(4.5)	14,053	(2.4)	16,454	(2.3)	15,831	(1.8)	8,482	(1.6)	8,521	(1.6)
Pleasant Prairie	4,972	(1.0)	26,933	(0.7)	33,734	(0.8)	28,726	(0.6)	33,656	(0.6)	32,175	(0.6)
Wisconsin Power and Light Co.												
Blackhawk	2,006	(6.5)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Columbia 1	24,937	(0.6)	18,616	(1.3)	21,372	(1.1)	15,056	(0.7)	13,729	(0.6)	15,330	(0.6)
Columbia 2	14,614	(0.6)	13,909	(0.8)	13,878	(0.7)	13,270	(0.7)	12,370	(0.7)	14,490	(0.7)
Edgewater 1-4	60,014	(5.4)	38,021	(2.7)	8,073	(0.7)	8,962	(0.7)	9,103	(0.7)	8,217	(0.7)
Edgewater 5	0		6,744	(0.7)	8,870	(0.7)	8,744	(0.6)	7,741	(0.6)	7,731	(0.6)
Nelson Dewey	32,304	(5.6)	10,985	(2.0)	3,425	(0.6)	14,275	(2.0)	14,999	(1.7)	15,698	(1.7)
Rock River	14,139	(6.0)	7,220	(3.3)	2,954	(1.1)	25	(0.0)	12	(0.0)	10	(0.0)
Wisconsin Public Service Corp.												
Pulliam	42,087	(4.9)	25,631	(3.3)	4,863	(0.4)	6,314	(0.4)	12,175	(0.4)	10,937	(0.4)
Weston 1,2	21,009	(5.6)	6,589	(1.8)	2,905	(0.6)	3,340	(0.6)	3,988	(0.6)	4,095	(0.6)
Weston 3	0		7,598	(0.7)	7,478	(0.6)	8,358	(0.6)	9,540	(0.6)	8,867	(0.6)
Municipal Utilities												
Manitowoc	1,318	(NA)	1,727	(1.3)	2,267	(1.2)	3,282	(1.1)	217	(1.1)	175	(1.1)
Marshfield	1,651	(NA)	139	(1.6)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Menasha	991	(NA)	695	(2.0)	26	(1.9)	79	(1.8)	0	(1.6)	85	(1.6)
Total												
Utility Sources	**513,622**	**(3.8)**	**275,523**	**(1.6)**	**188,463**	**(0.9)**	**189,374**	**(0.8)**	**175,734**	**(0.7)**	**177,130**	**(0.7)**
All Other Sources	**172,777**		**101,517**		**92,734**		**87,115**		**78,953**		**77,000**	
All Stationary Sources	**686,399**		**377,040**		**281,197**		**276,489**		**254,687**		**254,130**	
Percent Utility Sources	**74.8%**		**73.1%**		**67.0%**		**68.5%**		**69.0%**		**69.7%**	

NA – Not available.

[P] Preliminary estimates.

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, Sulfur Dioxide and Nitrogen Oxides Emissions Report PUBL-AM-343 (1986-2004).

Wisconsin Sulfur Dioxide Emissions and Coal Use 1980-2006



Source: Wisconsin Office of Energy Independence.

Wisconsin Utility Power Plant Inventory, 2006[a]

Utility/Site	Nameplate Capacity (MW)	Number of Units	Primary Fuel
Dairyland Power Cooperative			
Alma 1-3	45.0	3	Coal
Alma 4,5	136.0	2	Coal
J.P. Madgett	387.0	1	Coal
Flambeau	22.0	3	Hydro[b]
Genoa 3	345.6	1	Coal
Elk Mound	71.0	2	Gas
Seven Mile Creek	3.0	3	Gas, Landfill
Madison Gas and Electric Co.			
Blount Street 1,3,4,5,6,7	187.5	6	Coal/RDF[c]
Fitchburg 1,2	57.6	2	Gas
Nine Springs	16.2	1	Gas
Sycamore	41.6	2	Gas
Rosiere	11.0	17	Wind
West Marinette	83.0	1	Gas
West Campus	168.5	3	Gas
Diesel	54.0	1	Oil
Northern States Power Co.			
Bay Front 4,5,6	68.0	3	Wood/Coal
Flambeau	16.0	1	Gas
French Island 1,2	31.3	2	Wood/RDF[c]
French Island 3,4	157.6	2	Gas
Wheaton 1-6	322.0	6	Oil
Various Hydro	235.4	57	Hydro[b]
Wisconsin Electric Power Co.			
Concord	381.2	4	Gas
Germantown 1,2,3,4	244.8	4	Oil
Germantown 5	106.9	1	Gas
Milwaukee	11.0	1	Coal
S. Oak Creek 5-8	1191.6	4	Coal
S. Oak Creek 9	19.6	1	Gas
Pleasant Prairie 1,2	1233.0	2	Coal
Pleasant Prairie 3	2.0	1	Oil
Point Beach 1,2	1047.6	2	Nuclear
Point Beach 5	25.0	1	Oil
Port Washington 1-3	579.0	3	Gas
Valley 1,2	272.0	2	Coal
Valley 3	2.7	1	Oil
Various Hydro	13.6	8	Hydro[b]
Paris	381.2	4	Gas
Byron	1.2	2	Wind

Utility/Site	Nameplate Capacity (MW)	Number of Units	Primary Fuel
Wisconsin Public Service Corp.			
Pulliam 3-5	110.0	3	Coal
Pulliam 6-8	300.2	3	Coal
Weston 1-3	492.1	3	Coal
Weston 31,32	72.5	2	Gas
W. Marinette 31,32,33[e]	167.1	3	Gas
Oneida Casino	4.0	2	Oil
Eagle River	4.0	2	Oil
Various Hydro	55.3	30	Hydro[b]
Glenmore	1.2	2	Wind
Lincoln	9.2	14	Wind
Pulliam 31	83.0	1	Gas
De Pere	187.2	1	Gas
Wisconsin Power and Light Co.			
Blackhawk 3,4	50.0	2	Gas
Columbia 1[f]	512.0	1	Coal
Columbia 2[f]	511.0	1	Coal
Edgewater 3	60.0	1	Coal
Edgewater 4[g]	330.0	1	Coal
Edgewater 5[h]	380.0	1	Coal
South Fond Du Lac	344.0	4	Gas
Nelson Dewey 1,2	200.0	2	Coal
Berlin	2.4	3	Gas, Landfill
Rock River 1,2	150.0	2	Gas
Rock River 3-6	144.0	4	Gas
Sheepskin	40.0	1	Gas
Sheboygan Falls	380.0	2	Gas
Various Hydro	36.6	12	Hydro[b]
Municipal Utilities			
Manitowoc, City of	11.0	2	Gas
	64.0	3	Coal/RDF[c]
	24.5	1	Gas
Menasha, City of	21.1	2	Coal
Other Utilities and Power Cooperatives			
	94.5	90	Hydro[b]
	63.0	2	Gas
	107.5	79	Oil
Dominion Energy[d]	560.1	1	Nuclear
Wisconsin Public Power Inc			
	60.5	1	Gas
	1.1	1	Oil

[a] Does not include non-utility generation.

[b] Hydroelectric capacity differs from sum on other tables due to different definitions of capacity in data sources.

[c] RDF is Refuse Derived Fuel.

[d] The Kewaunee unit is owned and operated by Dominion Energy for Wisconsin Public Service Corp. (59%) and Alliant Energy (41.0%).

[e] The West Marinette 33 unit is jointly owned by Wisconsin Public Service Corp. (68%) and the City of Marshfield (32%).

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

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

[h] The Edgewater 5 unit is owned by Alliant Energy (75%) and Wisconsin Electric Power Co. (25%).

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.

4 Renewable Energy

Renewable energy resources play a key role in Wisconsin's efforts to reduce dependence on imported fuels. Renewable resource use in Wisconsin is dominated by wood burning for space and process heat, primarily in homes and industry. In 2006, the residential and industrial sectors accounted for 59.7 percent and 32.4 percent, respectively, of the wood burned. Wood energy use decreased about 1 percent in 2006 primarily due to a warmer winter which resulted in decreased wood burned in homes for heating. Industrial and utility wood use grew slightly. In the utility sector, Northern States Power uses wood for a significant amount of their electricity-generating fuel at the Bay Front and French Island generating plants.

Hydroelectric power currently ranks third as a renewable energy source in Wisconsin. Hydroelectric power production comes from approximately 72 utility sites and about 50 privately owned sites; production is affected by annual rainfall. Historic data on state average rainfall is provided to help gauge the importance of rainfall in the state's overall energy patterns.

Biogas is produced from the state's landfills and wastewater treatment plants that have installed collection and conversion equipment. Bio-solid waste is derived from pre- and post-commercial waste used as fuel, such as waste from paper mills.

Ethanol, a renewable energy source primarily made from corn, is used as the oxygenate in reformulated gasoline sold in southeastern Wisconsin and also is used as an octane booster in a portion of conventional gasoline sold in Wisconsin. In 2006, Wisconsin's use of ethanol in motor fuel increased 6.1 percent to over 130 million gallons. Since 1994, ethanol use has jumped over 880 percent. The reason for the dramatic jump is that starting in 1995, the federal government mandated the sale of reformulated gasoline (RFG) in six southeastern Wisconsin counties to improve air quality. In 2006, all of the RFG sold in the state (over 776 million gallons) used ethanol as the oxygenate.

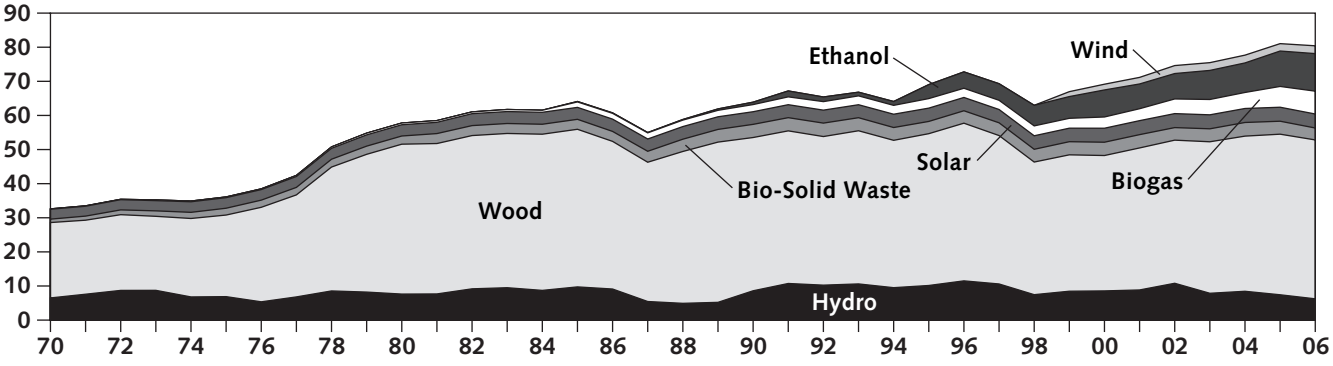
Installation of passive and active solar systems in Wisconsin remains slow compared to the early 1980s. However, it is anticipated that increased use of passive solar technologies for heating and daylighting will occur in the future.

In 2006, Wisconsin utilities operated 55 large wind turbines at five sites in Wisconsin. These utility-scale wind turbines, along with smaller, individually owned wind turbines, generated 104.7 million kWh. For perspective, the electricity generated by wind is just over 7 percent of the electricity generated by utilities from hydro in Wisconsin in 2006, or enough electricity to meet the needs of 12,447 average Wisconsin households in 2006. While the amount of generation is small, utility electricity generated by wind in Wisconsin has almost doubled since 2000. However, wind production of electricity peaked in 2002 and since then has stagnated, with 2006 production over 4 percent below the peak.

Wisconsin Renewable Energy Use, by Type of Fuel 1970-2006

(Trillions of Btu)

Renewable energy use in Wisconsin decreased 0.8 percent in 2006 primarily because of decreased use of hydro, wood and bio-solid waste. In 2006, biogas use increased 6.7 percent, and ethanol use in the transportation sector increased 6.1 percent. Hydro generation includes electricity generation by Wisconsin utilities and estimates of privately owned dams. Solar energy includes both active solar collectors and estimated passive solar applications. In 2006, energy from wind increased slightly and is more than double the amount generated in 2000. However, energy from wind has been relatively stable since 2002.



Year	Hydro	Wood	Bio-Solid Waste[a]	Solar	Biogas	Ethanol[b]	Wind	Total
1970	6.5	22.1	1.0	2.9	0.1	0.0	0.0	32.6
1975	6.9	23.9	2.0	3.1	0.2	0.0	0.0	36.1
1980	7.6	43.9	2.4	3.3	0.5	0.0	0.0	57.8
1985	9.7	46.2	2.9	3.5	1.6	0.1	0.0	64.1
1990	8.6	44.9	3.9	3.7	2.1	0.7	0.0	63.9
1995	10.1	44.5	3.6	3.9	2.8	4.1	0.0	69.0
2000	8.6	39.7	3.9	4.1	3.3	7.9	0.5	68.0
2001	8.8	41.6	3.9	4.1	3.5	7.3	0.7	70.0
2002	10.8	42.0	3.7	4.1	4.3	7.4	1.1	73.4
2003	7.9	44.4	3.8	4.1	4.5	8.5	1.1	74.3
2004	8.5	45.5	4.0	4.1	4.7	8.7	1.1	76.5
2005	7.4	47.1	3.8	4.1	6.1	10.4	1.0	79.9
2006[p]	**6.2**	**46.6**	**3.5**	**4.1**	**6.7**	**11.0**	**1.1**	**79.2**

[a] Includes municipal and industrial solid waste.

[b] Ethanol is blended with a petroleum-based fuel to produce reformulated gasoline or gasohol.

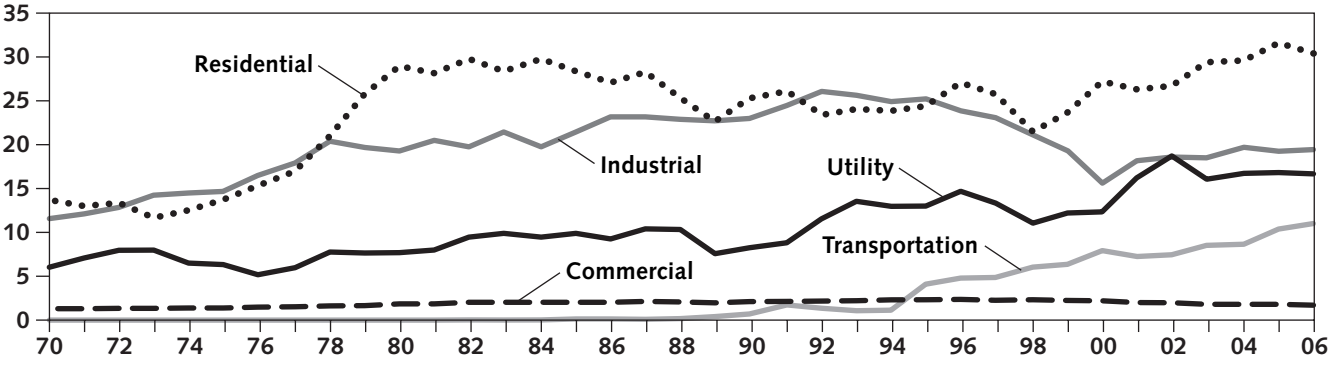
[p] Preliminary estimates.

Source: Compiled from tables in this publication for Wisconsin wood and hydro and unpublished administrative data (2006).

Wisconsin Renewable Energy Use, by Economic Sector 1970-2006

(Trillions of Btu)

Wood dominates industry's renewable energy use, but hydroelectric, biogas and bio-solid waste energy are also utilized. Renewable energy use in the residential sector is divided between wood (90 percent) and solar (10 percent). In 2006, utility use of renewable energy consists primarily of hydro, wood, biogas and wind. Commercial use of renewable energy includes wood, bio-solid waste. Transportation use of renewable energy consists of using ethanol as an oxygenate and octane enhancer in gasoline.



Year	Residential	Commercial	Industrial	Electric Utility	Transportation	Total Resources	Total End Use
1970	13.7	1.3	11.6	6.0	0.0	32.6	26.6
1975	13.7	1.4	14.7	6.3	0.0	36.1	29.8
1980	28.9	1.9	19.3	7.7	0.0	57.8	50.1
1985	28.3	2.1	23.2	10.4	0.1	64.1	53.7
1990	23.4	2.2	26.1	11.6	0.7	63.9	52.3
1995	24.4	2.3	25.2	13.0	4.1	69.0	56.0
2000	27.2	2.2	15.6	12.3	7.9	65.3	52.9
2001	26.3	2.0	18.2	16.2	7.3	70.0	53.7
2002	26.7	2.0	18.6	18.7	7.4	73.4	54.7
2003	29.4	1.8	18.5	16.1	8.5	74.3	58.2
2004	29.6	1.8	19.7	16.7	8.7	76.5	59.8
2005	31.6	1.8	19.2	16.8	10.4	79.9	63.0
2006[p]	**30.4**	**1.7**	**19.4**	**16.7**	**11.0**	**79.2**	**62.5**

[p] Preliminary estimates.

Source: Compiled from tables in this publication for Wisconsin wood and hydro and unpublished administrative data (2006).

Wisconsin Wood Use, by Economic Sector 1970-2006

(Trillions of Btu and Percent of Total)

Wood energy use in Wisconsin decreased 1.1 percent in 2006, primarily because wood energy use in the residential sector decreased 4.1 percent. This decrease was primarily due to warmer winter weather.

Year	Residential[a]		Commercial		Industrial		Electric Utility		Total
1970	11.9	(53.8%)	0.2	(0.9%)	10.0	(45.2%)	0.0	(0.0%)	22.1
1975	11.8	(49.3)	0.2	(0.8)	11.9	(49.8)	0.0	(0.0)	23.9
1980	26.9	(61.2)	0.6	(1.4)	15.7	(35.7)	0.7	(1.7)	43.9
1985	26.1	(56.5)	0.8	(1.7)	17.6	(38.2)	1.7	(3.6)	46.2
1990	21.1	(47.0)	0.7	(1.6)	20.0	(44.6)	3.1	(6.9)	44.9
1995	21.9	(49.2)	0.6	(1.3)	18.5	(41.6)	3.5	(7.9)	44.5
1996	24.6	(53.2)	0.6	(1.3)	17.2	(37.2)	3.8	(8.3)	46.2
1997	23.3	(53.6)	0.5	(1.1)	16.4	(37.6)	3.3	(7.6)	43.5
1998	19.0	(48.9)	0.5	(1.3)	15.5	(39.9)	3.9	(10.0)	38.9
1999	21.2	(53.0)	0.4	(1.0)	14.6	(36.6)	3.8	(9.4)	40.0
2000	24.6	(62.0)	0.4	(1.0)	11.3	(28.4)	3.4	(8.6)	39.7
2001	23.7	(56.9)	0.3	(0.7)	14.2	(34.0)	3.5	(8.4)	41.6
2002	24.1	(57.4)	0.3	(0.7)	14.3	(34.1)	3.3	(7.8)	42.0
2003	26.8	(60.3)	0.2	(0.5)	14.3	(32.1)	3.2	(7.1)	44.4
2004	27.0	(59.4)	0.2	(0.4)	15.4	(33.9)	2.9	(6.3)	45.5
2005	29.0	(61.6)	0.2	(0.4)	14.9	(31.7)	3.0	(6.3)	47.1
2006[p]	**27.8**	**(59.7)**	**0.2**	**(0.4)**	**15.1**	**(32.4)**	**3.5**	**(7.5)**	**46.6**

[a] Revised.

[p] Preliminary estimates.

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 (1972-2005); USDA Forest Service, *Residential Fuelwood Consumption and Production in Wisconsin* (1994); Wisconsin Department of Administration, Division of Energy, "Wisconsin Residential Wood Energy Model," unpublished (2003), and *Directory of Wisconsin Wood Burning Facilities* (1995).

Wisconsin Manufacturing Industry Use of Wood Fuel, by Industry Group, 1972-2006

(Thousands of Tons and Trillions of Btu[a])

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.

	Lumber		Furniture		Paper & Allied		Other Manufacturing		Total	
Year	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)
1972	391.2	4.43	13.2	0.15	508.5	4.88	16.1	0.18	929.0	10.50
1975	437.2	4.94	24.5	0.27	575.6	6.51	17.1	0.19	1,054.5	11.92
1980	447.5	5.06	56.9	0.64	872.8	9.86	12.0	0.13	1,389.2	15.70
1985	427.3	4.83	53.9	0.61	1,046.7	11.83	33.5	0.38	1,561.3	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	490.2	5.54	49.0	0.55	1,050.0	11.87	48.0	0.54	1,637.2	18.50
1996	481.0	5.42	45.0	0.51	951.0	10.75	45.0	0.51	1,522.0	17.19
1997	473.0	5.34	40.0	0.45	902.0	10.19	35.0	0.40	1,450.0	16.38
1998	459.0	5.19	35.0	0.40	853.0	9.64	25.0	0.28	1,372.0	15.51
1999	448.0	5.06	30.0	0.34	801.0	9.05	15.0	0.17	1,294.0	14.62
2000	433.5	4.90	20.1	0.23	534.5	6.04	8.0	0.09	996.1	11.26
2001	420.5	4.75	19.0	0.21	800.7	9.05	12.2	0.14	1,252.4	14.15
2002	415.2	4.69	17.2	0.19	823.4	9.30	10.4	0.12	1,266.2	14.30
2003	384.3	4.34	15.3	0.17	855.2	9.66	8.0	0.09	1,262.8	14.26
2004	434.7	4.91	13.5	0.15	905.3	10.23	10.2	0.12	1,363.7	15.41
2005	422.4	4.77	10.8	0.12	877.0	9.91	10.2	0.12	1,320.4	14.92
2006[p]	**425.0**	**4.80**	**11.0**	**0.13**	**890.0**	**10.06**	**10.0**	**0.11**	**1,336.0**	**15.10**

[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.

[p] Preliminary estimates.

Source: Estimates by the Wisconsin Office of Energy Independence, based on Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-2005); 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 1970-2006

Wood energy used for electricity in Wisconsin increased in 2006 when Northern States Power Co. increased wood usage at its Bay Front plant. Northern States Power Co. began using wood fuel at its Bay Front electric generation facility 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.

Year	Tons	Billions of Btu
1970-1975	0	0
1980	76,282	740
1985	155,717	1,666
1990	299,464	3,112
1991	296,197	3,061
1992	297,436	3,115
1993	307,478	3,399
1994	379,106	3,536
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[P]	**288,907**	**3,482**

[P] Preliminary estimates.

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-1994); annual reports of various Wisconsin electric generating utilities (1995-2006). http://psc.wi.gov/apps/annlreport/content/munilist.aspx

Wisconsin Electric Utility and Non-Utility Hydroelectric Generation[a], 1970-2006

(Millions of kWh)

Total Wisconsin electric utility hydroelectric production decreased 16.0 percent in 2006. Statewide average precipitation decreased 1.7 percent, to 28.7 inches in 2006.

Year	Wisconsin Owned Utility Plant Location		Total Utility	Wisconsin Non-Utility[b]	Total Wisconsin	Total Wisconsin Precipitation (inches per year)
	Wisconsin	Michigan				
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[c,r]	1,791.0	340.2	1,865.2	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	1,498.9	360.5	1,859.4	241.3	1,740.2	29.2
2006[p]	**1,218.0**	**355.5**	**1,573.5**	**244.0**	**1,462.0**	**28.7**

[a] Including Wisconsin power cooperatives.

[b] Estimated.

[c] Beginning in 1990, the U.S. DOE data source has been used.

[p] Preliminary estimates.

[r] Revised.

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 (2007/03)] (March 2007), http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html.

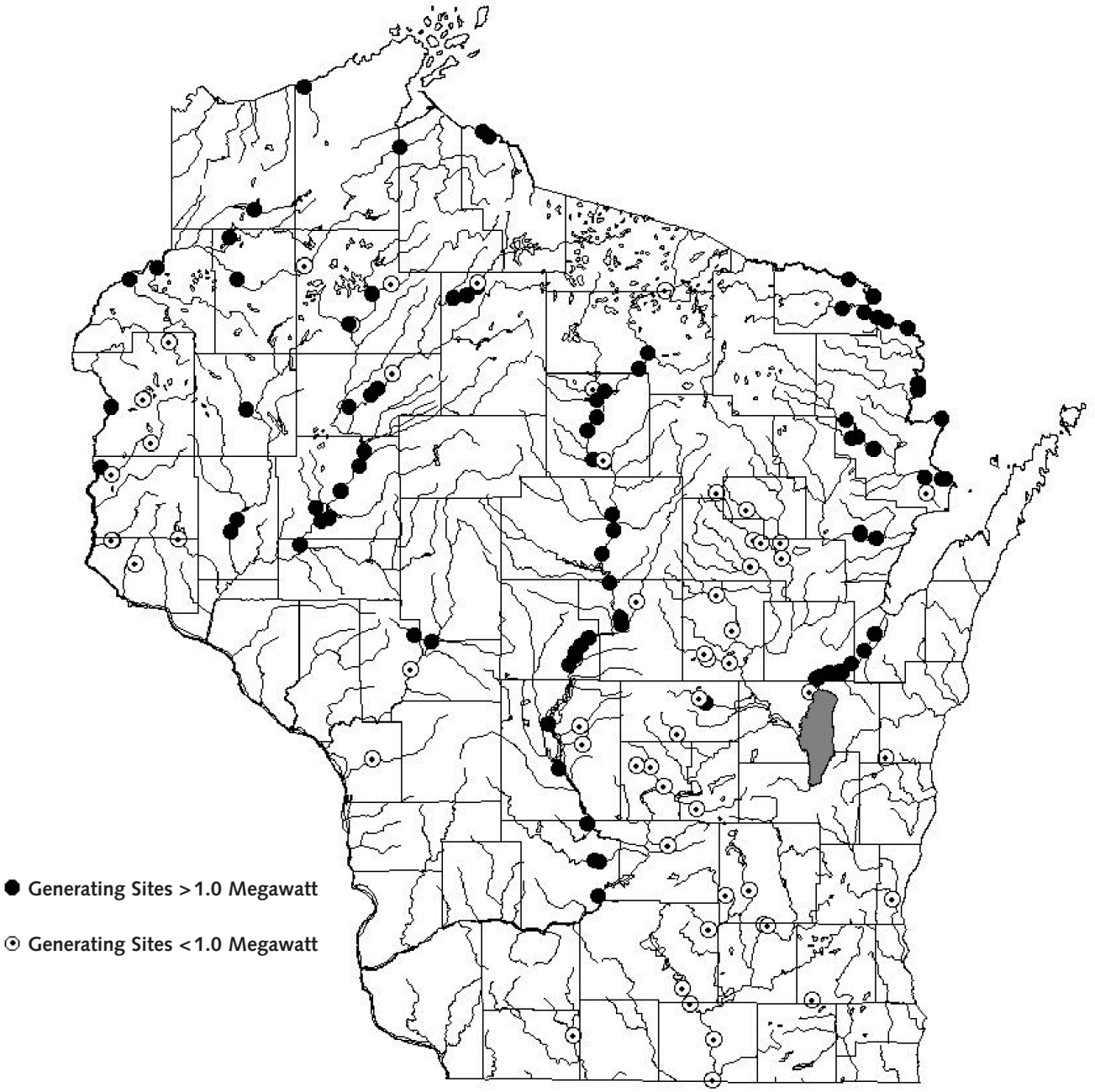
Wisconsin Electric Utility Hydroelectric Generation, by County, 2006[a]

County	Sites (No.)	Generating Capacity (kW)	Generation (MWh)
Adams	1	15,000	79,216
Ashland	1	1,000	3,904
Barron	1	72	215
Burnett	2	2,300	7,210
Chippewa	4	171,900	338,321
Columbia	2	8,300	50,192
Douglas	0	200	0
Dunn	2	11,400	44,858
Eau Claire	1	9,500	32,430
Florence	1	3,600	11,021
Grant	0	100	0
Jackson	2	993	3,209
Juneau	1	20,000	78,604
LaFayette	0	100	0
Lincoln	5	26,800	111,937
Marathon	1	5,400	24,146
Marinette	6	22,700	47,271
Oconto	2	2,400	17,405
Oneida	1	1,700	6,986
Outagamie	7	24,200	143,469
Pierce	2	375	1,156
Polk	4	24,100	91,567
Portage	3	17,800	74,921
Rusk	4	29,300	66,061
St. Croix	2	3,000	13,268
Sauk	1	28,500	111,067
Sawyer	4	2,300	10,080
Shawano	3	1,700	3,156
Vilas	1	800	1,298
Washburn	2	1,700	7,486
Wood	2	15,400	81,556
Total	**68**	**452,640**	**1,462,010**

[a] In this table, hydro generation corresponds to total Wisconsin hydro generation and includes hydro generation from utility owned hydro facilities and hydro generation purchased by utilities from privately owned hydro facilities.

Source: U.S. Department of Energy, Energy Information Administration, *Inventory of Power Plants in the United States* [DOE/EIA-0095(2007/3)] (March 2007), *Electric Power Monthly* [DOE/EIA-0226 (2007/05)] (April 2007), annual utility reports and information provided by PSC staff.

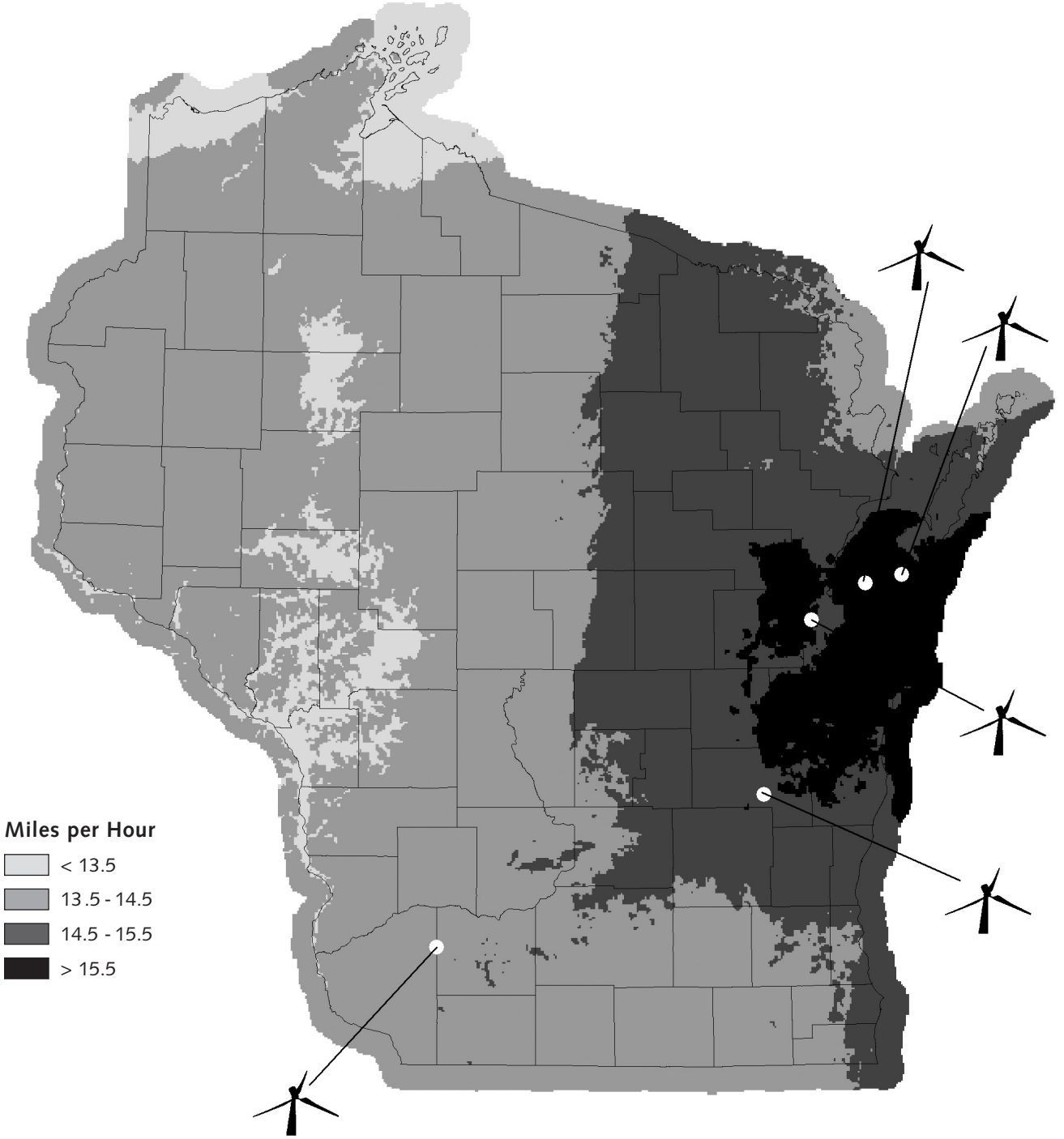
Electric Utility Hydroelectric Sites in Wisconsin 2006[a]



[a] Total number of sites: 68. Generating Capacity: 452,640 kW. Generation: 1,462,010 MWh.

Source: Wisconsin Office of Energy Independence.

Estimated Wisconsin Wind Energy Potential (at 60 Meters) and Wind Farm Locations, 2006



Source: Wisconsin Office of Energy Independence. Based on WindMap model and data collected by the Wisconsin Wind Interest Group (2001).

Wisconsin Renewable Energy Electricity Generated and Purchased, 1990-2006

(Millions of kWh)

In 2006, Wisconsin's electric utilities decreased their sales of electricity generated from renewable energy sources by over 6 percent. The primary renewable energy source used was hydropower, which decreased 7.7 percent. The only renewable energy sources for which use increased were wood and biogas. Electricity generated by renewable energy, but not purchased from utilities—such as residential photovoltaic systems and biomass to electricity systems within paper mills—is not included in this table.

Year	Hydro	Wood	Bio-Solid Waste[b]	Biogas	Wind	Total[a]
1990	2,014.4	196.9	68.1	75.1	0	2,354.6
1991	2,516.6	193.7	70.6	85.1	0	2,866.0
1992	2,401.6	197.2	71.2	95.1	0	2,765.0
1993	2,486.6	215.1	48.0	100.1	0	2,849.8
1994	2,228.3	223.8	58.1	100.1	0	2,610.3
1995	2,378.5	221.9	54.2	110.1	0	2,764.7
1996	2,696.0	242.8	56.5	112.8	0	3,108.1
1997	2,483.3	210.5	57.5	121.2	0	2,872.5
1998	1,747.4	245.0	60.9	131.7	0	2,184.9
1999	1,984.6	238.3	71.2	127.1	23.7	2,444.9
2000	1,990.8	217.1	80.7	197.2	46.6	2,532.4
2001	2,056.2	220.5	85.6	203.3	70.2	2,635.8
2002	2,515.0	206.3	73.4	214.3	109.2	3,118.3
2003	1,843.3	199.6	81.7	280.5	103.8	2,508.9
2004	1,980.7	182.1	100.8	317.5	104.7	2,685.8
2005	1,740.2	187.4	90.6	382.2	93.0	2,493.4
2006[p]	**1,462.0**	**220.4**	**72.0**	**446.4**	**104.7**	**2,305.5**

[a] Wisconsin utilities generate a small amount of electricity—less than 0.2 million kilowatt-hours annually—through solar power using photovoltaic systems.

[b] Includes municipal and industrial solid waste.

[p] Preliminary estimates.

Source: Other renewable energy tables in this publication, renewable portfolio reporting and personal conversations with utility staff.

5 Energy Efficiency Indices

Energy efficiency is an important aspect of Wisconsin's strategy to provide energy services to its citizens and businesses. These energy efficiency indices aid in tracking Wisconsin's progress in using energy more efficiently.

In 2006, total energy use per $1,000 of gross state product decreased almost 4 percent to reach a new record low. The decreased in part was driven by milder winter and summer weather, which resulted in residential energy use per capita decreasing 5.5 percent.

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.

In 2006, state energy use per gross square foot in state-owned buildings decreased almost 3 percent. In the transportation sector, the long term trend of driving more miles per vehicle reversed itself slightly in **2005**, while fuel efficiency increased slightly.

Total carbon dioxide emissions from energy production decreased this year by 3.7 percent because of the impact of milder winter and summer weather and increased energy efficiency more than off-set the effects of an expanding economy and increased state population. Total emissions are up almost 21 percent from 1990, the international benchmark year for greenhouse gas emissions.

Indices of Wisconsin Energy Efficiency 1970-2006[r]

(Millions of Btu)

These indices can be useful in evaluating energy efficiency trends in Wisconsin. Total energy use per dollar of gross state product continued its downward trend. Electricity use per dollar of gross state product also decreased. Because of milder winter and summer weather, residential energy use per capita decreased 5.5 percent in 2006. In 2006, Wisconsin commercial employment continued to increase as energy use per employee decreased 0.6 percent. Industrial energy use per $1,000 manufacturing value added decreased 4 percent and is 36.7 percent lower than in 1970. Agricultural energy use per acre remained constant in 2006.

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[b]	Industrial Energy Use Per $1,000 Manufacturing Value Added[a,c]	Agricultural Energy Use Per Acre
1970	13.4	0.99	74.5	156.1	11.2	1.42
1975	12.8	1.11	74.7	165.9	9.1	1.6
1980	11.2	1.12	76.3	153.5	7.8	2.0
1985	10.2	1.15	71.8	156.5	7.8	2.1
1990	9.7	1.18	69.4	154.4	7.7	2.0
1995	9.4	1.17	75.2	159.9	7.3	2.1
2000	8.3	1.08	74.6	160.2	6.8	2.2
2001	8.2	1.09	73.8	159.9	7.3	2.3
2002	8.3	1.09	77.9	168.0	7.1	2.3
2003	8.2	1.07	78.5	168.4	6.9	2.4
2004	8.0	1.05	75.8	159.5	7.4	2.4
2005	8.0	1.08	77.4	163.3	7.4	2.4
2006[p]	**7.7**	**1.05**	**73.2**	**162.3**	**7.1**	**2.4**

[a] Manufacturing Value Added and Gross State Product in 2006 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.

[r] Revised.

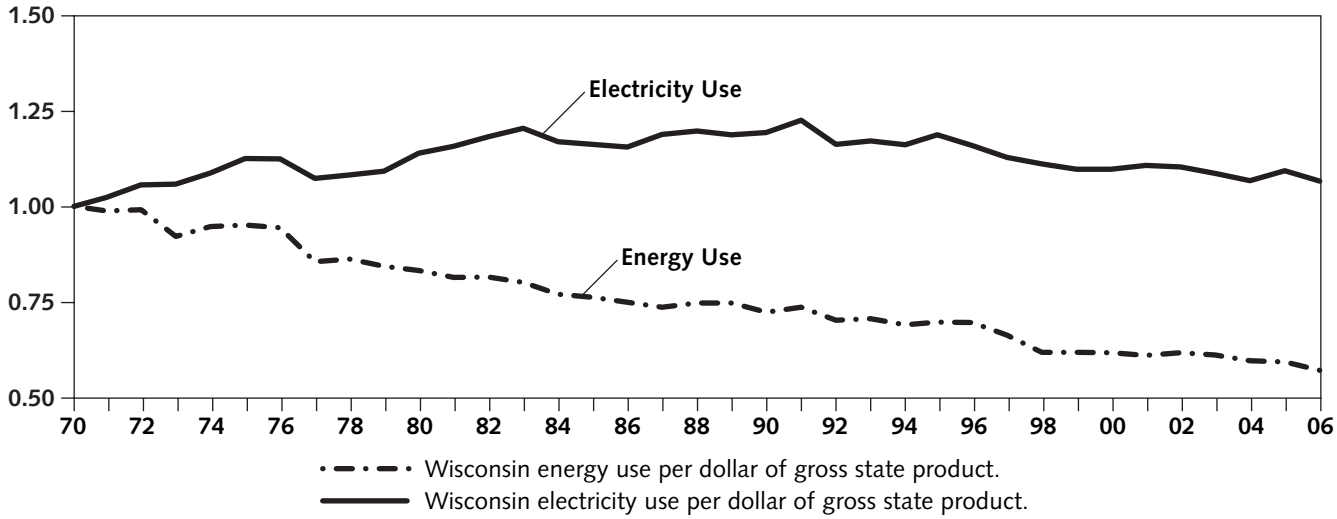
[p] Preliminary data.

Source: Wisconsin Department of Workforce Development, unpublished employment data; U.S. Department of Commerce, *Annual Survey and Census of Manufacturers* http://www.census.gov/mcd/asm-as3.html (1972-2001); households estimated by Wisconsin Department of Administration, Division of Energy Services; Wisconsin Department of Agriculture, Trade and Consumer Protection, *Wisconsin's Agricultural Statistics, 2007*; gross state product; other tables in this publication for total resource energy use and use by sector.

Indices[a] of Wisconsin Energy Efficiency 1970-2006

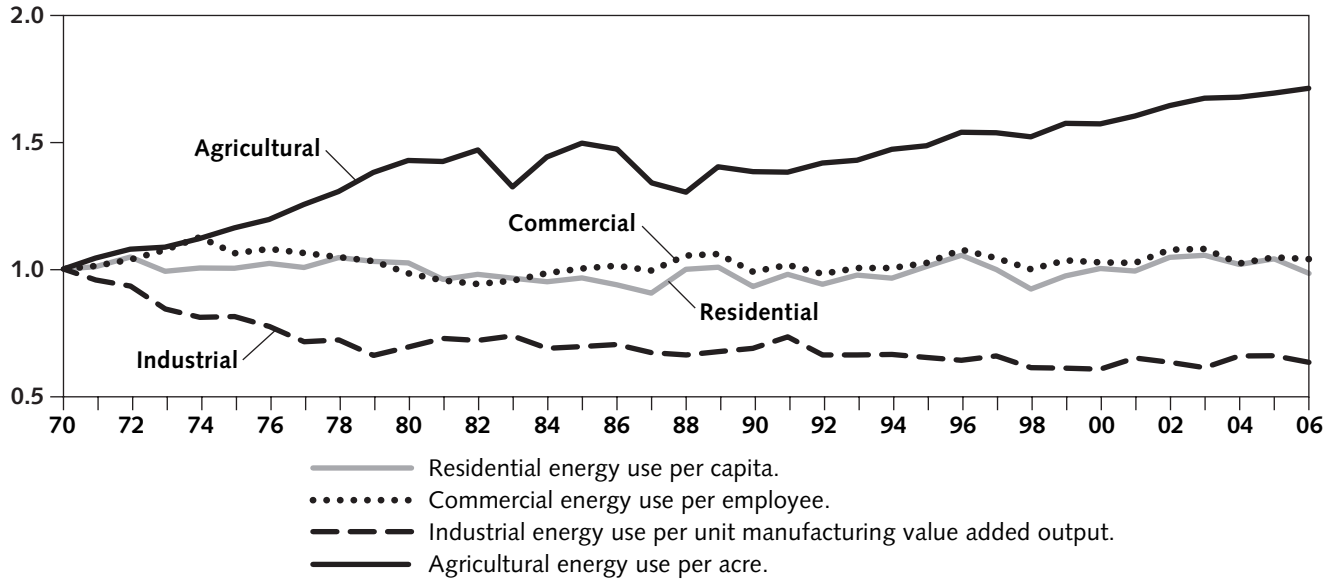
Energy and Electricity Use Per Dollar of Gross State Product

Index: 1970 = 1.0



Energy Indices by Economic Sector

Index: 1970 = 1.0



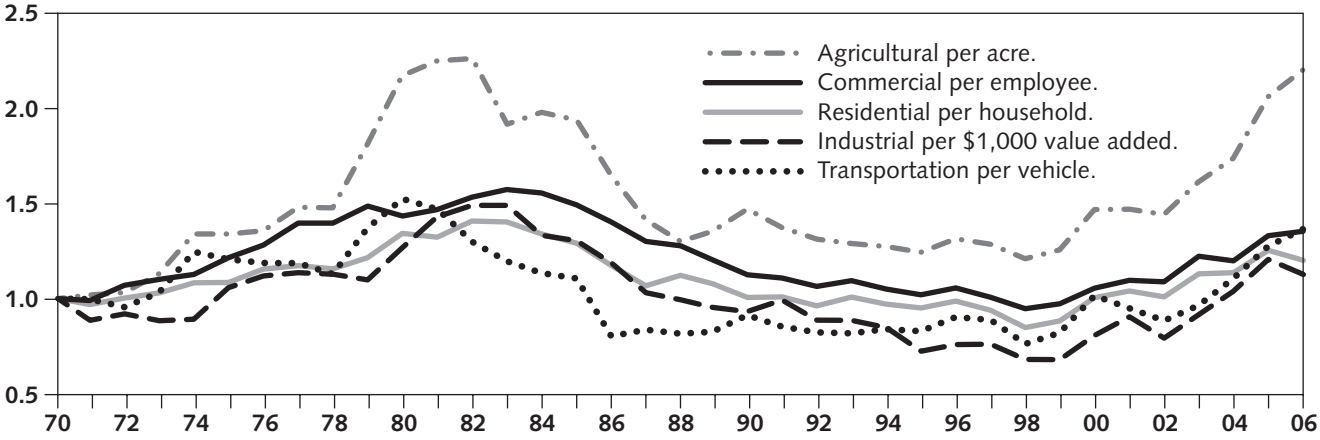
[a] All data normalized to 1.0 in 1970, an arbitrary baseline to which all other years can be compared.

Source: Wisconsin Office of Energy Independence.

Indices of Wisconsin Energy Expenditures 1970-2006 (2006 Dollars)

Index: 1970 = 1.0

In 2006, higher gasoline and diesel fuel prices caused transportation expenditures per vehicle to increase almost 7 percent. Commercial expenditures per employee and agricultural expenditures per acre increased 1.7 percent and 6.8 percent, respectively. Warmer winter and cooler summer weather cause residential expenditures per household to decrease by 4.1 percent. Industrial natural gas prices decreased by over 13 percent and resulted in industrial expenditures per $1,000 of value added decreasing by 6.5 percent. Natural gas is the major energy source used in the industrial sector.



Year	Agricultural Expenditures Per Acre	Commercial Expenditures Per Employee	Residential Expenditures Per Household	Industrial Expenditures Per $1,000 Value Added	Transportation Expenditures Per Vehicle
1970	12	980	1,530	37	1,274
1975	16	1,191	1,660	39	1,536
1980	26	1,404	2,054	47	1,939
1985	23	1,463	1,976	48	1,409
1990	17	1,103	1,539	35	1,162
1995	15	1,000	1,455	27	1,056
2000	17	1,034	1,537	30	1,292
2005	24	1,304	1,917	45	1,624
2006[P]	**26**	**1,327**	**1,838**	**42**	**1,737**

[P] Preliminary estimate.

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

Wisconsin Per Capita Resource Energy Consumption, by Type of Fuel, 1970-2006

(Millions of Btu)

Wisconsin's per capita resource energy consumption decreased 2.7 percent in 2006. However, compared to the low point in 1982, 2006 per capita energy use in Wisconsin has risen over 20 percent. The 2006 decrease is primarily due to cooler summer and warmer winter weather and higher petroleum prices.

Year	Petroleum	Natural Gas	Coal	Renewable	Nuclear	Electric Imports[a]	Total
1970	103.6	74.7	80.4	7.4	0.4	-6.4	260.1
1975	104.0	80.0	57.4	7.9	24.3	-4.5	269.2
1980	96.6	73.2	69.0	12.3	22.7	-1.4	272.4
1985	86.8	64.3	78.9	13.5	25.0	-0.4	268.1
1990	90.8	62.6	84.1	13.1	24.8	8.1	283.5
1991	89.5	66.7	86.0	13.6	24.0	8.6	288.6
1992	90.1	66.2	83.0	13.1	24.3	9.8	286.4
1993	91.7	68.7	85.6	13.2	24.5	11.7	295.6
1994	92.6	68.8	89.5	12.6	24.4	12.8	300.6
1995	92.2	74.2	90.3	13.4	23.1	14.9	308.1
1996	94.3	77.9	94.0	14.0	21.1	15.1	316.4
1997	94.1	76.5	97.5	13.2	8.1	24.5	314.0
1998	93.1	68.4	93.9	11.7	19.2	17.9	304.2
1999	95.5	70.5	95.0	12.0	23.3	16.5	312.9
2000	93.8	73.1	96.8	12.2	23.2	16.3	315.4
2001	93.5	66.5	96.4	12.9	23.0	20.2	312.4
2002	94.4	70.3	93.1	13.4	24.6	23.0	318.9
2003	94.2	71.6	95.8	13.5	24.0	20.3	319.4
2004	95.2	68.8	96.8	13.8	23.2	20.6	318.5
2005	92.9	73.8	95.2	14.3	19.2	22.6	317.8
2006[p]	**91.0**	**67.3**	**91.3**	**14.1**	**23.5**	**22.1**	**309.2**

[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.

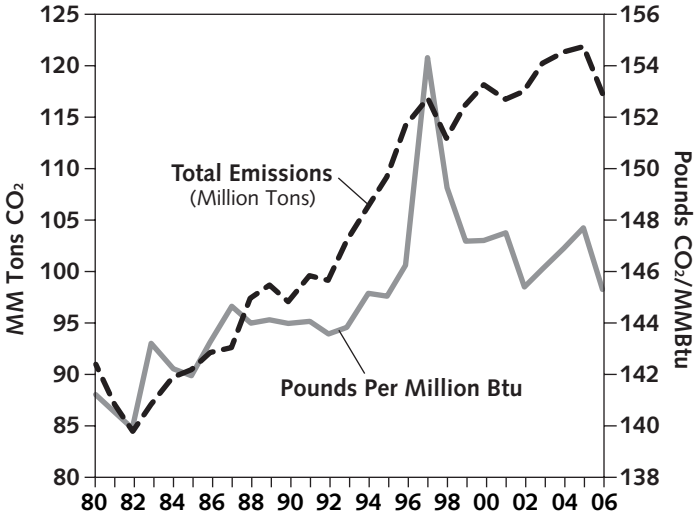
[p] Preliminary estimates.

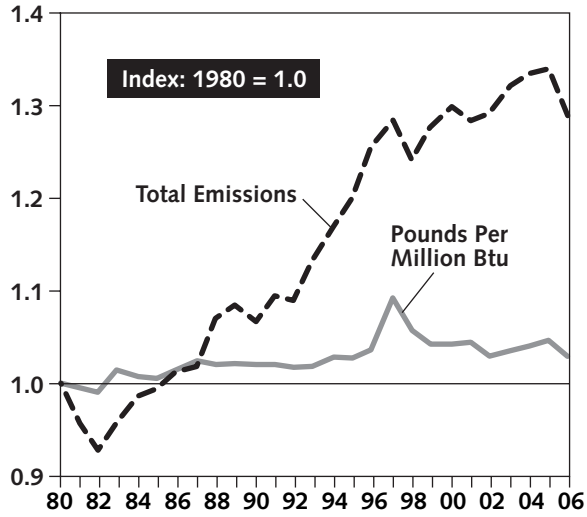
Source: Compiled from tables in this publication for Wisconsin petroleum, natural gas, coal and renewable energy use, electric imports and population.

Wisconsin Carbon Dioxide Emissions from Energy Use 1980-2006[a]

(Millions of Tons and Pounds Per Million Btu)

Wisconsin's CO_2 emissions from energy decreased 3.7 percent in 2006, as fossil fuel resource energy use, excluding resource energy used to generate electricity imported into Wisconsin, decreased 4.1 percent. The decrease is due to milder weather, higher petroleum prices and increased energy efficiency, which more than off-set the increases in energy use from an expanding economy. Since 1990, total CO_2 emissions have increased almost 21 percent. However, in 2006, CO_2 emissions are lower than they were in 2000.





Year	Tons CO_2 (Millions)	Pounds CO_2 Per MMBtu
1980	91.0	141.2
1985	90.4	141.9
1990	97.0	144.0
2000	118.1	147.2
2001	116.7	147.5
2002	117.5	145.4
2003	120.2	146.1
2004	121.3	146.9
2005	121.8	147.6
2006[p]	**117.3**	**145.3**

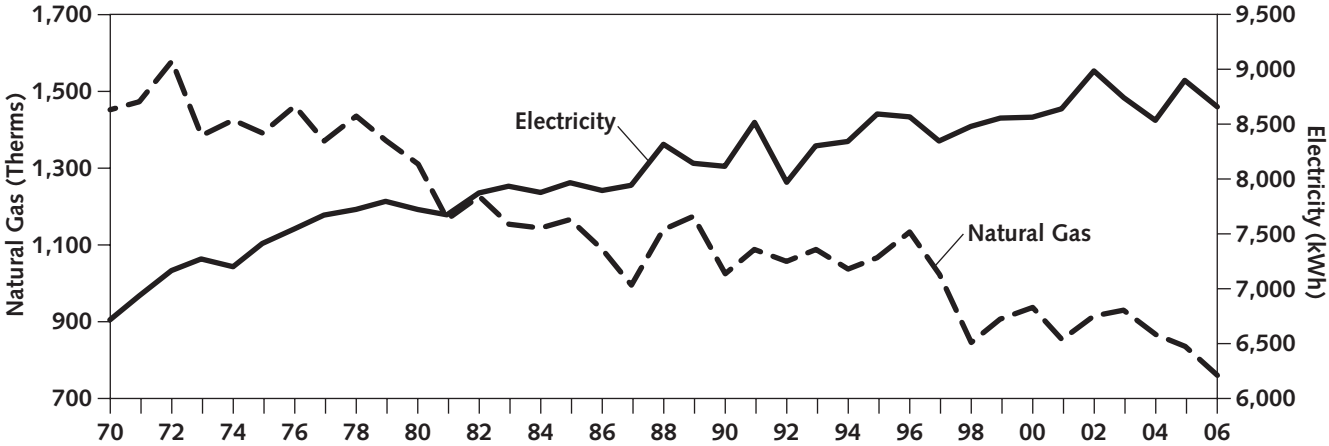
[a] Does not include electric imports.

[p] Preliminary estimates.

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

Wisconsin Residential Electricity and Natural Gas Use Per Customer, 1970-2006

Weather and events affecting the economy can cause per customer natural gas and electricity use to fluctuate. Electricity use per customer decreased 2.7 percent in 2006, while natural gas use decreased 9.1 percent.



Year	Natural Gas[a] Number of Customers (Thousands)	Natural Gas[a] Use Per Customer (Therms)	Electricity[b] Number of Customers (Thousands)	Electricity[b] Use Per Customer (kWh)
1970	754.5	1,450	1,429	6,711
1975	857.9	1,389	1,607	7,407
1980	951.3	1,309	1,801	7,716
1985	1,010.8	1,164	1,870	7,960
1990	1,122.1	1,022	2,017	8,109
1995	1,291.4	1,065	2,170	8,586
2000	1,458.0	935	2,329	8,557
2001	1,484.5	851	2,365	8,634
2002	1,514.7	913	2,404	8,976
2003	1,541.5	928	2,445	8,736
2004	1,569.7	865	2,486	8,526
2005	1,592.6	834	2,526	8,890
2006[p]	**1,615.6**	**759**	**2,565**	**8,653**

[a] U. S. Department of Energy data.

[b] Edison Electric Institute data.

[p] Preliminary estimates.

Source: Edison Electric Institute, *Statistical Yearbook* (1971-1996); American Gas Association, *Gas Facts* (1971-2000); U.S. Department of Energy, *Electric Sales and Revenues 1993-2000* [DOE/EIA-0540(2000)] (November 2001), *Natural Gas Annual, 1991-2004* {DOE/EIA-0131(2004)] (December 2005) and *Natural Gas Monthly* [DOE/EIA-0130 (2006/04)] (April 2006).

Low Income Units Weatherized[a] Through State and Utility Supported Programs, 1980-2006

The transfer of responsibility for low income weatherization from the utilities to the Department of Administration (DOA) was completed on December 31, 2002. Through 2002, some homes received weatherization funding from both DOA and Wisconsin utilities. Therefore, both may include the same home in their weatherization totals. With the transfer of this program to DOA the double counting is eliminated. The partial elimination of double counting of weatherized homes is the primary reason for the apparent decline in total homes weatherized between 2000 and 2006.

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[c]	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[e]	4,246	6,434	10,680
2001	4,867	3,378	8,245
2002	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[p]	**9,012**	**0**	**9,012**
Total	**186,455**	**81,227**	**267,682**

[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] Estimates.

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

[e] 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.

[p] Preliminary estimate.

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 2006, and computerized data which augments this report.

Reported Building Activity Affected by Wisconsin Energy Codes[a], 1979-2006

Over 30,000 buildings were certified in 2006 as meeting Wisconsin's energy efficiency building codes. The codes, developed and enforced by the Wisconsin Department of Commerce or local code officials, establish minimum energy standards for new construction, major renovation and existing rental units.

Year	New One & Two Family Units[b]	New Manufactured Dwelling Units[c]	Manufactured Homes (HUD Certified)[f]	Public and Commercial Buildings[d]	Existing Rental Properties[e]
1979	NA	NA		4,332	NA
1980	3,302	906		3,818	NA
1985	6,146	1,147		6,380	2,267
1990	10,286	1,253		7,378	4,849
1995	12,846	1,991		8,434	6,955
1996	14,051	2,108		8,088	7,162
1997	13,390	1,826		7,341	7,488
1998	14,662	1,856		6,793	7,616
1999	13,282	2,292		7,387	7,270
2000	14,799	2,085		6,606	7,510
2001	14,653	1,926		6,501	6,296
2002	15,479	1,933		6,516	6,318
2003	18,851	1,999		6,455	5,136
2004	18,641	2,141	2,016	6,658	5,221
2005	19,762	1,962	1,710	6,810	4,948
2006[p]	**14,767**	**1,596**	**1,124**	**8,932**	**3,997**
Total	**320,650**	**41,871**	**4,850**	**178,949**	**129,188**

[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 under 2,500 population 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] Properties certified as meeting code requirements during current year, regardless of year of actual transfer of ownership.

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

[p] Preliminary.

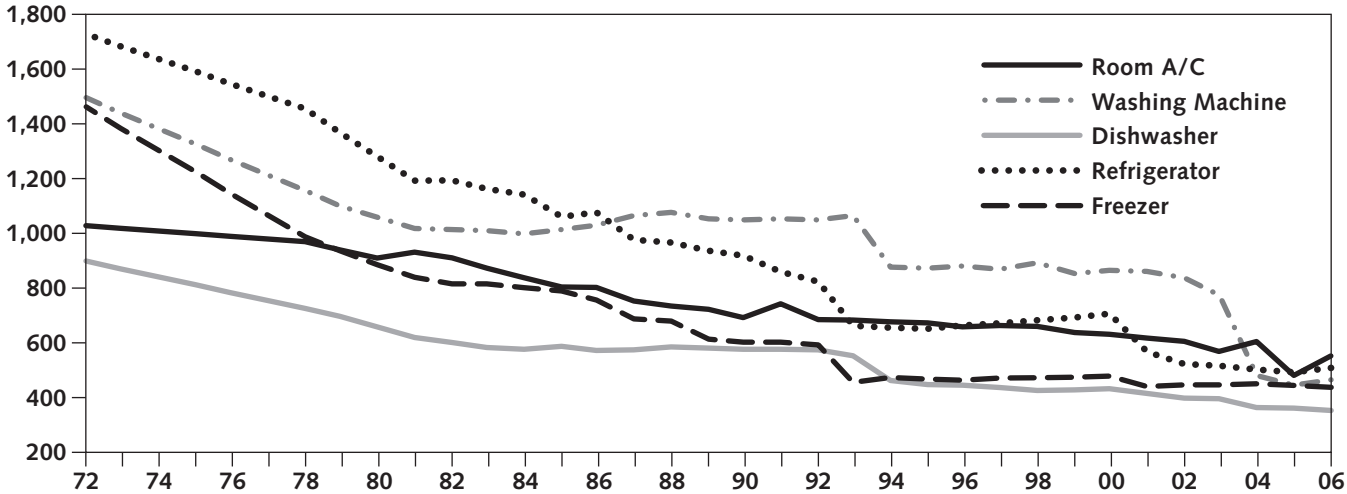
NA – Not applicable. Rental Unit Energy Efficiency Code effective January 1, 1985 and Uniform Dwelling Code Effective June 1, 1980.

Source: Department of Commerce, Division of Safety and Buildings, internal data files.

Energy Consumption by Major New Household Appliances 1972-2006

(kWh Per Year)

Since 1980, energy efficiencies of new household appliances sold in the U.S. have increased from 29 percent to 60 percent, depending upon the appliance. From 1994 to 2000, average efficiencies remained essentially unchanged. However, changes in federal energy efficiency standards since 2000 have reduced average new appliance energy consumption from 8.6 percent for freezers to 46.3 percent for washing machines.



Average Annual New Appliance Energy Consumption (kWh) 1972-2006

Year	Room A/C[a]	Washing Machine[b]	Dishwasher[b]	Refrigerator	Freezer
1972	1,026	1,494	897	1,726	1,460
1980[c]	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	629	862	430	704	476
2005	478	443	359	490	442
2006[e]	**550**	**463**	**350**	**506**	**435**
Energy Star[d]	**556**	**173**	**344**	**442**	**370**
Best Available[f]	**460**	**120**	**190**	**407**	**336**

[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] Refrigerator and freezer values estimated.

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

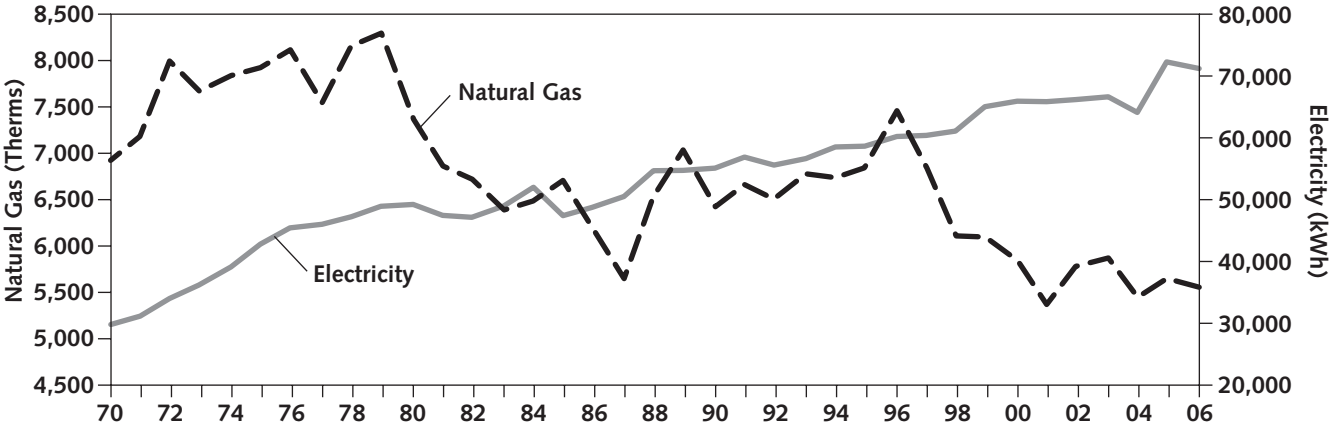
[e] Refrigerator and freezer standards increased July 1, 2001. Air conditioner standards increased October 1, 2000.

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

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

Wisconsin Commercial Electricity and Natural Gas Use Per Customer, 1970-2006

Commercial electricity use per customer in 2006 decreased 1.5 percent due to a cooler summer. Warmer winter weather resulted in a 1.6 percent decrease in natural gas use per commercial customer.



Year	Natural Gas[a] Number of Customers (Thousands)	Natural Gas[a] Use Per Customer (Therms)	Electricity[b] Number of Customers (Thousands)	Electricity[b] Use Per Customer (kWh)
1970	61.0	6,918	167	29,701
1975	72.0	7,917	178	42,709
1980	83.4	7,362	193	49,115
1985	89.3	6,697	224	47,292
1990	104.0	6,413	229	54,990
1995	125.5	6,837	254	58,540
2000	140.3	5,837	278	65,817
2001	144.3	5,357	284	65,741
2002	149.8	5,774	290	66,081
2003	150.1	5,863	301	66,522
2004	151.9	5,438	302	63,963
2005	155.1	5,642	312	72,156
2006[p]	**157.7**	**5,549**	**315**	**71,100**

[a] U.S. Department of Energy data for "Commercial" category.

[b] Edison Electric Institute data for "Commercial" category ("Small Light & Power" prior to 1981).

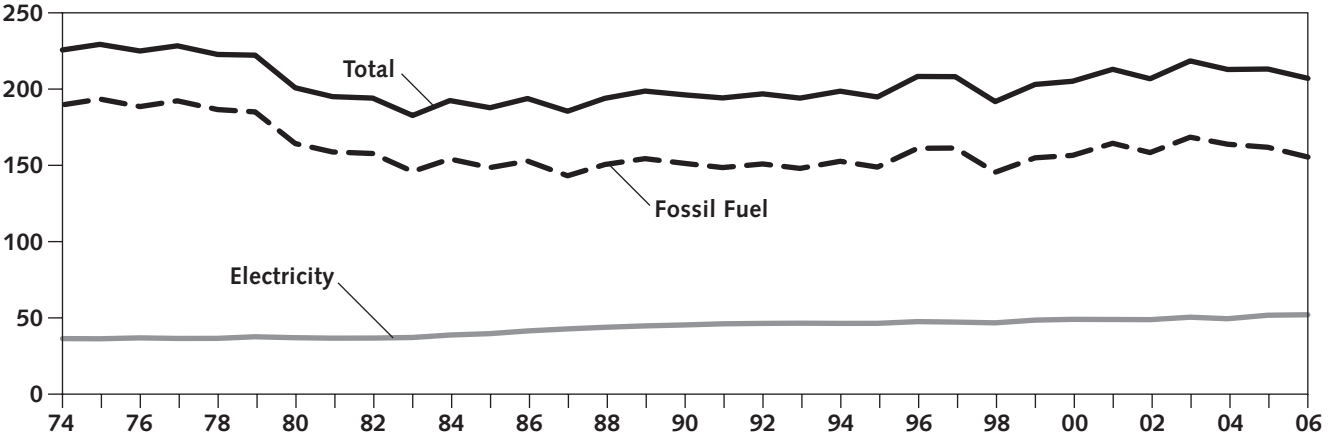
[p] Preliminary estimates.

Source: Edison Electric Institute, Statistical Yearbook (1971-1996); American Gas Association, Gas Facts (1971-2000); U.S. Department of Energy, Electric Sales and Revenues 1993-2000 [DOE/EIA-0540(2000)] (November 2001), Natural Gas Annual, 1991-2005 {DOE/EIA-0131(05)] (November 2006), and Natural Gas Monthly [DOE/EIA-0130 (2006/04)] (April 2006).

Energy Use in State Owned Buildings 1974-2006

(Thousands of Btu Per Gross Square Foot Per Year)

In 2006, total energy use per gross square foot (GSF) decreased 2.9 percent from 2005 levels. Since 1974, fossil fuel use per GSF in state owned buildings has fallen 18.1 percent. However, since the early 1980s, fossil fuel energy use per GSF has been relatively constant, fluctuating primarily with changes in the weather. Electricity use has increased 43.3 percent per GSF between 1974 and 2006.



Fiscal Year	Fossil Fuel	Electricity[a]	Total Energy	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	200.4	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	157.9	48.4	206.3	57.9
2003	168.0	50.0	218.0	58.9
2004	163.4	49.0	212.4	59.4
2005	161.4	51.3	212.7	59.6
2006[p]	**155.0**	**51.6**	**206.6**	**61.5**

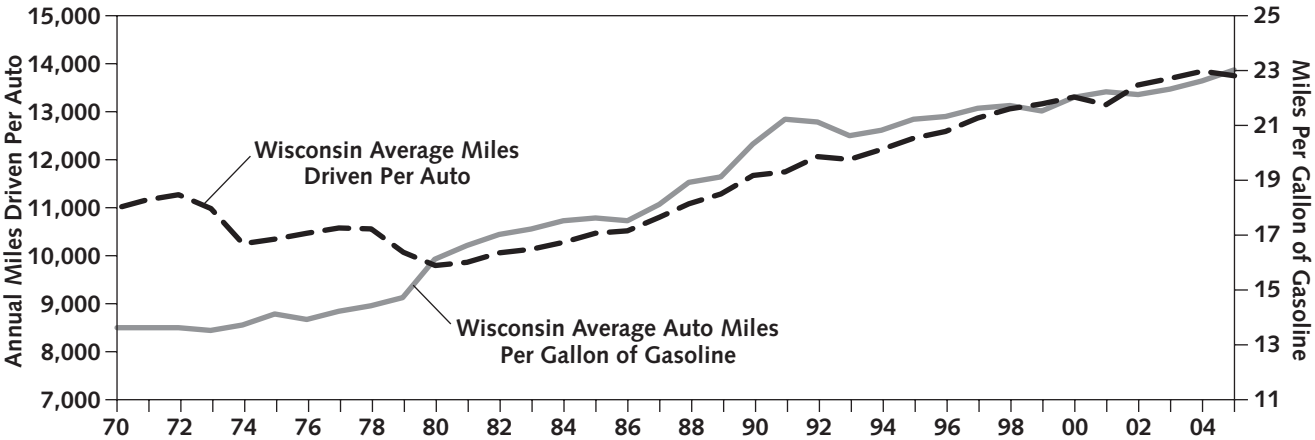
[a] Electricity conversion uses 3,413 Btu per kWh.

[p] Preliminary estimates

Source: State of Wisconsin, Department of Administration Energy Use in State Owned Facilities, Report for Fiscal Year 2006. http://www.doa.state.wi.us/docs_view2.asp?docid=990

Average Miles Driven Per Auto and Average Auto Miles Per Gallon of Gasoline, Wisconsin and United States[a], 1970-2005

The average number of miles driven annually per automobile in Wisconsin decreased slightly in 2005. It is nearly 40 percent higher than in 1980 and 11 percent higher than the U.S. average. Fuel efficiency has been relatively stagnant since 1991. This is because of the increasing number of less fuel efficient large cars sold each year. However, Wisconsin cars were nearly 71 percent more fuel efficient in 2005 than in 1973. Improved mileage since 1999 may be due to mileage credits for new cars able to burn ethanol.



Year	Average Annual Miles Per Auto Wisconsin[b]	Average Annual Miles Per Auto U.S.[b]	Average Auto Miles Per Gallon of Gasoline Wisconsin[b]	Average Auto Miles Per Gallon of Gasoline U.S.[b]
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
2001	13,132	11,831	22.2	22.1
2002	13,544	12,202	22.1	22.0
2003	13,681	12,325	22.3	22.2
2004	13,831	12,460	22.6	22.5
2005[p]	**13,736**	**12,375**	**23.0**	**22.9**

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

[b] Does not include minivans, pickups or sport utility vehicles.

[p] Preliminary estimates.

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* [DOE/EIA-0035 (2007/02)] (February 2007) http://www.eia.doe.gov/emeu/mer/.

6 United States Energy Use

The information in this chapter shows Wisconsin's energy use in the national context. Where United States energy use data are presented, the Wisconsin Office of Energy Independence has adjusted some national figures to make more appropriate per capita comparisons with Wisconsin data. For example, national data for the thermal equivalent of hydroelectric kilowatt hours generated were adjusted to the same Btu-per-kilowatt-hour basis as the Wisconsin data.* All of the adjustments are annotated in the tables for per capita energy use.

In 2006, world crude oil production was 73.5 million barrels per day, an decrease of 0.3 percent from a year earlier. The Organization of Petroleum Exporting Countries produced 41.7 percent of the world's crude oil in 2005. The top four producers of crude oil were Russia, Saudi Arabia, the U.S. and Iran, producing 12.6 percent, 12.5 percent, 7 percent and 5.5 percent, respectively.

Milder winter and summer weather helped reduce nationally natural gas use by 1.7 percent (measured in trillions of cubic feet). The decline encompassed all sectors except the utility sector. Despite a summer with 1.9 percent fewer cooling degree days, natural gas use in the utility sector increase by over 6 percent. Domestic natural gas production increased 2.3 percent, while net imports (primarily from Canada) decreased 5 percent. Working gas in storage increased 16.5 percent compared to a year ago. In contrast, the U.S. is a net exporter of coal, with net exports in 2006 of 13.4 million tons. This is over 31 percent lower than a year earlier.

In 2006, when the resource energy used to produce electricity imported into Wisconsin is included, Wisconsin's per capita energy consumption was 100.8 percent of the national average. Wisconsin's per capita use of petroleum and natural gas was approximately 81.1 percent and 89.5 percent, respectively, of the national per capita use for 2006. Per capita coal use in Wisconsin has consistently been higher than the national average—50.1 percent higher in 2006—because of greater dependence on coal for electricity generation. In 2006, Wisconsin per capita nuclear energy use was 85.7 percent of the national average. This figure has fallen from 422 percent of the national average in 1971, as other states have increased their reliance on nuclear energy. Per capita use of renewable energy in Wisconsin is 85.2 percent of the national average.

When comparing Wisconsin's 2003 per capita energy use to the other 49 states and the District of Columbia, Wisconsin is in the middle (25 largest user of 51), with its per capita energy consumption 1.2 percent above the U.S. average.

*There is no generally accepted method of assessing hydropower conversion rates. The U.S. Department of Energy's Energy Information Administration (EIA) uses the prevailing equivalent heat rates at fossil fuel steam electric power plants (approximately 10,400 Btu per kWh), making it possible to evaluate fossil fuel requirements for replacing hydropower production during periods of drought. The Wisconsin Office of Energy Independence uses an energy conversion rate of 4,266 Btu per kWh, assuming a hydro facility efficiency factor of 80 percent.

United States Resource Energy Consumption, by Type of Fuel 1970-2006

(Quadrillions of Btu and Percent of Total)

In 2006, total energy consumption in the United States decreased 0.8 percent, with only renewable use increasing by 6.6 percent. Petroleum, natural gas and coal use decreased 1.5 percent, 1.8 percent and 0.9 percent, respectively, while nuclear energy use remained constant. The major drivers reducing energy use were a warmer winter and cooler summer than last year.

Year	Petroleum		Natural Gas		Coal		Nuclear		Renewable[a]		Total
1970	29.5	(43.4%)	21.7	(31.9%)	12.3	(18.1%)	0.2	(0.3%)	4.3	(6.3%)	68.0
1975	32.7	(45.4)	20.0	(27.7)	12.7	(17.6)	1.9	(2.6)	4.8	(6.7)	72.1
1980	34.2	(43.6)	20.4	(26.0)	15.4	(19.6)	2.7	(3.4)	5.8	(7.4)	78.5
1985	30.9	(40.1)	17.9	(23.2)	17.5	(22.7)	4.2	(5.5)	6.5	(8.4)	77.0
1990	33.6	(39.6)	19.7	(23.3)	19.2	(22.6)	6.1	(7.2)	6.1	(7.2)	84.7
1991	32.8	(38.9)	20.1	(23.8)	19.0	(22.5)	6.4	(7.6)	6.2	(7.3)	84.5
1992	33.5	(39.0)	20.8	(24.3)	19.1	(22.3)	6.5	(7.5)	5.9	(6.9)	85.9
1993	33.8	(38.6)	21.4	(24.4)	19.8	(22.6)	6.4	(7.3)	6.2	(7.0)	87.6
1994	34.7	(38.9)	21.8	(24.5)	19.9	(22.3)	6.7	(7.5)	6.1	(6.8)	89.2
1995	34.6	(37.9)	22.8	(25.0)	20.1	(22.0)	7.1	(7.8)	6.7	(7.3)	91.2
1996	35.8	(38.0)	23.2	(24.6)	21.0	(22.3)	7.1	(7.5)	7.1	(7.6)	94.2
1997	36.3	(38.3)	23.3	(24.6)	21.4	(22.6)	6.6	(7.0)	7.1	(7.5)	94.7
1998	36.9	(38.8)	22.9	(24.1)	21.7	(22.8)	7.1	(7.4)	6.6	(6.9)	95.1
1999	37.8	(39.1)	23.0	(23.8)	21.6	(22.4)	7.6	(7.9)	6.6	(6.8)	96.7
2000	38.3	(38.7)	23.9	(24.2)	22.6	(22.9)	7.9	(8.0)	6.2	(6.2)	98.8
2001	38.3	(39.8)	22.9	(23.8)	21.9	(22.7)	8.0	(8.3)	5.2	(5.4)	96.3
2002	38.2	(39.1)	23.6	(24.2)	22.0	(22.5)	8.2	(8.4)	5.8	(5.9)	97.8
2003	38.8	(39.6)	23.0	(23.4)	22.4	(22.8)	8.0	(8.2)	6.0	(6.1)	98.1
2004	40.3	(40.2)	23.0	(22.9)	22.7	(22.6)	8.2	(8.2)	6.1	(6.0)	100.3
2005	40.4	(40.2)	22.9	(22.8)	22.8	(22.7)	8.2	(8.1)	6.1	(6.1)	100.4
2006[p]	**39.8**	**(39.9)**	**22.5**	**(22.6)**	**22.6**	**(22.7)**	**8.2**	**(8.2)**	**6.5**	**(6.5)**	**99.6**

[a] Includes net imports of electricity.

[p] Preliminary estimates.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2007/03)] (March 2006).

United States Resource Energy Consumption, by Economic Sector[a], 1970-2006

(Quadrillions of Btu and Percent of Total)

Total U.S. energy use decreased 0.8 percent in 2006. Despite, the increasing number of households, a summer with 0.9 percent fewer cooling degree days and a winter with 7.4 percent fewer heating degree days resulted in a 2.9 percent decrease in residential energy use, but energy use in the commercial sector remained unchanged. Energy use in the industrial sector decreased 1.2 percent, while in the transportation sector, energy use rose 0.4 percent as the number of vehicles in use continued to increase. However, higher motor fuel prices moderated this increase.

Year	Residential		Commercial		Industrial		Transportation		Total
1970	13.7	(20.5%)	8.3	(12.4%)	28.6	(42.9%)	16.1	(24.1%)	66.7
1975	14.9	(21.0)	9.5	(13.4)	28.4	(40.0)	18.2	(25.6)	71.0
1980	15.9	(20.7)	10.6	(13.8)	30.6	(39.8)	19.7	(25.7)	76.8
1985	16.1	(21.5)	11.5	(15.3)	27.3	(36.4)	20.1	(26.8)	75.0
1990	16.9	(20.0)	13.3	(15.7)	31.9	(37.7)	22.5	(26.6)	84.6
1991	17.4	(20.6)	13.5	(15.9)	31.5	(37.3)	22.1	(26.2)	84.5
1992	17.3	(20.2)	13.4	(15.6)	32.7	(38.0)	22.5	(26.2)	85.9
1993	18.2	(20.8)	13.8	(15.7)	32.7	(37.3)	22.9	(26.1)	87.6
1994	18.1	(20.3)	14.1	(15.8)	33.6	(37.6)	23.5	(26.3)	89.2
1995	18.7	(20.4)	14.7	(16.1)	33.9	(37.2)	24.0	(26.3)	91.2
1996	19.6	(20.8)	15.2	(16.1)	34.9	(37.0)	24.5	(26.0)	94.2
1997	19.1	(20.1)	15.7	(16.6)	35.2	(37.1)	24.8	(26.2)	94.7
1998	19.1	(20.0)	16.0	(16.8)	34.8	(36.6)	25.4	(26.6)	95.1
1999	19.6	(20.3)	16.3	(16.9)	34.7	(35.8)	26.1	(27.0)	96.8
2000	20.5	(20.7)	17.1	(17.3)	34.5	(34.9)	26.7	(27.0)	98.8
2001	20.1	(20.9)	17.2	(17.9)	32.7	(34.0)	26.3	(27.3)	96.3
2002	20.9	(21.4)	17.4	(17.8)	32.7	(33.4)	26.8	(27.4)	97.8
2003	21.2	(21.6)	17.4	(17.7)	32.5	(33.1)	27.0	(27.5)	98.1
2004	21.2	(21.1)	17.7	(17.6)	33.5	(33.4)	27.9	(27.8)	100.3
2005	21.7	(21.6)	18.0	(17.9)	32.5	(32.3)	28.3	(28.2)	100.4
2006[p]	**21.1**	**(21.2)**	**18.0**	**(18.1)**	**32.1**	**(32.2)**	**28.4**	**(28.5)**	**99.6**

[a] Agricultural energy use allocated between residential and commercial sectors.

[p] Preliminary estimates.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA0035 (2007/03] (March 2007).

Sources of U.S. Crude Oil and Petroleum Products 1975-2006

(Thousands of Barrels Per Day)

In 2006, U.S. petroleum use decreased 1.0 percent. However, since 1985, U.S. consumption of petroleum products has increased almost 31 percent. Over this same period, U.S. crude oil production has decreased almost 43 percent (lower 48 production has fallen 38.5 percent). This has resulted in a 168.6 percent increase in imports since 1985, with a corresponding 200 percent increase in imports from the Organization of Petroleum Exporting Countries (OPEC). In 2006, U.S. imports of crude oil and petroleum products decreased 0.7 percent, and imports from OPEC decreased 1.6 percent.

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	Crude Oil from Wells in Alaska	Percent of U.S. Produced Crude Oil from Lower 48	U.S. Crude Oil and Product Exports	U.S. Crude Oil and Product Imports (Total)[c]	U.S. Crude Oil Imports for the SPR	U.S. Crude Oil and Product Imports from OPEC	Imports as a Percent of U.S. Petroleum Use
1975	16,322	10,007	8,375	1,633	8,184	191	97.7%	209	6,056	0	3,601	37.1%
1980	17,506	10,170	8,597	1,573	6,980	1,617	81.2%	544	6,909	44	4,300	39.5%
1985	15,726	10,581	8,971	1,609	7,146	1,825	79.7%	781	5,067	118	1,830	32.2%
1990	16,988	8,914	7,355	1,559	5,582	1,773	75.9%	857	8,018	27	4,296	47.2%
1991	16,714	9,076	7,417	1,659	5,619	1,798	75.8%	1,001	7,627	0	4,092	45.6%
1992	17,033	8,868	7,171	1,697	5,457	1,714	76.1%	950	7,888	10	4,092	46.3%
1993	17,237	8,582	6,847	1,736	5,265	1,582	76.9%	1,003	8,620	15	4,354	50.0%
1994	17,718	8,388	6,662	1,727	5,103	1,559	76.6%	942	8,996	12	4,247	50.8%
1995	17,725	8,322	6,560	1,762	5,076	1,484	77.4%	949	8,835	0	4,002	49.8%
1996	18,309	8,295	6,465	1,830	5,072	1,393	78.5%	981	9,478	0	4,211	51.8%
1997	18,620	8,269	6,452	1,817	5,156	1,296	79.9%	1,003	10,162	0	4,569	54.6%
1998	18,917	8,011	6,252	1,759	5,077	1,175	81.2%	945	10,708	0	4,905	56.6%
1999	19,519	7,731	5,881	1,850	4,832	1,050	82.1%	940	10,852	8	4,953	55.6%
2000	19,701	7,733	5,822	1,911	4,851	970	83.3%	1,040	11,459	8	5,203	58.2%
2001	19,649	7,670	5,801	1,868	4,832	963	83.4%	971	11,871	11	5,528	60.4%
2002	19,761	7,626	5,746	1,880	4,761	984	82.9%	984	11,530	16	4,605	58.3%
2003	20,034	7,400	5,681	1,719	4,706	974	82.9%	1,027	12,264	0	5,162	61.2%
2004	20,731	7,228	5,419	1,809	4,510	908	83.2%	1,048	13,145	77	5,701	63.4%
2005	20,802	6,895	5,178	1,717	4,314	864	83.3%	1,165	13,714	52	5,587	65.9%
2006[p]	**20,588**	**6,872**	**5,136**	**1,735**	**4,395**	**741**	**85.6%**	**1,333**	**13,612**	**6**	**5,499**	**66.1%**

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

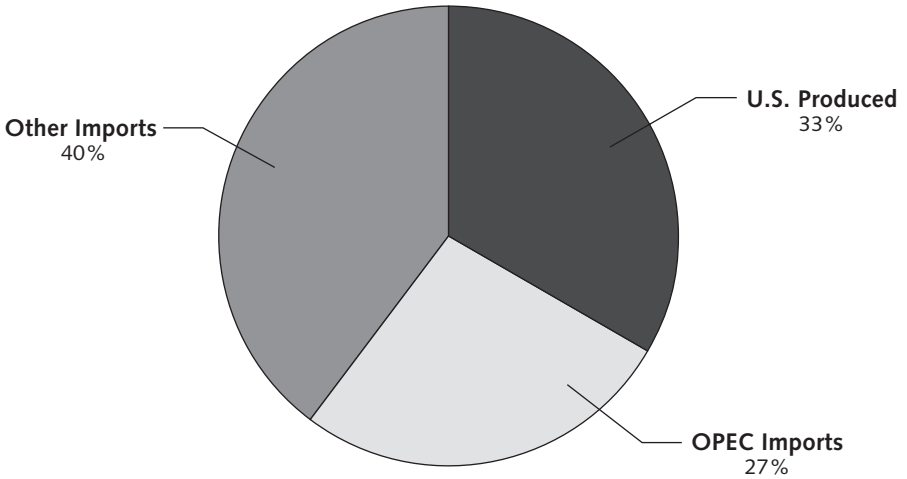
[b] Natural gas liquids recovered from natural gas in gas processing plants and, in some situations, from natural gas field facilities.

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

[p] Preliminary.

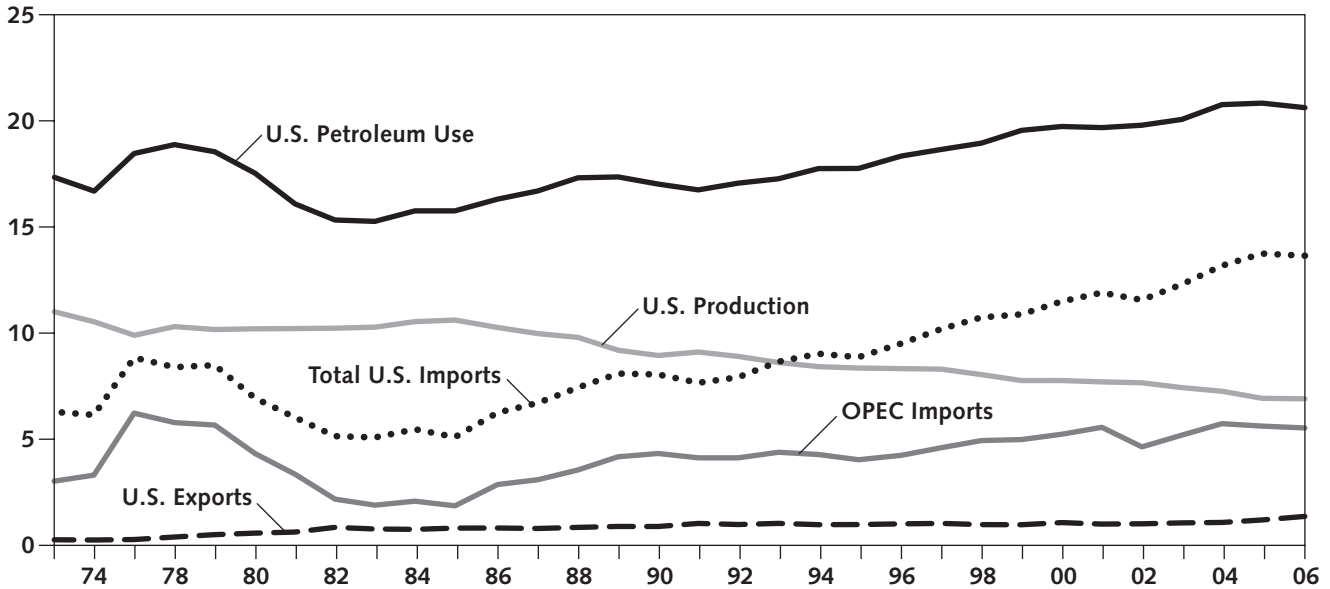
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035(2007/03)] (March 2007).

Percent of 2006 U.S. Petroleum Use Domestically Produced and Imported



U.S. Petroleum Use, Production, Imports and Exports 1973-2006

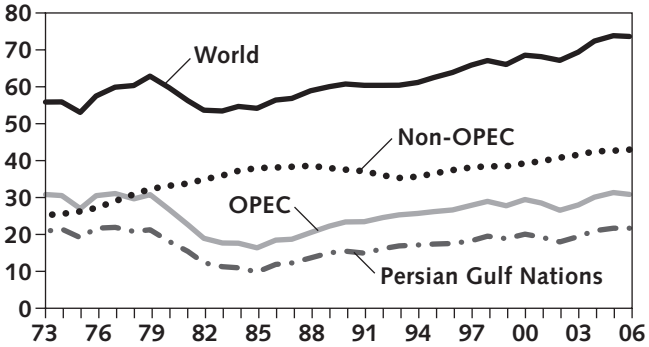
(Millions of Barrels Per Day)

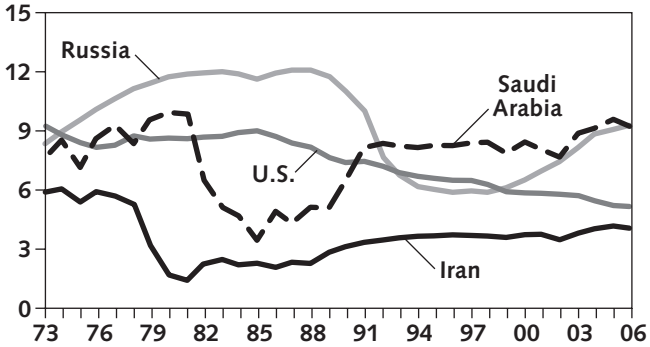


Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035(2007/03)] (March 2007).

World Crude Oil Production[r]
1973-2006
(Million Barrels Per Day)

In 2006, world production of crude oil was 73.45 million barrels per day, an decrease of 0.3 percent from a year ago. The Organization of Petroleum Exporting Countries (OPEC) produced 421.7 percent of the world's crude oil in 2006. The top four producers of crude oil in 2006 were Russia, Saudi Arabia, the U.S. and Iran, producing 12.6 percent, 12.5 percent, 7 percent and 5.5 percent, respectively, of the world's crude oil.





Year	World	Non-OPEC	OPEC[b]	Persian Gulf Nations[c]	Major Crude Oil Producers			
					U.S.	Saudi Arabia	Iran	Russia[a]
1973	55.68	25.05	30.63	20.67	9.21	7.60	5.86	8.32
1975	52.83	26.06	26.77	18.93	8.37	7.08	5.35	9.52
1980	59.60	32.99	26.61	17.96	8.60	9.90	1.66	11.71
1985	53.98	37.80	16.18	9.63	8.97	3.39	2.25	11.59
1990	60.57	37.37	23.20	15.28	7.36	6.41	3.09	10.98
1995	62.33	36.33	26.00	17.21	6.56	8.23	3.64	6.00
2000	68.37	39.10	29.27	19.89	5.82	8.40	3.70	6.48
2005	73.66	42.50	31.16	21.50	5.18	9.55	4.14	9.04
2006[p]	**73.45**	**42.79**	**30.66**	**21.50**	**5.13**	**9.20**	**4.03**	**9.25**

[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.

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

[p] Preliminary estimates.

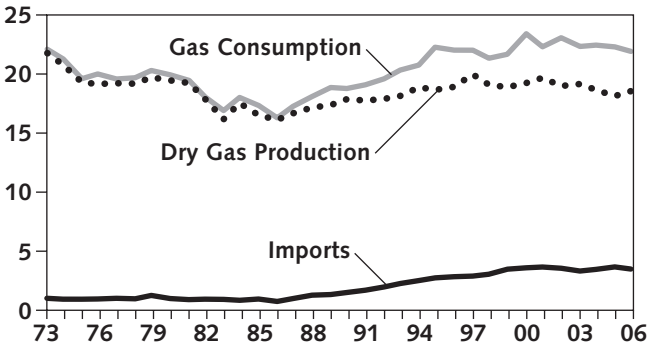
[r] Revised.

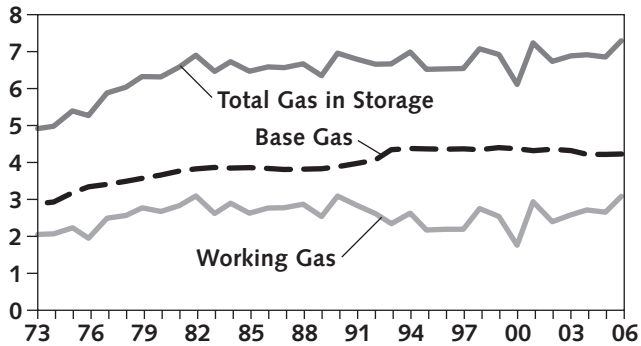
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2007/03)] (March 2007).

United States Natural Gas Production, Imports, Consumption and Storage[r], 1973-2006

(Trillions of Cubic Feet)

In 2006, U.S. natural gas consumption decreased 1.7 percent. While domestic natural gas production increased 2.3 percent, net imports, primarily from Canada, decreased 5 percent. Working gasc in storage increased 216.5 percent.





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
1973	21.731	0.956	22.049	2.864	2.034	4.898
1975	19.236	0.880	19.538	3.162	2.212	5.374
1980	19.403	0.936	19.877	3.642	2.655	6.297
1985	16.454	0.894	17.281	3.842	2.607	6.449
1990	17.810	1.447	19.174	3.868	3.068	6.936
1995	18.599	2.687	22.207	4.349	2.153	6.502
2000	19.182	3.538	23.333	4.352	1.719	6.071
2005	18.074	3.612	22.241	4.200	2.635	6.835
2006[p]	**18.491**	**3.433**	**21.861**	**4.211**	**3.070**	**7.281**

[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 estimates.

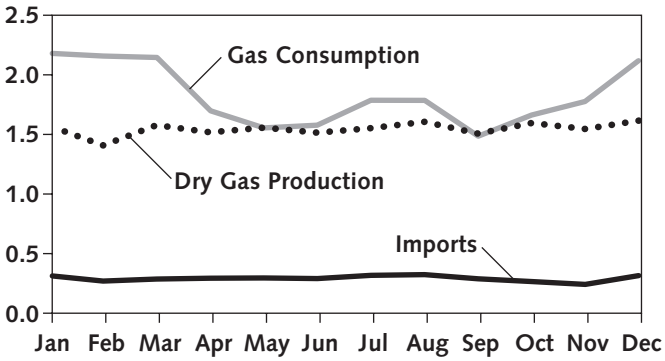
[r] Revised.

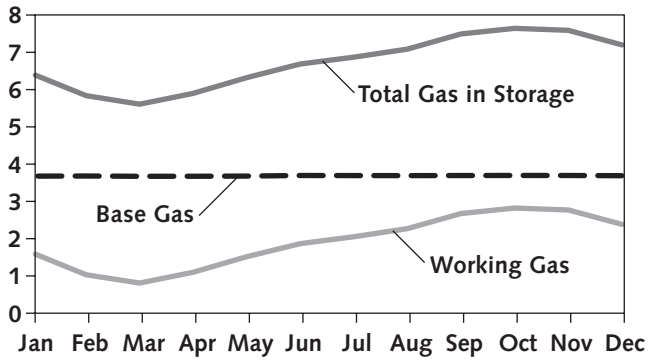
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2007/03)] (March 2007).

United States Monthly Natural Gas Production, Imports, Consumption and Storage, 2006[p]

(Trillions of Cubic Feet)

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.





2006	U.S. Dry Natural Gas Production[a]	Net Imports	Consumption	Natural Gas in Underground Storage Month End		
				Base Gas[b]	Working Gas[c]	Total
January	1.557	0.307	2.174	4.201	2.371	6.572
February	1.402	0.264	2.152	4.204	1.886	6.090
March	1.572	0.281	2.140	4.197	1.692	5.889
April	1.512	0.288	1.693	4.198	1.945	6.143
May	1.551	0.290	1.549	4.202	2.310	6.512
June	1.509	0.285	1.572	4.216	2.617	6.833
July	1.547	0.312	1.781	4.214	2.779	6.993
August	1.600	0.318	1.780	4.213	2.969	7.182
September	1.501	0.283	1.479	4.215	3.323	7.538
October	1.590	0.260	1.657	4.217	3.452	7.669
November	1.540	0.236	1.771	4.216	3.407	7.623
December	1.610	0.310	2.114	4.211	3.070	7.281
Total	**18.490**	**3.434**	**21.862**			

[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.

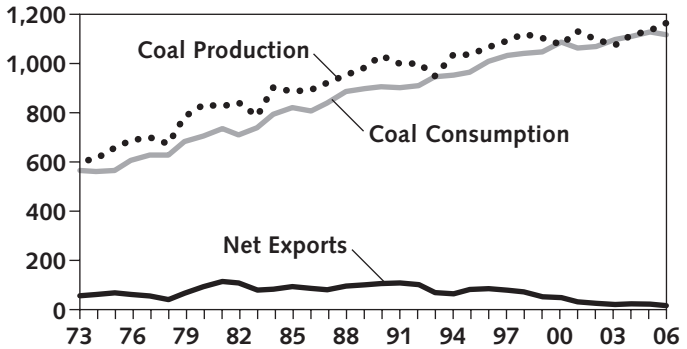
[p] Preliminary estimates.

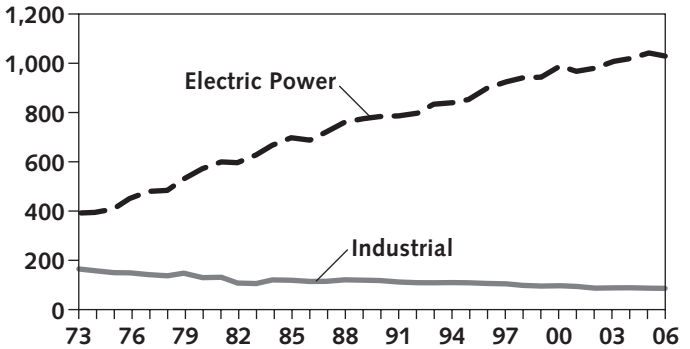
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2007/03)] (March 2007).

United States Coal Production, Net Exports, Consumption and Sector Usage[r], 1973-2006

(Millions of Tons)

Unlike petroleum or natural gas, domestic production of coal exceeds demand, and the U.S. is a net exporter of coal. Over 92 percent of the coal used in the U.S. is for generating electric power. The Industrial sector uses about 7.5 percent, with the residential and commercial sectors combined using about 0.4 percent of total domestic consumption.





Year	Coal Production	Net Exports	Consumption	Coal Use by Sector		
				Res. & Com.[a]	Industrial	Electric Power
1973	598.6	53.5	562.6	11.1	162.1	389.2
1975	654.6	65.4	562.6	9.4	147.2	406.0
1980	829.7	90.5	702.7	6.5	127.0	569.3
1985	883.6	90.7	818.0	7.8	116.4	694.8
1990	1,029.1	103.1	902.9	6.7	115.2	781.0
1995	1,033.0	79.1	962.0	5.8	106.1	850.2
2000	1,073.6	46.0	1,084.1	4.1	94.1	985.8
2001	1,127.7	28.9	1,060.1	4.4	91.3	964.4
2002	1,094.3	22.7	1,066.4	4.4	84.4	977.5
2003	1,071.8	18.0	1,094.9	4.2	85.5	1,005.1
2004	1,112.1	20.7	1,107.3	5.1	85.9	1,016.3
2005	1,131.4	19.5	1,125.5	5.1	84.2	1,039.0
2006[p]	**1,161.4**	**13.4**	**1,114.2**	**4.2**	**83.5**	**1,026.5**

[a] Res. & Com. represents residential and commercial.

[p] Preliminary estimates.

[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2007/03)] (March 2007).

United States Per Capita Resource Energy Consumption, by Type of Fuel[r], 1970-2006

(Millions of Btu)

In 2006, U.S. per capita energy consumption decreased 1.8 percent.

Year	Petroleum[a]	Natural Gas	Coal	Nuclear	Renewable[b]	Total[r]
1970	127.0	106.0	60.0	1.0	13.5	307.5
1975	133.0	93.0	59.0	9.0	13.5	307.5
1980	128.0	90.0	68.0	12.0	17.5	315.5
1985	113.0	75.0	74.0	17.0	18.9	297.9
1990	114.0	77.0	76.0	25.0	17.4	309.4
1991	111.0	78.0	74.0	26.0	17.3	306.3
1992	111.0	79.0	74.0	26.0	17.0	307.0
1993	111.0	81.0	76.0	26.0	17.1	311.1
1994	113.0	82.0	75.0	25.4	17.0	312.5
1995	112.0	85.6	75.4	26.6	18.0	317.5
1996	115.0	86.1	78.0	26.3	18.6	324.0
1997	113.4	85.6	78.7	24.2	18.1	319.9
1998	113.2	83.1	78.5	25.6	16.7	317.2
1999	114.5	82.5	77.5	27.3	16.7	318.5
2000	116.0	84.7	80.0	27.9	15.9	324.6
2001	114.5	80.3	76.8	28.0	13.7	313.3
2002	113.1	82.0	76.2	28.5	14.6	314.4
2003	113.5	79.0	76.9	27.5	15.2	312.1
2004	116.1	78.3	77.3	27.9	15.3	315.0
2005	115.3	77.2	77.0	27.5	15.3	312.3
2006[p]	**112.1**	**75.1**	**75.5**	**27.4**	**16.5**	**306.7**

[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] Hydropower thermal conversion rates for the U.S. were changed from approximately 10,400 Btu per kWh to 4,266 Btu per kWh, in order to compare with Wisconsin data. This category includes hydro, wood, waste, alcohol, geothermal, solar and wind.

[p] Preliminary estimates.

[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2006/054] (April 2007).

Wisconsin Per Capita Resource Energy Consumption as Percent of United States Per Capita Resource Energy Consumption, by Type of Fuel, 1970-2006

(Percent)

In 2006, Wisconsin used about 100.8 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. Also, the assumption was made that coal was used to generate all the electricity imported into Wisconsin. However, Wisconsin used less petroleum, natural gas, renewable and nuclear energy per capita than the national average.

Year	Petroleum[a]	Natural Gas	Coal	Nuclear	Renewables[b]	Total[c]
1970	82.0	70.0	123.4	33.0	54.7	84.6
1975	78.0	86.0	89.8	276.0	58.6	87.6
1980	75.0	82.0	99.4	189.0	70.2	86.3
1985	77.0	86.0	106.1	143.0	71.5	90.0
1990	80.0	81.0	121.3	100.0	75.2	91.6
1995	82.3	86.8	139.4	86.9	74.9	97.0
2000	80.9	86.2	141.4	83.2	79.5	97.2
2001	81.6	82.8	151.9	81.8	94.5	99.7
2002	83.4	85.8	152.3	86.5	92.2	101.4
2003	83.0	90.7	151.0	87.1	88.8	102.3
2004	82.0	87.9	152.0	82.9	90.2	101.1
2005	80.5	95.6	152.9	69.7	93.5	101.8
2006[p]	**81.1**	**89.5**	**150.1**	**85.7**	**85.2**	**100.8**

[a] This list excludes asphalt, road oil, lubricants, waxes, petroleum feedstocks and other petroleum products not used as energy sources.

[b] Hydropower thermal conversion rates for the United States were changed from approximately 10,400 Btu per kWh to 4,266 Btu per kWh, in order to compare with Wisconsin data.

[c] Total includes geothermal power, electricity produced from wood and waste, and net imports of electricity.

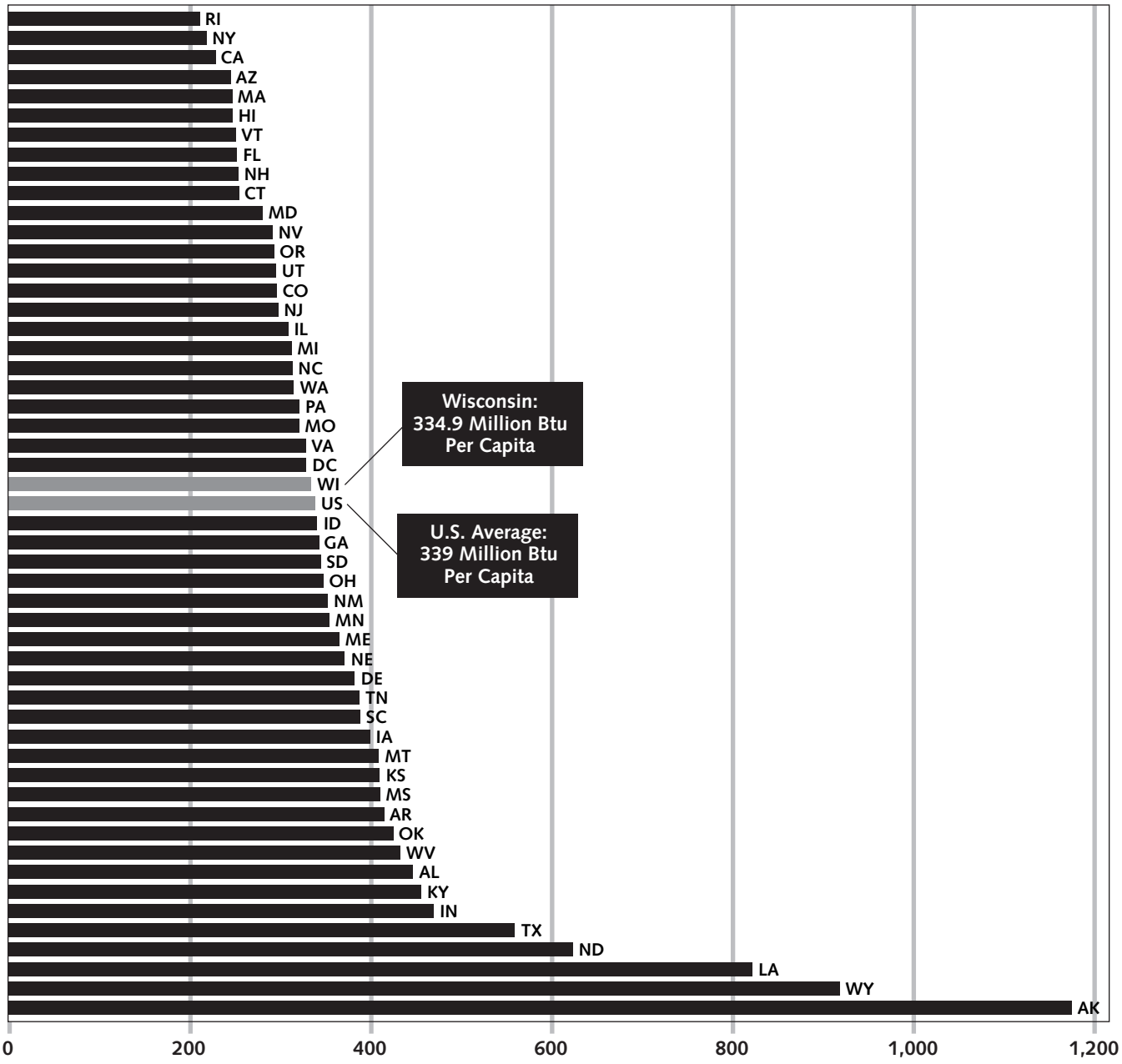
[p] Preliminary estimates.

Source: Compiled from tables in this publication for United States and Wisconsin per capita resource energy use.

U.S. Per Capita Resource Energy Consumption, by State 2003[a]

(Millions of Btu Per Capita)

In 2003, when non-energy uses of petroleum are included (such as road oil, asphalt and lubricants), Wisconsin ranked as the 25th largest state user in the nation, including the District of Columbia, in per capita energy consumption or 1.2 percent above the U.S. average per capita energy consumption.



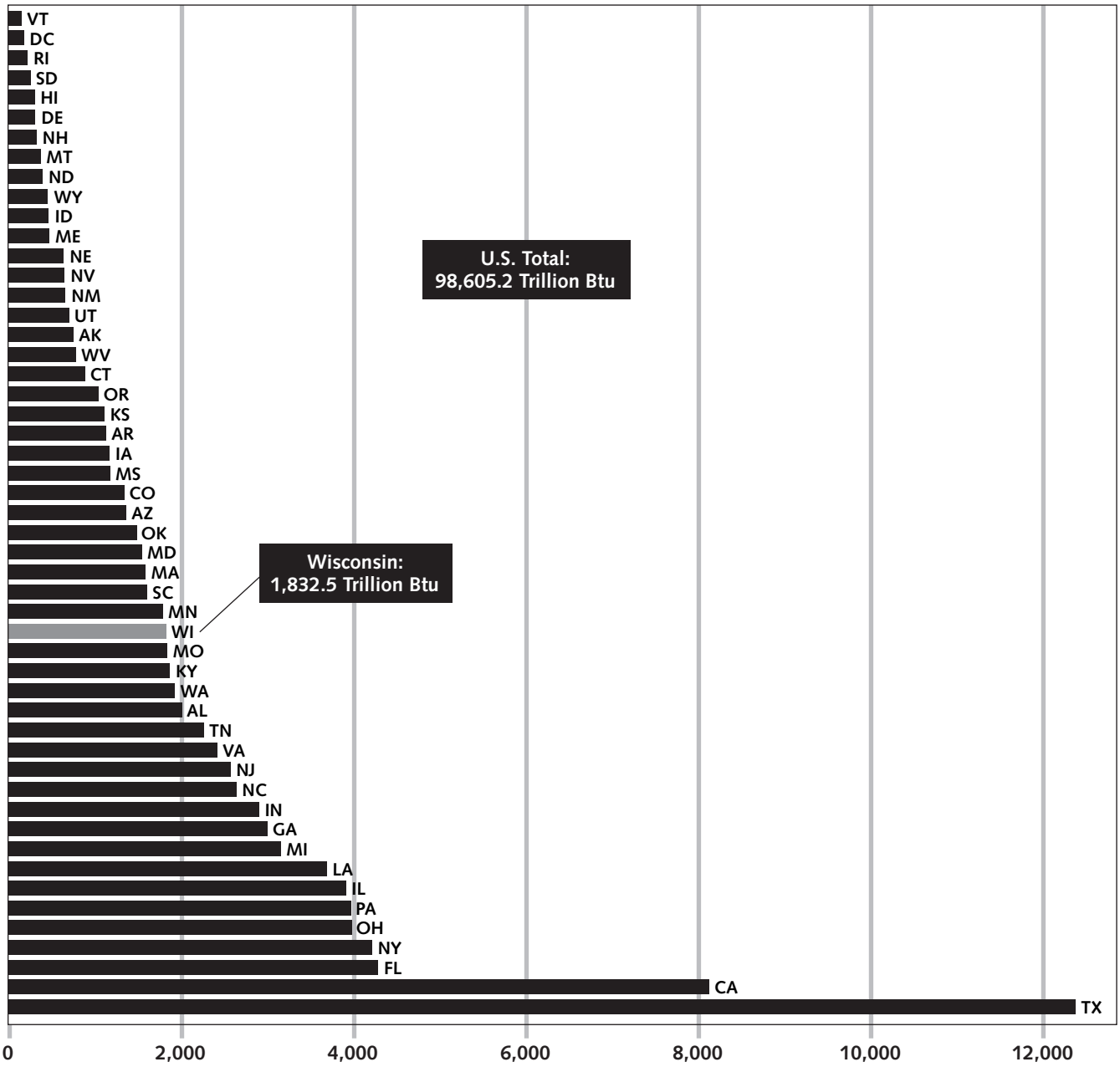
[a] Data reported in this table may differ from other tables because of different sources.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data 2003: Consumption*.

U.S. Resource Energy Consumption, by State 2003[a]

(Trillions of Btu)

In 2003, when non-energy uses of petroleum are included (such as road oil, asphalt and lubricants), Wisconsin used 1.9 percent of total energy consumed in the United States.



[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 2003: Consumption*, web based tables at www.eia.doe.gov.

7 Wisconsin and United States Prices and Average Costs of Fuels

This chapter begins with graphs showing the average annual costs of major fuels for the residential, commercial and industrial sectors over the past 37 years. Actual prices are presented, along with adjusted prices, which account for the effects of general price inflation. The Gross Domestic Product price deflator was used to adjust prices for inflation between each year and 2006. In other words, actual prices are adjusted to be comparable to 2006 prices, in "real" terms, with the effects of inflation removed. All prices are reported in current or actual terms unless noted explicitly as being real or adjusted prices.

Electric utilities' average annual costs for petroleum, natural gas and coal are shown for 1970, 1975, 1980, 1985, 1990 and each year from 1995 on. Annual retail gasoline and diesel prices are shown, along with applicable taxes, in five-year intervals from 1970 to 2005, and each year after that. Also, the average price of gasoline is shown by month.

Petroleum prices increased in 2006. For example, the regular, unleaded gasoline price rose by over 13 percent between 2005 and 2006.

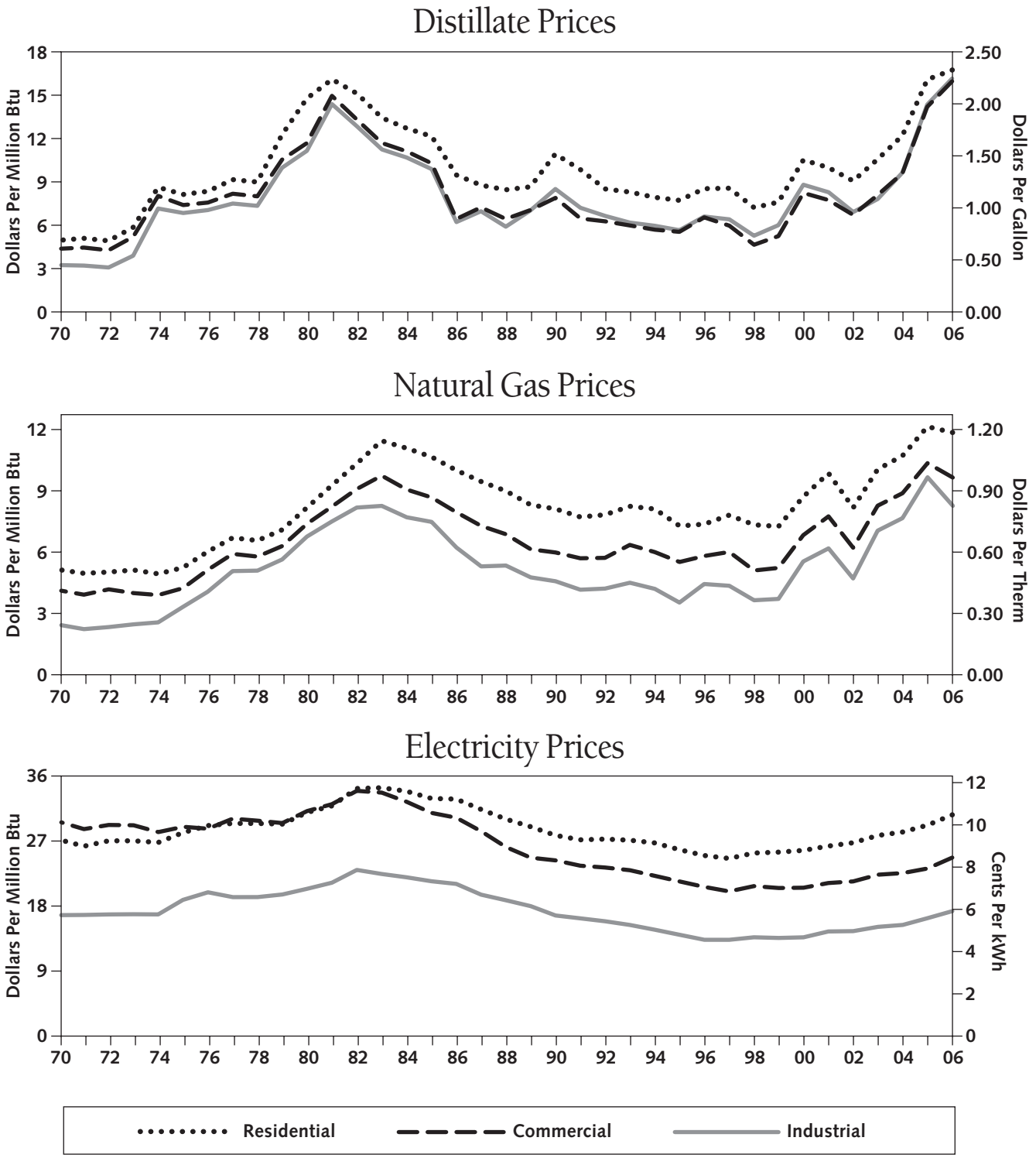
In 2006, natural gas prices decreased in all the sectors except residential, where it increased by 0.5 percent. In the industrial sector, the natural gas price decreased 11.8 percent. However, in real 2006 dollars, the industrial natural gas price was over 33 percent higher than in 1986. That is the year many interstate natural gas pipelines opened their systems for large industrial users to purchase natural gas directly from gas producers or wholesale brokers. In real dollars, the industrial natural gas price in 2006 was 14.3 percent above the previous 2005 peak price. In nominal dollars, the utility coal price increased 18.3 percent in 2006, but in real dollars, it is 9.4 percent lower than it was in 1970.

The chapter compares natural gas and electricity prices for residential, commercial, industrial and other customer service classes with the average price for all customers as a whole. Also included is a sector-by-sector comparison of 2006 Wisconsin natural gas and electricity prices with prices in other midwestern states and selected other states.

The final tables in the chapter show that U.S. crude oil prices increased in nominal dollars 19.9 percent in 2006 but in real dollars were 12.9 percent less than the peak 1981 price. The real wellhead price of natural gas decreased 14.9 percent in 2006, after setting a new record high in 2005.

Wisconsin Energy Prices, 1970-2006

(2006 Dollars)



Source: Wisconsin Office of Energy Independence.

Wisconsin Residential Energy Prices, by Type of Fuel 1970-2006

(Dollars Per Million Btu)

In 2006, prices for liquid propane (LPG), natural gas, heating oil and electricity increased 8.3 percent, 0.5 percent, 7.1 percent and 8 percent, respectively. The last four columns in the table below show the same prices after adjusting for inflation.

	Current Dollars				2006 Dollars[a]			
Year	Fuel Oil	LPG	Natural Gas	Electricity	Fuel Oil	LPG	Natural Gas	Electricity
1970	1.17	2.07	1.21	6.42	4.93	8.72	5.10	27.04
1975	2.65	3.74	1.71	9.20	8.09	11.42	5.22	28.09
1980	6.87	6.55	3.80	14.39	14.75	14.06	8.16	30.89
1985	7.28	8.43	6.39	19.72	12.12	14.03	10.64	32.82
1990	7.65	8.75	5.69	19.48	10.88	12.44	8.09	27.71
1995	6.10	7.84	5.76	20.42	7.68	9.88	7.26	25.73
1996	6.87	9.69	5.94	20.16	8.49	11.98	7.34	24.92
1997	7.01	9.61	6.40	20.16	8.53	11.69	7.78	24.51
1998	5.97	7.98	6.08	21.01	7.18	9.60	7.31	25.27
1999	6.38	8.06	6.10	21.42	7.56	9.56	7.23	25.39
2000	9.03	11.22	7.49	22.09	10.48	13.02	8.69	25.63
2001	8.78	12.92	8.67	23.15	9.95	14.64	9.82	26.23
2002	8.10	10.63	7.30	23.97	9.02	11.84	8.13	26.69
2003	9.67	12.62	9.20	25.40	10.54	13.76	10.03	27.70
2004	11.49	14.17	10.09	26.57	12.18	15.02	10.70	28.18
2005	15.60	16.87	11.77	28.30	16.06	17.36	12.11	29.13
2006[p]	**16.71**	**18.27**	**11.83**	**30.56**	**16.71**	**18.27**	**11.83**	**30.56**

[a] 2006 dollar values computed with Gross National Product Implicit Price Deflator. See table on price indices (page 106).

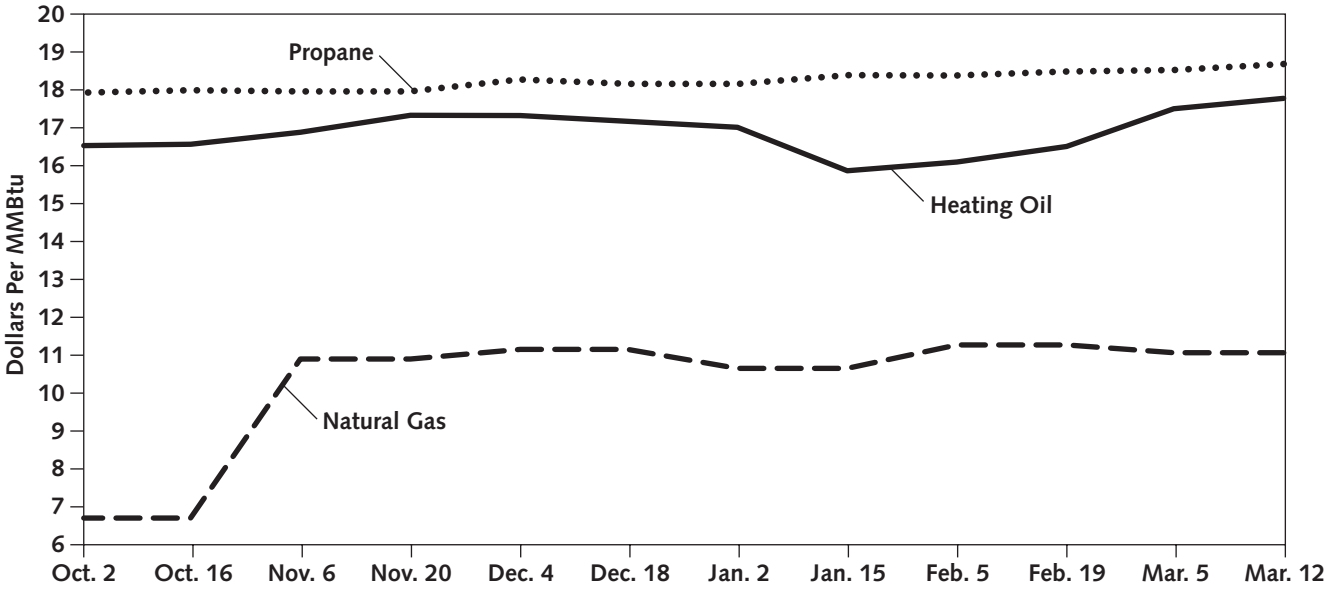
[p] Preliminary estimates.

Source: U.S. Department of Energy, "State Btu Unit Price Data Base," unpublished (May 1981); Wisconsin Office of Energy Independence, periodic telephone surveys of fuel oil and LP gas distributors and natural gas and electricity price monitoring reports; American Gas Association, *Gas Facts* (1971-2001); Edison Electric Institute, *Statistical Year Book* (1971-2003).

Wisconsin Residential Energy Prices, by Type of Fuel, 2006-2007 Winter Heating Season

(Dollars Per Gallon and Dollars Per Million Btu)

For the 2006-2007 winter heating season, both heating oil and propane prices peaked in mid March, while natural gas prices peaked in February.



Date 2006-07	Heating Oil $/Gallon	Heating Oil $/MMBtu	Propane $/Gallon	Propane $/MMBtu	Natural Gas[a] $/MMBtu
Oct. 2	2.290	(16.512)	1.710	(17.910)	(6.686)
Oct. 16	2.295	(16.548)	1.716	(17.973)	(6.686)
Nov. 6	2.339	(16.865)	1.713	(17.942)	(10.882)
Nov. 20	2.401	(17.312)	1.713	(17.942)	(10.882)
Dec. 4	2.400	(17.305)	1.743	(18.256)	(11.136)
Dec. 18	2.379	(17.153)	1.732	(18.141)	(11.136)
Jan. 2	2.357	(16.995)	1.732	(18.141)	(10.635)
Jan. 15	2.198	(15.848)	1.754	(18.371)	(10.635)
Feb. 5	2.230	(16.079)	1.753	(18.361)	(11.253)
Feb. 19	2.287	(16.490)	1.763	(18.466)	(11.253)
Mar. 5	2.425	(17.485)	1.767	(18.507)	(11.048)
Mar. 12	2.463	(17.759)	1.782	(18.665)	(11.048)

[a] The natural gas cost is the variable cost. There is also a fixed charge, which varies by utility but averages around $6.80 per month.

Source: Telephone survey conducted by the Department of Administration, Division of Energy throughout the winter heating season, starting October 2, 2006 and ending March 12, 2007.

Wisconsin Commercial Energy Prices, by Type of Fuel 1970-2006

(Dollars Per Million Btu)

In 2006, the real price of distillate oil, residual oil and electricity increased 12.4 percent, 20.6 percent and 6.5 percent, respectively, while the real price of natural gas decreased 6.7 percent. The real price of electricity, the major energy expense in the commercial sector, is 20.7 percent lower than its 1980 price, adjusted for inflation.

	Current Dollars				2006 Dollars[a]			
Year	Distillate Oil	Residual Oil	Natural Gas	Electricity	Distillate Oil	Residual Oil	Natural Gas	Electricity
1970	1.03	0.51	0.97	7.00	4.34	2.15	4.09	29.51
1975	2.41	2.11	1.38	9.46	7.36	6.44	4.21	28.90
1980	5.43	3.85	3.43	14.47	11.66	8.27	7.36	31.08
1985	6.16	4.85	5.20	18.52	10.25	8.07	8.66	30.82
1990	5.52	2.41	4.19	17.05	7.85	3.43	5.96	24.25
1995	4.37	2.36	4.36	16.94	5.50	2.97	5.49	21.33
1996	5.26	2.91	4.68	16.64	6.50	3.60	5.79	20.58
1997	4.88	2.55	4.92	16.41	5.93	3.10	5.98	19.95
1998	3.83	2.35	4.22	17.20	4.61	2.82	5.08	20.69
1999	4.40	2.67	4.39	17.23	5.22	3.17	5.20	20.42
2000	7.06	4.34	5.87	17.64	8.19	5.04	6.81	20.47
2001	6.80	2.67	6.81	18.63	7.71	3.03	7.72	21.12
2002	5.99	4.01	5.54	19.16	6.67	4.47	6.17	21.34
2003	7.40	4.58	7.57	20.42	8.07	4.99	8.25	22.27
2004	9.03	4.88	8.36	21.21	9.57	5.17	8.86	22.49
2005	13.77	6.35	10.03	22.47	14.17	6.54	10.32	23.13
2006[p]	**15.93**	**7.88**	**9.63**	**24.64**	**15.93**	**7.88**	**9.63**	**24.64**

[a] 2006 dollar values computed with Gross National Product Implicit Price Deflator. See table on price indices (page 106).

[p] Preliminary estimates.

Source: U.S. Department of Energy, "State Btu Unit Price Data Base", unpublished (May 1981), *Petroleum Marketing Monthly*, (Jan. 1985-Mar. 2007), and unpublished analysis of Wisconsin residual oil prices (1985-2006); American Gas Association, *Gas Facts* (1971-2001); Edison Electric Institute, *Statistical Year Book* (1971-2001); U.S. Department of Energy, *Electric Sales and Revenue 1993-1997* [DOE/EIA-0540 (97)] (December 1999), *Electric Power Monthly* [DOE/EIA-0226 (03/07)] (March 2007), *Natural Gas Annual, (1994-2005)* [DOE/EIA-0131(05)] (November 2006), and *Natural Gas Monthly* [DOE/EIA-0130(04/06)] (April 2007).

Wisconsin Industrial Energy Prices, by Type of Fuel 1970-2006

(Dollars Per Million Btu)

In 2006, the real prices of all industrial fuels increased. However, the real price of coal and electricity are almost 32 percent and 25 percent lower than their 1981 peak price and 1982 peak price, respectively, adjusted for inflation.

	Current Dollars					2006 Dollars[a]				
Year	Distillate Oil	Residual Oil	Natural Gas	Coal	Electricity	Distillate Oil	Residual Oil	Natural Gas	Coal	Electricity
1970	0.76	0.50	0.57	0.66	3.96	3.20	2.11	2.40	2.78	16.67
1975	2.23	2.06	1.08	1.28	6.15	6.81	6.29	3.30	3.91	18.79
1980	5.18	3.31	3.14	1.75	9.46	11.12	7.11	6.74	3.76	20.32
1985	5.92	4.21	4.48	2.11	12.83	9.85	7.01	7.46	3.51	21.36
1990	5.95	2.29	3.20	1.80	11.69	8.46	3.26	4.55	2.56	16.63
1995	4.46	2.35	2.78	1.66	11.08	5.62	2.96	3.50	2.09	13.95
1996	5.31	2.90	3.57	1.68	10.72	6.56	3.59	4.41	2.08	13.26
1997	5.24	2.54	3.56	1.66	10.90	6.37	3.09	4.33	2.02	13.26
1998	4.35	2.34	3.01	1.66	11.31	5.23	2.81	3.62	2.00	13.60
1999	5.04	2.67	3.11	1.61	11.40	5.98	3.17	3.69	1.91	13.51
2000	7.55	4.34	4.76	1.66	11.72	8.76	5.04	5.52	1.93	13.60
2001	7.28	2.67	5.43	1.80	12.72	8.25	3.03	6.15	2.04	14.41
2002	6.17	4.01	4.19	1.97	12.98	6.87	4.47	4.67	2.19	14.45
2003	7.14	4.58	6.45	1.95	13.80	7.79	4.99	7.03	2.13	15.05
2004	9.07	4.88	7.21	2.10	14.44	9.62	5.17	7.64	2.23	15.32
2005	13.92	6.35	9.35	2.56	15.79	14.33	6.54	9.62	2.63	16.25
2006[p]	**16.13**	**7.88**	**8.25**	**2.81**	**17.23**	**16.13**	**7.88**	**8.25**	**2.81**	**17.23**

[a] 2006 dollar values computed with Gross National Product Implicit Price Deflator. See table on price indices (page 106).

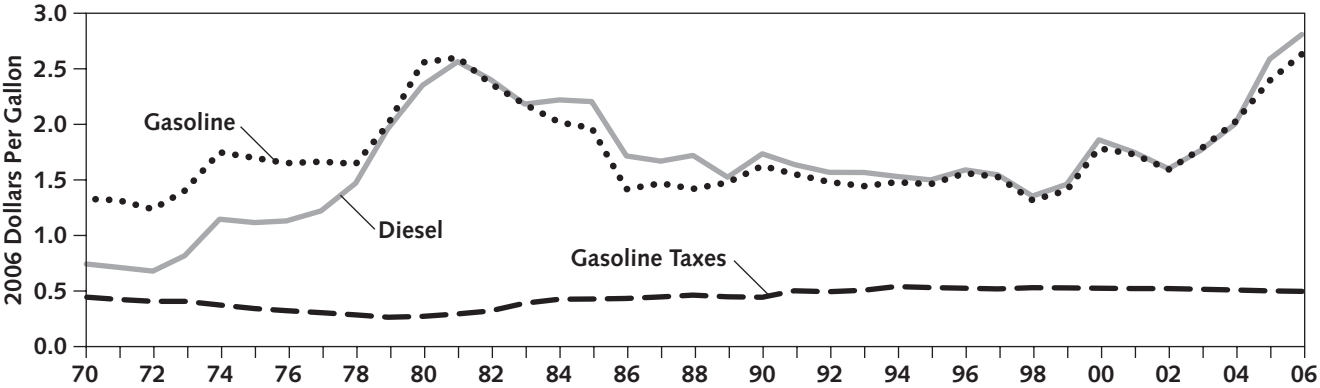
[p] Preliminary estimates.

Source: U.S. Department of Energy, "State Btu Unit Price Data Base", unpublished (May 1981), *State Energy Consumption, Price and Expenditure Report 1960-2004* http://www.eia.doe.gov/emeu/states/_seds.html, (June 2007), *Petroleum Marketing Monthly* (Jan. 1985-Mar. 2007), *Quarterly Coal Report* [DOE/EIA-0121(2006/4Q)] (March 2007), http://www.eia.doe.gov/cneaf/coal/quarterly/qcr.pdf, *Natural Gas Annual, (1994-2005)* [DOE/EIA-0131(05)] (November 2006), and *Natural Gas Monthly* [DOE/EIA-0130(04/06] (April 2006; Wisconsin Department of Administration, Division of Energy, telephone surveys of fuel oil and LP gas distributors (1977-2006) and unpublished analysis of Wisconsin's residual oil prices (1985-2006).

Wisconsin Motor Gasoline and Diesel Fuel Retail Prices, by Grade and Type of Service, 1970-2006

(Dollars Per Gallon)

The regular unleaded gasoline price (self-service) is a weighted average of conventional and reformulated gasoline. The real price of gasoline in 2006 was 9.9 percent higher than in 2005 and 1.2 percent higher than the previous peak real price of $2.595 reached in 1981. Starting on January 1, 1995, only reformulated gasoline could be sold in six southeastern Wisconsin counties in order to improve air quality.



	Current Dollars				2006 Dollars		
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		0.184	0.110	1.324	0.737	0.439
1975	0.554		0.363	0.110	1.692	1.110	0.336
1980	1.188	NA	1.093	0.124	2.551	2.347	0.266
1985	1.178	NA	1.321	0.254	1.961	2.199	0.422
1990	1.139	NA	1.215	0.308	1.620	1.728	0.438
1995	1.156	1.181	1.186	0.417	1.456	1.494	0.525
2000	1.532	1.556	1.598	0.447	1.778	1.854	0.519
2005	2.321	2.338	2.510	0.481	2.389	2.583	0.495
2006p	**2.626**	**2.639**	**2.804**	**0.491**	**2.626**	**2.804**	**0.491**

NA – Not available.

[a] Since 1991, over 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 2006, this fee was 3 cents per gallon.

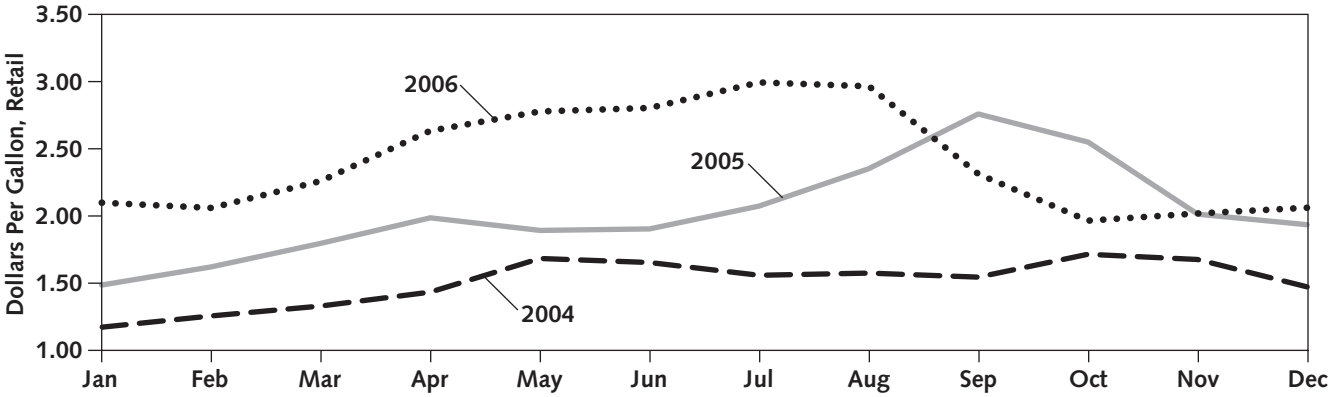
p Preliminary estimates.

Source: Wisconsin Division of the American Automobile Association, *Fuel Gauge Report*.

Wisconsin Retail and Wholesale Self-Service Unleaded Motor Gasoline Prices, by Month, 2004-2006[a]

(Dollars Per Gallon)

The retail and wholesale prices are for regular grade gasoline. The wholesale price of regular grade gasoline (before taxes and retail mark-up) increased 16.8 percent in 2006, while the statewide retail price increased 16.8 percent. The retail price increase was more moderate because almost 20 percent of the retail price of gasoline in 2006 was composed of a petroleum inspection fee and federal and state taxes, which together increased 2 percent.



Month	2004 Retail	2004 Wholesale	2005 Retail	2005 Wholesale	2006 Retail	2006 Wholesale
January	1.634	1.095	1.885	1.313	2.375	1.741
February	1.701	1.160	1.993	1.384	2.344	1.688
March	1.760	1.215	2.133	1.553	2.504	1.914
April	1.843	1.314	2.285	1.621	2.803	2.163
May	2.043	1.515	2.210	1.536	2.918	2.233
June	2.019	1.381	2.219	1.625	2.939	2.287
July	1.943	1.382	2.355	1.700	3.091	2.424
August	1.956	1.366	2.577	2.012	3.068	2.320
September	1.932	1.361	2.903	2.215	2.545	1.845
October	2.068	1.466	2.736	2.029	2.268	1.655
November	2.037	1.376	2.307	1.614	2.311	1.693
December	1.874	1.204	2.244	1.653	2.345	1.700
Average	**1.901**	**1.320**	**2.321**	**1.688**	**2.626**	**1.972**

[a] The retail and wholesale prices are for a blend of regular, unleaded conventional and reformulated gasolines. The wholesale price refers to the delivered dealer tank wagon price. In 2003, 2004, 2005 and 2006, the gasoline price at the terminal (the rack price) was $0.997 a gallon, $1.258 a gallon $1.648 a gallon and $1.958, respectively.

Source: U. S. Department of Energy, Energy Information Administration, *Petroleum Marketing Monthly* 1993-2006; Wisconsin Division of the American Automobile Association, *Fuel Gauge Report* (1993-2006).

Wisconsin Electric Utility Average Costs of Fuel 1970-2006

(Dollars Per Million Btu)

In 2006, the cost of coal used as electric utility fuel increased 18.3 percent. The utility cost of natural gas decreased 17 percent. Oil prices increased 24 percent. Adjusted for inflation, coal prices are 55 percent below their peak in 1982, also the peak year for natural gas and oil prices. Coal remained the lowest cost electric utility fossil fuel.

	Current Dollars[b,c]			2006 Dollars[a]		
Year	Oil	Natural Gas	Coal	Oil	Natural Gas	Coal
1970	0.66	0.35	0.39	2.78	1.48	1.64
1975	2.01	0.80	0.89	6.14	2.44	2.72
1980	4.98	2.89	1.44	10.69	6.21	3.09
1985	5.43	4.17	1.80	9.04	6.94	3.00
1990	5.26	2.93	1.36	7.48	4.17	1.93
1995	3.85	2.21	1.14	4.85	2.78	1.44
1996	4.82	3.01	1.06	5.96	3.72	1.31
1997	4.63	3.15	1.09	5.63	3.83	1.33
1998	3.49	2.64	1.07	4.20	3.18	1.29
1999	4.14	2.91	1.02	4.91	3.45	1.21
2000	6.27	4.45	1.02	7.28	5.16	1.18
2001	6.45	4.73	1.05	7.31	5.36	1.19
2002	5.24	3.78	1.10	5.84	4.21	1.23
2003	6.32	5.83	1.13	6.89	6.36	1.23
2004	7.24	6.36	1.16	7.68	6.74	1.23
2005	12.19	9.46	1.26	12.55	9.74	1.30
2006[p]	**15.11**	**7.84**	**1.49**	**15.11**	**7.84**	**1.49**

[a] 2006 dollar values computed with Gross National Product Implicit Price Deflator. See table on price indices (page 112).

[b] Beginning in 1988, the U.S. DOE data source has been used.

[c] Beginning in 1990, *Statistical Yearbook* natural gas data has been used.

[p] Preliminary estimates.

Source: Edison Electric Institute, *Statistical Yearbook* (1971-1996); American Gas Association, *Gas Facts* (1971-1990). U.S. Department of Energy, Energy Information Administration, *Electric Power Annual*, 1990-2000, [DOE/EIA-0348(2000)/1] (August 2001), and *Electric Power Monthly*, [DOE/EIA-0226(2007/04)] www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html

Wisconsin Electric Utility Coal Costs and Sulfur Content of Coal, by Utility Plant, 2006

Wisconsin utility coal has 58 percent less sulfur and costs 13.8 percent less 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 2006, the average Wisconsin coal cost, in cents per million Btu, increased 16.5 percent, while sulfur content decreased 9.5 percent.

Plant	Receipts Thousand Tons	Average Btu Per Pound	Average Cents Per Million Btu	Average Dollars Per Ton	Average Percent Sulfur[a]
Dairyland Power Cooperative	3,016	9,597	143.2	27.76	0.60
Alma - Madgett	1,806	9,396	141.3	26.82	0.53
Genoa 3	1,210	9,897	148.0	29.17	0.71
Madison Gas and Electric Co.	119	11,012	218.1	48.04	1.29
Blount Street	119	11,012	218.1	48.04	1.29
Manitowoc Public Utilities	201	12,801	212.4	54.39	1.49
Manitowoc	201	12,801	212.4	54.39	1.49
Northern States Power Co.	181	9,053	272.2	49.29	0.26
Bay Front	181	9,053	272.2	49.29	0.26
Wisconsin Electric Power Co.	11,524	8,580	149.3	25.62	0.30
Oak Creek	3,437	8,811	144.1	24.22	0.22
Pleasant Prairie	4,938	8,367	121.7	19.92	0.32
Port Washington	–	–	–	–	–
Presque Isle	2,276	10,305	206.0	42.46	0.35
Valley	873	11,932	239.2	57.09	0.41
Wisconsin Power and Light Co.	7,812	8,541	143.6	24.53	0.29
Columbia	4,502	8,452	129.5	21.89	0.29
Edgewater	2,658	8,913	171.1	30.50	0.28
Nelson Dewey	652	9,940	157.6	31.33	0.32
Wisconsin Public Service Corp.	3,621	8,695	126.8	22.05	0.32
Pulliam	1,540	8,578	124.5	21.98	0.37
Weston	2,081	8,664	127.5	22.17	0.28
Wisconsin	**24,641**	**8,730**	**145.6**	**25.42**	**0.38**
United States	**799,190**	**10,142**	**169.0**	**34.28**	**0.90**

[a] Percent by weight.

Source: U.S. Department of Energy, EIA, *Electric Power Monthly*, [DOE/EIA-0226(2007/04)] (April 2007); http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html. Annual reports of Wisconsin electric generating utilities (2006), http://psc.wi.gov/a_annlreport/default.htm.

Wisconsin Natural Gas Prices, by Economic Sector 1970-2006

(Dollars Per Million Btu)

In 2006, natural gas prices decreased in all sectors except residential, with the average price decreasing by 5.2 percent.

Year	Residential	Commercial	Industrial	Utility	Average
1970	$1.21	$0.97	$0.57	$0.35	$0.80
1975	1.71	1.38	1.08	0.80	1.31
1980	3.80	3.43	3.14	2.89	3.42
1985	6.39	5.20	4.48	4.17	5.36
1990	5.69	4.19	3.20	2.93	4.37
1995	5.76	4.36	2.78	2.21	4.20
2000	7.49	5.87	4.76	4.45	5.93
2005	11.77	10.03	9.35	8.82	10.20
2006P	**11.83**	**9.63**	**8.25**	**7.80**	**9.67**

P Preliminary estimates.

Source: Pages 98 and 104 of this publication, and the following table.

Industrial and Commercial Natural Gas Prices, in Detail 2003-2006

(Dollars Per Million Btu)

Because Wisconsin's industrial and commercial sectors purchase transport gas, their average gas prices fall below the average utility system price reported in the U.S. Department of Energy's *Natural Gas Annual* and *Natural Gas Monthly*.

	Industrial				Commercial			
	2003	2004	2005	2006P	2003	2004	2005	2006P
Interruptible	$5.89	$6.95	$8.92	$8.20	$5.59	$6.95	$8.92	$8.20
Firm	8.00	8.80	10.50	10.40	8.00	8.80	10.50	10.40
Space Heating	7.75	10.05	10.18	10.10	7.75	10.05	10.18	10.10
Transport	6.27	7.03	9.27	8.01	6.27	7.03	9.27	8.01
Average Without Transport (utility system gas)	**$7.18**	**$7.97**	**$9.78**	**$9.44**	**$7.92**	**$8.70**	**$10.25**	**$10.18**
Average With Transport	**$6.45**	**$7.21**	**$9.35**	**$8.25**	**$7.57**	**$8.36**	**$10.03**	**$9.63**

P Preliminary estimates.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, form PSC-AF 2 (1994-2006); U.S. Department of Energy, *Natural Gas Annual, 1994-2005* [DOE/EIA-0131(04)] (December 2006), and *Natural Gas Monthly* [DOE/EIA-0130(2006/04)] (April 2006).

Wisconsin Natural Gas Prices, by Public Service Commission of Wisconsin Sector, 1970-2006

(Dollars Per Million Btu)

The prices of utility gas for all customer classes, except residential, decreased in 2006. The average price of natural gas in 2006 was 0.6 percent lower than in 2005. 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.

Year	Residential		Commercial and Industrial			Average
	General	Space Heating	Firm	Interruptible	Space Heating	
1970	$1.55	$1.18	$0.72	$0.48	$0.92	$0.81
1975	2.13	1.68	1.16	1.00	1.39	1.31
1980	4.25	3.78	3.26	3.01	3.45	3.42
1985	7.49	6.35	5.02	4.04	5.30	5.33
1990	6.78	5.67	4.27	2.97	4.52	4.86
1991	6.53	5.59	3.87	2.92	4.43	4.78
1992	7.00	5.79	4.20	3.10	4.52	4.96
1993	7.62	6.28	4.74	3.10	5.05	5.36
1994	7.56	6.26	4.72	2.89	4.99	5.22
1995	7.02	5.74	4.14	2.46	4.63	4.71
1996	7.03	5.95	4.28	3.30	4.76	5.15
1997	7.47	6.39	4.96	3.64	5.17	5.62
1998	7.40	6.08	4.68	3.14	4.74	5.28
1999	7.60	6.10	5.21	3.16	4.71	5.33
2000	8.87	7.49	7.32	4.63	6.05	6.75
2001	10.01	8.66	7.60	5.17	7.27	7.86
2002	8.79	7.29	6.19	3.91	5.92	6.50
2003	10.11	9.19	8.00	5.89	7.75	8.39
2004	11.21	10.08	8.80	6.95	8.56	9.27
2005	13.35	11.75	10.50	8.92	10.18	10.82
2006[p]	**13.70**	**11.80**	**10.40**	**8.20**	**10.10**	**10.75**

[p] Preliminary estimates.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1971-1993), and form PSC-AF 2 (1994-2006).

Wisconsin Electricity Prices, by Economic Sector 1970-2006

(Cents Per kWh)

Electricity prices increased across all sectors in 2006. These rate increases are due to higher fuel costs and costs associated with new generating capacity. High costs for purchased power during summer peak demand also contributed to higher costs. The Public Service Commission of Wisconsin and the Edison Electric Institute both report electricity prices for Wisconsin economic sectors. Because of differences in sectoral definitions, accounting methods and inclusion of cooperative utilities, their prices do not match.

	Public Service Commission of Wisconsin Sectors				Edison Electric Institute Sectors[c]			
Year	Residential	Commercial & Industrial	Rural[a]	Average[b]	Residential	Commercial	Industrial	Average[b]
1970	2.13	1.69	2.41	1.89	2.19	2.39	1.35	1.91
1975	3.22	2.60	3.42	2.85	3.14	3.23	2.10	2.80
1980	4.80	3.91	4.80	4.24	4.91	4.94	3.23	4.31
1985	6.70	5.15	6.38	5.67	6.73	6.32	4.38	5.75
1990	6.55	4.68	6.29	5.27	6.65	5.82	3.99	5.38
1991	6.67	4.74	6.42	5.37	6.73	5.84	4.03	5.46
1992	6.85	4.75	6.55	5.40	6.91	5.91	4.02	5.49
1993	6.98	4.74	6.71	5.44	7.03	5.95	3.98	5.52
1994	7.01	4.63	6.76	5.35	7.08	5.87	3.89	5.46
1995	6.91	4.55	6.61	5.27	6.97	5.78	3.78	5.36
1996	6.81	4.43	6.40	5.15	6.88	5.68	3.66	5.25
1997	6.81	4.40	6.27	5.11	6.88	5.60	3.72	5.22
1998	7.16	4.61	6.42	5.35	7.17	5.87	3.86	5.44
1999	7.31	4.69	6.56	5.46	7.31	5.88	3.89	5.53
2000	7.55	4.83	6.84	5.62	7.54	6.02	4.00	5.69
2001	7.93	5.18	7.23	6.01	7.90	6.36	4.34	6.05
2002	8.19	5.34	7.59	6.23	8.18	6.54	4.43	6.28
2003	8.73	5.63	8.27	6.57	8.67	6.97	4.71	6.64
2004	9.11	5.84	8.73	6.81	9.07	7.24	4.93	6.88
2005	9.72	6.36	9.23	7.38	9.66	7.67	5.39	7.48
2006[p]	**10.57**	**7.01**	**10.22**	**8.08**	**10.43**	**8.41**	**5.88**	**8.13**

[a] Rural, as listed by utilities.

[b] Utilities' average revenue per kWh.

[c] Starting in 1996, Edison Electric Institute began using U.S. Department of Energy electricity prices.

[p] Preliminary estimates.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Statistics of Wisconsin Public Utilities*, Bulletin #8 (1971-1994); Edison Electric Institute, *Statistical Yearbook* (1971-1996); U.S. Department of Energy, *Electric Sales and Revenue 1993-2000* [DOE/EIA-0540 (2000)] (November 2001), and *Electric Power Monthly* [DOE/EIA-0226 (2007/03)] (March 2007). www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html

Average Utility Electricity and Natural Gas Prices[a], by Economic Sector, for Selected Midwestern and Other States, 2006

In 2006, Wisconsin's average electricity price was 8.1 percent less than the national average and the second highest in the Midwest. Wisconsin's commercial price was 13.7 percent below the national average, while the industrial price was 19.6 percent above the national average. However, almost 83 percent of the natural gas purchased by Wisconsin industry is not purchased from directly from the utilities but is lower cost transport gas.

Electricity[p] (Cents Per kWh)

State	Average	Residential	Commercial	Industrial
Wisconsin	**8.13**	**10.43**	**8.41**	**5.88**
Illinois	7.11	8.51	7.99	4.70
Indiana	6.47	8.23	7.22	4.96
Iowa	6.98	9.59	7.32	4.87
Michigan	8.38	10.02	8.75	6.24
Minnesota	6.96	8.65	7.03	5.23
Ohio	7.71	9.42	8.48	5.52
California	12.84	14.34	13.13	9.46
New York	13.89	16.69	13.59	8.62
Tennessee	7.05	7.74	8.00	5.35
Texas	10.30	12.70	9.73	7.77
Washington	6.15	6.81	6.55	4.51
Average U.S.	**8.85**	**10.40**	**9.36**	**6.09**

Natural Gas[p] (Dollars Per 1,000 Cubic Feet)

State	City Gate[b]	Residential	Commercial	Industrial
Wisconsin	**NA**	**NA**	**10.33**	**9.56**
Illinois	8.25	11.23	10.96	9.45
Indiana	8.33	13.06	11.54	9.36
Iowa	8.07	12.44	10.37	8.41
Michigan	8.35	11.66	10.58	9.99
Minnesota	8.35	11.62	NA	8.35
Ohio	NA	14.35	12.85	11.67
California	6.76	11.82	10.34	9.23
New York	9.08	15.91	12.10	11.75
Tennessee	9.00	14.60	12.85	9.76
Texas	7.59	12.89	10.12	6.80
Washington		13.37	11.97	NA
Average U.S.	**8.54**	**13.75**	**11.97**	**7.88**

NA – Not available.

[a] Total revenue divided by total sales, by sector, statewide.

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

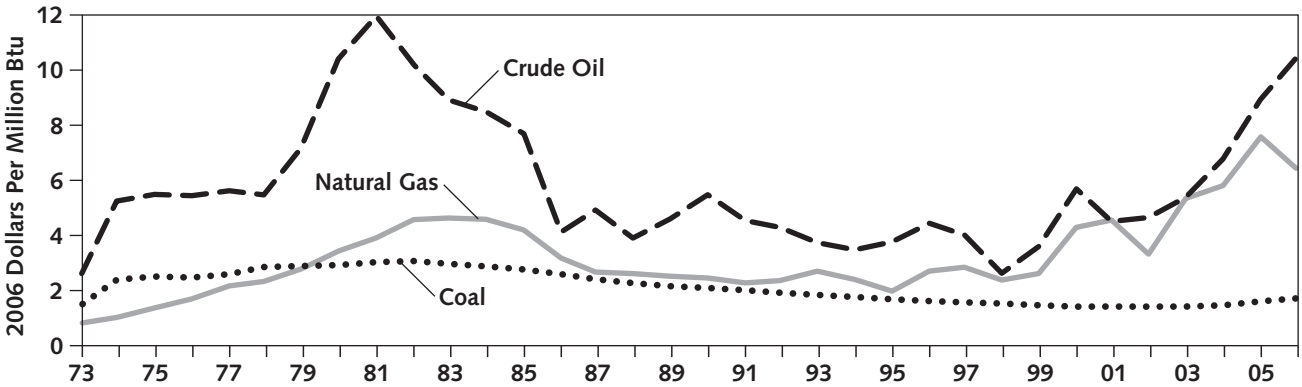
[p] Preliminary estimates from primary source.

Source: U.S. Department of Energy, EIA, *Electric Power Monthly* [DOE/EIA-0226 (2007/03)] (March 2007) and *Natural Gas Monthly* [DOE/EIA-0130 (2007/06)] (June 2007). www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html

U.S. Energy Prices 1973 to 2006

(Dollars Per Million Btu)

In 2006, the real cost of crude oil and coal increased 16.5 percent and 6.6 percent and, respectively, while natural gas prices decreased 14.9 percent.



Year	Current Dollars				2006 Dollars		
	Crude Oil Refiners Cost[a] $/Barrel	Crude Oil Refiners Cost $/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	2.61	0.80	1.48
1975	10.38	1.79	0.44	0.81	5.46	1.34	2.49
1980	28.07	4.84	1.59	1.35	10.39	3.41	2.90
1985	26.75	4.61	2.51	1.65	7.68	4.18	2.74
1990	22.22	3.83	1.71	1.46	5.45	2.43	2.07
1995	17.23	2.97	1.55	1.32	3.74	1.95	1.66
2000	28.26	4.87	3.68	1.20	5.65	4.27	1.39
2001	22.95	3.96	4.00	1.23	4.48	4.53	1.40
2002	24.10	4.16	2.95	1.25	4.63	3.29	1.39
2003	28.53	4.92	4.88	1.28	5.36	5.32	1.40
2004	36.98	6.38	5.46	1.36	6.76	5.79	1.44
2005	50.24	8.66	7.33	1.54	8.91	7.54	1.58
2006[p]	**60.23**	**10.38**	**6.42**	**1.69**	**10.38**	**6.42**	**1.69**

[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] U.S. DOE natural gas price information is reported in dollars per 1,000 cubic feet. This table assumes 1,000 cubic feet and a million Btu are equivalent.

[c] Includes cost of delivery to utilities.

[p] Preliminary estimates.

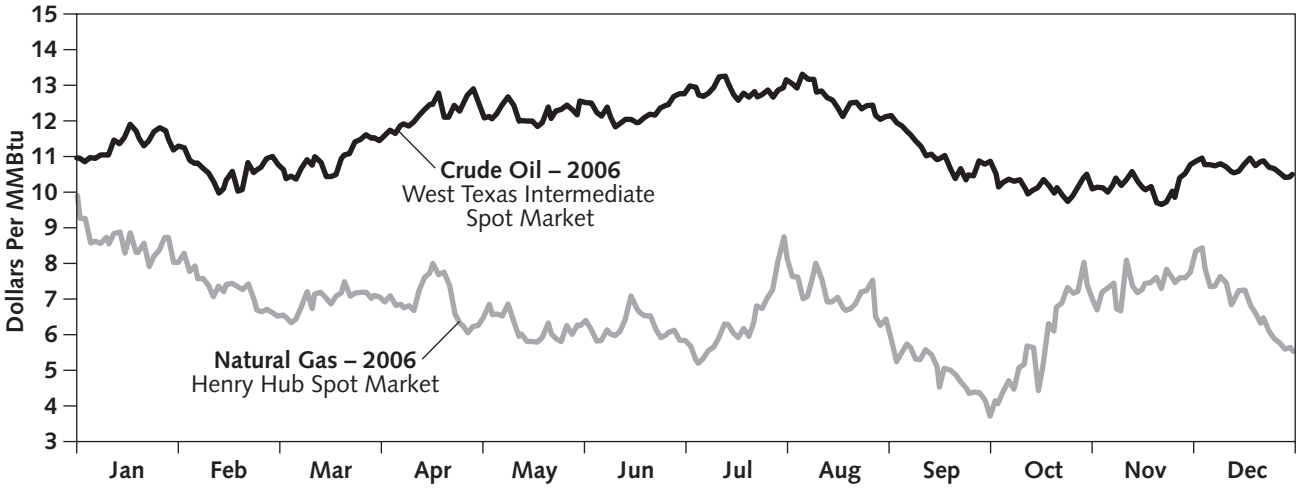
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035(2006/04)] (April 2006).

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

(Dollars Per Million Btu)

In 2006, the average West Texas Intermediate crude oil spot market price increased 16.9 percent, while the Henry Hub[b] spot market price of natural gas decreased 23.9 percent. The spot market prices for crude oil and natural gas continued to be volatile in 2006.

2006



2004-2006

	Crude Oil West Texas Intermediate			Natural Gas Henry Hub		
Month	2004	2005	2006	2004	2005	2006
Jan.	5.92	8.08	11.29	6.12	6.15	8.66
Feb.	5.98	8.30	10.63	5.36	6.14	7.53
Mar.	6.33	9.34	10.81	5.39	6.97	6.87
Apr.	6.34	9.13	11.97	5.71	7.16	7.06
May	6.94	8.59	12.21	6.34	6.47	6.17
Jun.	6.56	9.72	12.23	6.27	7.19	6.20
Jul.	7.03	10.17	12.83	5.93	7.62	6.15
Aug.	7.74	11.20	12.59	5.40	9.53	7.12
Sep.	7.92	11.31	11.00	5.16	12.01	4.90
Oct.	9.19	10.73	10.16	6.36	13.50	5.87
Nov.	8.36	10.06	10.19	6.26	10.31	7.43
Dec.	7.44	10.24	10.68	6.57	13.00	6.73
Average $/MMBtu	**7.14**	**9.74**	**11.38**	**5.91**	**8.84**	**6.72**
Average $/Barrel	**41.44**	**56.49**	**66.02**			

[a] Graph is plotted with daily 2006 data.

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

Source: Oil Daily, electronically received data.

National Indices of Price Inflation 1970-2006

(Annual Rate of Inflation)

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. Percent change is from previous year.

Year	Gross Domestic Product[a,r]		Producer Price Index[b]		Personal Consumption Expenditures[c,r]		Consumer Price Index[d]	
1970	27.53	(5.3%)	36.9	(3.7%)	26.45	(4.8%)	38.8	(5.7%)
1975	38.00	(9.4)	58.4	(9.2)	35.96	(8.3)	53.8	(9.1)
1980	54.04	(9.1)	89.8	(14.1)	52.08	(10.7)	82.4	(13.5)
1985	69.71	(3.0)	103.2	-(0.5)	66.94	(3.3)	107.6	(3.6)
1990	81.59	(3.9)	116.3	(3.7)	80.50	(4.6)	130.7	(5.4)
1995	92.11	(2.0)	124.7	(3.6)	91.58	(2.2)	152.4	(2.8)
1996	93.85	(1.9)	127.7	(2.4)	93.55	(2.2)	156.9	(3.0)
1997	95.41	(1.7)	127.6	-(0.1)	95.12	(1.7)	160.5	(2.3)
1998	96.47	(1.1)	124.4	-(2.5)	95.98	(0.9)	163.0	(1.6)
1999	97.87	(1.5)	125.5	(0.9)	97.58	(1.7)	166.6	(2.2)
2000	100.00	(2.2)	132.7	(5.7)	100.00	(2.5)	172.2	(3.4)
2001	102.40	(2.4)	134.2	(1.1)	102.09	(2.1)	177.1	(2.8)
2002	104.19	(1.7)	131.1	-(2.3)	103.54	(1.4)	179.9	(1.6)
2003	106.41	(2.1)	138.1	(5.3)	105.60	(2.0)	184.0	(2.3)
2004	109.43	(2.8)	146.7	(6.2)	108.37	(2.6)	188.9	(2.7)
2005	112.74	(3.0)	157.4	(7.3)	111.49	(2.9)	195.3	(3.4)
2006[p]	**116.03**	**(2.9)**	**164.8**	**(4.7)**	**114.56**	**(2.8)**	**201.6**	**(3.2)**

[a] Gross Domestic Product Implicit Price Deflator, 2000 = 100, used in other tables to deflate residential, commercial, industrial, motor fuel and electric utility prices.

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

[c] Implicit Price Deflator, 2000 = 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 2006) http://www.bea.gov/national/nipaweb/TableView.asp, *Survey of Current Business* (March 2006), and Bureau of Labor Statistics, (March 2006) http://data.bls.gov/cgi-bin/surveymost?cu.

8 Wisconsin Expenditures for Energy

In 2006, Wisconsin's energy expenditures were almost $19.5 billion. This was a 6 percent increase, or almost $1.1 billion above 2005 expenditures. Among the individual energy sources, petroleum expenditures increased $1,067.8 million, electricity expenditures increased $412.5 million and non-utility coal expenditures increased $13.5 million, while natural gas expenditures decreased $394.2 million.

In 2006, because of higher energy prices on all fuels, except natural gas, expenditures on petroleum, electricity and non-utility coal increased. Petroleum use decreased, primarily as a result of decreased gasoline usage in the transportation sector, while milder summer and winter weather were the major contributors to decreased electricity use. For electricity, expenditures increased $512.5 million or 7.9 percent because of higher prices. An 8.2 percent decline in natural gas use, primarily because a milder winter reduced natural gas use in the residential sector for heating and a milder summer reduced natural gas use in the electrical sector for generating electricity for cooling, along with lower prices resulted in a decrease in expenditures of over $394 million or 10.7 percent on natural gas.

In 2006, despite higher energy prices, milder winter and summer weather resulted in residential energy expenditures decreasing by 12.9 million or 0.3 percent. In 2006 dollars, 2006 residential expenditures were down 4.1 percent or $79 per household from the year before and up 20.1 percent, $308 more per household, than in 1970.

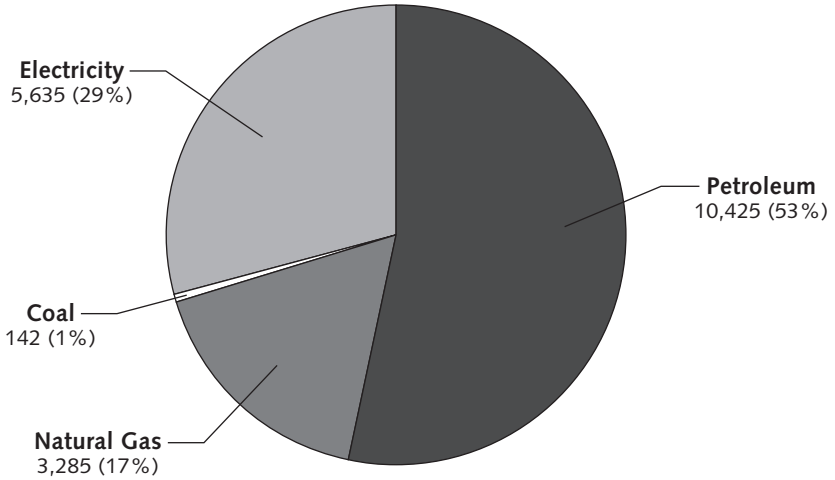
Commercial expenditures increased by over $160.5 million or 5.8 percent, with increases in electrical expenditures of almost $188 million, petroleum of $6.4 million and coal of $1.3 million off-set by a $35 million decrease in natural gas expenditures. Although industrial energy use decreased 3.2 percent, industrial expenditures increased $88 million or 2.9 percent, because the price of all fuels, except natural gas, increased. In particular, the price of electricity, which provides over 29 percent of the energy used in the industrial sector, increased over 9 percent. Despite a 0.4 percent decrease in transportation energy use, higher transportation fuel prices drove transportation energy expenditures up 12.4 percent, or $1,006.7 million.

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.

Wisconsin End Use Energy Expenditures, by Type of Fuel

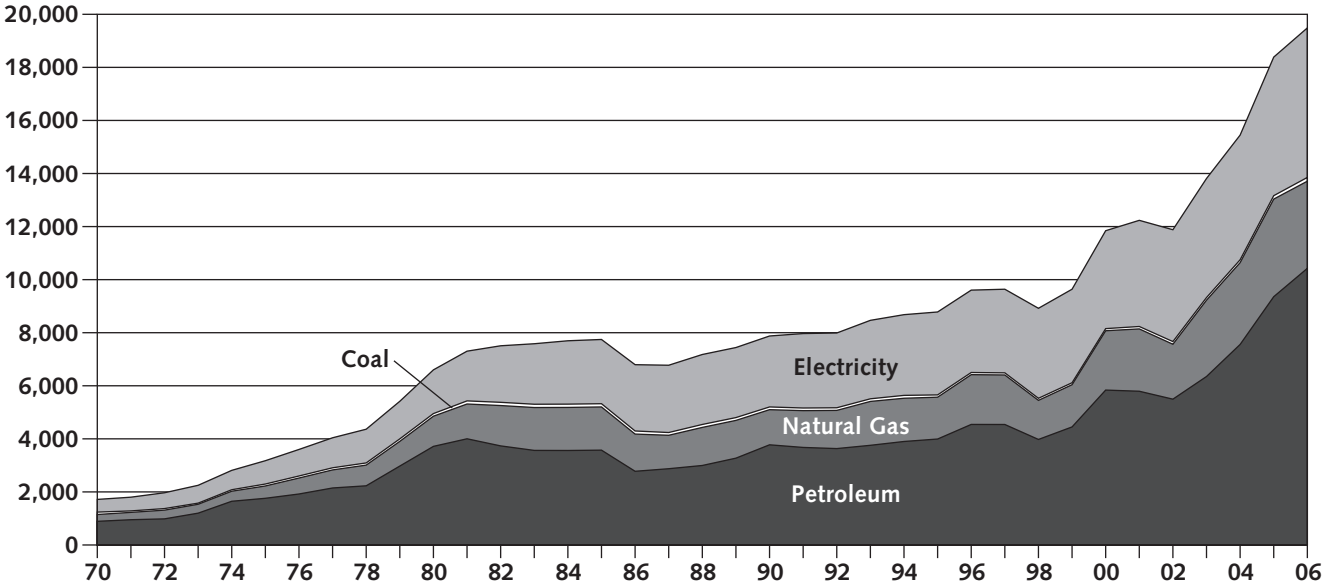
2006

(Millions of Dollars and Percent of Total)



1970-2006

(Millions of Dollars)



Source: Wisconsin Office of Energy Independence.

Wisconsin End Use Energy Expenditures, by Type of Fuel[r], 1970-2006

(Millions of Dollars and Percent of Total)

In 2006, Wisconsin's overall energy bill set a new record of over $19.5 billion by increasing $1.1 billion or 6 percent. Expenditures increased for all fuels, except natural gas. Since 1999, Wisconsin's total energy expenditures have increased over $9.8 billion or over 100 percent.

Year	Petroleum		Natural Gas		Coal		Electricity		Total
1970	891.1	(51.9%)	257.2	(15.2%)	91.3	(5.4%)	477.6	(28.3%)	1,717.1
1975	1,759.2	(55.4)	465.1	(14.6)	73.2	(2.3)	879.3	(27.7)	3,176.9
1980	3,715.9	(56.3)	1,137.4	(17.2)	99.3	(1.5)	1,648.0	(25.0)	6,600.6
1985	3,573.7	(46.1)	1,628.0	(21.0)	121.6	(1.6)	2,420.9	(31.3)	7,744.2
1990	3,775.4	(47.9)	1,324.4	(16.8)	102.9	(1.3)	2,673.9	(33.9)	7,876.6
1991	3,675.6	(46.1)	1,387.2	(17.4)	99.0	(1.2)	2,806.4	(35.2)	7,968.2
1992	3,633.4	(45.5)	1,438.6	(18.0)	98.7	(1.2)	2,818.4	(35.3)	7,989.1
1993	3,755.5	(44.4)	1,654.4	(19.5)	98.9	(1.2)	2,956.7	(34.9)	8,465.6
1994	3,900.3	(44.9)	1,629.8	(18.8)	107.7	(1.2)	3,042.4	(35.1)	8,680.2
1995	3,992.9	(45.5)	1,576.7	(18.0)	85.6	(1.0)	3,124.9	(35.6)	8,780.1
1996	4,543.1	(47.3)	1,876.5	(19.5)	81.3	(0.8)	3,105.1	(32.3)	9,606.0
1997	4,541.1	(47.1)	1,866.1	(19.4)	80.3	(0.8)	3,151.6	(32.7)	9,639.3
1998	3,977.4	(44.6)	1,473.0	(16.5)	78.3	(0.9)	3,391.6	(38.0)	8,920.4
1999	4,449.1	(46.2)	1,590.9	(16.5)	74.3	(0.8)	3,525.4	(36.6)	9,639.7
2000	5,837.9	(49.3)	2,235.9	(18.9)	80.1	(0.7)	3,690.2	(31.2)	11,844.1
2001	5,794.1	(47.4)	2,348.8	(19.2)	90.9	(0.7)	4,001.4	(32.7)	12,235.3
2002	5,495.4	(46.2)	2,070.4	(17.4)	101.5	(0.9)	4,215.4	(35.5)	11,882.7
2003	6,349.1	(46.0)	2,876.7	(20.8)	98.7	(0.7)	4,487.0	(32.5)	13,811.5
2004	7,556.5	(48.9)	3,082.8	(20.0)	109.2	(0.7)	4,697.7	(30.4)	15,446.3
2005	9,357.4	(50.9)	3,678.9	(20.0)	128.3	(0.7)	5,223.0	(28.4)	18,387.6
2006[p]	**10,425.3**	**(53.5)**	**3,284.6**	**(16.9)**	**141.8**	**(0.7)**	**5,635.5**	**(28.9)**	**19,487.1**

[r] Revised due to revisions in price and consumption data.

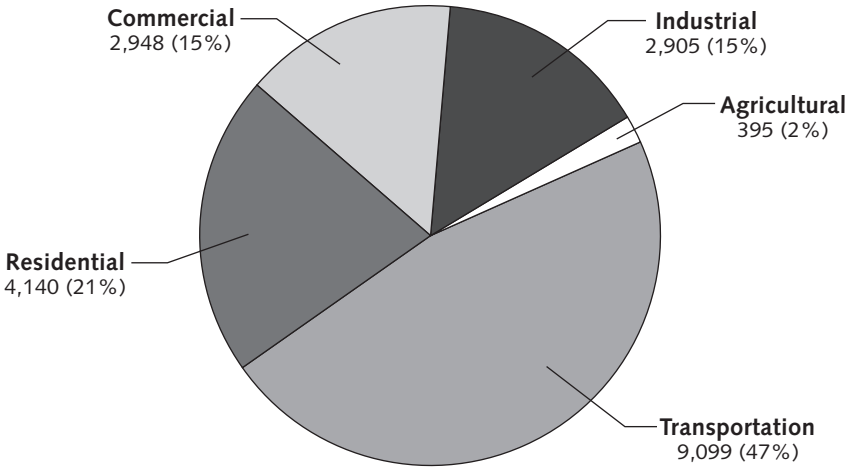
[p] Preliminary estimates.

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

Wisconsin End Use Energy Expenditures, by Economic Sector

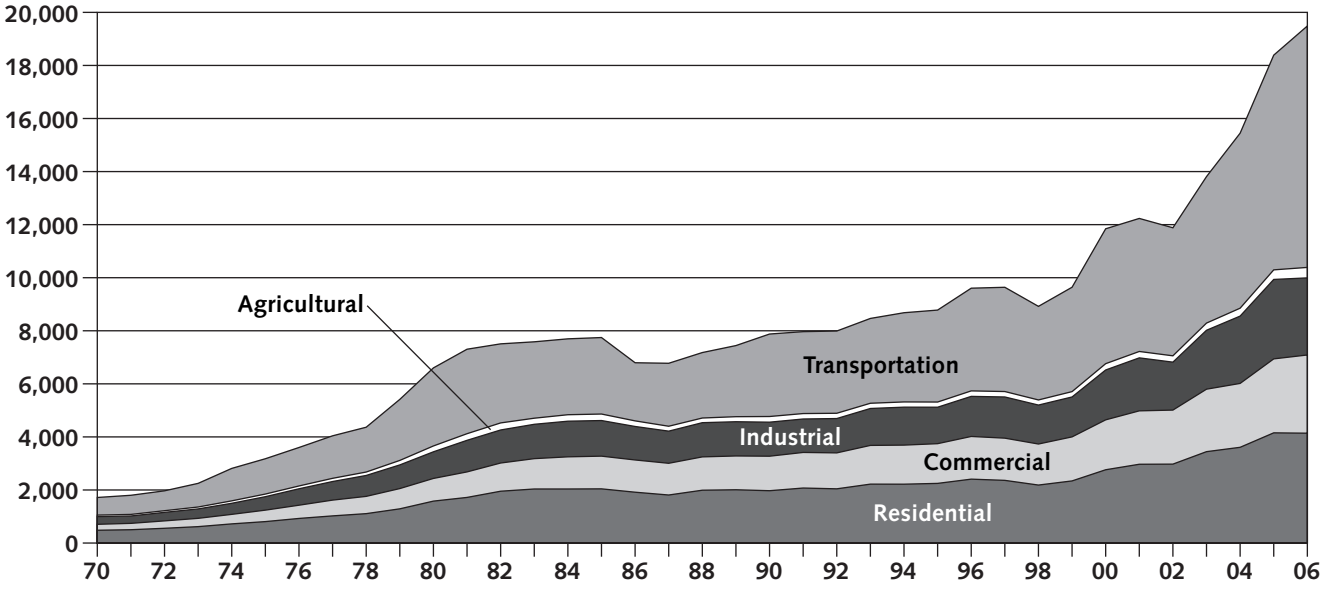
2006

(Millions of Dollars and Percent of Total)



1970-2006

(Millions of Dollars)



Source: Wisconsin Office of Energy Independence.

Wisconsin End Use Energy Expenditures, by Economic Sector[r], 1970-2006

(Millions of Dollars and Percent of Total)

In 2006, energy expenditures increased in all sectors, except residential and industrial, with total expenditures increasing almost $1.1 billion or 6 percent. This year's increase in transportation expenditures of over $1 billion was over 90 percent of the increase.

Year	Residential		Commercial		Industrial		Agricultural		Transportation		Total
1970	482.4	(28.1%)	224.4	(13.1%)	290.6	(16.9%)	56.1	(3.3%)	663.7	(38.6%)	1,717.1
1975	808.2	(25.4)	431.6	(13.6)	507.0	(16.0)	99.5	(3.1)	1330.6	(41.9)	3,176.9
1980	1,580.2	(23.9)	855.2	(13.0)	1,002.6	(15.2)	221.0	(3.3)	2,941.6	(44.6)	6,600.6
1985	2,041.8	(26.4)	1,232.7	(15.9)	1,342.3	(17.3)	244.9	(3.2)	2,882.6	(37.2)	7,744.2
1990	1,972.4	(25.0)	1,300.5	(16.5)	1,282.1	(16.3)	213.7	(2.7)	3,107.9	(39.5)	7,876.6
1991	2,073.0	(26.0)	1,342.2	(16.8)	1,260.1	(15.8)	205.4	(2.6)	3,087.5	(38.7)	7,968.2
1992	2,043.0	(25.6)	1,354.8	(17.0)	1,293.9	(16.2)	198.6	(2.5)	3,098.8	(38.8)	7,989.1
1993	2,220.5	(26.2)	1,459.5	(17.2)	1,391.4	(16.4)	197.3	(2.3)	3,197.0	(37.8)	8,465.6
1994	2,218.3	(25.6)	1,473.3	(17.0)	1,430.3	(16.5)	196.7	(2.3)	3,361.6	(38.7)	8,680.2
1995	2,248.2	(25.6)	1,496.8	(17.0)	1,374.0	(15.6)	194.9	(2.2)	3,466.3	(39.5)	8,780.1
1996	2,408.1	(25.1)	1,608.9	(16.7)	1,510.1	(15.7)	207.4	(2.2)	3,871.5	(40.3)	9,606.0
1997	2,361.7	(24.5)	1,591.3	(16.5)	1,552.4	(16.1)	204.9	(2.1)	3,929.0	(40.8)	9,639.3
1998	2,185.2	(24.5)	1,547.4	(17.3)	1,468.4	(16.5)	192.7	(2.2)	3,526.7	(39.5)	8,920.4
1999	2,340.6	(24.3)	1,659.5	(17.2)	1,503.6	(15.6)	201.8	(2.1)	3,934.2	(40.8)	9,639.7
2000	2,761.9	(23.3)	1,880.8	(15.9)	1,879.4	(15.9)	237.9	(2.0)	5,084.1	(42.9)	11,844.1
2001	2,969.3	(24.3)	2,013.4	(16.5)	1,997.4	(16.3)	240.9	(2.0)	5,014.4	(41.0)	12,235.3
2002	2,974.5	(25.0)	2,037.1	(17.1)	1,805.9	(15.2)	238.8	(2.0)	4,826.3	(40.6)	11,882.7
2003	3,444.2	(24.9)	2,355.4	(17.1)	2,220.2	(16.1)	271.2	(2.0)	5,520.5	(40.0)	13,811.5
2004	3,607.6	(23.4)	2,407.7	(15.6)	2,536.8	(16.4)	298.5	(1.9)	6,595.6	(42.7)	15,446.3
2005	4,152.9	(22.6)	2,787.5	(15.2)	2,993.1	(16.3)	362.2	(2.0)	8,091.9	(44.0)	18,387.6
2006[p]	**4,139.9**	**(21.2)**	**2,948.0**	**(15.1)**	**2,905.1**	**(14.9)**	**395.5**	**(2.0)**	**9,098.6**	**(46.7)**	**19,487.1**

[r] Revised due to revisions in price and consumption data.

[p] Preliminary estimates.

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

Wisconsin Expenditures for Residential Energy, by Type of Fuel[r], 1970-2006

(Millions of Dollars and Percent of Total)

The off-setting combination of milder winter weather and summer weather and higher energy prices compared to last year resulted in residential energy expenditures decreasing 0.3 percent in 2006. Petroleum and electricity expenditures were 0.8 percent and 4.9 percent higher, respectively, than a year ago, while natural gas expenditures were 7.3 percent lower.

Year	Petroleum		Natural Gas		Coal		Electricity		Total[a]
1970	142.6	(29.6%)	132.4	(27.4%)	15.5	(3.2%)	191.9	(39.8%)	482.4
1975	250.5	(31.0)	203.8	(25.2)	11.8	(1.5)	342.0	(42.3)	808.2
1980	483.8	(30.6)	473.1	(29.9)	9.0	(0.6)	614.4	(38.9)	1,580.2
1985	393.7	(19.3)	752.1	(36.8)	3.8	(0.2)	892.2	(43.7)	2,041.8
1990	342.9	(17.4)	652.6	(33.1)	1.3	(0.1)	975.6	(49.5)	1,972.4
1991	321.2	(15.5)	699.4	(33.7)	1.5	(0.1)	1,050.8	(50.7)	2,073.0
1992	291.5	(14.3)	723.3	(35.4)	1.4	(0.1)	1,026.8	(50.3)	2,043.0
1993	302.6	(13.6)	820.1	(36.9)	1.3	(0.1)	1,096.5	(49.4)	2,220.5
1994	278.0	(12.5)	815.8	(36.8)	1.2	(0.1)	1,123.2	(50.6)	2,218.3
1995	282.7	(12.6)	792.0	(35.2)	1.1	(0.0)	1,172.4	(52.1)	2,248.2
1996	357.9	(14.9)	889.8	(37.0)	1.0	(0.0)	1,159.3	(48.1)	2,408.1
1997	336.1	(14.2)	878.7	(37.2)	1.0	(0.0)	1,145.9	(48.5)	2,361.7
1998	237.6	(10.9)	712.6	(32.6)	0.9	(0.0)	1,234.1	(56.5)	2,185.2
1999	265.3	(11.3)	787.5	(33.6)	0.8	(0.0)	1,287.1	(55.0)	2,340.6
2000	394.5	(14.3)	1,021.6	(37.0)	0.7	(0.0)	1,345.1	(48.7)	2,761.9
2001	402.9	(13.6)	1,095.9	(36.9)	0.7	(0.0)	1,469.8	(49.5)	2,969.3
2002	359.3	(12.1)	1,009.6	(33.9)	0.7	(0.0)	1,604.9	(54.0)	2,974.5
2003	446.0	(13.0)	1,316.5	(38.2)	0.6	(0.0)	1,681.0	(48.8)	3,444.2
2004	496.7	(13.8)	1,369.2	(38.0)	0.6	(0.0)	1,741.2	(48.3)	3,607.6
2005	613.3	(14.8)	1,564.2	(37.7)	0.6	(0.0)	1,974.8	(47.6)	4,152.9
2006[p]	**617.9**	**(14.9)**	**1,450.4**	**(35.0)**	**0.5**	**(0.0)**	**2,071.2**	**(50.0)**	**4,139.9**

[a] Does not include renewable energy, except wood, wind and hydro used in electricity production.

[r] Revised due to revisions in price and consumption data.

[p] Preliminary estimates.

Source: Compiled from tables in this publication for Wisconsin residential energy use and prices.

Wisconsin Expenditures for Commercial Energy, by Type of Fuel[r], 1970-2006

(Millions of Dollars and Percent of Total)

Commercial energy expenditures increased 5.8 percent in 2006. Commercial energy expenditures are dominated by electricity used for lighting, cooling, ventilation and office equipment. Despite a cooler summer, electricity use increased slightly which combined with higher electricity prices caused electricity expenditures to increase 10.9 percent. A milder winter combined with lower natural gas prices caused commercial natural gas expenditures to decrease 4 percent in 2006.

Year	Petroleum		Natural Gas		Coal		Electricity		Total
1970	34.7	(15.4%)	40.9	(18.2%)	11.7	(5.2%)	137.1	(61.1%)	224.4
1975	70.8	(16.4)	78.7	(18.2)	9.1	(2.1)	273.0	(63.3)	431.6
1980	81.5	(9.5)	210.6	(24.6)	7.7	(0.9)	555.4	(64.9)	855.2
1985	104.5	(8.5)	311.0	(25.2)	9.3	(0.8)	807.9	(65.5)	1,232.7
1990	92.9	(7.1)	279.5	(21.5)	8.2	(0.6)	920.0	(70.7)	1,300.5
1991	79.2	(5.9)	297.4	(22.2)	8.1	(0.6)	957.6	(71.3)	1,342.2
1992	76.6	(5.7)	305.3	(22.5)	8.0	(0.6)	965.0	(71.2)	1,354.8
1993	79.6	(5.5)	374.0	(25.6)	7.9	(0.5)	998.0	(68.4)	1,459.5
1994	72.2	(4.9)	369.7	(25.1)	7.9	(0.5)	1,023.6	(69.5)	1,473.3
1995	73.7	(4.9)	374.1	(25.0)	6.2	(0.4)	1,042.8	(69.7)	1,496.8
1996	95.6	(5.9)	449.7	(28.0)	7.8	(0.5)	1,055.8	(65.6)	1,608.9
1997	85.0	(5.3)	441.3	(27.7)	7.7	(0.5)	1,057.3	(66.4)	1,591.3
1998	57.7	(3.7)	346.9	(22.4)	7.9	(0.5)	1,134.9	(73.3)	1,547.4
1999	66.5	(4.0)	363.1	(21.9)	8.0	(0.5)	1,221.9	(73.6)	1,659.5
2000	103.4	(5.5)	480.8	(25.6)	8.0	(0.4)	1,288.7	(68.5)	1,880.8
2001	103.7	(5.2)	526.4	(26.1)	8.6	(0.4)	1,374.7	(68.3)	2,013.4
2002	91.4	(4.5)	479.2	(23.5)	8.8	(0.4)	1,457.8	(71.6)	2,037.1
2003	114.8	(4.9)	666.2	(28.3)	9.2	(0.4)	1,565.2	(66.5)	2,355.4
2004	129.3	(5.4)	690.5	(28.7)	10.0	(0.4)	1,577.9	(65.5)	2,407.7
2005	171.8	(6.2)	877.6	(31.5)	12.2	(0.4)	1,725.8	(61.9)	2,787.5
2006[p]	**178.3**	**(6.0)**	**842.6**	**(28.6)**	**13.6**	**(0.5)**	**1,913.6**	**(64.9)**	**2,948.0**

[r] Revised due to revisions in price and consumption data.

[p] Preliminary estimates.

Source: Compiled from tables in this publication for Wisconsin commercial energy use and prices.

Wisconsin Expenditures for Industrial Energy, by Type of Fuel[r], 1970-2006

(Millions of Dollars and Percent of Total)

In 2006, industrial energy expenditures increased 2.9 percent. Industrial energy use is dominated by electricity and natural gas. Expenditures on electricity increased 8.2 percent, while natural gas expenditures decreased 19.8 percent. Also, in 2006, petroleum and coal expenditures increased 12.5 percent and 10.6 percent, respectively. Electricity, petroleum and coal expenditures for Wisconsin's industrial sector all reached record highs, as the price of these three fuels increased in 2006. In contrast, natural gas prices, after increasing almost 30 percent in 2005, declined 11.8 percent in 2006.

Year	Petroleum		Natural Gas		Coal		Electricity		Total
1970	18.7	(6.4%)	83.8	(28.9%)	64.1	(22.1%)	124.0	(42.7%)	290.6
1975	46.9	(9.3)	182.6	(36.0)	52.4	(10.3)	225.1	(44.4)	507.0
1980	64.1	(6.4)	453.7	(45.3)	82.6	(8.2)	402.1	(40.1)	1,002.6
1985	58.3	(4.3)	564.9	(42.1)	108.5	(8.1)	610.6	(45.5)	1,342.3
1990	117.8	(9.2)	392.3	(30.6)	93.5	(7.3)	678.5	(52.9)	1,282.1
1991	83.7	(6.6)	390.4	(31.0)	89.4	(7.1)	696.6	(55.3)	1,260.1
1992	71.7	(5.5)	410.0	(31.7)	89.4	(6.9)	722.9	(55.9)	1,293.9
1993	84.6	(6.1)	460.4	(33.1)	89.8	(6.5)	756.6	(54.4)	1,391.4
1994	97.2	(6.8)	444.3	(31.1)	98.6	(6.9)	790.2	(55.2)	1,430.3
1995	80.3	(5.8)	410.6	(29.9)	78.3	(5.7)	804.8	(58.6)	1,374.0
1996	114.9	(7.6)	536.9	(35.6)	72.5	(4.8)	785.8	(52.0)	1,510.1
1997	90.0	(5.8)	546.1	(35.2)	71.7	(4.6)	844.6	(54.4)	1,552.4
1998	72.8	(5.0)	413.6	(28.2)	69.5	(4.7)	912.5	(62.1)	1,468.4
1999	92.7	(6.2)	440.4	(29.3)	65.5	(4.4)	905.0	(60.2)	1,503.6
2000	133.4	(7.1)	733.5	(39.0)	71.3	(3.8)	941.1	(50.1)	1,879.4
2001	155.4	(7.8)	726.5	(36.4)	81.6	(4.1)	1,033.9	(51.8)	1,997.4
2002	107.5	(6.0)	581.6	(32.2)	92.0	(5.1)	1,024.8	(56.7)	1,805.9
2003	134.2	(6.0)	894.0	(40.3)	88.9	(4.0)	1,103.1	(49.7)	2,220.2
2004	180.9	(7.1)	1,023.1	(40.3)	98.6	(3.9)	1,234.2	(48.7)	2,536.8
2005	272.8	(9.1)	1,237.0	(41.3)	115.5	(3.9)	1,367.8	(45.7)	2,993.1
2006[p]	**306.2**	**(10.5)**	**991.7**	**(34.1)**	**127.7**	**(4.4)**	**1,479.5**	**(50.9)**	**2,905.1**

[r] Revised due to revisions in price and consumption data.

[p] Preliminary estimates.

Source: Compiled from tables in this publication for Wisconsin industrial energy use and prices.

Wisconsin Expenditures for Agricultural Energy, by Type of Fuel[r], 1970-2006

(Millions of Dollars and Percent of Total)

In 2006, Wisconsin's agricultural energy bill increased 9.2 percent, primarily because petroleum and electricity prices increased. Higher prices resulted in a 8 percent increase in petroleum expenditures and a 10.7 percent increase in electricity prices.

Year	Motor Gasoline	Diesel Fuel[a]	LPG	Total Petroleum		Electricity		Total
1970	19.1	9.8	2.6	31.5	(56.2%)	24.6	(43.8%)	56.1
1975	30.9	24.1	5.4	60.4	(60.7)	39.1	(39.3)	99.5
1980	38.7	94.8	11.5	144.9	(65.6)	76.0	(34.4)	221.0
1985	22.4	98.3	13.9	134.6	(55.0)	110.3	(45.0)	244.9
1990	9.6	93.3	10.9	113.9	(53.3)	99.8	(46.7)	213.7
1991	8.0	86.4	9.7	104.1	(50.7)	101.3	(49.3)	205.4
1992	7.7	75.7	11.4	94.9	(47.8)	103.7	(52.2)	198.6
1993	6.3	73.6	11.8	91.7	(46.5)	105.6	(53.5)	197.3
1994	6.5	73.1	11.7	91.3	(46.4)	105.4	(53.6)	196.7
1995	6.6	72.0	11.4	90.0	(46.2)	104.9	(53.8)	194.9
1996	6.5	79.7	17.0	103.2	(49.7)	104.2	(50.3)	207.4
1997	6.5	79.2	15.4	101.1	(49.3)	103.9	(50.7)	204.9
1998	5.4	68.1	9.2	82.6	(42.9)	110.1	(57.1)	192.7
1999	5.9	74.0	10.5	90.4	(44.8)	111.4	(55.2)	201.8
2000	7.1	102.0	13.5	122.6	(51.5)	115.3	(48.5)	237.9
2001	7.0	96.6	14.2	117.8	(48.9)	123.1	(51.1)	240.9
2002	6.4	92.3	12.2	111.0	(46.5)	127.9	(53.5)	238.8
2003	7.5	112.2	13.9	133.6	(49.2)	137.7	(50.8)	271.2
2004	9.1	128.7	16.3	154.0	(51.6)	144.4	(48.4)	298.5
2005	11.4	179.4	16.9	207.7	(57.3)	154.6	(42.7)	362.2
2006[p]	**13.1**	**193.8**	**17.4**	**224.3**	**(56.7)**	**171.1**	**(43.3)**	**395.5**

[a] Includes fuel oil and kerosene.

[r] Revised due to revisions in price and consumption data.

[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[r], 1970-2006

(Millions of Dollars)

Although consumption of transportation fuels decreased 0.4 percent in 2006, Wisconsin's transportation energy bill was up 12.4 percent (over a $1billion dollar increase), because of higher fuel prices. Almost three-quarters of transportation expenditures in 2006 were for vehicle gasoline, costing motorists over $6.6 billion.

Year	Vehicle Gasoline[a]	Diesel Fuel	Aviation Gasoline	Jet Fuel	Middle Distillate	Residual Oil	Total
1970	625.9	22.7	2.4	5.9	6.3	0.4	663.7
1975	1,215.8	73.6	4.5	21.2	13.8	1.7	1,330.6
1980	2,512.2	307.6	8.4	72.7	37.8	3.0	2,941.6
1985	2,369.2	428.4	5.5	52.0	23.7	3.8	2,882.6
1990	2,429.1	573.1	6.1	71.5	25.0	3.1	3,107.9
1991	2,399.1	585.9	5.7	72.8	21.9	2.1	3,087.5
1992	2,405.1	601.2	5.6	63.8	20.7	2.4	3,098.8
1993	2,457.2	654.1	6.4	55.8	21.5	1.9	3,197.0
1994	2,581.1	695.0	6.2	54.3	23.1	1.9	3,361.6
1995	2,661.8	724.3	6.5	50.9	22.7	0.0	3,466.3
1996	2,974.7	798.0	7.1	62.5	29.2	0.0	3,871.5
1997	3,006.2	830.7	7.2	60.4	24.6	0.0	3,929.0
1998	2,692.2	761.4	6.0	47.6	19.6	0.0	3,526.7
1999	2,993.5	852.0	7.4	55.6	25.7	0.0	3,934.2
2000	3,850.2	1,101.5	9.3	85.3	37.8	0.0	5,084.1
2001	3,842.3	1,054.6	8.0	73.8	35.7	0.0	5,014.4
2002	3,718.4	997.7	6.5	72.2	31.5	0.0	4,826.3
2003	4,284.1	1,113.0	6.1	83.8	33.6	0.0	5,520.5
2004	5,034.0	1,388.3	7.5	121.4	44.4	0.0	6,595.6
2005	6,005.6	1,815.2	9.3	193.6	68.2	0.0	8,091.9
2006[p]	**6,603.1**	**2,189.6**	**8.9**	**213.2**	**83.9**	**0.0**	**9,098.6**

[a] Includes gasohol.

[r] Revised due to revisions in price and consumption data.

[p] Preliminary estimates.

Source: Compiled from tables in this publication for Wisconsin transportation energy use and prices.

9 Miscellaneous

This chapter presents data that can be used to compare Wisconsin's energy consumption to non-energy indicators. The first table contains national population, energy and economic data. The remaining tables give Wisconsin-specific data.

Wisconsin's population is provided for readers interested in making per capita comparisons. Other indicators helpful in comparing current and past state energy use statistics are the number of households and personal income in Wisconsin. For purposes of explaining recent increases in residential energy use, personal income per capita and per household are shown in current and constant 2006 dollars. Similarly, the number of motor vehicles registered in the state will help in comparing current and past use of motor fuels, while appliance data makes it easier to understand residential energy use trends. Employment trends indicate changes in economic activity in the commercial and industrial sectors.

Because the energy needed to heat and cool homes and other buildings strongly depends on the outdoor temperature, a final set of tables lists typical and historic degree day figures throughout Wisconsin in eleven degree day zones. The heating and cooling degree days shown 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. In addition to heating and cooling degree days in different parts of the state, population-weighted averages for the state are offered for readers interested in comparing the severity of winters and summers to statewide energy use.

United States Population, Gross Domestic Product, Resource Energy Consumption and Electricity Sales 1970-2006[r]

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 about 21 percent since 1980, while energy use per dollar of Gross Domestic Product declined about 43 percent over the same period.

Year	Resident Population (Thousands)[a,r]	Gross Domestic Product[b] (Bil. of 2000$)	Resource Energy Consumption (Quad. Btu)[c]	Electric Sales to Ultimate Customers (Bil. of kWh)	Resource Energy Per GDP (Thous. Btu/2000$)	Electric Sales Per GDP (kWh/2000$)
1970	205,052	3,771.9	68.00	1,391.4	18.03	0.3689
1975	215,973	4,311.2	72.00	1,747.1[d]	16.70	0.4052
1980	227,225	5,161.7	78.28	2,094.4	15.17	0.4058
1985	237,924	6,053.7	76.58	2,324.0	12.65	0.3839
1990	249,623	7,112.5	84.73	2,712.6	11.91	0.3814
1995	266,278	8,031.7	91.20	3,013.3	11.36	0.3752
1996	269,394	8,328.9	94.23	3,101.1	11.31	0.3723
1997	272,647	8,703.5	94.79	3,145.6	10.89	0.3614
1998	275,854	9,066.9	95.20	3,264.2	10.50	0.3600
1999	279,040	9,470.3	96.83	3,312.1	10.22	0.3497
2000	282,217	9,817.0	98.97	3,421.4	10.08	0.3485
2001	285,226	9,890.7	96.30	3,394.5	9.74	0.3432
2002	288,126	10,048.8	97.79	3,465.5	9.73	0.3449
2003	290,796	10,301.0	98.10	3,493.7	9.52	0.3392
2004	293,638	10,703.5	100.20	3,547.5	9.36	0.3314
2005	296,507	11,048.6	100.51	3,661.0	9.10	0.3314
2006[p]	**299,398**	**11,422.4**	**99.61**	**3,665.1**	**8.72**	**0.3209**

[a] As of July 1.

[b] Gross Domestic Product adjusted for inflation using Gross Domestic Product Implicit Price Deflator (page 106).

[c] Quadrillions of Btu.

[d] Beginning in 1975, the DOE data source has been used.

[p] Preliminary estimates.

[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data Report* [DOE/EIA-0214 (97)] (September 1999), *Monthly Energy Review* [DOE/EIA-0035 (2007/06)] (June 2007), http://www.eia.doe.gov/mer/ ; Edison Electric Institute, *Statistical Yearbook* (various years); U.S. Department of Commerce, Bureau of Economic Analysis, *Economic Indicators* (May 2006); U.S. Department of Commerce, Bureau of Census, *Estimates of the Population of the United States; Annual Time Series*, Series NA-EST 2006-01 (June 2007). http://www.census.gov/popest/national/NA-EST2006-01.html

Wisconsin Population, Number of Households, Real Gross State Product and Total and Per Capita Personal Income 1970-2006

Wisconsin's population and number of households have continued to grow. The number of households has grown faster than the population, as the number of persons per household has declined. Household income growth, in constant 2006 dollars, has been about 1.3 percent annually over the sixteen-year period since 1990. In 2006, Gross State Product in 2006 dollars increased by 1.8 percent, reflecting a growing Wisconsin economy.

Year	Population[a,r] (Thousands)	No. of Households[b,r] (Thousands)	Gross State Product (Million 2006 Dollars)	Personal Income[r] (Current Dollars)			Personal Income (2006 Dollars)		
				Total (Million Dollars)	Dollars Per Capita	Dollars Per Household	Total (Million Dollars)	Dollars Per Capita	Dollars Per Household
1970	4,417.8	1,328.8	85,477	17,609	3,986	13,252	74,216	16,799	55,852
1975	4,565.8	1,486.8	96,137	27,810	6,091	18,705	84,916	18,598	57,113
1980	4,705.6	1,652.3	114,662	47,623	10,120	28,823	102,252	21,730	61,886
1985	4,744.7	1,720.4	124,185	65,709	13,849	38,195	109,370	23,051	63,574
1990	4,891.8	1,822.1	142,661	88,635	18,119	48,644	126,049	25,767	69,177
1995	5,134.1	1,946.3	168,926	115,180	22,434	59,179	145,091	28,260	74,547
1996	5,182.0	1,971.6	175,263	121,718	23,489	61,736	150,484	29,040	76,326
1997	5,233.9	1,998.4	184,309	129,099	24,666	64,601	157,000	29,997	78,563
1998	5,280.0	2,024.5	193,267	138,667	26,263	68,494	166,783	31,588	82,382
1999	5,323.7	2,053.9	200,380	144,702	27,181	70,452	171,552	32,224	83,525
2000	5,363.7	2,084.6	203,915	153,548	28,627	73,658	178,162	33,216	85,466
2001	5,413.8	2,114.3	206,160	158,888	29,349	75,149	180,037	33,255	85,152
2002	5,463.1	2,145.2	210,040	163,309	29,893	76,128	181,867	33,290	84,779
2003	5,501.3	2,171.6	214,082	168,120	30,560	77,418	183,319	33,323	84,417
2004	5,544.9	2,201.7	220,283	176,482	31,828	80,157	187,126	33,747	84,992
2005	5,587.3	2,229.5	222,650	183,948	32,923	82,506	189,316	33,883	84,914
2006[p]	**5,622.8**	**2,252.8**	**226,500**	**192,818**	**34,292**	**85,590**	**192,818**	**34,292**	**85,590**

[a] As of April 1.

[b] Household numbers for intercensal years estimated on basis of Public Service Commission of Wisconsin reports of electric utility residential customers.

[p] Preliminary estimates.

[r] Revised.

Source: U.S. Department of Commerce, Bureau of Census, *2000 Census of Population and Housing*, CPH-1-51 (August 2001); Wisconsin Department of Administration, Demographic Services Center, http://www.doa.state.wi.us/dir/ Population and Housing Estimates; Final Official Population Estimates and Census Counts for Wisconsin Counties: 1970 – 2006; U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, http://www.bea.gov/bea/regional/

Wisconsin Employment, by Type 1970-2006[r]

(Thousands)

In 2006, Wisconsin's working age labor force increased 1.0 percent; however, because of the recovery of the economy, state employment increased 1.0 percent (29,100 jobs). Employment in the manufacturing sector increased 0.1 percent compared to an increase of 4.8 percent in the mining and construction sector and a 1.0 percent increase in the commercial sector. Most Wisconsin jobs are classified as being commercial. Employment in manufacturing has fallen to levels not seen since 1975, while commercial employment is nearly double that of 1975.

Year	Working Age 18-64[a]	Total Employment[b]	Percent Working Age Employed	Mining and Construction	Manufacturing	Commercial
1970	2,362.6	1,530.5	(64.8%)	64.8	500.9	964.8
1975	2,572.5	1,677.0	(65.2)	63.4	507.1	1,106.5
1980	2,783.7	1,938.1	(69.6)	72.7	557.9	1,307.5
1985	2,858.3	1,983.1	(69.4)	66.5	513.9	1,402.7
1990	2,949.3	2,291.5	(77.7)	91.8	523.0	1,676.7
1995	3,122.9	2,558.6	(81.9)	105.9	566.6	1,886.1
2000	3,292.4	2,833.8	(86.1)	128.8	594.1	2,110.8
2001	3,336.3	2,813.9	(84.3)	129.3	560.3	2,124.3
2002	3,379.4	2,782.4	(82.3)	127.9	528.3	2,126.1
2003	3,417.8	2,775.3	(81.2)	127.9	504.0	2,143.4
2004	3,455.2	2,807.1	(81.2)	130.6	502.7	2,173.8
2005	3,490.6	2,839.6	(81.3)	133.2	506.5	2,199.8
2006[p]	**3,525.8**	**2,868.7**	**(81.4)**	**139.6**	**507.0**	**2,222.1**

[a] As of April 1.

[b] Nonfarm wage and salary employment.

[r] Employment data was revised to conform with the North American Industrial Classification System (NAICS), rather than the Standard Industrial Classification (SIC) system used previously. This results in the shifting of approximately 30,000 employees from the manufacturing to the commercial sector. A significant portion of this shift is management personnel in industrial facilities being moved from the industrial sector to the commercial sector.

[p] Preliminary estimates.

Source: Wisconsin Department of Administration, Demographic Services Center, *Revised Estimated Population for Wisconsin Counties, 1990-2000* (May 6, 2003), and *Final Population Projections for Wisconsin by Sex and Single Year of Age, 2000-2015* (January 2004); Wisconsin Department of Workforce Development, unpublished employment data (March 2007) http://worknet.wisconsin.gov/worknet/daces.aspx?menuselection=da; Wisconsin Department of Revenue, *Special Report, Wisconsin Historical Employment Data: 1963-1987* (November 19, 1993).

Wisconsin Occupied Dwelling Units, by Type of Fuel for Space Heating, 1970, 1980, 1990 and 2000

(Number of Units and Percent of Total)

Fuel	1970		1980		1990		2000	
Natural Gas	654,851	(49.3%)	945,092	(57.2%)	1,111,733	(61.0%)	1,384,230	(66.4%)
Fuel Oil[a]	521,256	(39.2%)	425,622	(25.8%)	265,600	(14.6%)	158,499	(7.6%)
LP Gas	85,549	(6.4%)	130,476	(7.9%)	152,823	(8.4%)	228,408	(11.0%)
Electricity	24,763	(1.9%)	101,489	(6.1%)	168,615	(9.3%)	236,755	(11.4%)
Wood	6,795	(0.5%)	42,783	(2.6%)	107,239	(5.9%)	56,862	(2.7%)
Coal or Coke	29,708	(2.2%)	2,591	(0.2%)	787	(b)	330	(b)
Other	5,334	(0.4%)	3,578	(0.2%)	11,294	(0.6%)	13,839	(0.7%)
None	548	(b)	630	(b)	4,027	(0.2%)	5,621	(0.3%)
Total	**1,328,804**		**1,652,261**		**1,822,118**		**2,084,544**	

[a] Includes kerosene.

[b] Less than 0.05 percent.

Source: U.S. Department of Commerce, Bureau of the Census, *Census of Housing* (1970, 1980, 1990 and 2000).

Wisconsin Occupied Dwelling Units, by Type of Fuel for Water Heating, 1970, 1980, 1990 and 2000

(Number of Units and Percent of Total)

Fuel	1970		1980		1990[c]		2000[c]	
Natural Gas	668,219	(50.3%)	877,135	(53.1%)	1,036,118	(56.9%)	1,244,544	(59.7%)
Fuel Oil[a]	36,913	(2.8%)	36,048	(2.2%)	32,000	(1.8%)	25,000	(1.2%)
LP Gas	93,955	(7.1%)	125,741	(7.6%)	150,000	(8.2%)	220,000	(10.6%)
Electricity	491,803	(37.0%)	599,827	(36.3%)	592,000	(32.5%)	585,000	(28.1%)
Wood	864	(0.1%)	b		b		b	
Coal or Coke	3,612	(0.3%)	b		b		b	
Other	1,389	(0.1%)	4,755	(0.3%)	7,000	(0.4%)	6,000	(0.3%)
None	32,049	(2.4%)	8,755	(0.5%)	5,000	(0.3%)	4,000	(0.2%)
Total	**1,328,804**		**1,652,261**		**1,822,118**		**2,084,544**	

[a] Includes kerosene.

[b] Included with "Other".

[c] Estimate by Wisconsin Office of Energy Independence.

Source: U.S. Department of Commerce, Bureau of the Census, *Census of Housing* (1970, 1980, 1990 and 2000).

Wisconsin Motor Vehicle Registrations, by Type of Vehicle[a], 1970-2007

Auto registrations showed a slight decrease in 2007. However, because of the growing popularity of vans, sports utility vehicles and light trucks, all of which are included in the truck category, truck registrations increased 2.1 percent. Total vehicle registrations increased 2.4 percent.

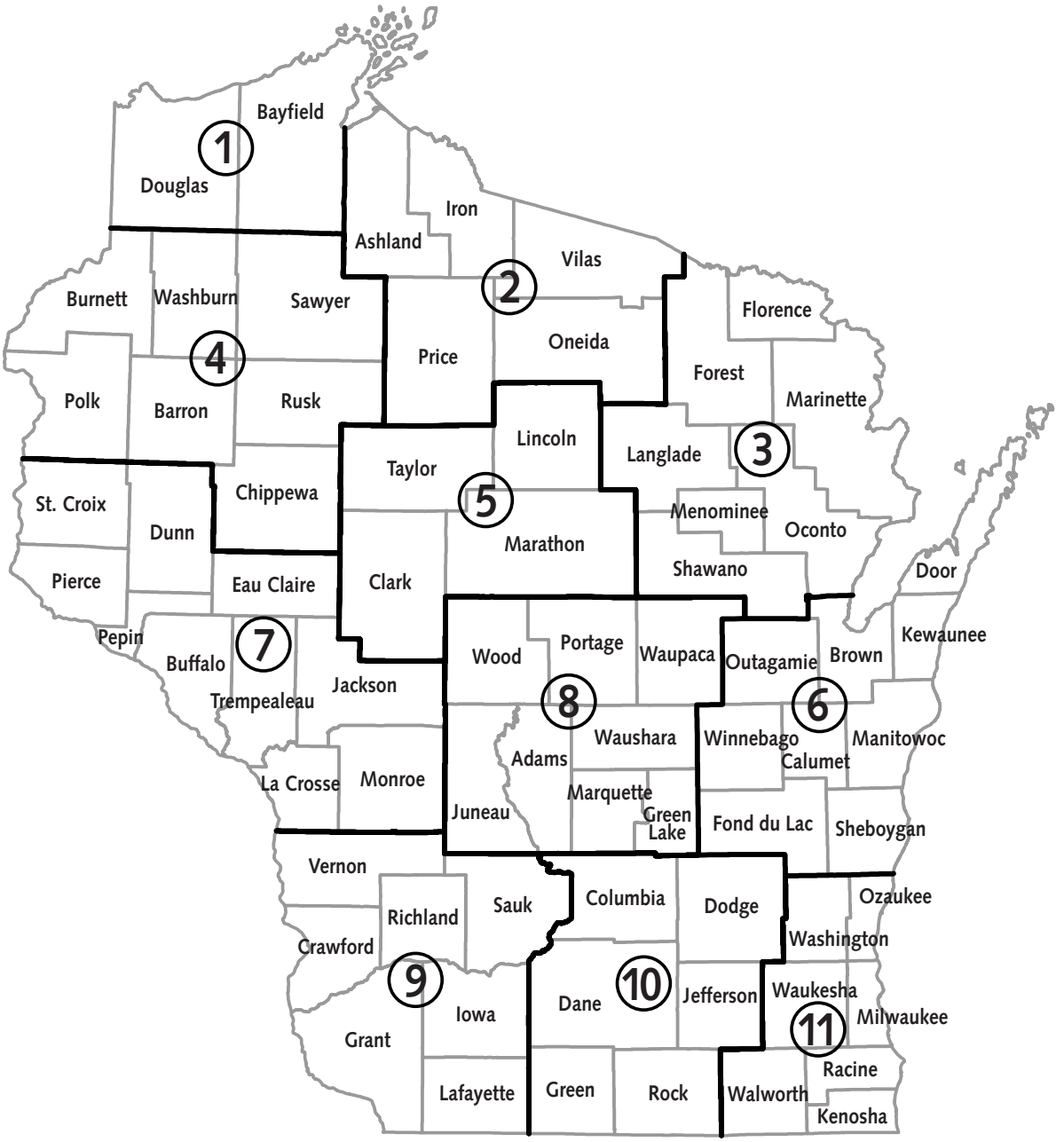
Year	Autos	Trucks	Buses	Motorcycles	Trailers	Total[b]
1970	1,762,681	317,096	8,178	53,642	64,065	2,210,492
1975	2,023,427	426,756	11,422	96,629	81,378	2,644,681
1980	2,248,951	665,012	13,375	169,329	93,288	3,215,302
1985	2,310,024	771,264	10,325	176,037	101,030	3,406,196
1990	2,456,175	1,053,280	14,518	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**	**2,405,488**	**13,517**	**324,833**	**419,816**	**5,591,536**

[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, Division of Planning and Budget, *Vehicle Registration File Analysis* (July 1, 2007).

Wisconsin Division of Energy Services Degree Day Zones



Source: Wisconsin Department of Administration, Division of Energy Services.

Wisconsin Normal Heating Degree Days, by Zone and Month[a]

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[b]
January	1,715	1,688	1,612	1,678	1,654	1,537	1,647	1,635	1,568	1,490	1,384	1,507
February	1,374	1,371	1,321	1,317	1,329	1,270	1,301	1,311	1,233	1,209	1,132	1,223
March	1,182	1,176	1,120	1,088	1,107	1,065	1,064	1,086	997	978	949	1,016
April	768	725	682	621	637	638	601	629	576	576	611	616
May	412	367	334	286	316	301	263	301	263	261	318	300
June	138	128	106	83	79	85	58	71	51	63	86	79
July	48	50	35	27	18	19	16	20	13	12	13	17
August	71	83	60	53	57	38	31	50	42	33	18	33
September	267	283	246	218	232	208	197	208	171	183	134	180
October	614	640	590	555	572	540	551	535	501	504	443	505
November	1044	1,057	991	1,018	1,012	925	997	986	937	892	808	900
December	1,517	1,512	1,431	1,508	1,480	1,350	1,470	1,450	1,378	1,298	1,200	1,323
Total	**9,150**	**9,080**	**8,528**	**8,452**	**8,493**	**7,976**	**8,196**	**8,282**	**7,730**	**7,499**	**7,096**	**7,699**

[a] 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 1971 through 2000.

[b] Population-weighted statewide average, based on 2000 census.

Wisconsin Normal Cooling Degree Days, by Zone and Month[a]

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[b]
April	0	0	1	1	1	3	1	1	1	6	5	3
May	10	25	25	38	29	24	44	36	35	33	27	30
June	31	52	73	85	88	95	111	92	108	123	114	105
July	116	117	147	164	166	177	214	164	200	214	222	199
August	83	83	105	121	125	126	155	120	163	154	180	151
September	10	11	23	20	16	36	28	27	35	48	63	44
October	0	0	1	0	0	2	1	1	1	4	5	3
Total	**250**	**288**	**375**	**429**	**425**	**463**	**554**	**441**	**543**	**582**	**616**	**535**

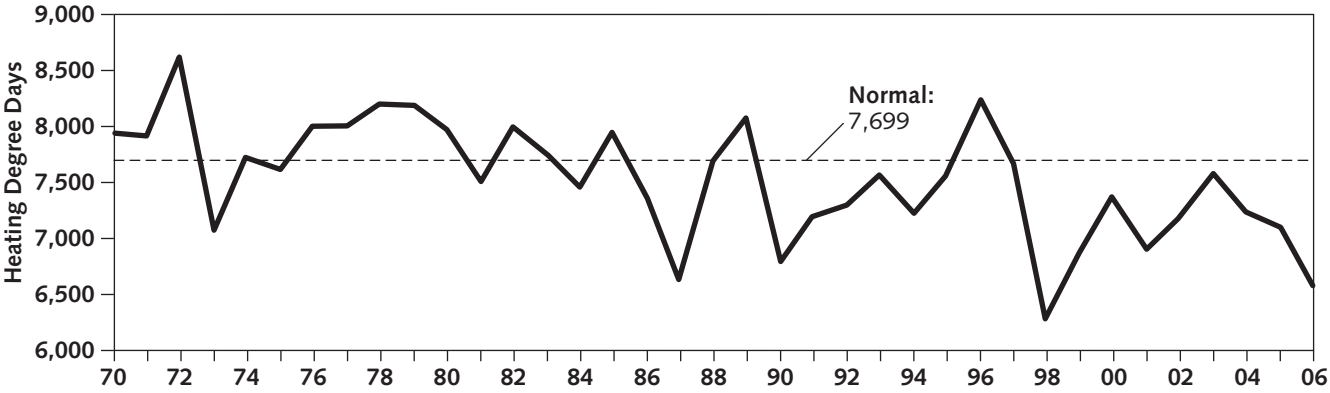
[a] Cooling degree days are relative measurements of outdoor air temperature and are defined as deviations of the mean daily temperature above a base temperature (65 degrees Fahrenheit, by convention). For example, a weather station recording a mean daily temperature of 90 degrees Fahrenheit would report 25 cooling degree days. The normal cooling degree days for each zone and month are the 30-year averages, from 1971 through 2000.

[b] Population-weighted statewide average, based on 2000 census.

Source for both tables: National Oceanic and Atmospheric Administration, "Monthly Normals of Temperature, Precipitation, and Heating and Cooling Degree Days, 1971-2000 Wisconsin" *Climatology of the United States No. 81 (by State)*, (December 2000).

Wisconsin Population-Weighted Heating Degree Days, by Month[a], Normal and 1970-2006

There were 14.6 percent fewer heating degree days in 2006 than the normal and 7.3 percent fewer than in 2005. Since 1987, eighteen of the last twenty winters have been warmer than the 1971 to 2000 30-year weather normal. Note that since 1997, the ten-year average has been 7,070 heating degree days, 8.2 percent fewer than the 30-year normal.



Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Normal	**1,507**	**1,223**	**1,016**	**616**	**300**	**79**	**17**	**33**	**180**	**505**	**900**	**1,323**	**7,699**
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
2001	1,335	1,287	1,069	491	251	96	19	7	192	495	581	1,072	6,895
2002	1,160	1,000	1,129	604	416	68	1	8	106	615	903	1,163	7,173
2003	1,477	1,333	1,025	644	345	97	10	5	167	484	841	1,142	7,570
2004	1,570	1,199	876	555	324	98	22	78	79	429	749	1,253	7,232
2005	1,436	1,043	1,073	491	331	20	9	12	75	425	811	1,369	7,095
2006[p]	**1,044**	**1,203**	**949**	**441**	**265**	**46**	**3**	**7**	**190**	**599**	**761**	**1,068**	**6,576**

[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 2000 census data).

[p] Preliminary estimates.

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

2005 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
January	1,781	1,649	1,564	1,613	1,602	1,480	1,517	1,535	1,516	1,400	1,318	1,436
February	1,235	1,185	1,137	1,144	1,151	1,088	1,117	1,097	1,057	995	973	1,043
March	1,270	1,224	1,196	1,131	1,178	1,168	1,134	1,132	1,012	1,010	997	1,073
April	677	560	544	473	502	528	449	452	402	417	518	491
May	460	391	364	349	376	337	305	311	307	283	344	331
June	114	17	17	8	11	17	5	9	8	14	29	20
July	76	18	13	11	16	9	6	11	11	9	5	9
August	58	27	21	20	22	15	18	18	15	12	2	12
September	226	129	110	85	121	90	105	91	72	69	46	75
October	582	486	462	454	486	439	457	471	458	445	370	425
November	996	976	905	885	941	833	874	890	840	795	733	811
December	1,374	1,439	1,418	1,390	1,484	1,397	1,414	1,414	1,507	1,391	1,293	1,369
Total	**8,849**	**8,101**	**7,751**	**7,563**	**7,890**	**7,401**	**7,401**	**7,431**	**7,205**	**6,840**	**6,628**	**7,095**

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

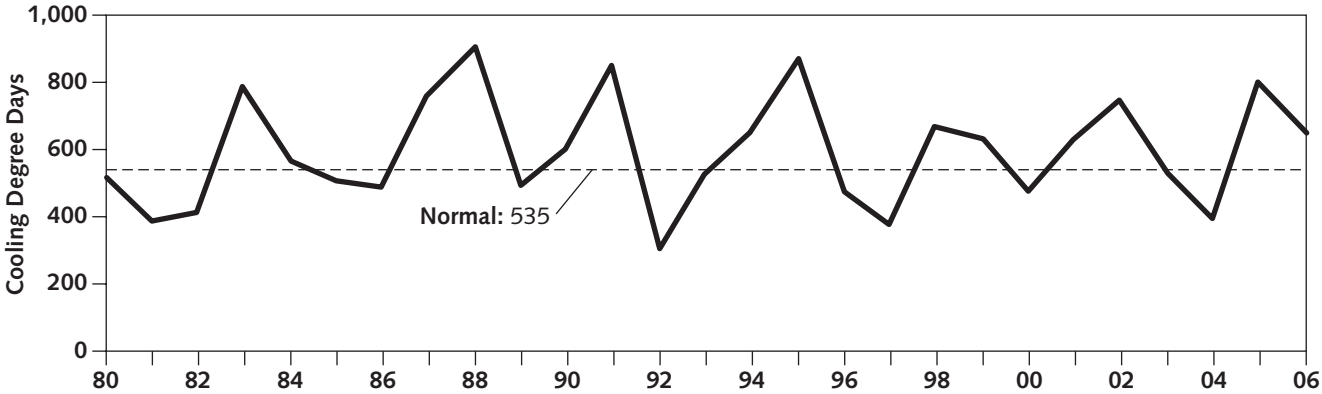
2006 Wisconsin Heating Degree Days, by Zone and Month

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State
January	1,235	1,238	1,149	1,161	1,207	1,060	1,128	1,088	1,101	1,029	955	1,044
February	1,396	1,374	1,326	1,319	1,338	1,279	1,272	1,259	1,222	1,192	1,092	1,203
March	1,154	1,075	1,029	1,009	1,054	983	997	966	957	935	888	949
April	569	499	482	385	475	465	383	426	420	417	451	441
May	385	298	280	235	307	262	222	264	287	257	270	265
June	122	56	54	35	42	52	27	41	49	36	50	46
July	11	4	5	1	0	6	0	2	4	2	3	3
August	39	13	17	6	19	20	3	4	9	2	0	7
September	309	237	227	265	268	218	227	223	212	215	125	190
October	746	756	685	707	708	613	648	616	617	611	527	599
November	888	908	834	907	864	761	863	783	805	762	686	761
December	1,203	1,269	1,168	1,188	1,214	1,066	1,129	1,102	1,122	1,062	996	1,068
Total	**8,057**	**7,727**	**7,256**	**7,218**	**7,496**	**6,785**	**6,899**	**6,774**	**6,805**	**6,520**	**6,043**	**6,576**

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

Wisconsin Population-Weighted Cooling Degree Days, by Month[a], Normal and 1980-2006

Using cooling degree days as an index, the summer of 2006 was hot, with 21 percent more cooling degree days than the 1971 to 2000 30-year normal. However, the summer of 2006 was cooler than the summer of 2005, with 19 percent fewer cooling degree days. The 1971 to 2000 30-year normal was 18 percent warmer than the 1961 to 1990 30-year normal. Since 1997 the ten-year average has been 588 cooling degree days, 10 percent above the 30-year normal.



Month	April	May	June	July	August	September	October	Total
Normal	**3**	**30**	**105**	**199**	**151**	**44**	**3**	**535**
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
2001	5	20	126	234	213	29	1	628
2002	20	20	162	297	152	87	6	744
2003	2	1	69	163	223	66	4	528
2004	3	11	66	140	83	87	1	391
2005	3	4	211	228	200	119	32	797
2006	**1**	**52**	**94**	**302**	**169**	**26**	**4**	**648**

[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 2000 census data).

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

Wisconsin Cooling Degree Days, by Zone and Month 2003-2006

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]
2003												
April	0	4	2	5	4	0	9	0	6	4	1	2
May	8	0	0	8	3	0	2	2	3	0	0	1
June	13	40	43	68	60	46	85	63	85	88	74	69
July	112	96	104	148	139	113	194	171	184	173	187	163
August	145	163	153	217	197	142	254	223	253	225	265	223
September	33	32	40	88	66	49	72	78	69	65	73	66
October	0	0	1	11	1	1	7	3	2	0	6	4
Total	**311**	**335**	**343**	**545**	**470**	**351**	**623**	**540**	**602**	**555**	**606**	**528**
2004												
April	0	0	0	0	0	0	2	1	5	4	6	3
May	0	5	7	6	2	9	4	7	5	16	15	11
June	14	44	47	53	49	51	63	67	86	89	70	66
July	79	97	107	129	123	116	159	138	133	155	151	140
August	21	30	51	53	46	73	71	68	69	91	105	83
September	29	60	70	83	64	79	100	88	72	93	93	87
October	0	0	0	0	0	0	1	0	0	2	2	1
Total	**143**	**236**	**282**	**324**	**284**	**328**	**400**	**369**	**370**	**450**	**442**	**391**
2005												
April	0	0	0	8	0	1	4	4	3	2	4	3
May	0	2	3	3	1	3	4	4	4	7	4	4
June	83	145	174	162	168	203	188	208	204	239	229	211
July	128	204	195	257	202	187	257	235	231	239	242	228
August	66	125	136	165	135	147	170	163	156	195	269	200
September	47	67	72	98	65	77	92	100	93	131	162	119
October	1	16	24	10	23	31	30	30	26	34	39	32
Total	**325**	**559**	**604**	**703**	**594**	**649**	**745**	**744**	**717**	**847**	**949**	**797**
2006												
April	0	0	0	0	0	0	0	0	0	2	3	1
May	23	55	51	68	49	47	78	62	56	63	42	52
June	56	67	71	112	75	76	146	100	84	90	98	94
July	252	243	257	345	251	271	376	289	258	297	316	302
August	98	103	107	134	107	110	177	157	172	161	222	169
September	6	35	24	21	10	14	22	20	16	18	39	26
October	0	0	2	0	0	3	4	4	9	6	3	4
Total	**435**	**503**	**512**	**680**	**492**	**521**	**803**	**632**	**595**	**637**	**723**	**648**

[a] Population-weighted statewide average, based on 2000 census.

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

Wisconsin New Single and Two Family Building Permits 1990-2006[a]

The underlying trends for new single and two family home construction are an increasing size of dwellings, increasing saturation of air conditioning and natural gas and propane as the preferred energy sources for space and water heating with only a very small percentage using oil. Single family homes throughout this time period represent about 94 percent of new construction, and two family homes represent about 6 percent.

	1990		1996		2000		2005		2006[p]	
Type										
Single Family	9,630	93.7%	15,413	93.0%	18,456	94.0%	22,372	93.7%	16,568	93.7%
Two Family	649	6.3%	1,164	7.0%	1,184	6.0%	1,495	6.3%	1,114	6.3%
Heating Equipment										
Forced Air	9,486	92.3%	15,565	96.5%	17,874	95.9%	21,462	91.9%	15,706	84.3%
Radiant Electric	118	1.1%	257	1.6%	324	1.7%	484	2.1%	431	2.3%
Heat Pump	12	0.1%	44	0.3%	55	0.3%	165	0.7%	193	1.0%
Boiler	75	0.7%	197	1.2%	379	2.0%	968	4.1%	884	4.7%
Not Specified	588	5.7%	70	0.4%	8	0.0%	271	1.2%	1,423	7.6%
AC Equipped										
Yes	2,415	23.5%	6,900	41.6%	11,151	56.8%	15,849	66.4%	11,678	65.9%
No	7,864	76.5%	9,678	58.4%	8,489	43.2%	8,036	33.6%	6,047	34.1%
Space Heating Source										
Natural Gas	8,312	80.9%	12,347	74.5%	12,386	63.3%	15,605	65.6%	10,174	57.2%
LP Gas	860	8.4%	2,407	14.5%	3,782	19.3%	4,552	19.1%	3,981	22.4%
Oil	60	0.6%	62	0.4%	56	0.3%	44	0.2%	17	0.1%
Electric	128	1.2%	220	1.3%	153	0.8%	278	1.2%	280	1.6%
Solid	12	0.1%	19	0.1%	0	0.0%	26	0.1%	121	0.7%
Solar	0	0.0%	19	0.1%	0	0.0%	26	0.1%	121	0.7%
Not Specified	907	8.8%	1,489	9.0%	3,200	16.3%	3,262	13.7%	3,081	17.3%
Water Heating Source										
Natural Gas	8,066	78.5%	12,392	74.7%	12,448	63.4%	14,225	59.6%	8,955	50.5%
LP Gas	720	7.0%	1,973	11.9%	2,817	14.3%	3,305	13.8%	2,512	14.2%
Oil	18	0.2%	12	0.1%	8	0.0%	12	0.1%	9	0.1%
Electric	480	4.7%	865	5.2%	1,449	7.4%	1,952	8.2%	1,810	10.2%
Solid	4	0.0%	6	0.0%	21	0.1%	15	0.1%	94	0.5%
Solar	0	0.0%	11	0.1%	7	0.0%	43	0.2%	22	0.1%
Not Specified	991	9.6%	1,319	8.0%	2,890	14.7%	4,333	18.1%	4,321	24.4%
Living Area (Sq. Ft)										
1-1,000	208	2.1%	639	3.9%	670	3.6%	579	2.5%	531	3.1%
1,001-1,800	4,292	43.6%	7,330	45.3%	8,027	43.1%	8,613	37.8%	6,354	37.2%
1,801-2,400	2,903	29.5%	4,782	29.5%	5,228	28.1%	6,717	29.5%	4,854	28.4%
2,401-Greater	2,451	24.9%	3,437	21.2%	4,689	25.2%	6,852	30.1%	5,324	31.2%
Total	9,854		16,188		18,614		22,761		17,063	
Average (Sq. Ft)	2,013		2,160		1,944		2,101		2,150	

[a] These statistics are incomplete before January 1, 2005, as not all municipalities who issue building permits reported this information.

[p] Preliminary

Source: Amerifax Data Corporation, 262-255-7430; Wisconsin Department of Commerce, Division of Safety and Buildings http://www.commerce.state.wi.us/SB/SB-StatsUDCStatisticsList.html

Energy Definitions and Conversion Factors

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 17,000,000 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. 4,000 lbs.

1 face cord of wood = 8 feet x 4 feet x 16 inches = 42.7 cubic feet = approx. 1,333 lbs.