



Maine Energy Profile

**State of Maine
Governor's Energy Office**



Summary

The first edition of the Maine Energy Profile is offered by the National Association for State Energy Officials (NASEO) and the Kentucky Department for Energy Development and Independence (DEDI) to function as a quick reference for energy information particular to the State of Maine. Data has been collected for the most-recent year available from a variety of sources such as the Energy Information Administration (EIA), the U.S. Environmental Protection Agency (EPA), the Bureau for Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), and the U.S. Census. This document provides data on the dynamics of energy expenditures, energy consumption, energy production, and electricity generation that describe the economy of Maine. Summary state-level statistics are provided in aggregate, as well as for specific sectors of the economy and individual commodities. Overall, Maine was net importer of energy in 2009, maintained an industrial sector that was the leading consumer of energy resources, and had electricity rates higher than most other states.

Maine Governor's Energy Office

Maine Energy Profile

The Maine Governor's Energy Office (MEGEO) is responsible for planning and coordinating state energy policy. As the designated State Energy Office, it is the responsibility of the MEGEO to work in conjunction with other departments of State government, the Legislature, and private and nonprofit sectors to advance and optimize Maine's energy security, economic development and environmental health.

In 2010, Maine had the 12th highest electricity prices in the United States. Natural gas and oil are the primary fuels for more than 70% of the electricity capacity in Maine. However, Maine has one of the highest renewable standards in the nation, requiring 40% of total retail electricity sales to come from renewable resources by 2017. Maine is also highly dependent on fossil fuel products to heat its homes, buildings and factories and power its automobiles, trains and transportation fleets.

The MEGEO thanks NASEO and the DEDI for working with MEGEO to create the first Maine Energy Profile. The data provided will provide the backdrop for policies and programs to:

- Decrease electricity prices and overall energy costs;
- Extend natural gas services and transmission infrastructure and provide a wide array of heating technology, fuel and system options for Maine consumers;
- Strengthen cost-effective energy efficiency and renewable energy initiatives; and
- Guide the State of Maine into a sustainable, reliable, secure, affordable and environmentally responsible energy future.

Kenneth C. Fletcher, Director

Jeff Marks, Deputy Director

Michael Barden, Deputy Director

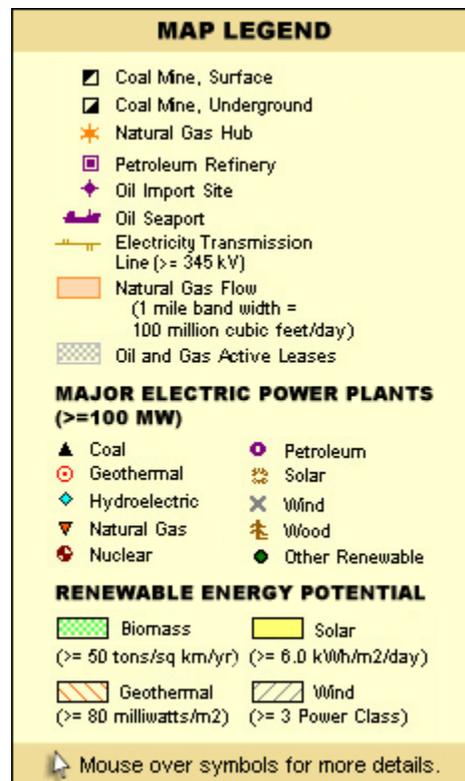
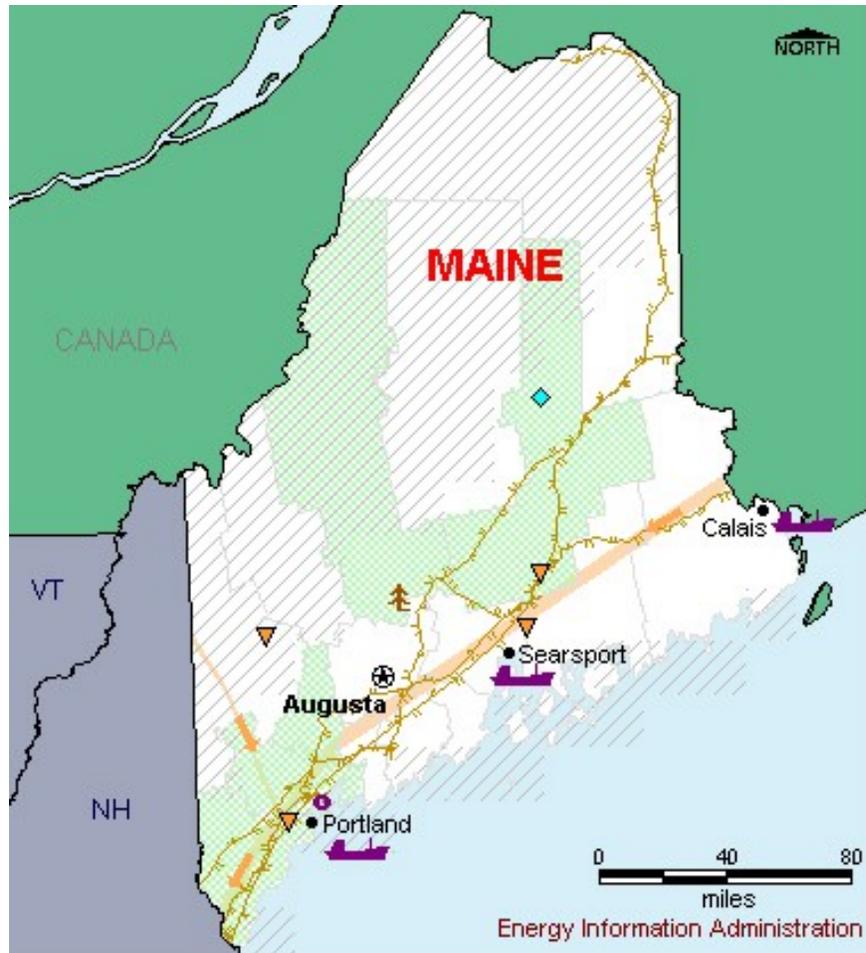
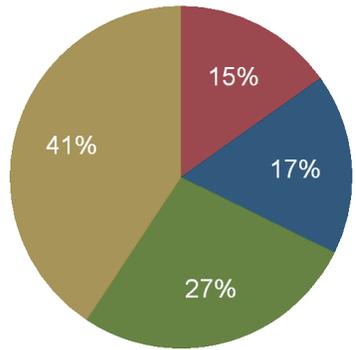


Table of Contents

Maine Energy Expenditures	7
Maine Gross Domestic Product & Population	8
Maine Energy Consumption	9
Industrial Sector & Commercial Sector	11
Residential Sector & Transportation Sector	12
Maine Energy Intensity per Capita	13
Maine Energy Intensity per Real GDP Dollar.....	14
Maine Electricity	15
Maine Electricity Intensity per Capita	16
Maine Electricity Intensity per Real GDP Dollar.....	17
Maine Renewable Energy	18
Maine Natural Gas.....	19
Maine Power Plant Emissions	20
Maine Electricity Prices.....	21

Maine Energy Expenditures

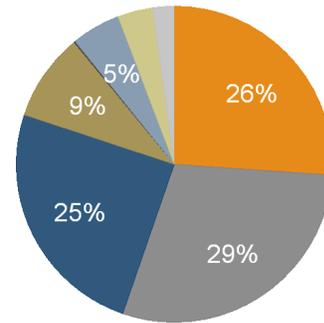
Maine Total Energy Expenditures, 2009
Energy Expenditures by Sector (%)



Industrial Commercial
Residential Transportation

DEDI Energy Database, 2012 (EIA)

Maine Total Energy Expenditures, 2009
Energy Expenditures by Fuel Type (%)



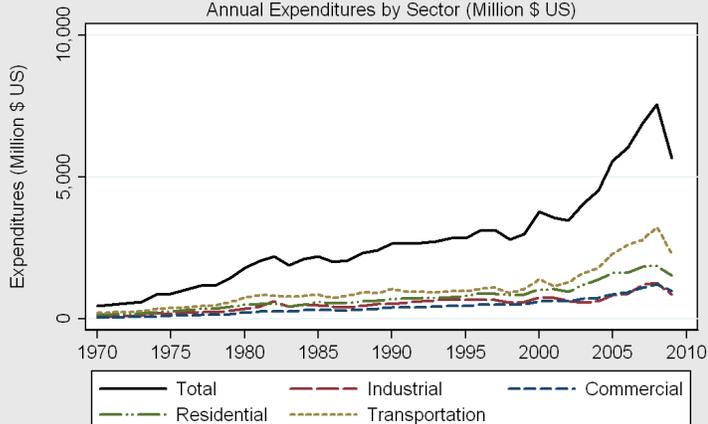
Electricity Gasoline Diesel
Natural Gas Coal Propane
Wood All Other

DEDI Energy Database, 2012 (EIA)

Sector	Million (\$ US)	Percentage
Total	5,658	100%
Transportation	2,303	41%
Residential	1,529	27%
Commercial	967	17%
Industrial	859	15%

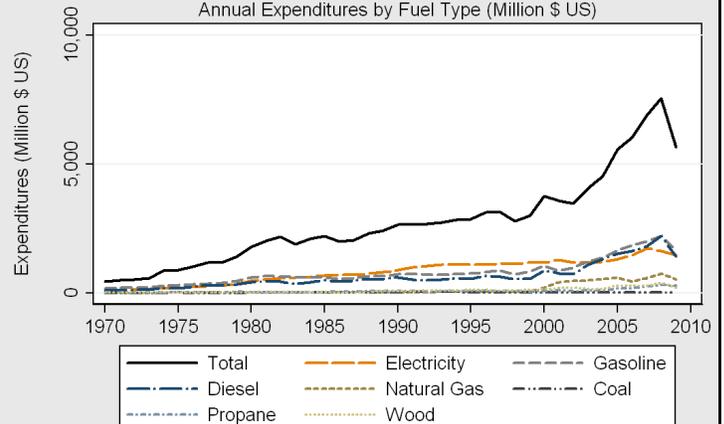
Fuel Type	Million (\$ US)	Percentage
Total	5,658	100%
Gasoline	1,651	29%
Electricity	1,477	26%
Diesel	1,402	25%
Natural Gas	511	9%
Propane	282	5%

Maine Total Energy Expenditures, 1970-2009
Annual Expenditures by Sector (Million \$ US)



DEDI Energy Database, 2012 (EIA)

Maine Total Energy Expenditures, 1970-2009
Annual Expenditures by Fuel Type (Million \$ US)

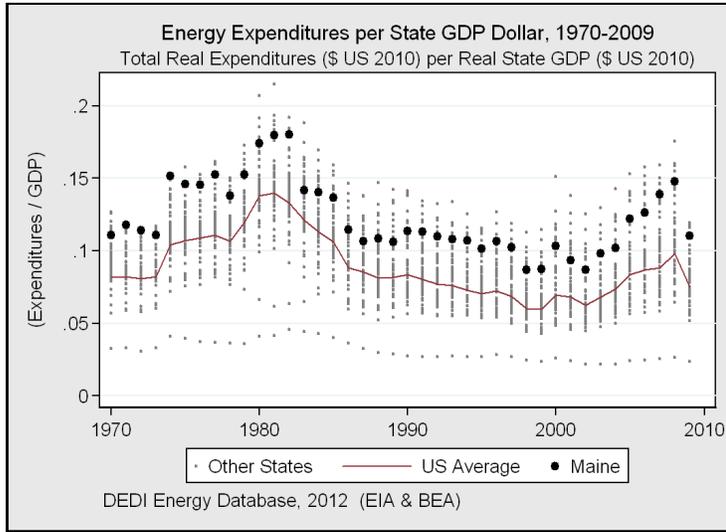


DEDI Energy Database, 2012 (EIA)

In 2009, total energy expenditures in Maine were 5.7 billion dollars, a decrease of 25% from 2008. Dividing these costs by economic sector, the transportation sector accounted for the largest amount of energy expenditures in 2009.

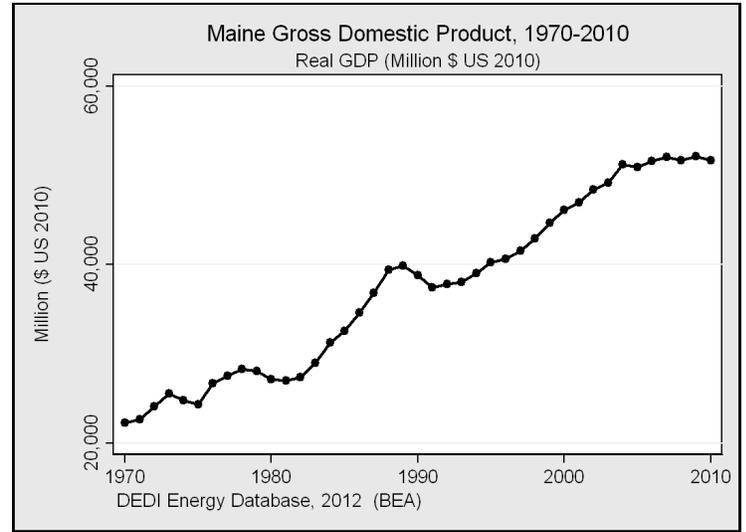
Analyzing energy expenditures by fuel type, the purchase of gasoline was the highest concentration of expenditures in Maine in 2009. Compared with 2008, total gasoline expenditures displayed a decrease of 25% in 2009. As a share of total energy expenditures, wood-related expenditures in Maine were the highest in the country at 3.6% in 2009.

Maine Energy Expenditures



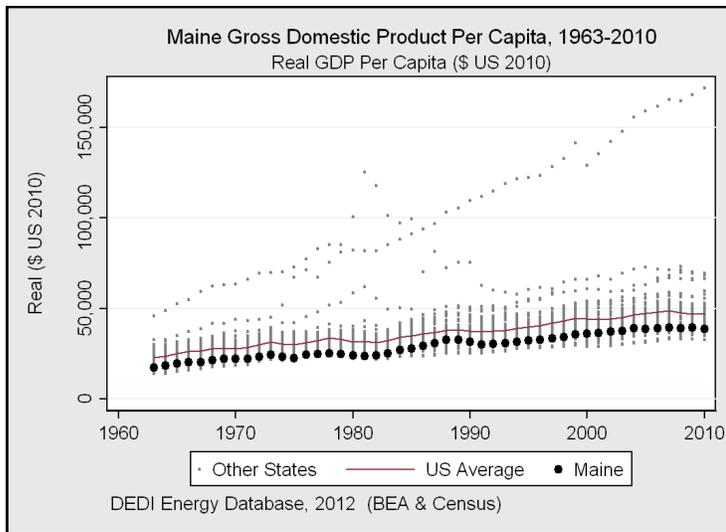
Energy Expenditures & GDP

In 2009, citizens, institutions, and firms in Maine on average spent \$0.11 on energy commodities and/or energy consumption to produce \$1 of state gross domestic product. This energy expenditure level per dollar of economic output fell by 25% compared with 2008.



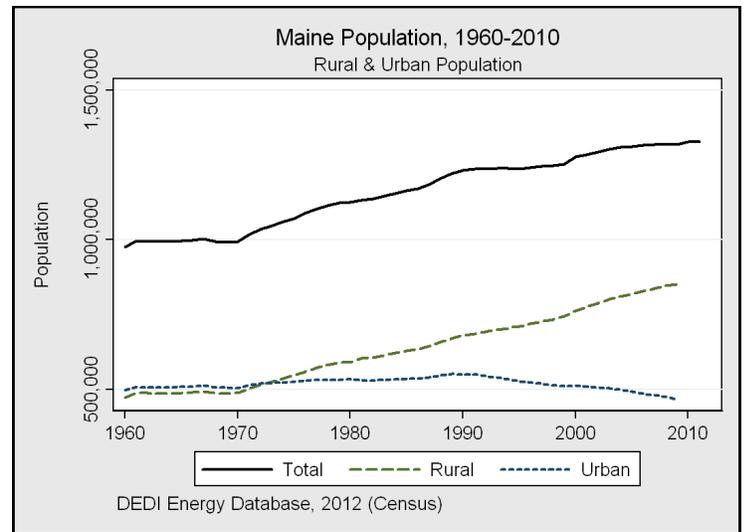
Gross Domestic Product

The state gross domestic product of Maine was \$51.6 billion in 2010. In that year, the state GDP of Maine fell by 1% in inflation-adjusted 2010 dollars. Since the year 2000, the state gross domestic product of Maine has risen by 12%.



Gross Domestic Product per Capita

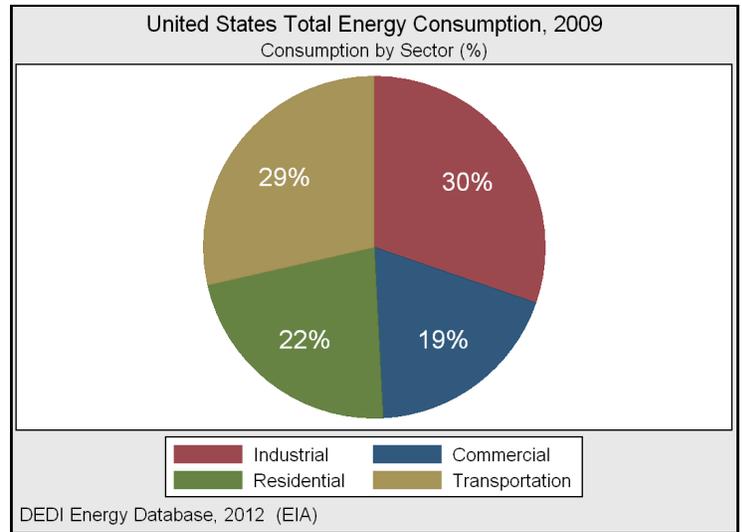
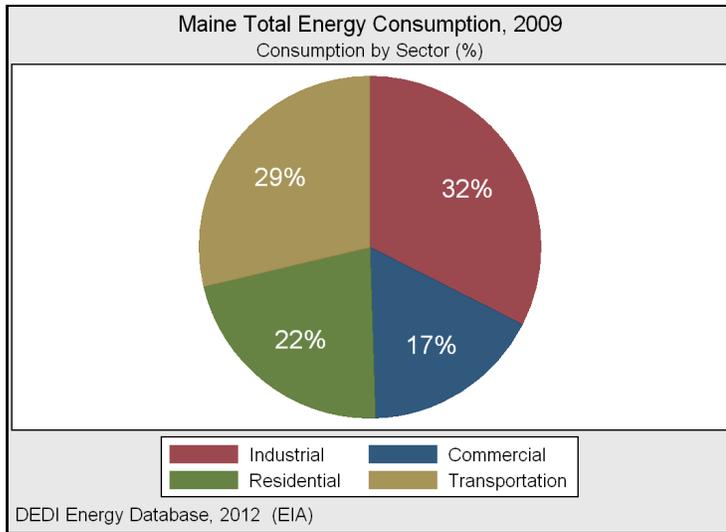
The state gross domestic product per capita of Maine in 2010 was \$38,877. Compared with 2009, state gross domestic product per capita fell by 1%. This statistic uses nominal income data adjusted for inflation to 2010 dollars.



Rural & Urban Population

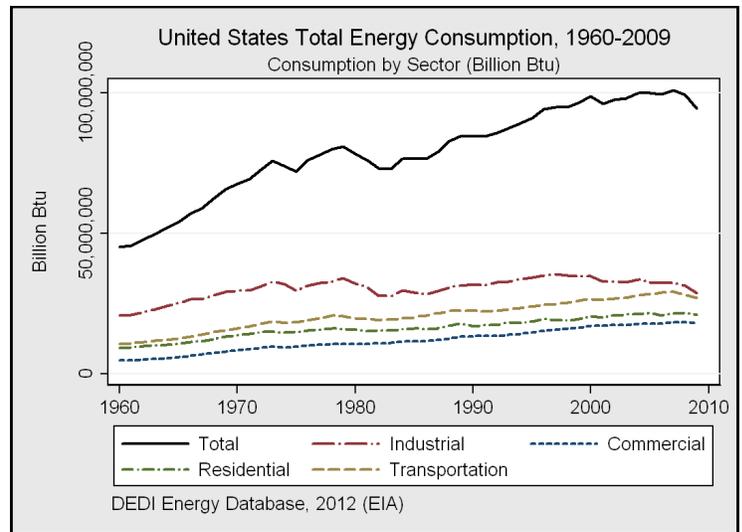
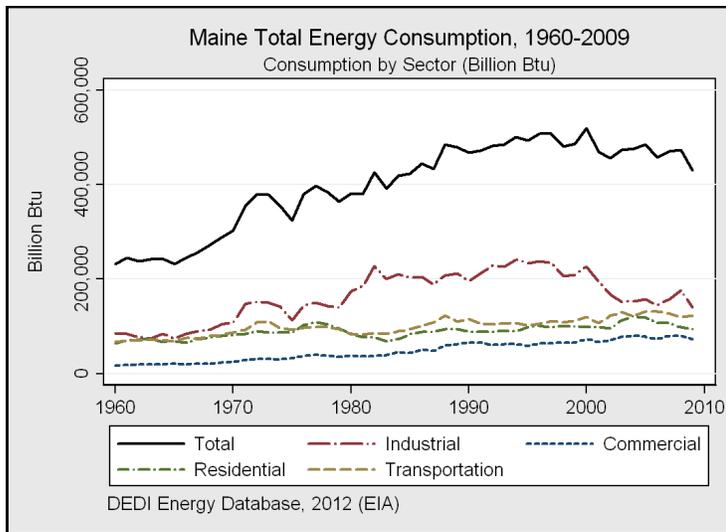
In 2010, the population of Maine was estimated to be around 1.3 million, with the majority of the population located in rural areas throughout the state. Since the year 2000, the population of Maine has risen by approximately 4%.

Maine Energy Consumption



Sector	Billion Btu	Percentage
Total	430,472	100%
Industrial	139,687	32%
Transportation	123,477	29%
Residential	94,015	22%
Commercial	73,293	17%

Sector	Billion Btu	Percentage
Total	94,400,000	100%
Industrial	28,600,000	30%
Transportation	27,000,000	29%
Residential	21,000,000	22%
Commercial	17,900,000	19%

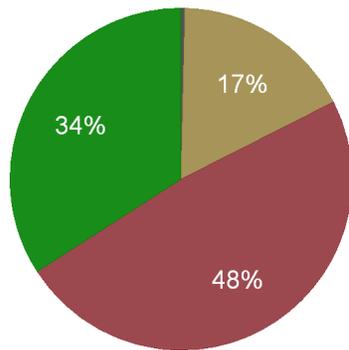


In 2009, total energy consumption in Maine was .43 quadrillion Btu, a decrease of 9% from 2008. Dividing this consumption by economic sector, the industrial sector accounted for the largest amount of energy consumption in 2009.

The distribution of total energy consumption in Maine by economic sector is generally consistent with the national average. Maine's industrial sector being 2% larger than the national average, and Maine's commercial sector 2% smaller in 2009.

Maine Energy Consumption

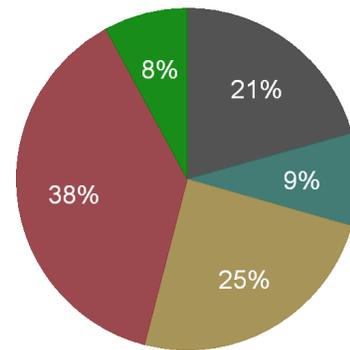
Maine Total Energy Consumption, 2009
Consumption by Fuel Type (%)



Coal Natural Gas Petroleum
Renewables

DEDI Energy Database, 2012 (EIA)

United States Total Energy Consumption, 2009
Consumption by Fuel Type (%)



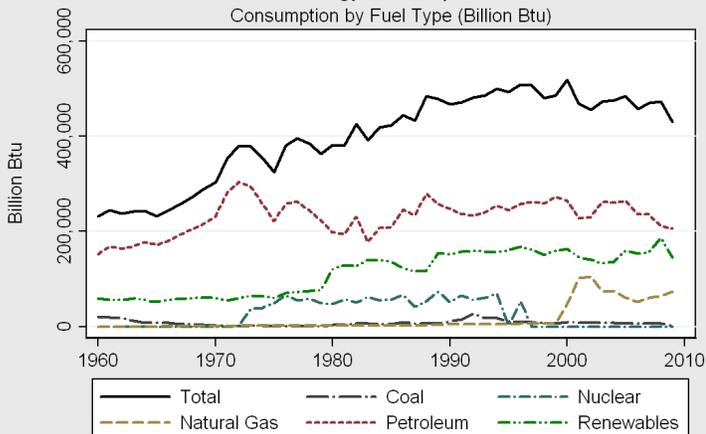
Coal Nuclear Natural Gas
Petroleum Renewables

DEDI Energy Database, 2012 (EIA)

Fuel Type	Billion Btu	Percentage
Total	430,472	100%
Petroleum	206,054	48%
Renewables	144,882	34%
Natural Gas	73,035	17%
Coal	1,652	<1%

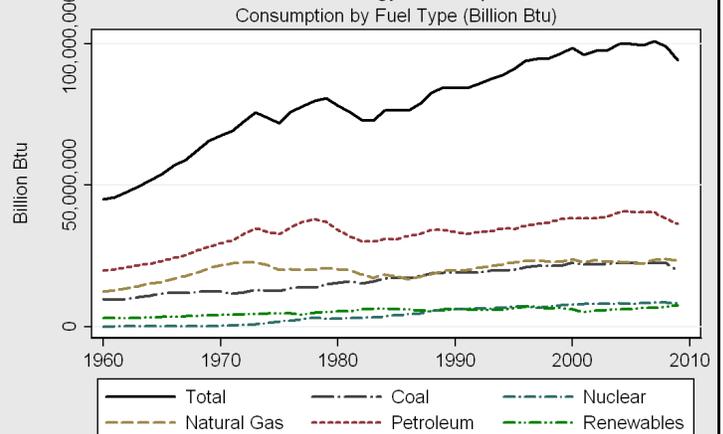
Fuel Type	Billion Btu	Percentage
Total	94,400,000	100%
Petroleum	36,300,000	38%
Natural Gas	23,000,000	24%
Coal	19,700,000	21%
Nuclear	8,356,019	9%
Renewables	7,545,698	8%

Maine Total Energy Consumption, 1960-2009
Consumption by Fuel Type (Billion Btu)



DEDI Energy Database, 2012 (EIA)

United States Total Energy Consumption, 1960-2009
Consumption by Fuel Type (Billion Btu)

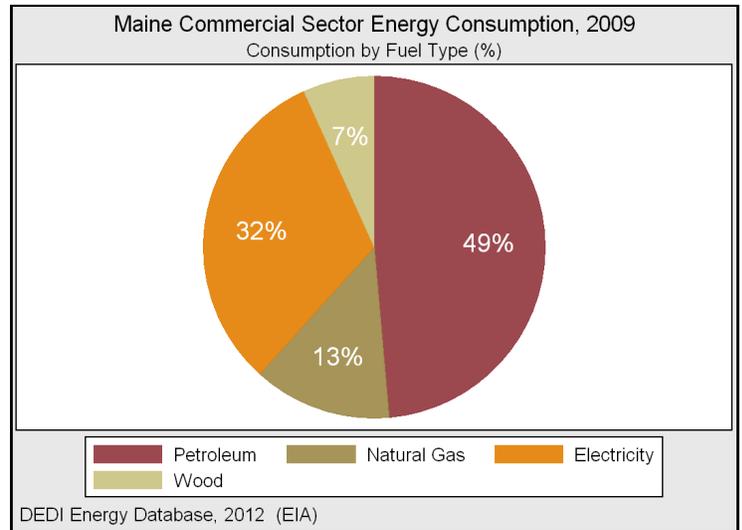
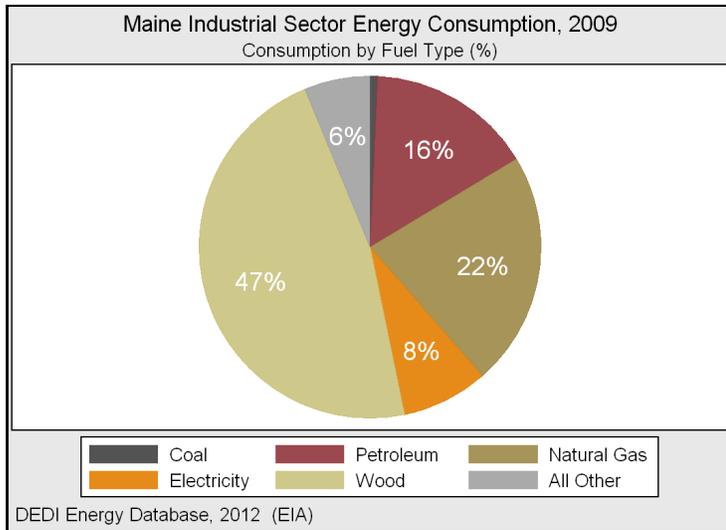


DEDI Energy Database, 2012 (EIA)

Characterizing energy consumption by fuel type or commodity, the use of petroleum was the highest concentration of energy consumption in Maine in 2009. Compared with 2008, the consumption of petroleum products displayed a decrease of 2% in 2009. Additionally, net electricity imports are included in energy consumption, and can explain the difference in the summed value and stated value for total energy consumption.

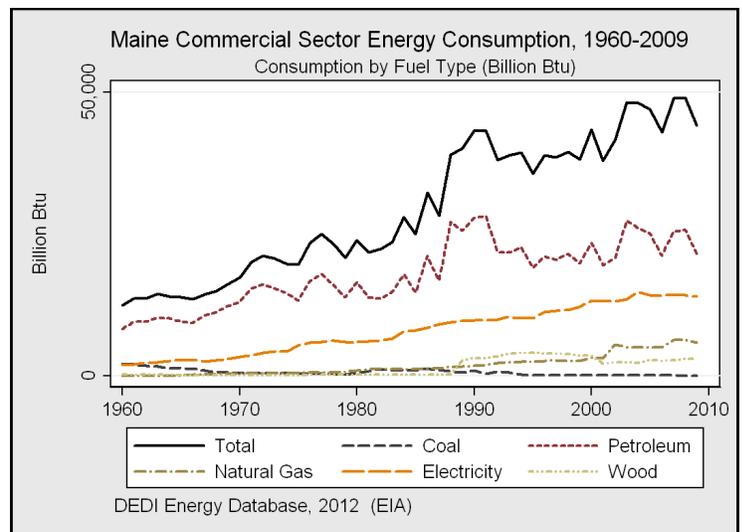
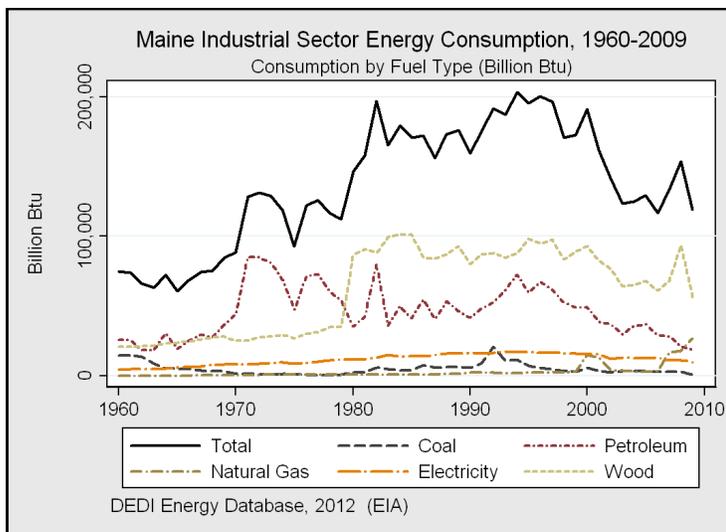
In terms of total energy consumption, dependence upon renewable hydro, woody biomass, and wind electricity generation made Maine the third highest renewable energy consumer in the United States after hydroelectric states of Washington and Oregon. Over one-third of total energy consumed in Maine came from renewable energy resources, versus only 8% for the United States as a whole.

Maine Energy Consumption



Fuel Type	Billion Btu	Percentage
Total	119,210	100%
Wood Products	56,078	47%
Natural Gas	26,499	22%
Petroleum	18,714	16%
Electricity	9,731	8%
Coal	797	1%

Fuel Type	Billion Btu	Percentage
Total	44,063	100%
Petroleum	21,414	49%
Electricity	13,890	32%
Natural Gas	5,778	13%
Wood Products	2,981	7%
Ethanol	11	<1%

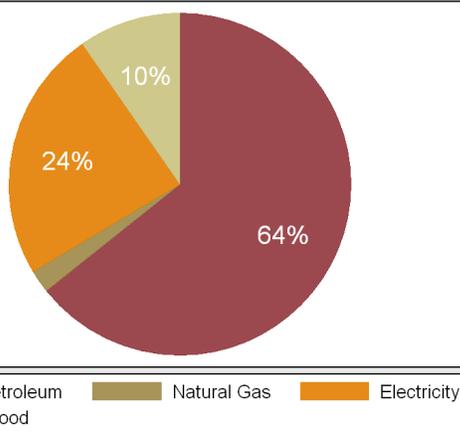


In 2009, net industrial energy consumption in Maine was 119,210 billion Btu, a decrease of 22% from 2008. Accounting for energy use across fuels or resources, wood products represented the largest amount of industrial energy consumption in 2009. (Note: Net energy consumption does not include the associated energy losses of electricity generation and transmission).

Net commercial energy consumption in Maine fell by 10% in 2009 to over 44,063 billion Btu. During 2009, petroleum constituted the largest portion of commercial energy consumption and displayed a decrease of 17% compared with 2008. (Note: Net energy consumption does not include the associated energy losses of electricity generation and transmission).

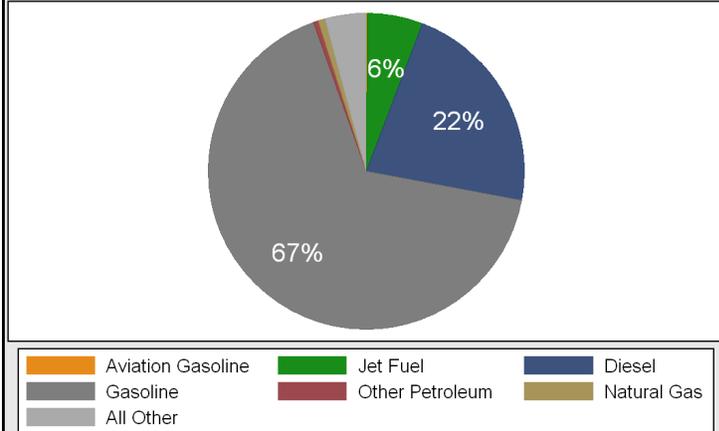
Maine Energy Consumption

Maine Residential Sector Energy Consumption, 2009
Consumption by Fuel Type (%)



DEDI Energy Database, 2012 (EIA)

Maine Transportation Sector Energy Consumption, 2009
Consumption by Fuel Type (%)

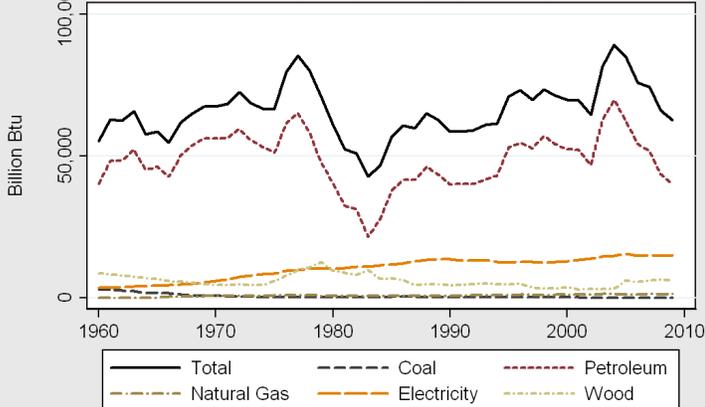


DEDI Energy Database, 2012 (EIA)

Fuel Type	Billion Btu	Percentage
Total	62,711	100%
Petroleum	40,167	64%
Electricity	14,876	24%
Wood	6,059	10%
Natural Gas	1,341	2%
Geothermal	61	<1%

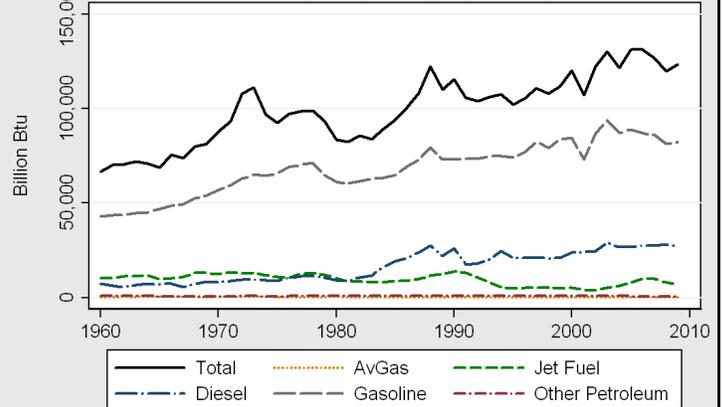
Fuel Type	Billion Btu	Percentage
Total	123,477	100%
Gasoline	82,258	67%
Diesel	27,388	22%
Jet Fuel	6,976	6%
Natural Gas	874	1%
Other Petroleum	610	<1%

Maine Residential Sector Energy Consumption, 1960-2009
Consumption by Fuel Type (Billion Btu)



DEDI Energy Database, 2012 (EIA)

Maine Transportation Sector Energy Consumption, 1960-2009
Consumption by Fuel Type (Billion Btu)

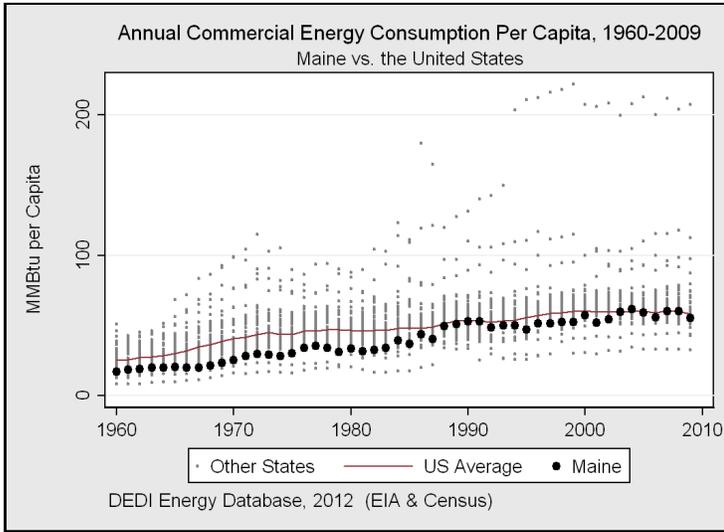


DEDI Energy Database, 2012 (EIA)

Net residential sector energy consumption was 62,711 billion Btu in Maine in 2009. This amount was a decrease of 5% compared with 2008. Overall, residential energy consumption was led by petroleum use in 2009. (Note: Net energy consumption does not include the associated energy losses of electricity generation and transmission).

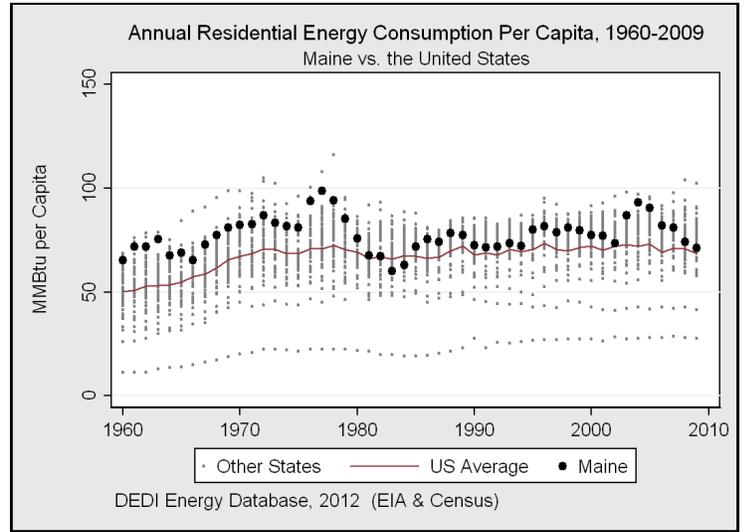
In 2009, the transportation sector of Maine consumed 123,477 billion Btu of energy commodities. This total reflected an increase of 3% in transportation energy consumption compared with the previous year. Unsurprisingly, gasoline was the largest source of transportation sector energy consumption in 2009.

Maine Energy Intensity



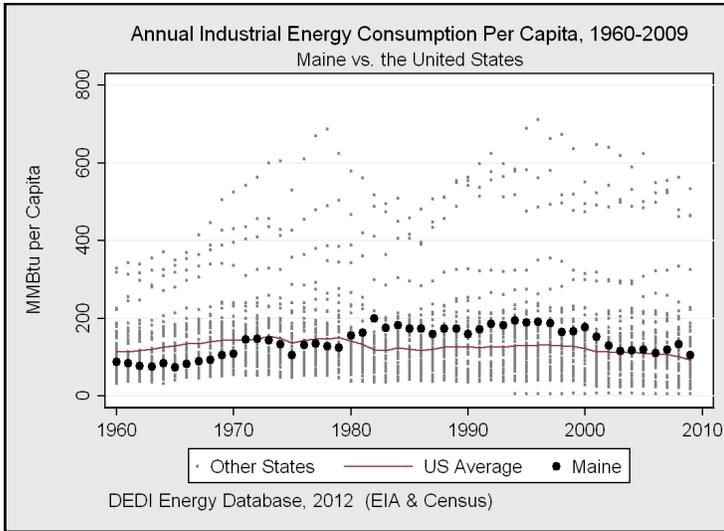
State	MMBtu per Capita	Rank
Wyoming	113	1st
Maine	56	38th
Hawaii	32	50th

Maine ranked 38th lowest nationally for commercial energy consumption per capita in 2009, a decrease of 8% compared with 2008. (MMBtu = 1 Million Btu).



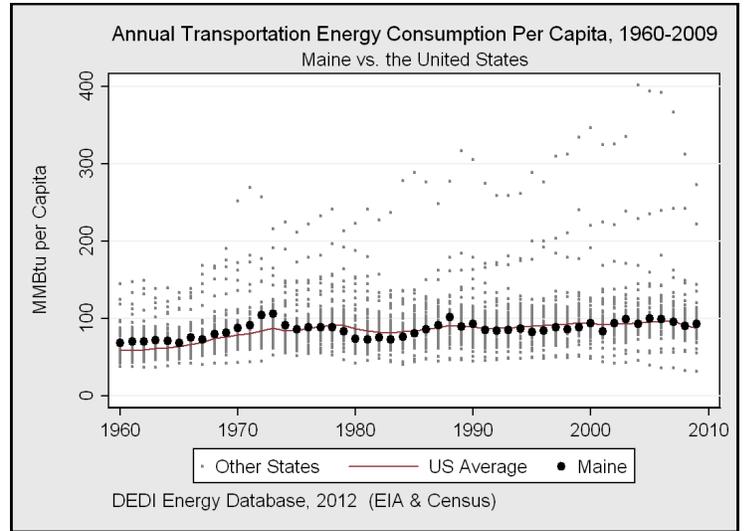
State	MMBtu per Capita	Rank
North Dakota	102	1st
Maine	71	35th
Hawaii	28	50th

Maine's residential sector consumed 71 Million Btu of energy per capita in 2009, a decrease of 4% from 2008. Maine ranked 35th lowest by state.



State	MMBtu per Capita	Rank
Wyoming	533	1st
Maine	106	22nd
New York	19	50th

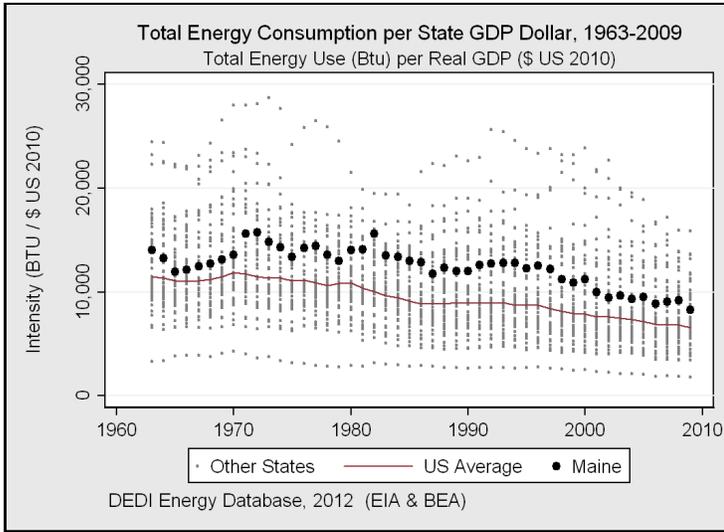
Industrial energy consumption per capita in Maine was 22nd highest in the country in 2009. Compared with 2008, industrial energy use per capita fell by 21%.



State	MMBtu per Capita	Rank
Alaska	273	1st
Maine	94	24th
New York	56	50th

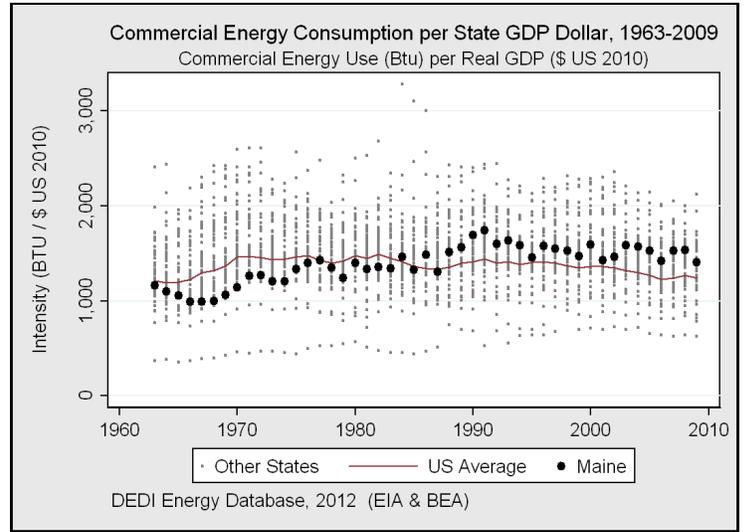
Transportation energy consumption per capita in Maine rose by 3% in 2009. Overall, Maine ranked 24th highest in the country for this metric.

Maine Energy Intensity



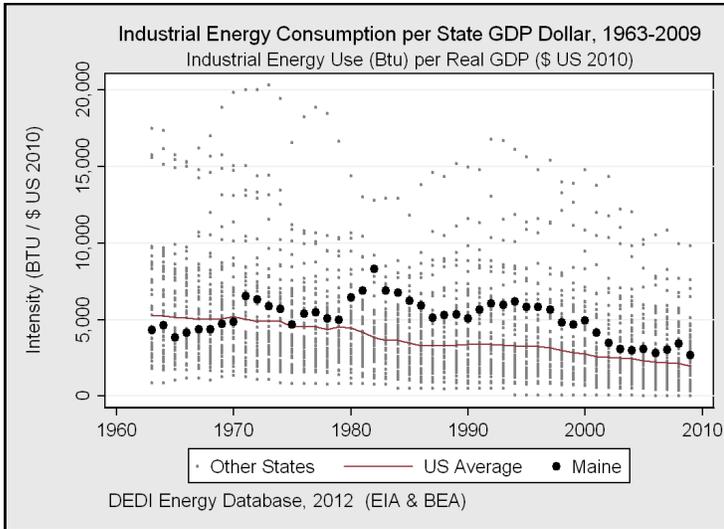
State	Btu / \$US GDP	Rank
Louisiana	15,894	1st
Maine	8,257	22nd
Connecticut	3,411	50th

Maine ranked 22nd highest for energy consumption used to produce one dollar of state GDP in 2009. This measurement fell by less than 1% compared with 2008.



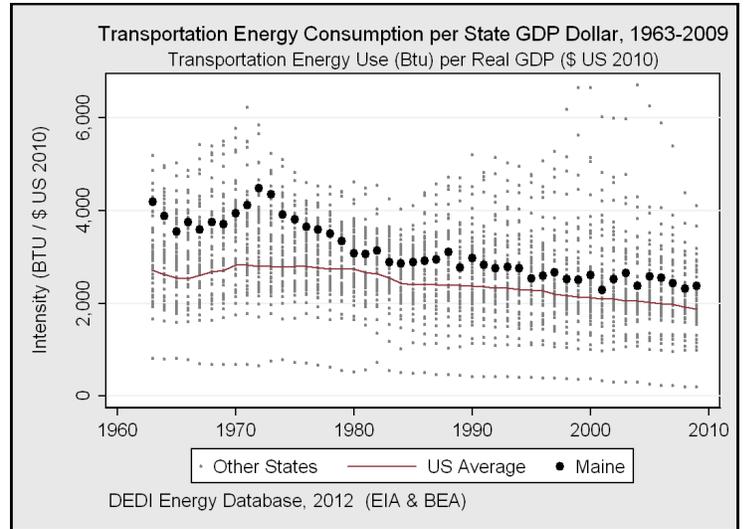
State	Btu / \$US GDP	Rank
Montana	2,124	1st
Maine	1,406	23rd
Hawaii	623	50th

Maine's commercial sector ranked 23rd highest for the ratio of energy use to state GDP dollar in 2009, a decrease of 8% from 2008.



State	Btu / \$US GDP	Rank
Louisiana	9,817	1st
Maine	2,679	22nd
New York	329	50th

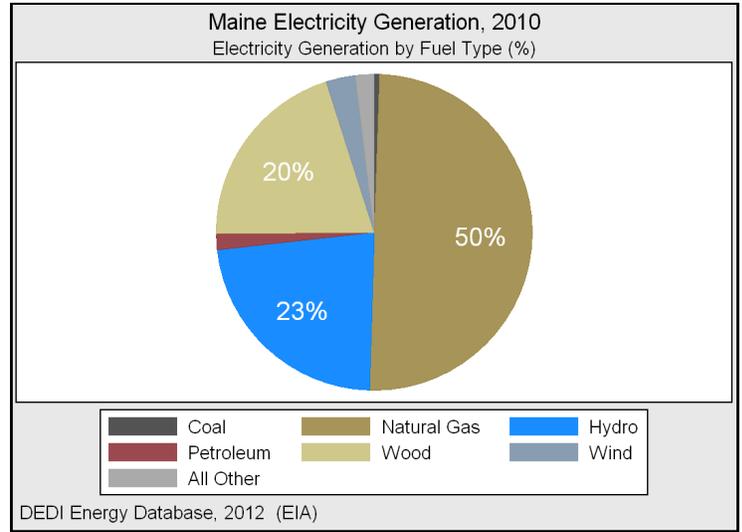
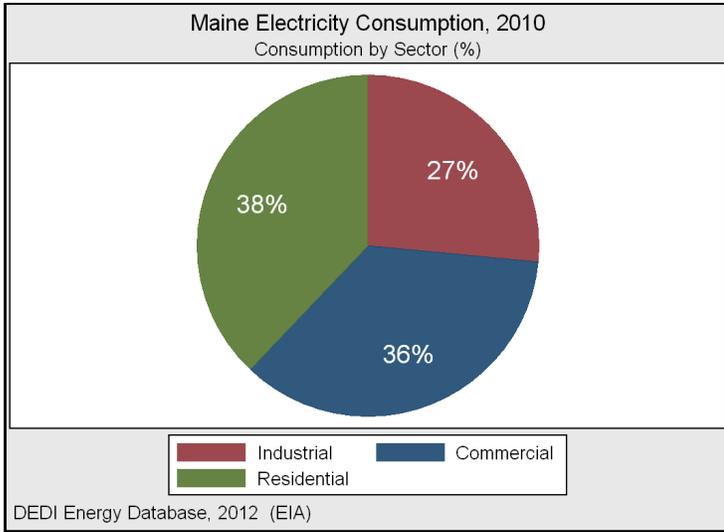
Industrial energy consumption per dollar of state GDP in Maine was 22nd highest in 2009. Compared with 2008, industrial energy intensity fell by 22%.



State	Btu / \$US GDP	Rank
Alaska	4,103	1st
Maine	2,368	16th
New York	982	50th

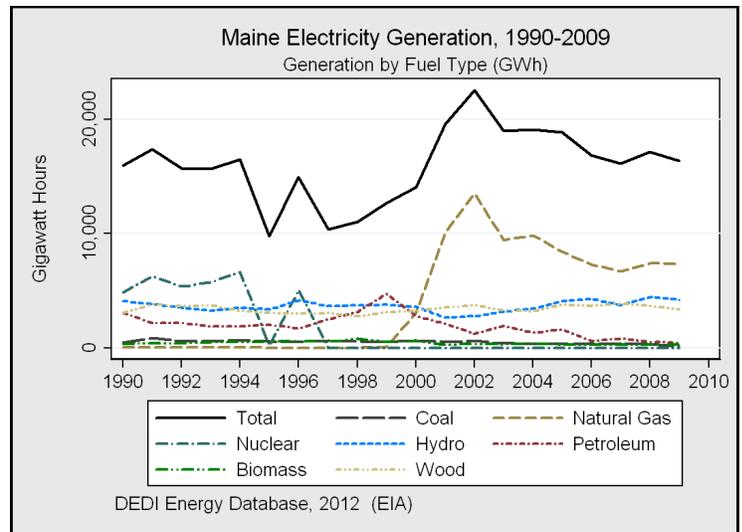
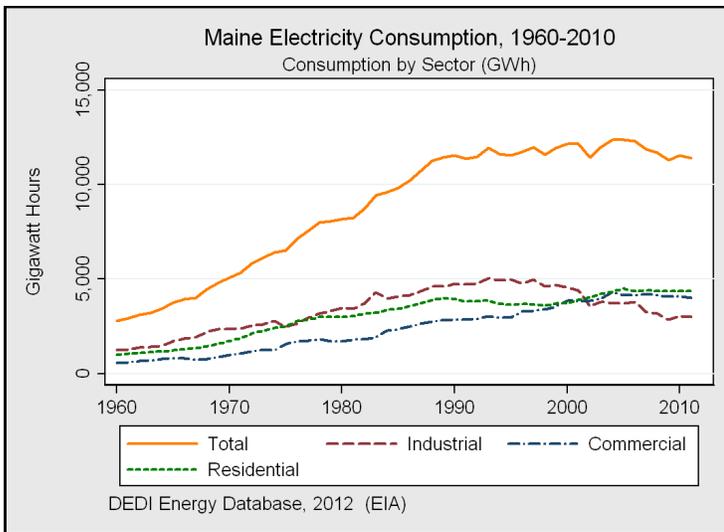
Transportation sector energy intensity per state GDP dollar in Maine rose by 2% in 2009. Overall, Maine ranked 16th highest in the country for this metric.

Maine Electricity



Sector	Gigawatt Hours	Percentage
Total	11,532	100%
Residential	4,372	38%
Commercial	4,101	36%
Industrial	3,059	27%

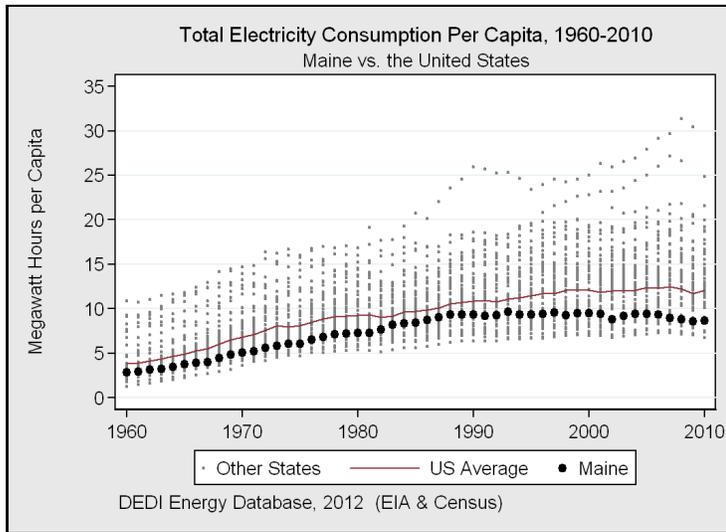
Fuel Type	Gigawatt Hours	Percentage
Total	17,019	100%
Natural Gas	8,374	49%
Hydro	3,810	22%
Wood	3,390	20%
Wind	499	3%
Petroleum	272	2%



In 2010, citizens, institutions, and firms in Maine consumed 11,532 gigawatt-hours of electricity. Compared with 2009, total electricity consumption rose by 2%. Dividing electricity consumption by economic sector, residential customers were the largest consumers of electricity in Maine in 2010.

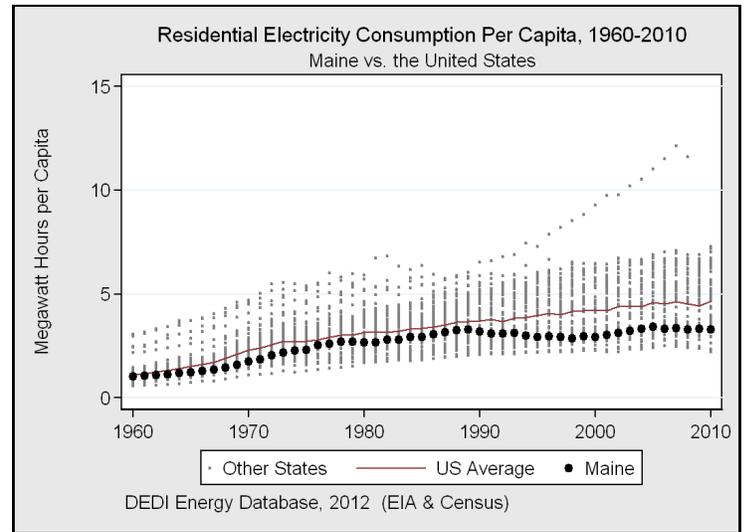
Electric power facilities in Maine generated over 17,019 gigawatt-hours of electricity in 2010. The use of natural gas represented the largest portion of this electricity, accounting for 8,374 gigawatt-hours. Overall, electricity generation rose by 4% versus the previous year.

Maine Electricity Intensity



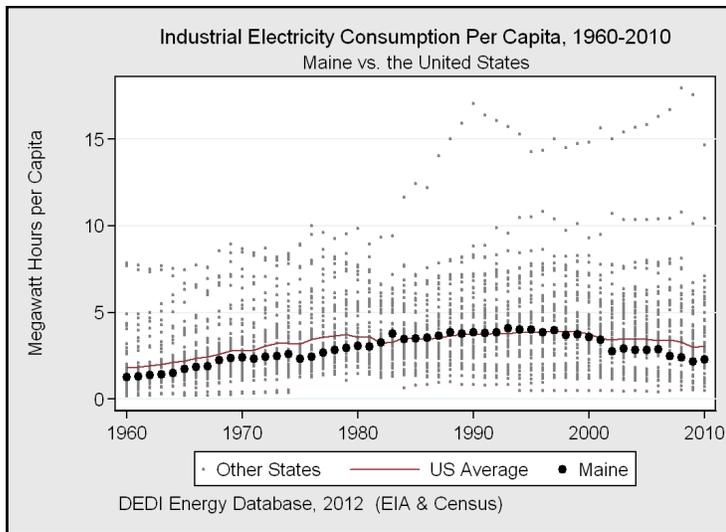
State	MWh per Capita	Rank
Wyoming	24.9	1st
Maine	8.7	43rd
California	6.7	50th

At 8.7 MWh, Maine ranked 43rd lowest nationally for total electricity consumption per capita in 2010, an increase of 1% from 2009.



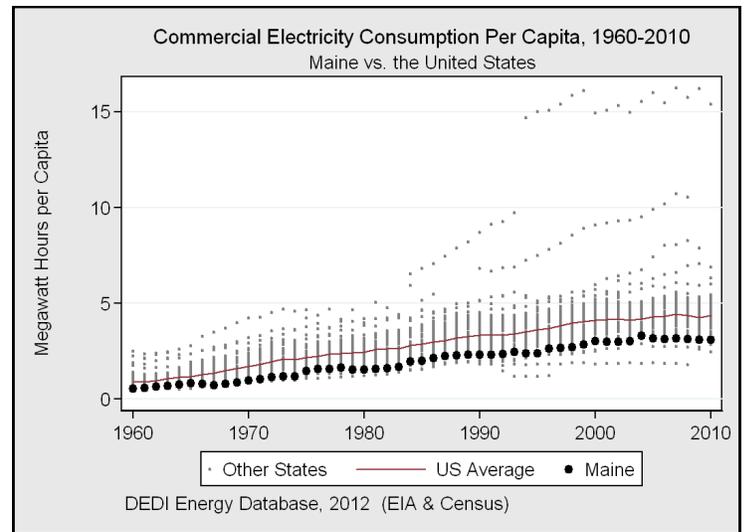
State	MWh per Capita	Rank
Alabama	7.3	1st
Maine	3.3	42nd
Hawaii	2.2	50th

Residents of Maine used on average 3.3 MWh of electricity in 2010. Representing a decrease of 1%, this amount ranked Maine 42nd lowest by state.



State	MWh per Capita	Rank
Wyoming	14.7	1st
Maine	2.3	38th
New York	0.7	50th

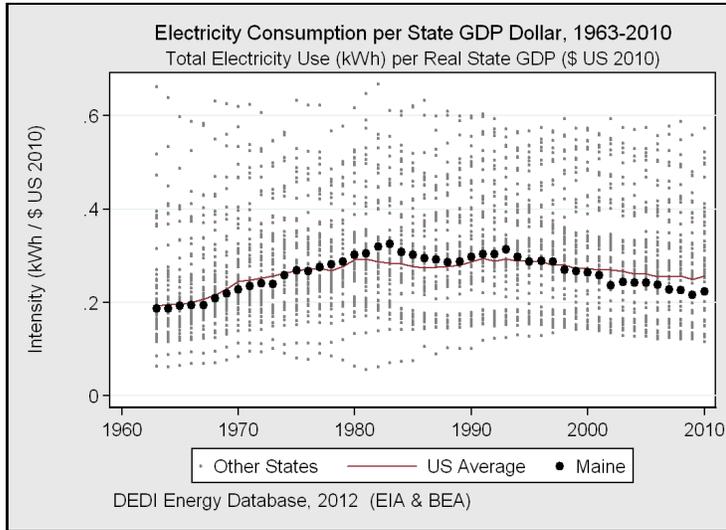
Industrial electricity consumption per capita in Maine was 38th lowest in 2010. Versus 2009, industrial electricity consumption per capita rose by 7%.



State	MWh per Capita	Rank
North Dakota	6.9	1st
Maine	3.1	48th
Hawaii	2.5	50th

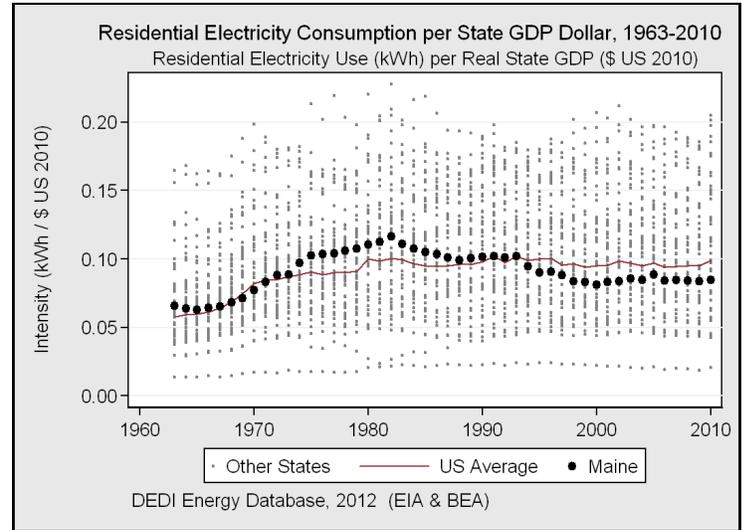
Maine's commercial electricity consumption per capita fell by less than 1% in 2010 to 3.1 MWh. Overall, Maine ranked 48th lowest in the country for this metric.

Maine Electricity Intensity



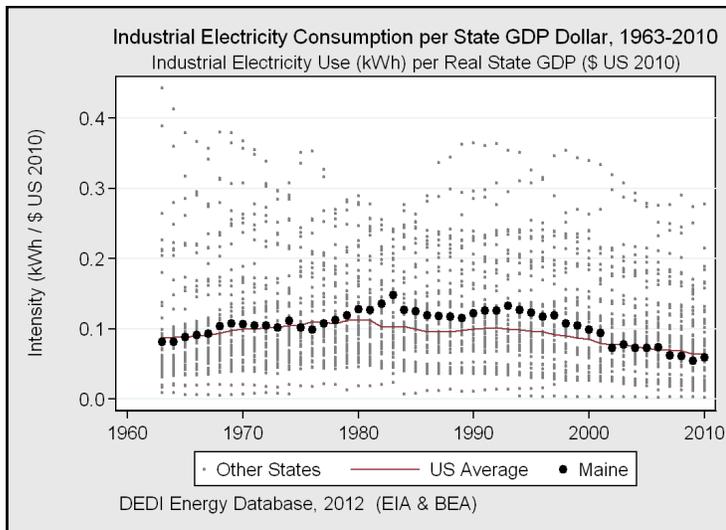
State	kWh / \$ US GDP	Rank
Kentucky	0.57	1st
Maine	0.22	36th
New York	0.13	50th

Maine ranked 36th lowest nationally for total electricity consumption per state GDP dollar in 2010. This amount rose by 3% to 0.22 kWh per dollar for the year.



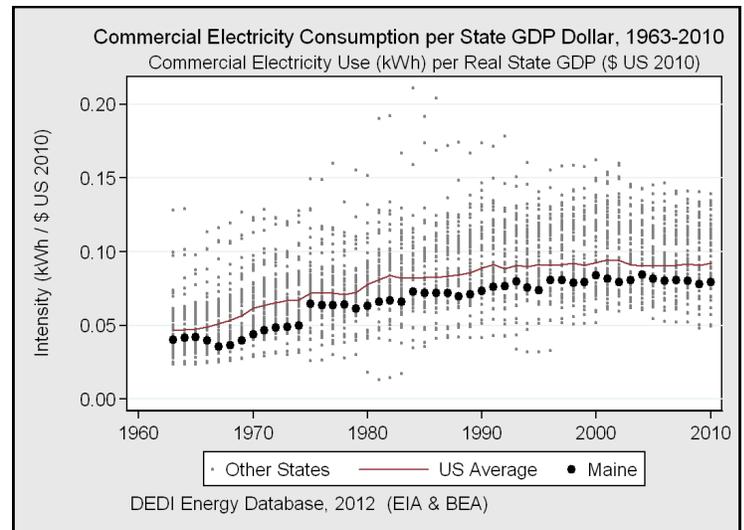
State	kWh / \$ US GDP	Rank
Mississippi	0.20	1st
Maine	0.08	34th
Alaska	0.04	50th

In 2010, Maine ranked 34th lowest for residential electricity use relative to one dollar of state GDP. This metric rose by 1% compared to 2009.



State	kWh / \$ US GDP	Rank
Kentucky	0.28	1st
Maine	0.06	32nd
New York	0.01	50th

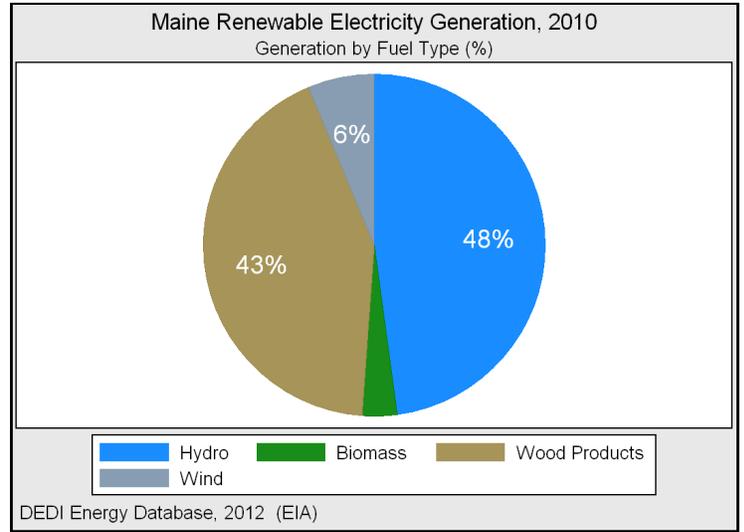
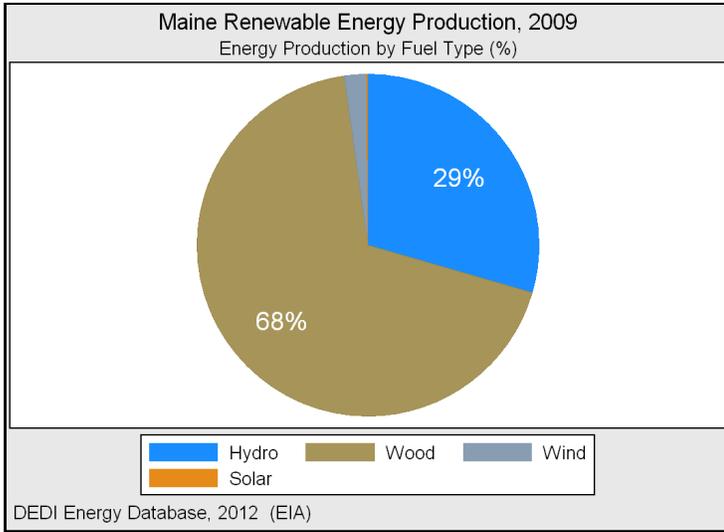
Industrial electricity consumption per state GDP dollar in Maine was 32nd lowest in the country in 2010. Versus 2009, industrial electricity intensity rose by 8%.



State	kWh / \$ US GDP	Rank
Mississippi	0.14	1st
Maine	0.08	38th
Massachusetts	0.05	50th

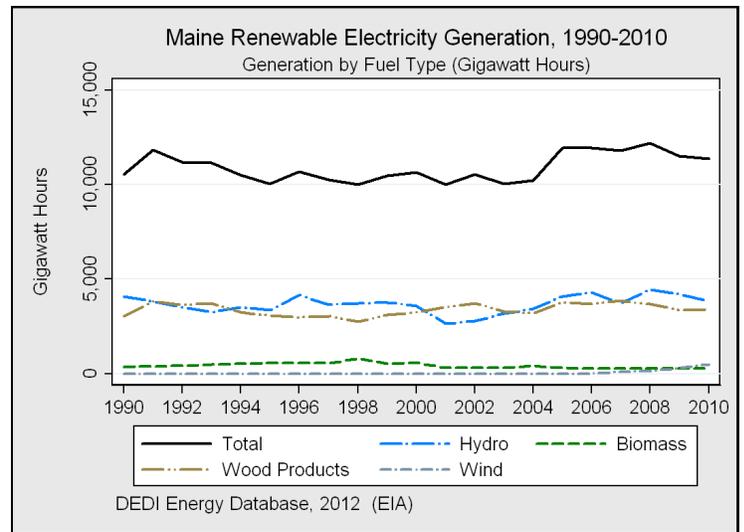
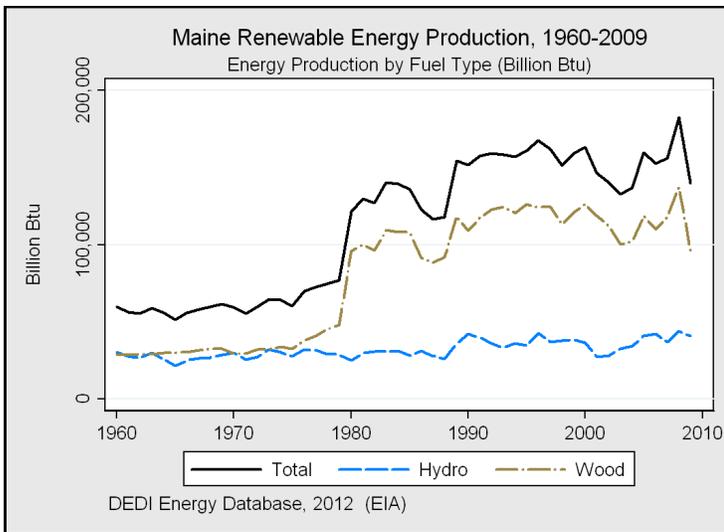
Maine's commercial sector used 0.08 kWh of electricity to generate one dollar of economic output. A increase of 2%, this ratio ranked the state 38th lowest.

Maine Renewable Energy



Fuel Type	Billion Btu	Percentage
Total	139,654	100%
Wood & Biomass	95,366	68%
Hydro	41,106	29%
Wind	2,915	2%
Solar	206	<1%
Geothermal	61	<1%

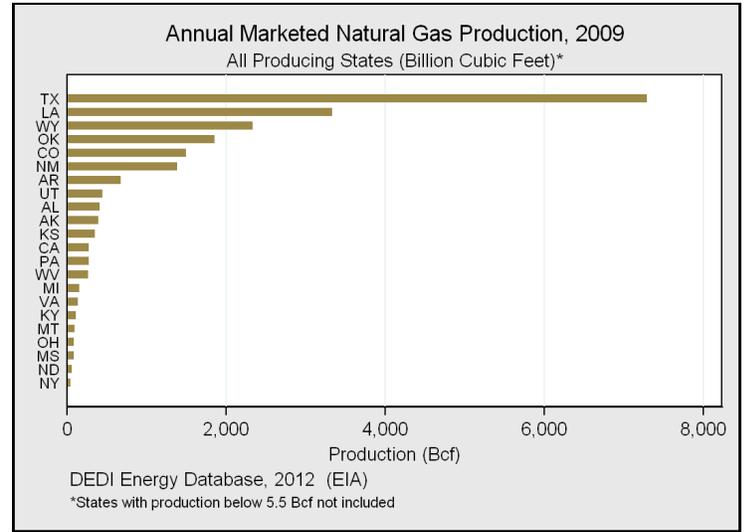
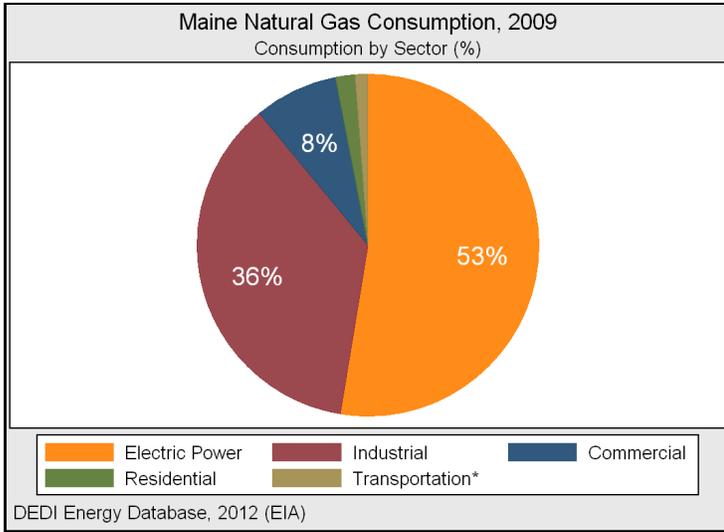
Fuel Type	Gigawatt Hours	Percentage
Total	7,963	100%
Hydro	3,810	48%
Wood	3,390	43%
Wind	499	6%
Biomass	264	3%



In 2009, renewable energy production in Maine was 139,654 billion Btu, a decrease of 24% from 2008. Dividing this production by fuel type, wood & biomass resources accounted for the largest amount of energy production in 2009.

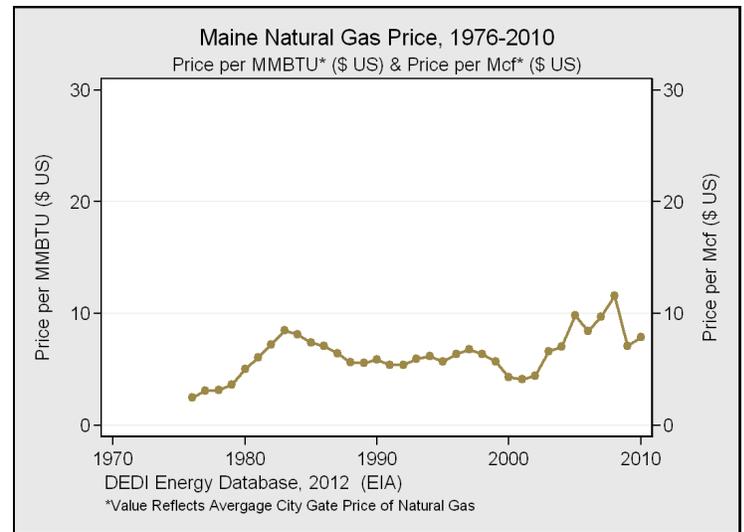
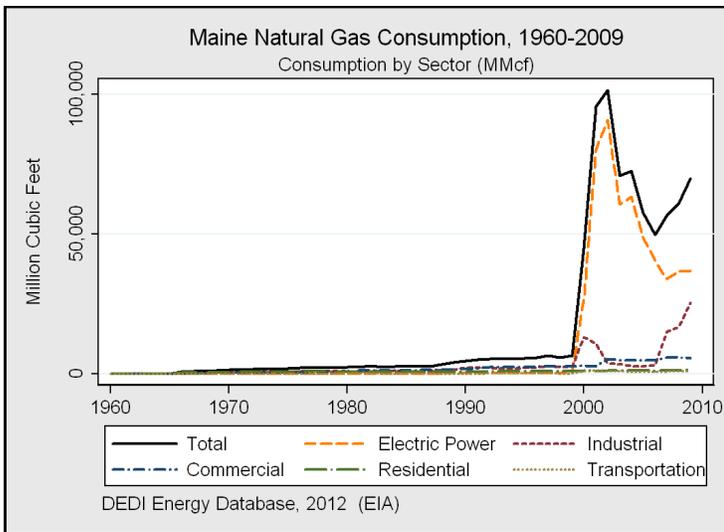
Describing renewable electricity generation by fuel type or commodity, the production from hydroelectric facilities represented the largest portion of renewable electricity generation in Maine in 2010. Compared with 2009, the electrical output of hydroelectric facilities displayed a decrease of 10%. (Total biomass generation is divided between wood products - labeled Wood - and other biomass resources - labeled Biomass - such as landfill gas).

Maine Natural Gas



Sector	Million Cubic Feet	Percentage
Total	69,823	100%
Electric Power	36,746	53%
Industrial	25,412	36%
Commercial	5,541	8%
Residential	1,286	2%
Transportation	838	1%

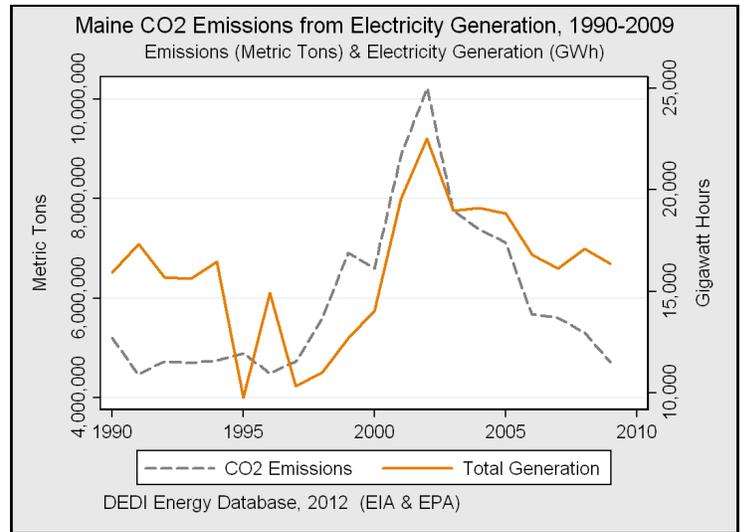
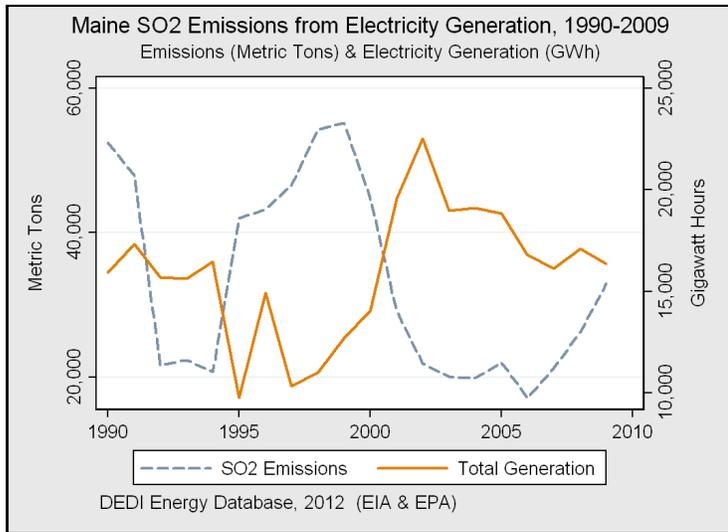
Maine registered no natural gas production in 2009 according to the EIA SEDS database. As a result of this dynamic, Maine was a net importer of natural gas supplies for the year. The top three states by natural gas production in 2009 were Texas, Louisiana, and Wyoming, with Texas by far the single largest producer of the commodity.



In 2009, natural gas consumption in Maine was 69,823 million cubic feet. Compared with 2008, total natural gas consumption rose by 14% on the year. Dividing natural gas use by economic sector, the electric power sector was the largest consumer of natural gas in Maine in 2009. (Natural gas consumption by the Transportation Sector is the summation of direct, vehicle fuel use and natural gas used by transmission and distribution pipelines).

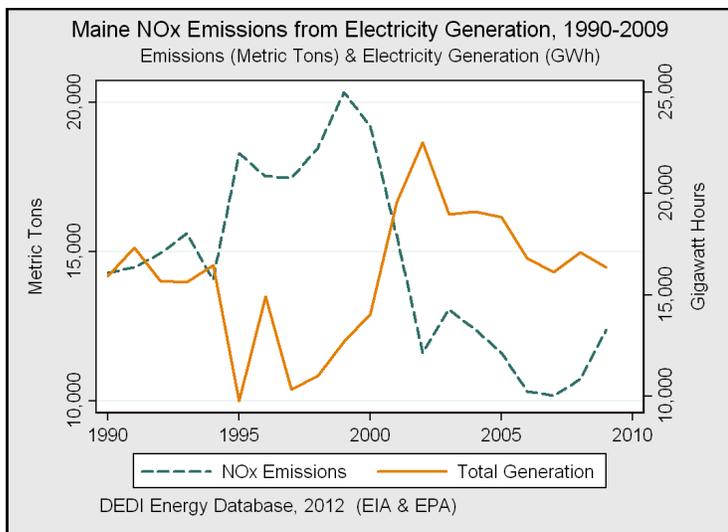
The average city gate price of natural gas in Maine was \$7.88 per thousand cubic feet in 2010. Versus the previous year, this average annual price rose by 11%. The city gate price of natural gas is typically reported at the connection where a natural gas distribution company or utility takes control of natural gas delivered by a pipeline or transmission company.

Maine Power Plant Emissions



Emission	Metric Tons	Since 1990
Carbon Dioxide	4,714,269	-9%
Sulfur Dioxide	32,926	-37%
Nitrogen Oxides	12,397	-13%

Sulfur dioxide is a highly reactive gas and major pollutant that is monitored and regulated at the State and Federal level. In 2009, the electric power sector of Maine emitted 32,926 metric tons of sulfur dioxide, representing an increase of 26% compared with 2008. Overall, the electric power sector of Maine has decreased sulfur dioxide emissions by 37% since 1990.

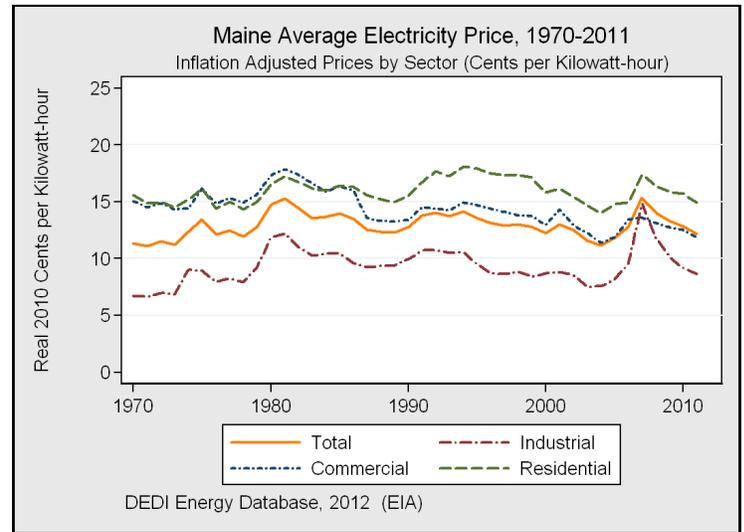
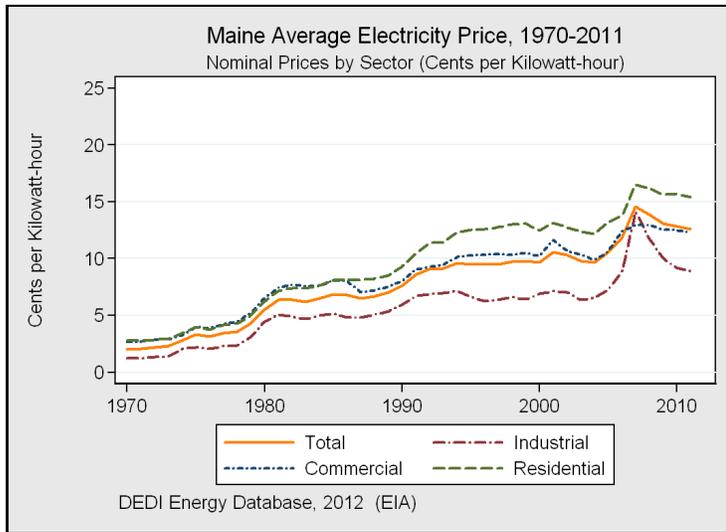


Nitrogen oxides are a group of highly reactive regulated pollutants. In 2009, the electric power sector of Maine emitted 12,397 metric tons of nitrogen oxides, representing an increase of 15% compared with 2008. Overall, the electric power sector of Maine has decreased nitrogen oxides emissions by 13% since 1990.

Carbon dioxide emissions from fossil fuel power plants have been monitored over time at the State and Federal level. In 2009, the electric power sector of Maine emitted 4,714,269 metric tons of carbon dioxide, representing a decrease of 11% compared with 2008.

The last major amendments to the Clean Air Act were implemented in 1990. These amendments focused on National Ambient Air Quality Standards and the mechanisms which would ensure compliance with emission reduction targets. Subsequently, the emission of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) from electric generating plants were regulated and scheduled for reduction. The dual display of electricity generation and regulated emissions indicates that over time, though electricity demand and generation have increased, the release of targeted pollutants has actually decreased. Therefore, both the aggregate emission as well as intensity of emission per gigawatt-hour of criteria pollutants, such as sulfur dioxide and nitrogen oxides, have been decreasing nationally since 1990. The reductions have been made through a combination of fuel switching and the installation of pollution mitigation systems at power plants.

Maine Electricity Prices



Sector	Cents / kWh	Since 2000
Average	12.84	33%
Industrial	9.17	33%
Commercial	12.51	22%
Residential	15.72	26%

Prices and percent changes above are displayed and calculated in terms of nominal prices (\$ US) for the period 1970-2010.

Fuel Type	Real Cents / kWh	Since 2000
Average	12.84	5%
Industrial	9.17	5%
Commercial	12.51	-3%
Residential	15.72	-1%

Prices and percent changes above are displayed and calculated in terms of real, inflation-adjusted dollars (Real \$ US 2010) for the period 1970-2010.

Electricity usage in Maine is billed in terms of cents per kilowatt-hour of electricity consumed. Due to the variations between economic sectors, electric utilities, and electric power producers, the price of electricity is not uniform across Maine. As a result, each economic sector in Maine pays a different average price for the consumption of electricity.

In 2010, the average price of electricity across economic sectors in Maine was 12.84¢ per kilowatt-hour. With a decrease of 2% versus 2009, this overall, weighted-average price ranked Maine 11th highest in the country in terms of electricity. Since 2000, the average price of electricity in Maine has risen by 33%.

Adjusting for inflation over time, the trends in the real cost of electricity in Maine between 1970 and 2010 can be placed in context to the adjacent, nominal graphic. Resetting historical price data to inflation-adjusted 2010 values, the price of electricity in real economic terms in Maine has risen by 5% since the year 2000. Additionally, in 2010 Maine ranked 11th highest in the nation for the real price of electricity.

Since 1990, the two most influential factors explaining the changes in both nominal and real electricity prices have been the type of generation portfolio developed within a state, and the price of fossil fuel inputs for the electric power sector. Specifically, these factors involve the type of generation technology (i.e. coal, gas, nuclear) used within a state, the share of each technology in supplying baseload power, and the price of the primary fossil fuel commodities.

