

CHAPTER 4

Energy Efficiency Indices

Indices of Wisconsin Energy Efficiency

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

1970-2012 MILLIONS OF BTU

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

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

b Not adjusted for yearly variations in temperature.

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

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

p Preliminary data.

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

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

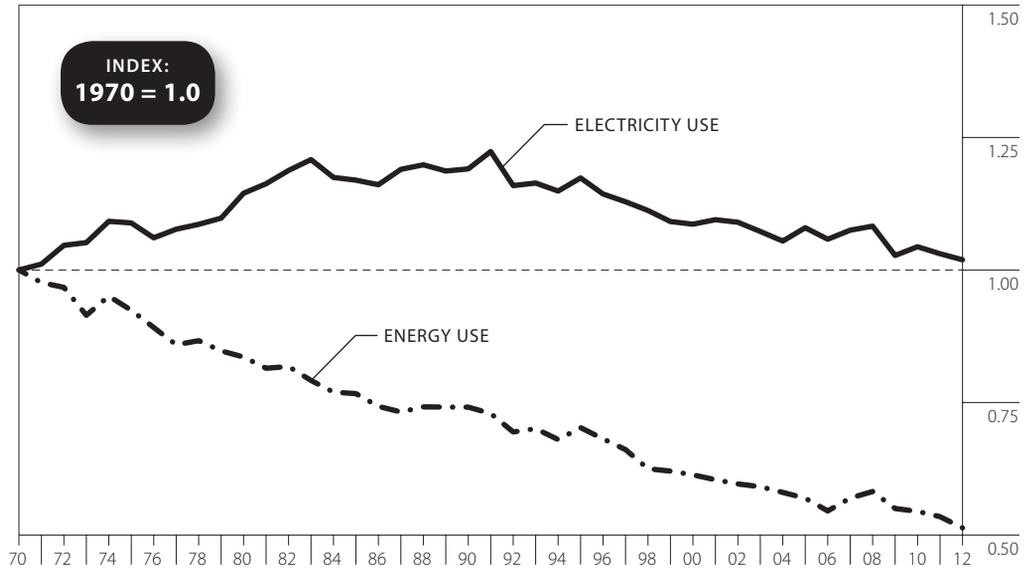
4.0%

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

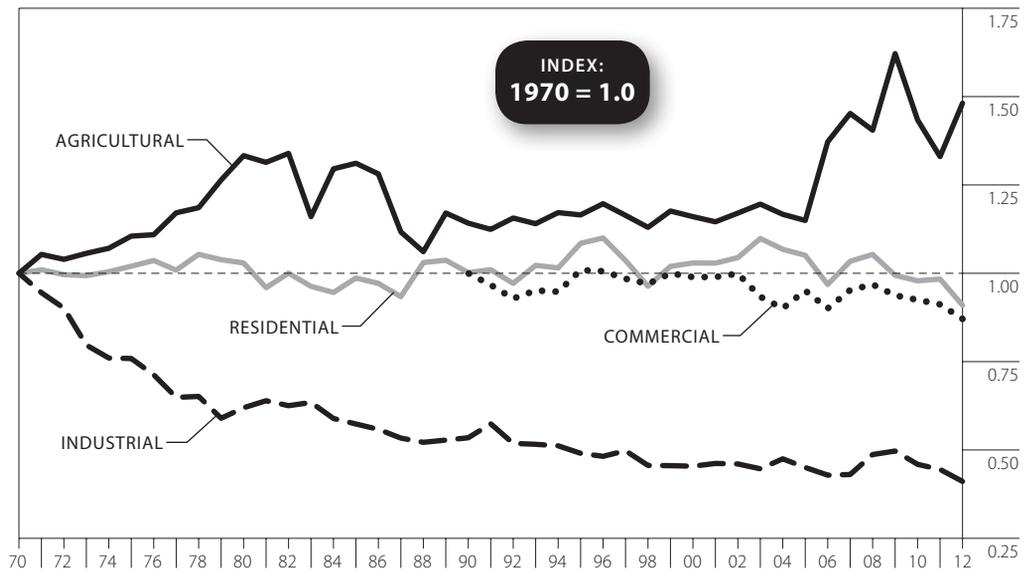
In 2012, Wisconsin Commercial Energy Use per Employee decreased by 4.5 percent; Industrial Energy Use per \$1,000 Manufacturing Value Added decreased 7.6 percent and is 58.9 percent lower than in 1970. Agricultural Energy Use per Acre increased 7.1 percent in 2012, from 1.6 to 1.71 MMBtu/acre.

Indices of Wisconsin Energy Efficiency

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



1970-2012 ENERGY INDICES BY ECONOMIC SECTOR^a



.....
WISCONSIN
ENERGY USE
PER DOLLAR OF
GROSS STATE
PRODUCT

—————
WISCONSIN
ELECTRICITY USE
PER DOLLAR OF
GROSS STATE
PRODUCT

—————
RESIDENTIAL
ENERGY USE PER
CAPITA

.....
COMMERCIAL
ENERGY USE PER
EMPLOYEE

—————
INDUSTRIAL
ENERGY USE
PER UNIT
MANUFACTURING
VALUE ADDED
OUTPUT

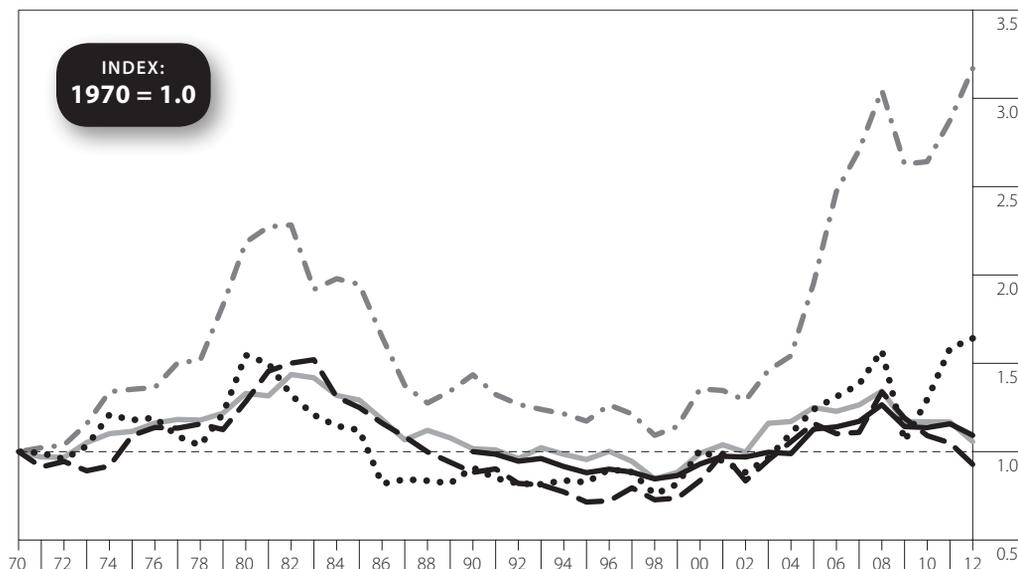
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AGRICULTURAL
ENERGY USE PER
ACRE

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

Source: Wisconsin State Energy Office.

Indices of Wisconsin Energy Expenditures, 2012 Dollars

1970-2012 2012 DOLLARS



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

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

^p Preliminary estimate.

^r Revised.

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

— — — — —
AGRICULTURAL
PER ACRE

—————
RESIDENTIAL
PER HOUSEHOLD

••••••••••
TRANSPORTATION
PER VEHICLE

—————
COMMERCIAL
PER EMPLOYEE

—————
INDUSTRIAL
PER \$1,000 VALUE
ADDED

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

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

Wisconsin Per Capita Resource Energy Consumption, by Type of Fuel

PER CAPITA
RESOURCE
ENERGY
CONSUMPTION
2.8%

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

1970-2012 MILLIONS OF BTU

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

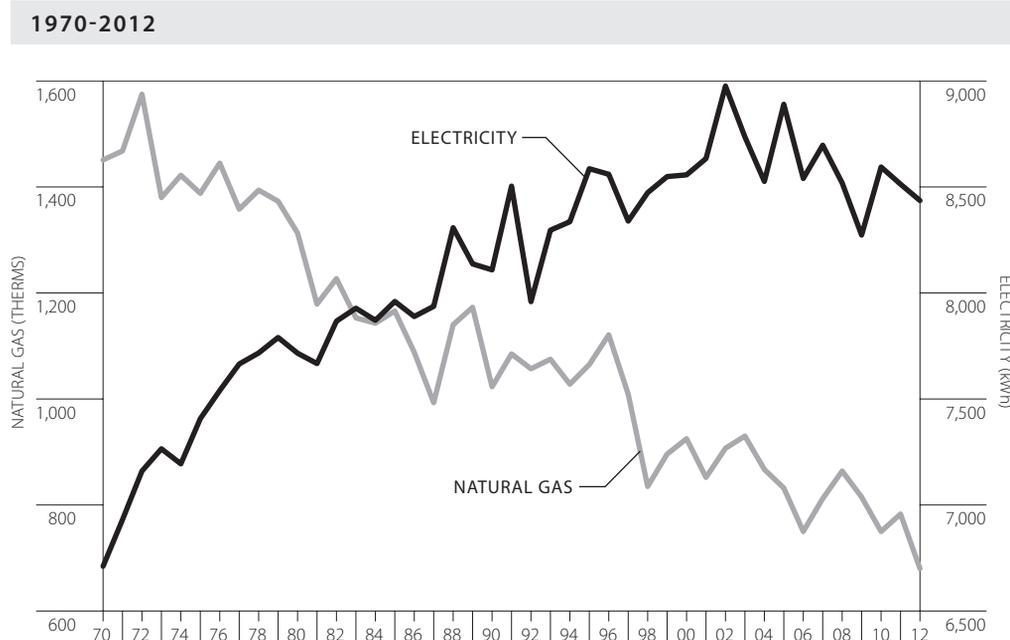
^a "Electric Imports" is the estimated resource energy used in other states or Canada to produce the electricity imported into Wisconsin. This resource energy is estimated assuming 11,300 Btu of resource energy per kWh imported into Wisconsin. A negative sign indicates that resource energy was used in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

^p Preliminary estimates.

^r Revised.

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

Wisconsin Residential Electricity and Natural Gas Use Per Customer



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

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

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

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

Statistics/Tables.

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

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

^p Preliminary estimates.

^r Revised.

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

Wisconsin Commercial Electricity and Natural Gas Use Per Customer

ELECTRICITY
USE PER
CUSTOMER

0.1%

NATURAL GAS
USE PER
CUSTOMER

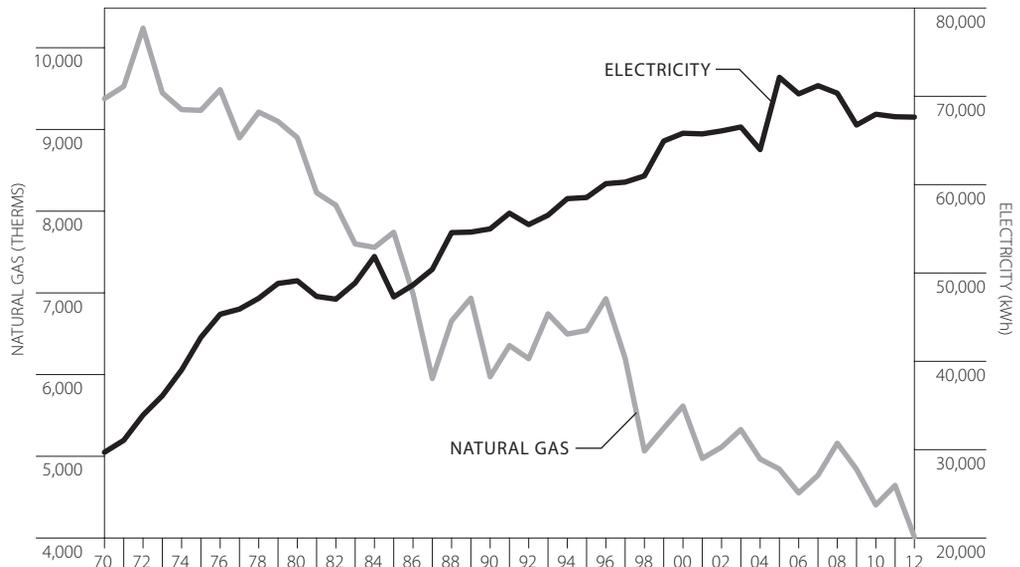
13.6%

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

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

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

1970-2012



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

^p Preliminary estimates.

^r Revised.

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

Focus on Energy Tracked Energy Savings

2001-2012 MILLIONS OF kWh, THERMS AND DOLLARS

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

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

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

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

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

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

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

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

Focus on Energy Ranked Energy Savings Measures

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

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

2001-2012 ENERGY SAVING ACTIVITIES RANKED BY OVERALL SAVINGS

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

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

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

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

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

d Other includes a wide variety of improvements.

e Recovery of exhaust heat from natural gas combustion.

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

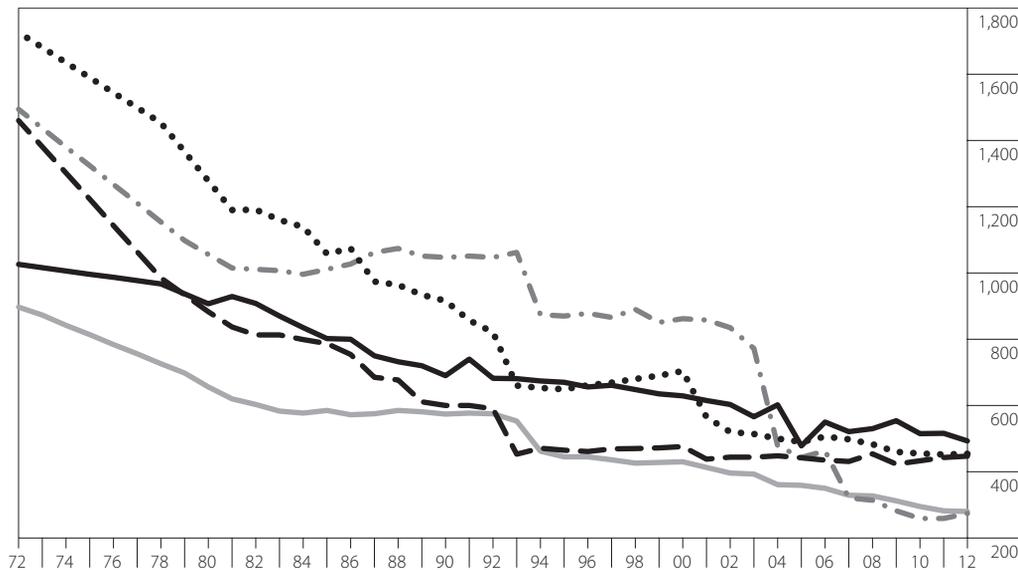
g Steam trap improvement to avoid loss of thermal energy.

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

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

Energy Consumption by Major New Household Appliances

1972-2012 AVERAGE kWh PER YEAR



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

^a Room air conditioner assumes 600 hours per year.

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

^c Freezer value estimated.

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

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

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

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

●●●●●●●●
REFRIGERATOR

· · · · ·
WASHING MACHINE

— — — — —
FREEZER

—————
ROOM A/C

—————
DISHWASHER

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

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

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

Energy Use in State Owned Buildings

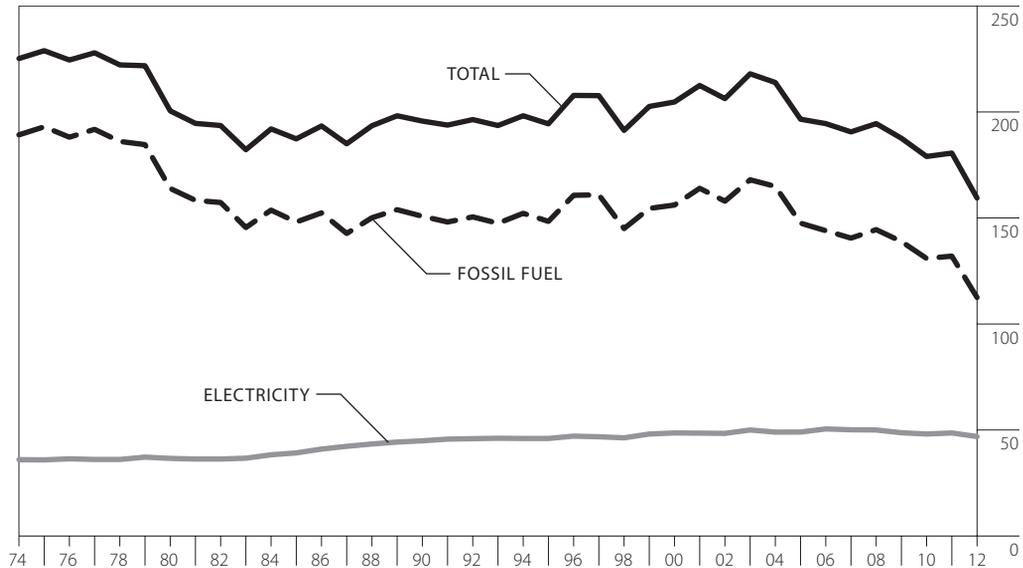
**TOTAL
ENERGY USE
PER GSF
3.4%
IN 2012**

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

Energy use in state-owned buildings was weather-corrected back to 2005.

All data are based on the State Fiscal Year, July 1 – June 30, for example the data for 2012 are for the period July 1, 2011 to June 30, 2012.

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



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

^a Weather-adjusted data are not available previous to 2005.

^p Preliminary estimates.

^r Revised.

Source: State of Wisconsin, Department of Administration; *Energy Use in State Owned Facilities* (unpublished).

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

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

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

1980-2012

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

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

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

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

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

e Estimates.

r Revised.

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

NUMBER
OF UNITS
WEATHERIZED
45.0%

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

Reported Building Activity Affected by Wisconsin Energy Codes

BUILDINGS
CERTIFIED
IN 2012
DECREASED
5.1%

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

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

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

1979-2012

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

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

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

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

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

e Estimate.

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

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

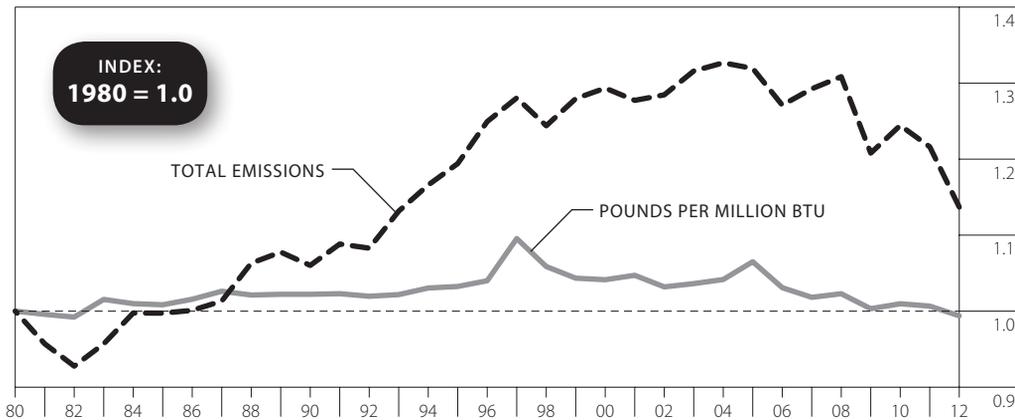
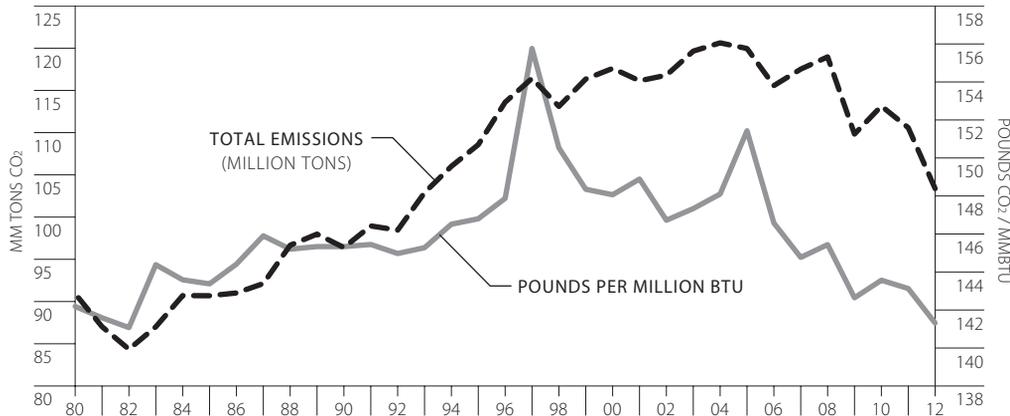
h From 2007 forward, this category is fully captured in the One and Two Family Dwelling total.

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

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

Wisconsin Carbon Dioxide Emissions from Energy Use

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



Year	Tons CO ₂ (Millions)	Pounds CO ₂ Per MMBtu
1980	90.9	142.2
1985	90.7	143.4
1990	96.4	145.3
1995	108.6	146.8
2000	117.6	148.1
2005	120.0	151.4
2006	115.6	146.6
2007	117.5	144.8
2008	119.0	145.4
2009	109.8	142.6
2010	113.1	143.6
2011	110.6	143.1
2012 ^p	103.4	141.3

^a Does not include electric imports.

^p Preliminary estimates.

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

CO₂
EMISSIONS
1.3%

Wisconsin's CO₂ emissions from energy (pounds per MMBtu) decreased 1.3 percent in 2012. Since 1990, total CO₂ emissions, in millions of tons, have increased 7.4 percent, but 2012 levels reflect a decrease of 6.5 percent from 2011.

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

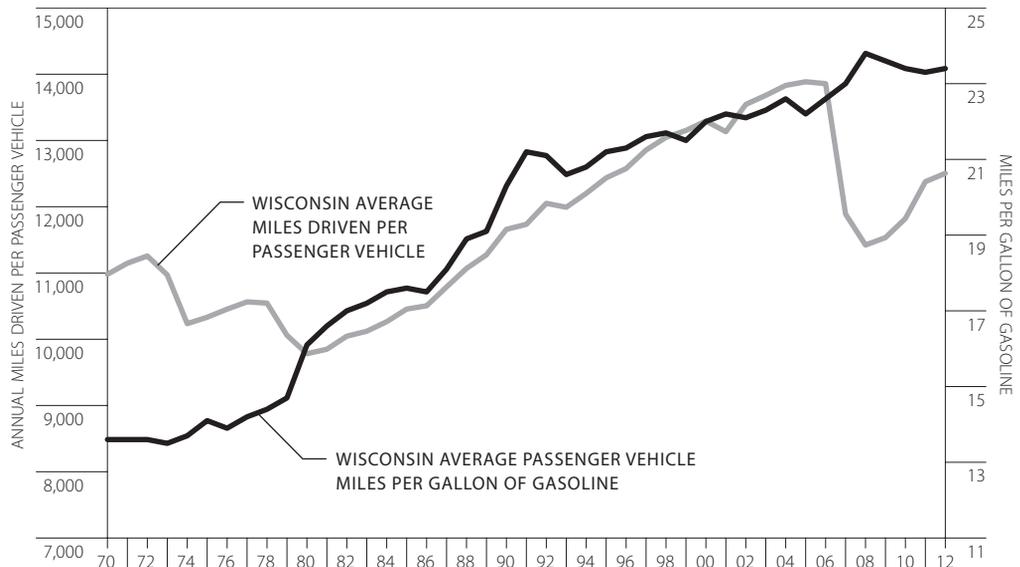
**AVERAGE
NUMBER OF
MILES DRIVEN
ANNUALLY
1.0%**

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

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

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

1970-2012



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

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

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

^p Preliminary estimates.

^r Revised.

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