

Iowa Economic Development Authority (IEDA) houses the State Energy Office (SEO) which oversees a variety of programs and initiatives. As the designated SEO, the energy team receives State Energy Program Formula funding from the U.S. Department of Energy to carry out designated energy activities for the state. These activities include promoting energy efficiency, biofuels and renewable energy. In addition, the energy team administers several programs as listed below.

City Energy Management Program: A Regional Energy Manager Approach

Through this program, cities set energy reduction goals and implement energy efficiency projects through the shared use of a Regional Energy Manager (REM). REMs work directly with each city to identify opportunities to reduce energy costs in city-owned buildings, exterior lighting and water/wastewater facilities. The 19 pilot communities receive one-on-one customized assistance in benchmarking city-owned buildings, determining energy priorities, reviewing building operation and maintenance procedures, developing a city Energy Action Plan, and implementing energy efficiency projects.

Background

The SEO was awarded a U.S. DOE State Energy Program Competitive Award in the amount of \$368,218 with a match of \$92,055. The monies from this have been used to develop a City Energy Management Program (CEMP) to drive demand for energy efficiency in city owned buildings. The energy office partnered with Main Street Iowa and the Community Development division at IEDA to market the REM model to communities. The ultimate goal of this project is to demonstrate success with this model, and then continue and replicate it in other communities in Iowa.

Process

SEO recruited 19 Iowa communities to participate in this program. Participating communities have access to a technical expert (REM) provided by Franklin Energy who assists with the design and implementation of an energy action plan. These technical experts provide assistance in the following areas:

- Creating an energy action plan
- Making a business case to invest in energy efficiency
- Creating new programs that provide steady source of funding for energy efficiency projects, and more.

The REM follows the U.S. Environmental Protection Agency's Energy Star Energy action model. In following this model, a number of key steps are required of the cities:

- Establish an energy advisory team
- Enroll in the Iowa Public Benchmarking program to provide a baseline and benchmark
- Engage the utilities for audits and rebate opportunities
- Undertake energy efficiency projects as recommended by the audit reports

The REM concept is fairly new but has the potential to make significant impact in communities that lack dedicated personnel for energy efficiency projects. The REM program aims to change the local municipal perspective of looking at energy efficiency on a project-by-project basis and instead undertake energy improvements as critical elements of a successful energy action strategy for the city.

Solar Ready Iowa

This program is designed to help Iowa communities reduce barriers to solar photovoltaic (PV) projects at the local government level for their residents and businesses through standardizing planning, zoning and permitting, and the educating of city staff on solar PV.

Background

IEDA has undertaken “Solar Ready Iowa” to reduce market barriers and lower the soft costs of rooftop solar installations in Iowa. Soft costs are the non-hardware costs associated with installation such as permitting, zoning and customer acquisition that can add up to 40 percent of the total installed cost of a rooftop PV system, according to the Department of Energy.

IEDA is partnering with five pilot communities to work towards reducing soft costs in their communities. These communities will review and adopt best practices and implement those steps for the duration of the award. In return, they will receive financial and technical assistance. Communities develop their own plans for reducing costs based on their priorities and local resources.

Process

The energy office selected Great Plains Institute for Sustainable Development to conduct workshops on the soft costs of solar PV with each of the pilot local governments. Listed below are the topics that the trainings will cover:

- The workshops will be focused on comprehensive plans, development regulations and permitting processes for each individual local pilot government as they pertain to solar photovoltaic development. The audience will consist of planning staff, city manager’s office staff, building inspectors and permitting officials.
- Incorporate solar PV as an energy resource in the Comprehensive Plan for each pilot local government.
- Review development regulations for each pilot local government and the challenges they may create for solar PV.
- Identify and incorporate model language to reduce barriers to solar PV in local pilot government.
- Present case studies of other communities that have reduced the soft costs of solar PV in their communities.
- Review of the local government permitting process as it pertains to solar PV and steps that could be taken to reduce challenges to solar PV.
- Provide an expert review on the barriers to solar PV resulting from the current strategies in the pilot local governments.

- Guide the development of pilot local governments in their creation of individual actions to reduce solar PV soft costs.

B3 Benchmarking Program

The B3 Public Building Benchmarking Database is a web-based tool providing needed information for building owners to evaluate the efficiency level at which their buildings are performing.

Background

The state Energy Office, in partnership with the Iowa Energy Center, has been administering the B3 Benchmarking program since 2010. As of December 2014, 103 Iowa public organizations have enrolled over 2,000 buildings in the program. To continue the success of this valuable program, the SEO is partnering with the Iowa Energy Center at Iowa State University, MidAmerican Energy Company, Interstate Power and Light and Iowa Association of Municipal Utilities. These partners will jointly sponsor the next phase of the project which will accommodate up to 3,000 buildings in the database system.

Process

The SEO selected The Weidt Group to provide the benchmarking database tool used to benchmark public buildings. Public buildings for purposes of this benchmarking effort include K-12, city-owned, county-owned, community college, higher education and state of Iowa facilities. Multiple state agencies such as the Board of Regents, the Department of Public Safety, the Department of Transportation and the Department of Administrative Services participate in the program. It is estimated there are approximately 5,000 – 6,000 public buildings in Iowa.

The benchmarking tool allows users to compare their energy performance to either a code compliant building or to a “peer” building of similar size and use. Users can then gauge which buildings will yield the higher return on investment and target those buildings for further analysis such as through a full audit.

Benefits of Building Energy Benchmarking

The Iowa Public Building Benchmarking program allows building owners several benefits, including:

- Conduct an “apples to apples” comparison of similar public buildings both in state and nationwide.
- Measure and track energy use across the portfolio and identify variances in buildings’ performances.
- Track water usage and costs.
- Lastly and most importantly, the EPA found that buildings that were benchmarked consistently reduced energy use by an average of 2.4 percent per year.

The buildings – including offices, hospitals, schools, supermarkets, factories, and more – account for nearly 40 percent of all the energy consumed in the United States. Improving energy efficiency is not just an investment in equipment, but an understanding that we can all make small changes in our behavior that, when combined, can make a big difference. Benchmarking is essential in developing an energy action plan and reducing overall energy use and greenhouse gas emissions.

Expanding Combined Heat and Power in Iowa

The promotion of Combined Heat and Power (CHP) by the U.S. Department of Energy has created interest among Iowa facility managers and others who contact the SEO seeking technical and financial assistance for CHP projects. To increase access to CHP, the SEO is building on recommendations resulting from the National Governors Association (NGA) Policy Academy on CHP to minimize barriers limiting the spread of CHP. As the NGA effort focused on manufacturing applications for CHP, the SEO is targeting additional stakeholders in the institutional (hospital and higher education, etc.) and commercial building sectors by providing resources to facilitate CHP applications in Iowa.

Background

As a result to the NGA effort, IEDA was tasked with the following:

- Research existing CHP-related information and share that information with stakeholders by providing links via a website hosted by the IEDA.
- Provide documents (flow chart and contact info) to parties who have questions concerning siting, permitting and approval of facilities.
- Increase understanding of potential CHP market; and
- Provide information regarding existing CHP facilities and Iowa's technical and economic potential for CHP with stakeholders and interested parties which will be posted on the CHP web page hosted by IEDA.

Process

In collaboration with the Iowa Department of Natural Resources, the SEO is working to expand upon the above goals by streamlining the CHP permitting process. In addition, the SEO is exploring the market potential for CHP in the commercial and institutional sectors, and identifying the benefits of and barriers to CHP. By the end of the project, Iowa will complete a whitepaper outlining financial incentives such as tax credits, loans and other approaches; conduct community outreach and education to increase the understanding of the potential CHP market; and create a resource guide that will serve as a roadmap for future CHP projects. The project, which is scheduled for completion in January 2016, is partially funded through a Department of Energy grant of \$78,371.

Biogas

IEDA sponsored the development of a new resource to evaluate the potential for biogas projects. The Iowa Biogas Assessment Model (IBAM) is an economic analysis tool integrated with Geographic Information System mapping which provides an overview of materials available as biomass feedstock. By utilizing both IBAM and the input-output modeling tool IMPLAN to analyze the economic impacts of one to two Anaerobic Digestion (AD) projects in rural communities, the results will be used to extrapolate statewide economic impact of AD.

Background

The IBAM study demonstrated that Iowa has a large supply of biomass that can potentially be converted to biogas and pipeline quality renewable natural gas to be used as transportation fuel. There are numerous sites within the state where the aggregate volume of available biomass can support the installation of a biodigester. However, since IBAM does not calculate the economic impact of such investments on the state and the rural economies that comprise it, the program will take the next step by conducting an economic impact study to understand the potential monetary and economic value of AD industry in Iowa.

Process

EcoEngineers, in partnership with the SEO and Iowa State University, launched IBAM last year. This tool provides data on the type, quantity and location of a wide variety of waste streams, making the siting of AD projects more straightforward than it would be otherwise. The second phase of the project will provide concrete data by using IMPLAN, a software widely used for economic impact studies. Since the models are designed using localized data, the results directly correlate to the economic conditions of the region being studied. Some of the input variables that will be used include economic data, such as initial investment, timeframe for the completion of the project, equipment utilized, annual operating expenditures, projected employment, etc. The outputs will contain direct, indirect and induced economic impacts such as job creation, economic productivity, workers' earnings, as well as new or enhanced business activities.

Energy Assurance

The Iowa Department of Agriculture and Land Stewardship and the Iowa Utilities Board have primary responsibility for the state's Energy Assurance Plan. The functions they oversee include energy planning and coordination for the state, promoting the synchronization of risk management activities and emergency response preparedness programs/plans.

Building Codes

IEDA continues to provide financial support for the building codes program at the Iowa Department of Public Safety. The state adopted the 2012 International Energy Conservation Code in early 2014. The State Building Code Bureau of DPS works with local governments to train them on the code and provide the necessary technical assistance for compliance enforcement.

The background of the entire page is a photograph of a wind farm. Several white wind turbines are visible against a clear blue sky. In the foreground, there is a lush green field of crops, likely corn, arranged in neat rows. A large, semi-transparent green circle is centered on the page, framing the main title.

IOWA ENERGY **PROFILE**

IOWA[®]
economic development

This first edition of the *Iowa Energy Profile* was developed by the *Iowa Energy Office* in partnership with the *Kentucky Department for Energy Development and Independence* and *National Association for State Energy Officials*. The data summarized in this publication have been collected for the most-recent year available from a variety of sources, including 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 Bureau*.

SUMMARY

Energy and Iowa's Economy

Energy is a central part of Iowa's economy. During the past five years, an average of \$15.5 billion has been spent annually on energy in Iowa (page 8), which is over \$5,000 per person. More than 10 cents of every dollar made in Iowa is spent on energy—25 percent higher than the national average (page 13). More than half of Iowa's energy expenditures go to transportation fuels, of which gasoline is by far the largest expenditure (page 8). In 2012, Iowa spent over \$8 billion on transportation fuels alone—nearly \$5.2 billion on gasoline, and \$2.7 billion on diesel (page 29), most of which was imported from out of state. However, Iowa is becoming increasingly energy independent. In 1960, Iowans imported virtually all of the energy they required from out of state and primarily in the form of fossil fuels including petroleum, coal and natural gas. While Iowa was still a net-importer of energy in 2014, increasing production of ethanol and electricity generated from wind have substantially reduced energy imports, created local employment opportunities, and increased Iowa's energy security and independence (page 29).

Energy Production

Iowa is a leader in renewable energy production. Iowa farmers produced over 4 billion gallons of ethanol in 2014, 28 percent of total production nationally, making the state the nation's largest producer (see page 27). Since 2005, ethanol production in Iowa has increased by 19 percent each year, on average. Iowa produced nearly twice as much fuel ethanol as the second largest producing state, Nebraska. Iowa ranks just third behind Washington and California in renewable energy production because of the state's abundance of ethanol and wind energy production.

Fully 29 percent of electricity generated in Iowa came from the state's 36 wind farms' 3,204 individual wind turbines (see map on page 16). Iowa is second only to Texas in total wind-based electricity generation (see page 28), but in terms of percentage of electricity generated from wind power, Iowa is second to none (see page 14). The rise of wind energy in Iowa has been transformational—approximately three quarters of wind turbines began generating electricity in the last decade.

Iowa's 13 coal-fired power plants, the oldest of which was built in 1927 at the University of Northern Iowa, produced 34.2 terawatt-hours of electricity in 2014, or 60 percent of all electricity generated in Iowa. The largest generating station in Iowa is the Walter Scott Jr. Energy Center in Council Bluffs, which generated approximately 19 percent of all electricity generated in Iowa in 2014. Total coal generation has decreased by 17 percent since 2010, and will likely continue to decrease as coal units at 8 plants are expected to retire in the next three years.

Electricity Prices

Wind, nuclear, and coal power plants are working together to provide low cost electricity. Iowa had the 9th lowest electricity prices in the United States in 2014. In real terms, electricity prices have decreased substantially for Iowa. This is largely a result of its large industrial base, which generally consumes a large amount of electricity but requires less transmission infrastructure than the commercial and residential sectors. Only Indiana and Wyoming have more industrial electricity consumption as a percentage of total consumption as Iowa.

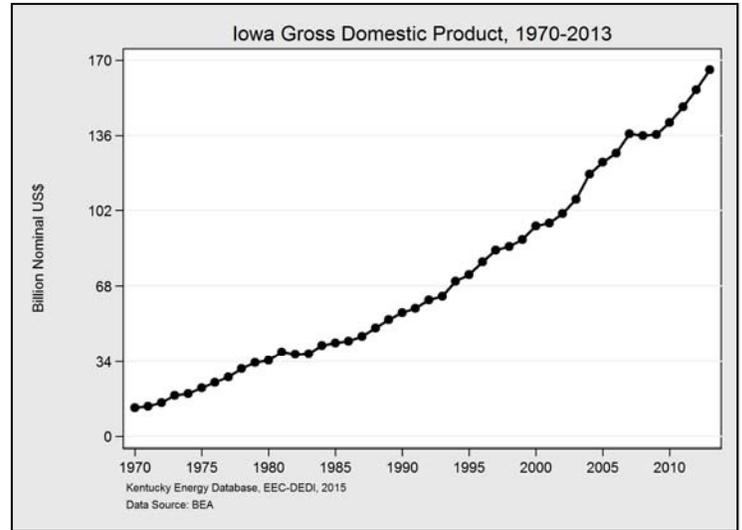
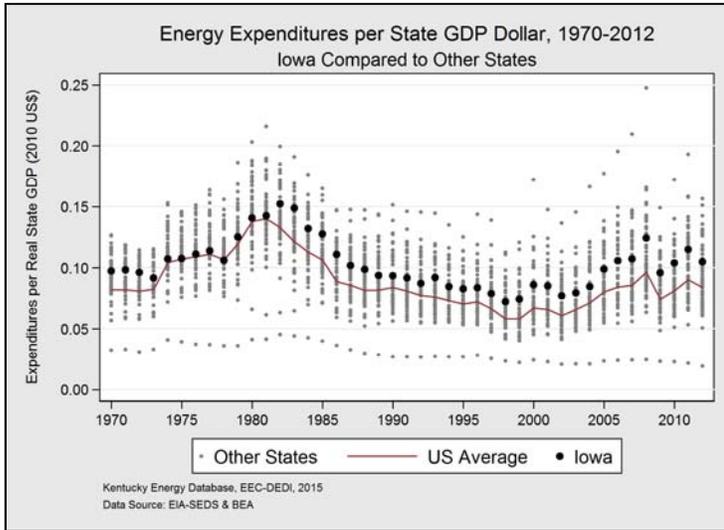
Home Heating Fuels

Iowa households spend approximately \$2 billion annually to heat and cool their homes, but the primary heating fuel used varies significantly across the state. Natural gas heat is the leading home heating fuel, used in over 686 thousand homes, or 68 percent of all Iowa households, and costs residential consumers over \$500 million annually. Natural gas heat is most common in the suburban communities near Des Moines, Cedar Rapids, Sioux City, and Waterloo (see map on page 20). Electric heat is the second most-common primary heating source, serving 183 thousand homes, or 18 percent. Electric heat is more prevalent in western Iowa in Ida, Harrison, Crawford, Appanoose, and Sioux counties (see page on page 21). On average, winter residential electricity bills are 25 percent higher than in spring and fall months. Propane heats over 107 thousand homes, or 10.6 percent, and costs residential consumers across the state a total of \$330 million annually. However, in most rural Iowa communities, propane heat is the primary heating source. Over 10,000 Iowa families, or 2.4 percent, burn wood to heat their homes. Wood heat is more common near the forests along the Des Moines River in southern Iowa and tributaries of the Mississippi River in northeast Iowa. However, Iowa is a dual-peaking state, with both cold winters and hot summers. Iowa households spend over \$300 million annually on 2.5 terawatt hours of electricity for air conditioning and average residential electricity bills nearly double from \$73 a month in the spring months of April and May to \$143 in July.

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GENERAL STATISTICS

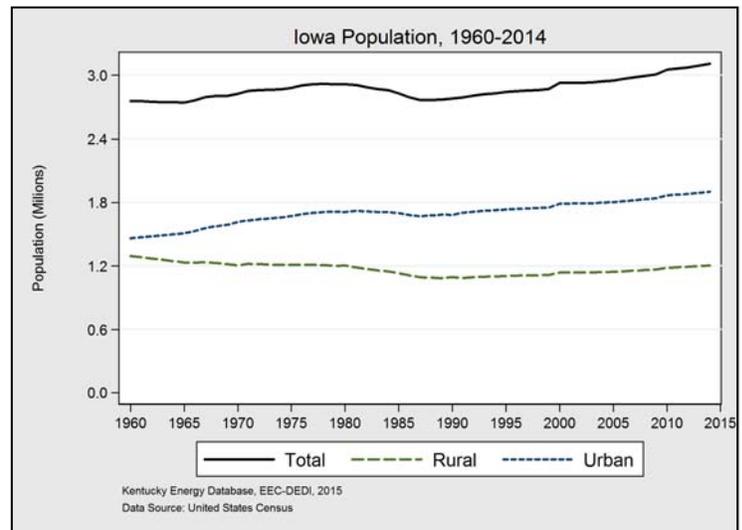
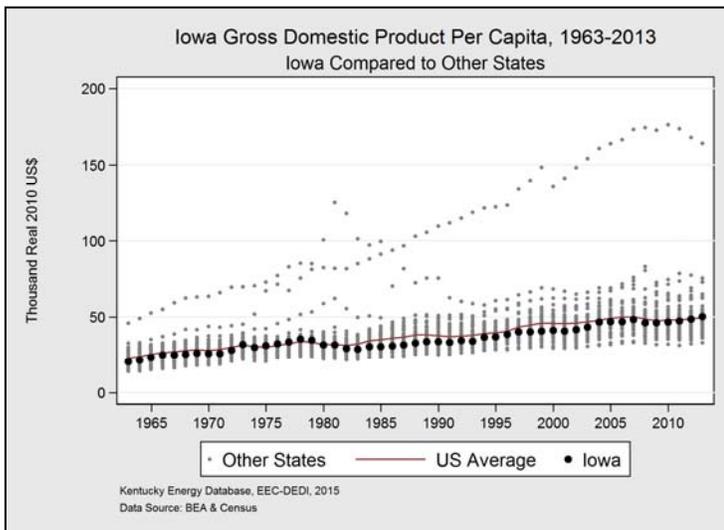


Energy Expenditures & GDP

In 2012, an average \$0.11 was spent on energy to produce one dollar of state Gross Domestic Product (GDP). This energy intensity of GDP fell by 7% compared with 2011.

Gross Domestic Product

Iowa's GDP was \$165.8 billion in 2013. In that year, the state GDP of Iowa rose by 6%. Since the year 2000, the state gross domestic product of Iowa has risen by 74% in nominal terms.



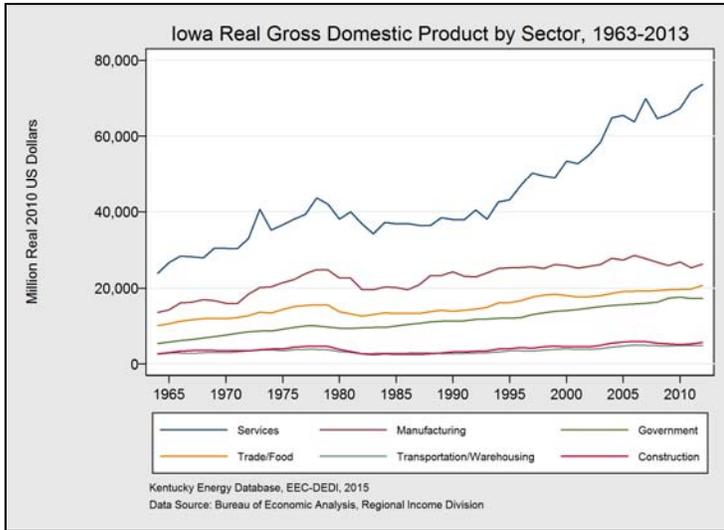
Gross Domestic Product per Capita

The per capita state GDP of Iowa in 2013 was \$50,208. Compared with 2012, nominal state GDP per capita rose by 6%.

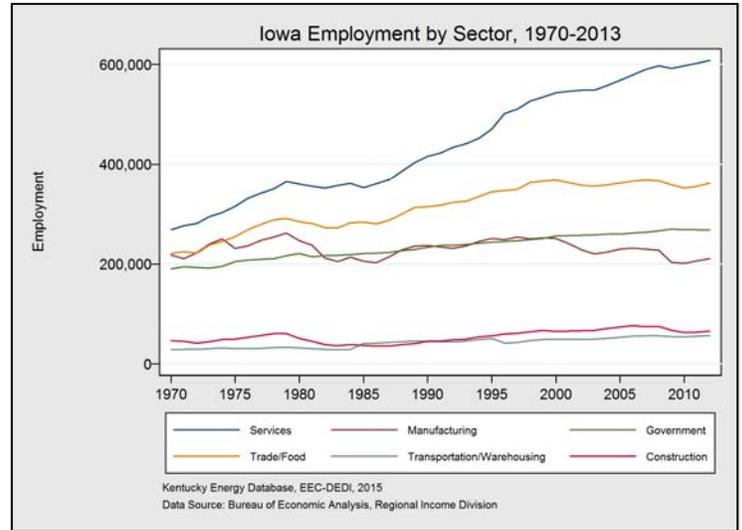
Rural & Urban Population

In 2013, the population of Iowa was 3 million people, with the majority of the population located in urban areas throughout the state. Since the year 2000, the population of Iowa has risen by approximately 6%.

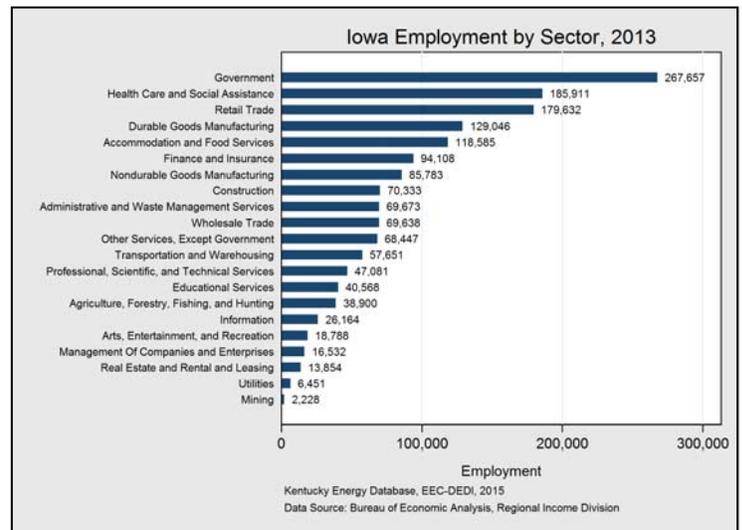
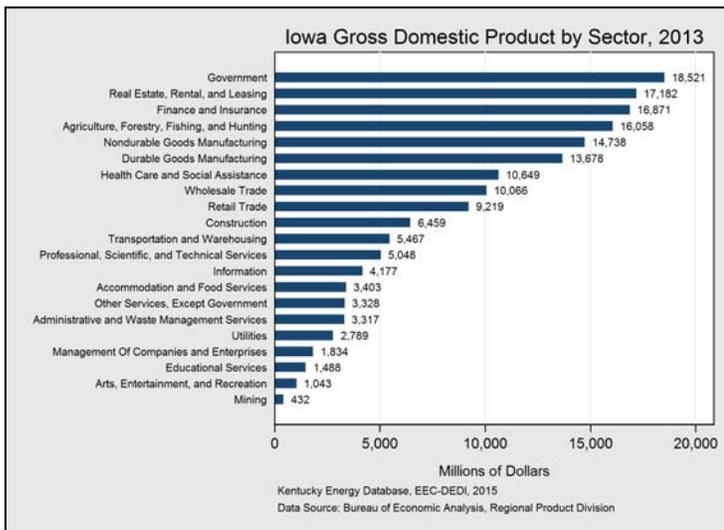
IOWA'S ECONOMY



Sector	Million 2010 \$	Percent	1 Year Change
Total	155,164	100%	4.3%
Services	79,666	51%	8.2%
Manufacturing	26,598	17%	1.1%
Trade/Food	20,400	13%	-1.4%
Government	17,336	11%	0.1%
Construction	6,046	>1%	4.7%
Transportation	5,117	>1%	2.6%



Sector	Employment	Percent	1 Year Change
Total	1,595,727	100%	1.4%
Services	637,262	40%	1.7%
Trade/Food	347,995	22%	1.3%
Government	267,657	17%	0.1%
Manufacturing	214,829	13%	1.8%
Construction	70,333	4.4%	5.3%
Transportation	57,651	>1%	0.3%

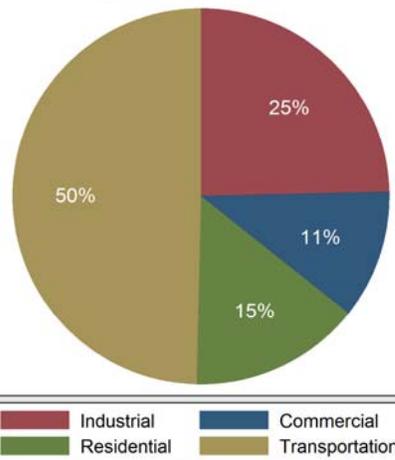


Iowa's inflation-adjusted GDP in 2013 was \$155 billion in 2010 dollars, an increase of 4.3% from the year before. The services sector accounted for the largest amount of output in 2013, with 51% of total GDP. The time series graph above disaggregated major industrial sectors and portrays their portion of GDP, defined as the value added by sector, or the summation of employee compensation, gross operating surplus, and taxes (minus subsidies).

Total employment in Iowa was 1,595,727 in 2013, and increased by 1.4% from the year prior. The services sector was Iowa's primary employment sector, which increased by 1.7% compared with 2012. Employment is defined as the average number of full-time and part-time jobs where wages or salaries are paid.

IOWA ENERGY EXPENDITURES

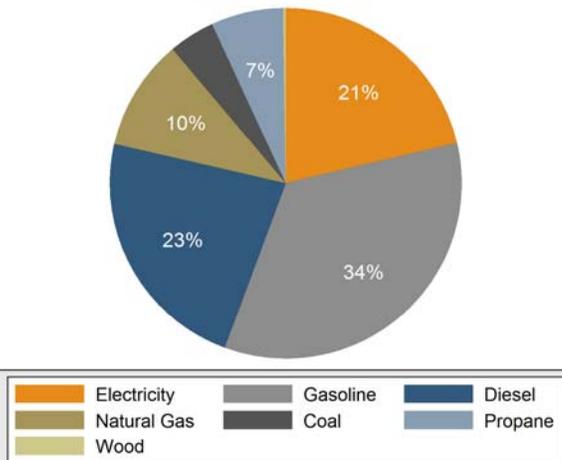
Iowa Energy Expenditures by Sector, 2012



Kentucky Energy Database, EEC-DEDI, 2015

Sector	Million (\$ US)	Percent	1 Year Change
Total	16,419	100%	-4.2%
Transportation	8,150	50%	-3.2%
Industrial	4,047	25%	-5.0%
Residential	2,415	15%	-8.4%
Commercial	1,808	11%	-1.4%

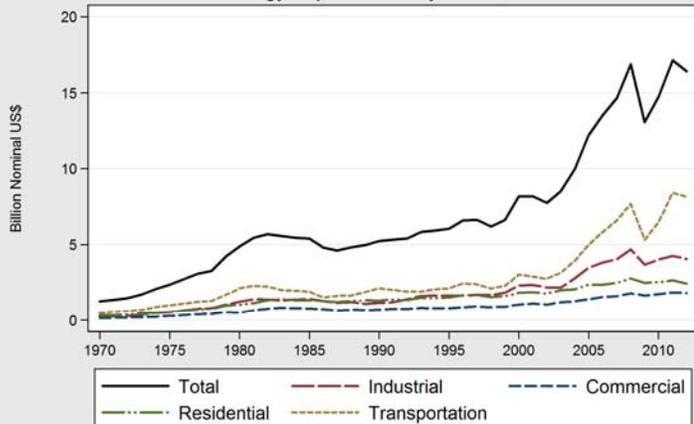
Iowa Energy Expenditures by Fuel, 2012



Kentucky Energy Database, EEC-DEDI, 2015

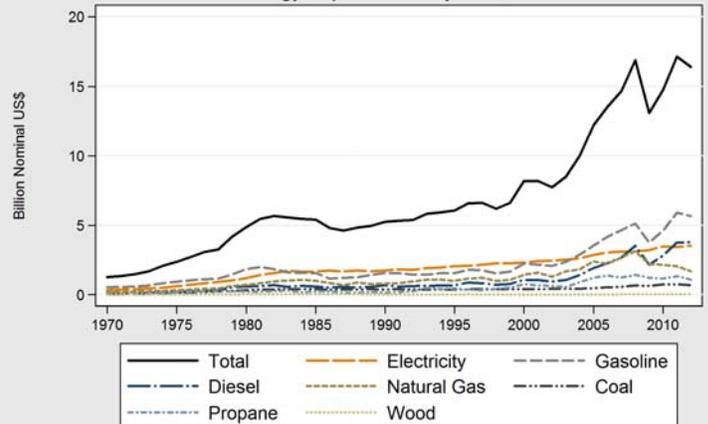
Fuel Type	Million (\$ US)	Percent	1 Year Change
Total	16,419	100%	-4.2%
Gasoline	5,666	35%	-4.2%
Diesel	3,782	23%	0.9%
Electricity	3,524	21%	2.1%
Natural Gas	1,698	10%	-17.3%
Propane	1,099	6.7%	-17.4%
Coal	704	4.3%	-6.2%

Iowa Energy Expenditures by Sector, 1970-2012



Kentucky Energy Database, EEC-DEDI, 2015
Data Source: EIA-SEDS

Iowa Energy Expenditures by Fuel, 1970-2012

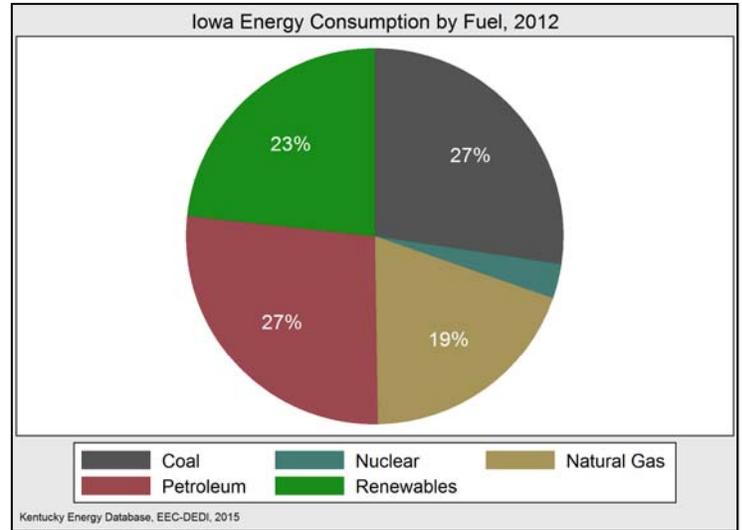
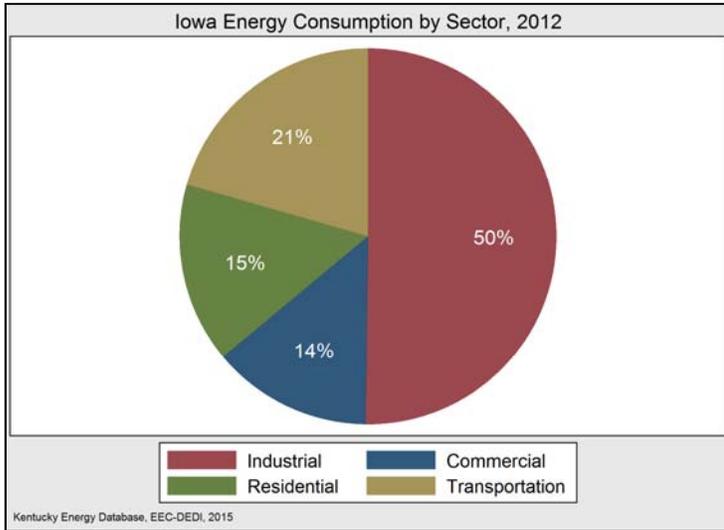


Kentucky Energy Database, EEC-DEDI, 2015
Data Source: EIA-SEDS

In 2012, total energy expenditures in Iowa were 16.4 billion dollars, a decrease of 4% from 2011. The transportation sector accounted for the largest amount of energy expenditures in 2012 with 50% of total spending.

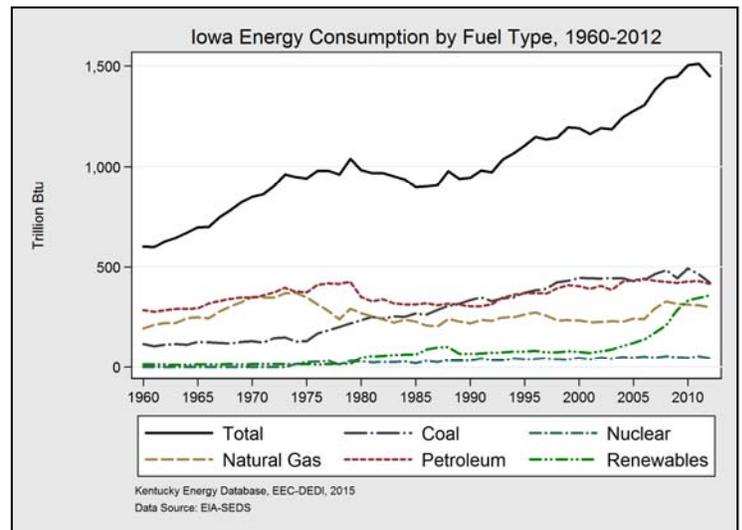
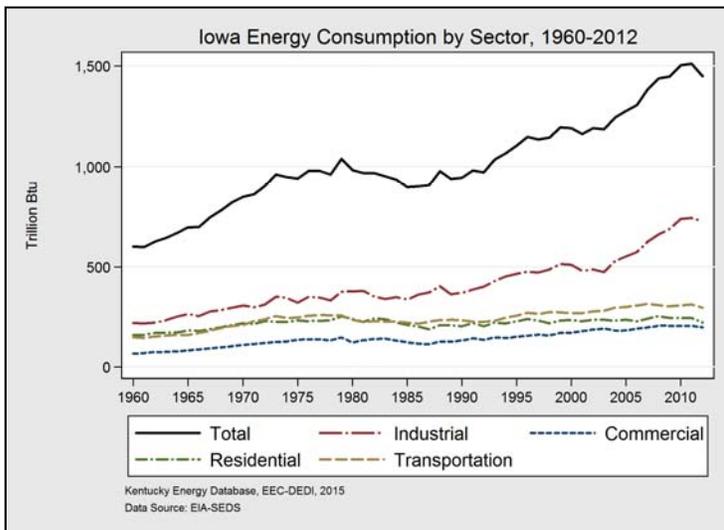
In 2012 \$16,419 million was spent on energy in Iowa, of which gasoline was the highest concentration of expenditures. Compared with 2011, total gasoline expenditures decreased by 4% in 2012.

IOWA ENERGY CONSUMPTION



Sector	Billion Btu	Percent	1 Year Change
Total	1,449,576	100%	-4.1%
Industrial	727,707	50%	-2.2%
Transportation	298,217	21%	-4.9%
Residential	224,016	15%	-8.9%
Commercial	199,636	14%	-4.0%

Fuel Type	Billion Btu	Percent	1 Year Change
Total*	1,449,576	100%	-4.1%
Coal	422,581	27%	-8.8%
Petroleum	416,245	27%	-3.2%
Renewables	359,063	23%	3.7%
Natural Gas	299,315	19%	-3.3%
Nuclear	45,552	3.0%	-16.5%

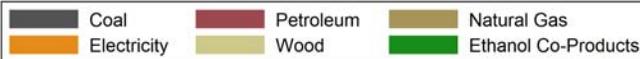
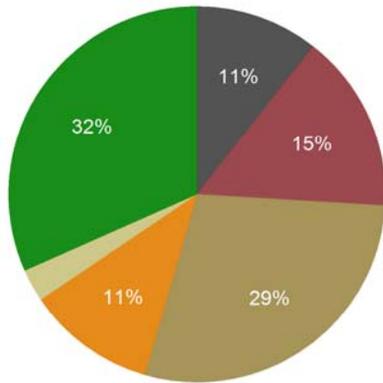


In 2012, total energy consumption in Iowa was 1.45 quadrillion Btu, a decrease of 4% from 2011. The industrial sector accounted for the largest amount of energy consumption in 2012, with 50% of total energy consumption.

Coal was Iowa's primary energy source in 2012, which decreased by 9% compared with 2011. *Iowa exported 56,999 billion Btu of electricity in 2012, which is subtracted from the summation of in-state energy consumption.

IOWA ENERGY CONSUMPTION

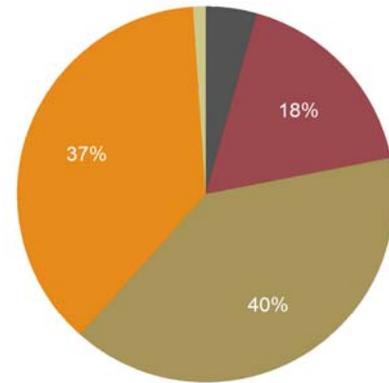
Iowa Industrial Energy Consumption by Fuel, 2012



Kentucky Energy Database, EEC-DEDI, 2015

Fuel Type	Billion Btu	Percent	1 Year Change
Net Consumed*	580,375	100%	-2.5%
Grain Biomass	189,621	33%	-6.3%
Natural Gas	171,184	29%	1.5%
Petroleum	92,076	16%	5.0%
Electricity	66,574	11%	1.4%
Coal	63,591	11.0%	-9.6%
Wood Products	16,893	>1%	-8.2%

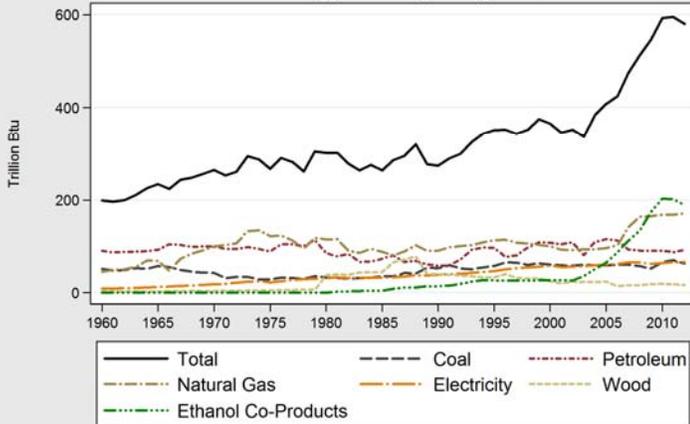
Iowa Commercial Energy Consumption by Fuel, 2012



Kentucky Energy Database, EEC-DEDI, 2015

Fuel Type	Billion Btu	Percent	1 Year Change
Net Consumed*	107,440	100%	-6.0%
Natural Gas	44,370	41%	-15.2%
Electricity	41,660	39%	1.0%
Petroleum	19,609	18%	6.4%
Coal	4,893	5%	-14.0%
Wood Products	1,208	1.1%	-14.7%

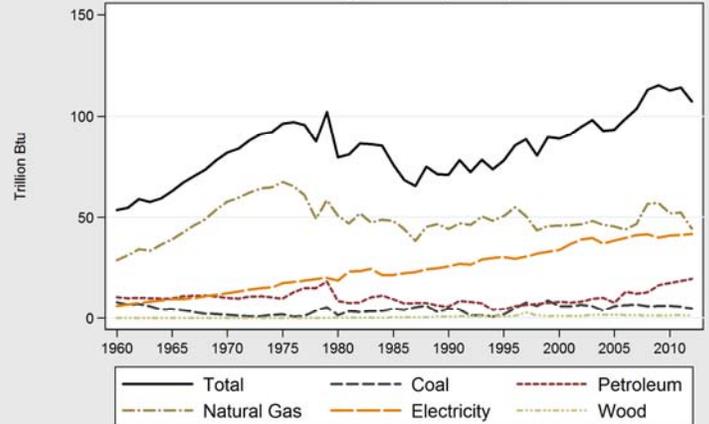
Iowa Industrial Energy Consumption by Fuel, 1960-2012



Kentucky Energy Database, EEC-DEDI, 2015
Data Source: EIA-SEDS

In 2012, industry in Iowa consumed 580,375 billion Btu of energy, a decrease of 3% from 2011. Grain Biomass represented the largest amount of energy consumption in 2012. *Net energy consumption does not include the associated energy losses of electricity generation and transmission; therefore, the sum of fuel inputs may differ from the total energy consumed.

Iowa Commercial Energy Consumption by Fuel, 1960-2012

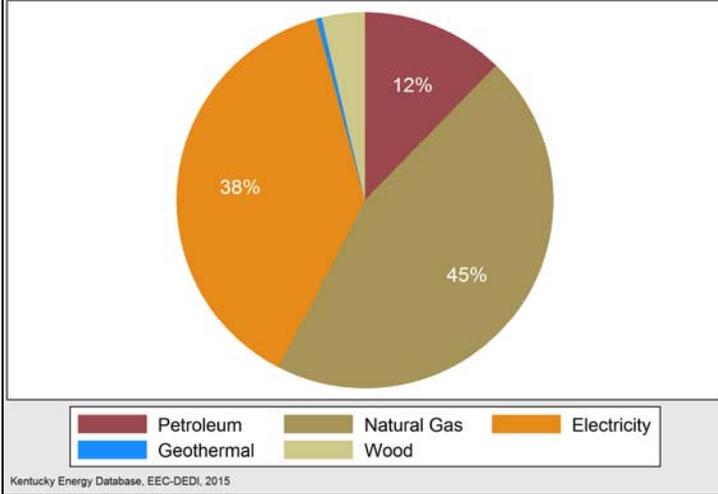


Kentucky Energy Database, EEC-DEDI, 2015
Data Source: EIA-SEDS

Net commercial energy consumption in Iowa fell by 6% in 2012 to 107,440 billion Btu. During 2012, natural gas was the largest portion of commercial energy consumption, with 44,370 billion Btu consumed, and fell by 15% compared with 2011. *Net energy consumption does not include the associated energy losses of electricity generation and transmission; therefore, the sum of fuel inputs may differ from the total energy consumed.

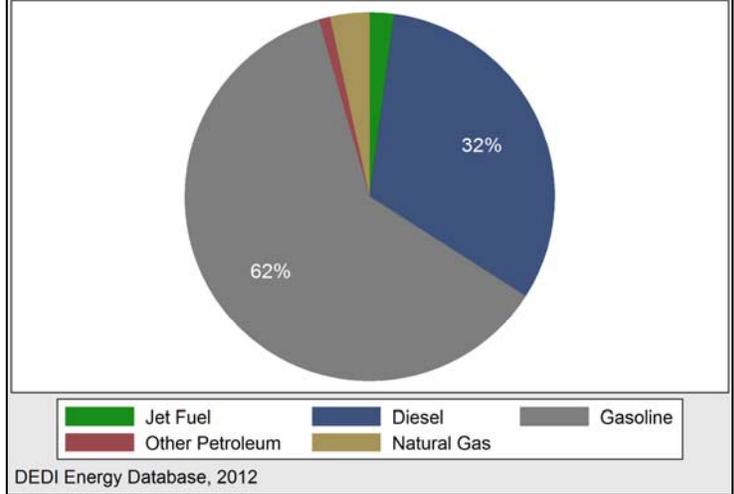
IOWA ENERGY CONSUMPTION

Iowa Residential Energy Consumption by Fuel, 2012



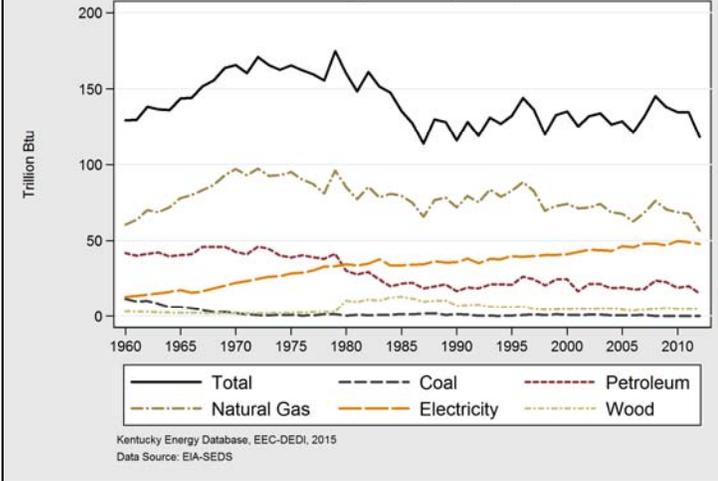
Fuel Type	Billion Btu	Percent	1 Year Change
Net Consumed*	118,396	100%	-12.2%
Natural Gas	56,611	48%	-16.4%
Electricity	47,726	40%	-2.4%
Petroleum	15,298	13%	-23.0%
Wood	4,611	4%	-6.7%
Geothermal	538	<1%	-17.4%

Iowa Transportation Energy Consumption by Fuel, 2012

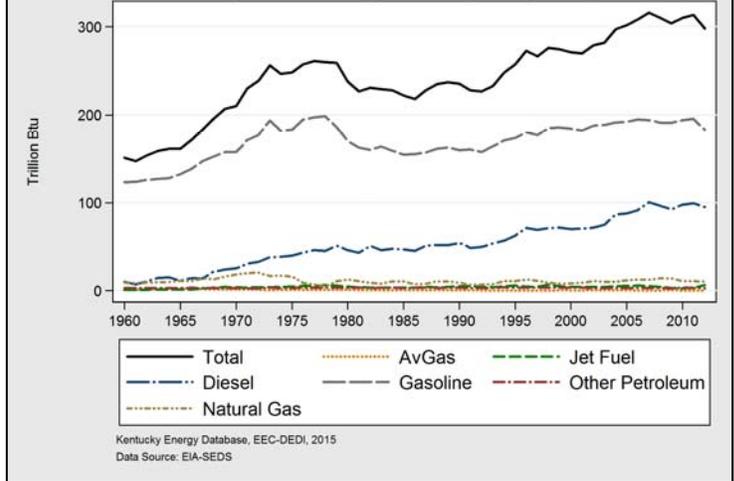


Fuel Type	Billion Btu	Percent	1 Year Change
Net Consumed	298,217	100%	-4.9%
Gasoline	183,438	62%	-6.3%
Diesel	95,170	32%	-4.2%
Natural Gas	10,282	3%	-5.7%
Jet Fuel	6,242	2%	66.0%
Other Petroleum	2,864	1.0%	-12.1%
AvGas	221	<1%	-33.2%

Iowa Residential Energy Consumption by Fuel, 1960-2012



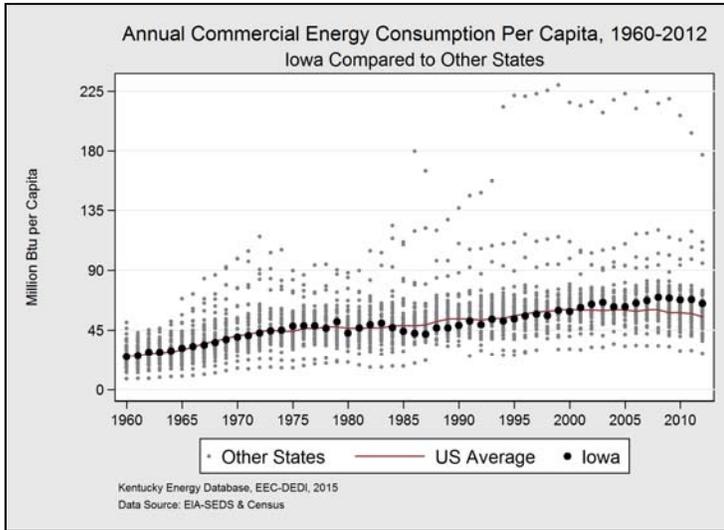
Iowa Transportation Energy Consumption by Fuel, 1960-2012



Net residential sector energy consumption was 118,396 billion Btu in Iowa in 2012. This constituted a decrease of 12% compared with 2011. Overall, residential energy consumption was led by natural gas use in 2012, followed by electricity. *Net energy consumption does not include the associated energy losses of electricity generation and transmission; therefore, the sum of fuel inputs may differ from the total energy directly consumed by end-users.

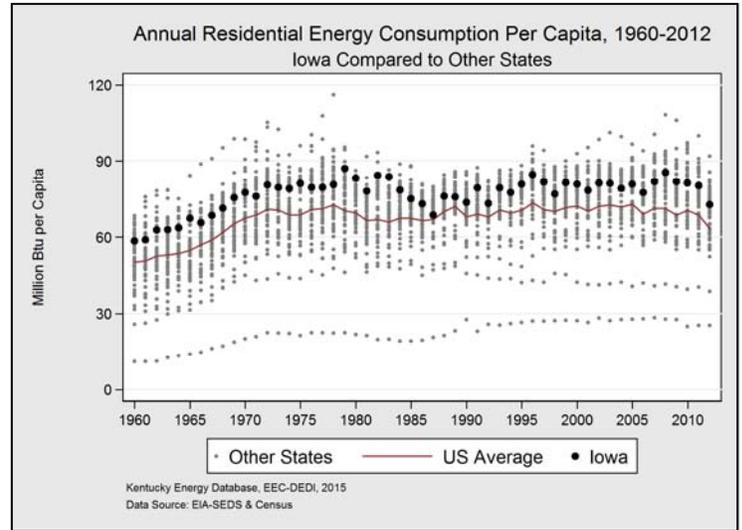
In 2012, the transportation sector of Iowa consumed 298,217 billion Btu of energy, a decrease of 5% compared with the previous year. Gasoline was the largest source of transportation sector energy consumption in 2012.

IOWA ENERGY INTENSITY



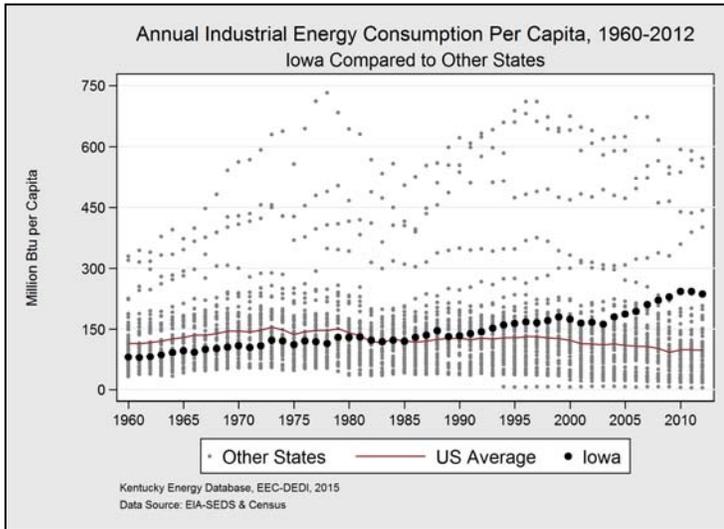
State	MMBtu	Rank
Wyoming	111	1st
Iowa	65	12th
Hawaii	27	50th

Iowa ranked 12th highest nationally for commercial energy consumption per capita in 2012, a decrease of 4% compared with 2011. (MMBtu = 1 Million Btu).



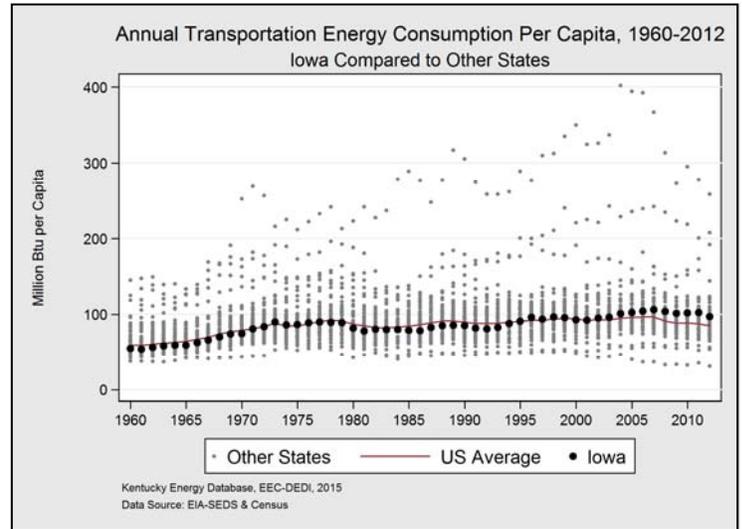
State	MMBtu	Rank
North Dakota	92	1st
Iowa	73	18th
Hawaii	25	50th

Homes in Iowa consumed 73 MMBtu of energy per capita in 2012, a decrease of 9% from 2011. Iowa was 18th highest by state for residential energy consumption per capita.



State	MMBtu	Rank
Louisiana	571	1st
Iowa	237	6th
New York	17	50th

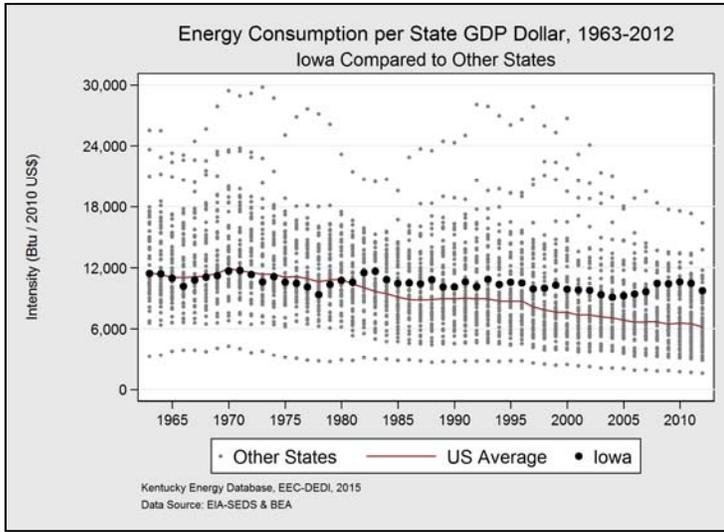
Industrial energy consumption per capita in Iowa was 6th highest in the country in 2012. Compared with 2011, industrial energy use per capita fell by 3%.



State	MMBtu	Rank
Alaska	259	1st
Iowa	97	15th
New York	54	50th

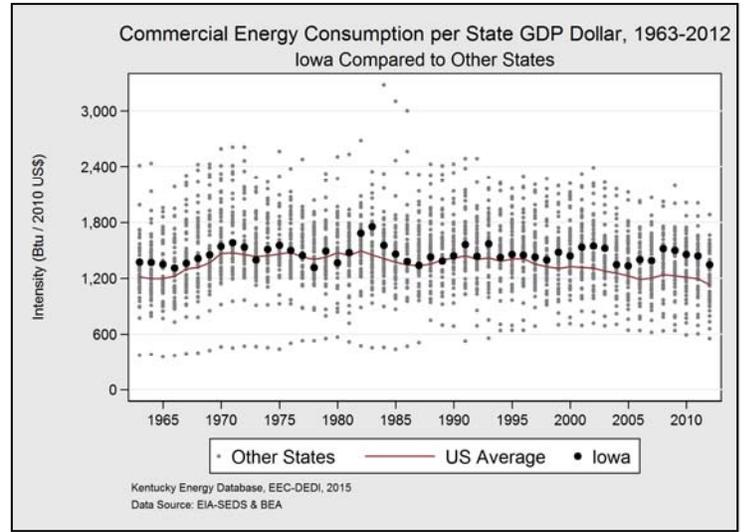
Transportation energy consumption per capita in Iowa fell by 5% in 2012. Iowa ranked 15th highest in the country for this metric.

IOWA ENERGY INTENSITY



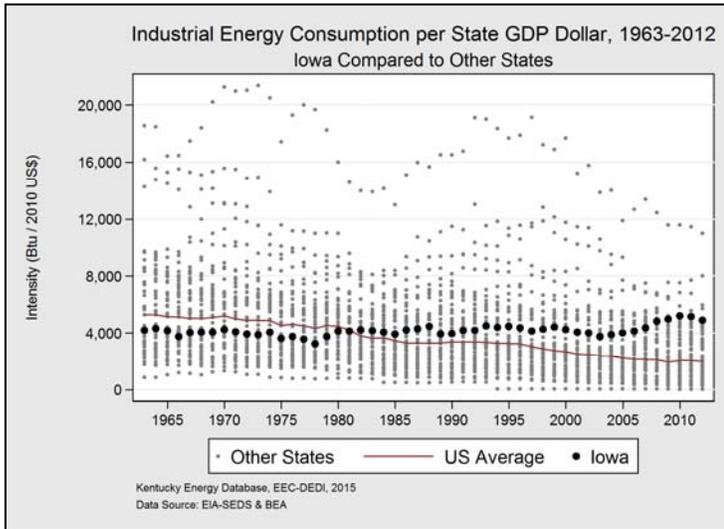
State	MMBtu/\$GDP	Rank
Louisiana	16.37	1st
Iowa	9.75	10th
New York	2.89	50th

Iowa ranked 10th highest for energy consumption used to produce one dollar of state GDP in 2012. Total energy intensity of GDP fell by less than 1% compared with 2011.



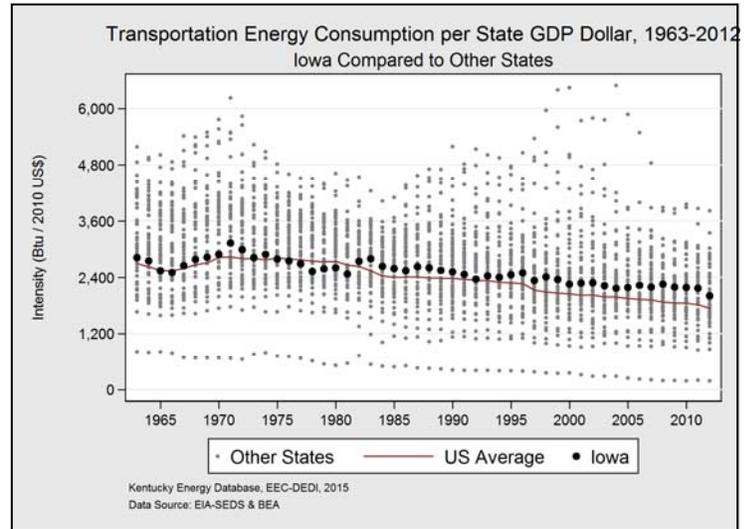
State	MMBtu/\$GDP	Rank
Montana	1.88	1st
Iowa	1.34	20th
Hawaii	0.55	50th

Iowa's commercial sector ranked 20th highest for the ratio of energy use to state GDP dollar in 2012, a decrease of 7% from 2011.



State	MMBtu/\$GDP	Rank
Louisiana	11.01	1st
Iowa	4.89	5th
New York	0.28	50th

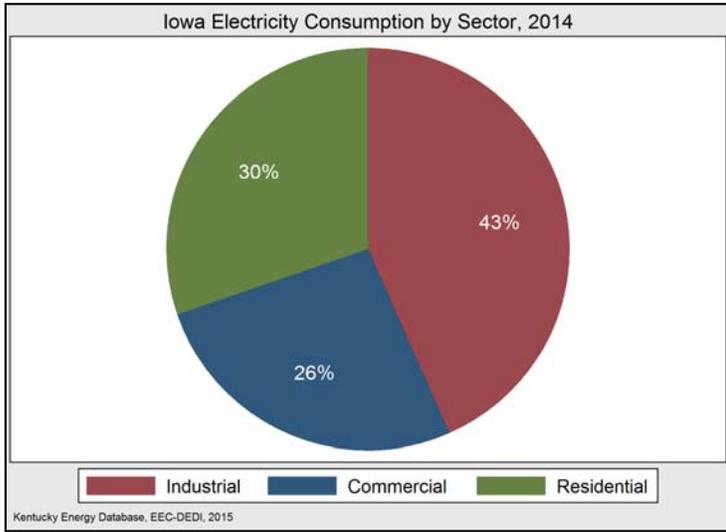
Industrial energy consumption per dollar of state GDP in Iowa was 5th highest in 2012. Compared with 2011, industrial energy intensity fell by 5%.



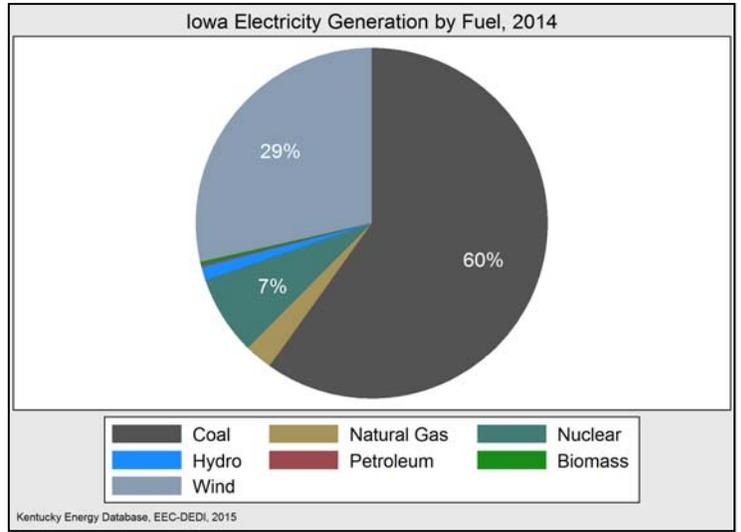
State	MMBtu/\$GDP	Rank
Mississippi	3.82	1st
Iowa	2.01	26th
New York	0.86	50th

Transportation sector energy intensity of GDP in Iowa fell by 8% in 2012, making the state 26th lowest for the ratio of transportation energy use to state GDP dollar in 2012.

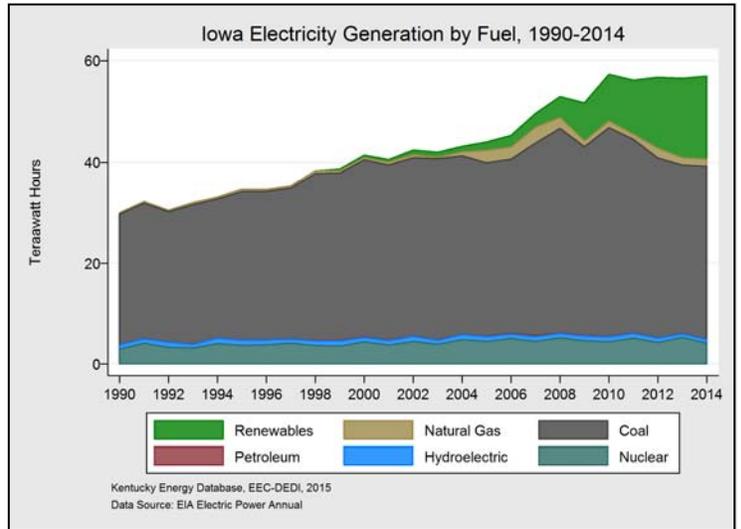
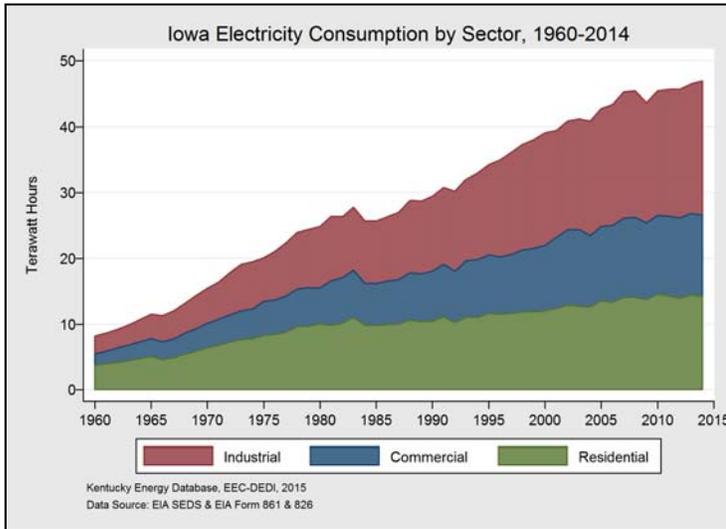
IOWA ELECTRICITY



Sector	GWh	Percent	1 Year Change
Total	46,949	100%	1.0%
Industrial	20,367	43%	3.6%
Residential	14,200	30%	-1.9%
Commercial	12,383	26%	0.1%



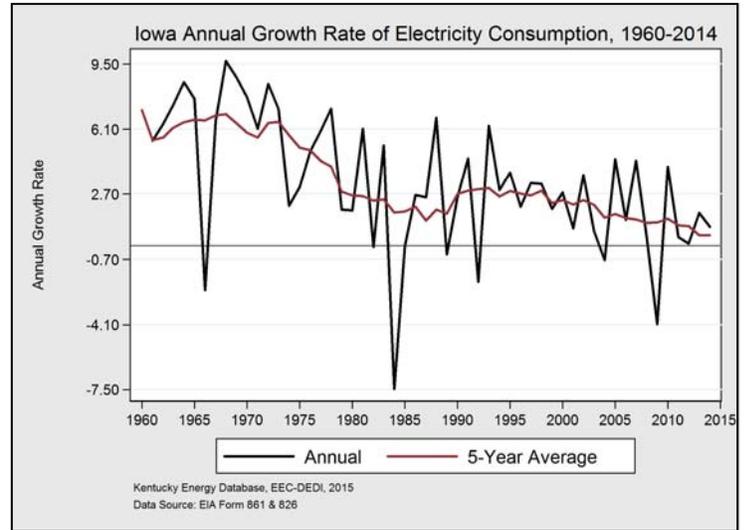
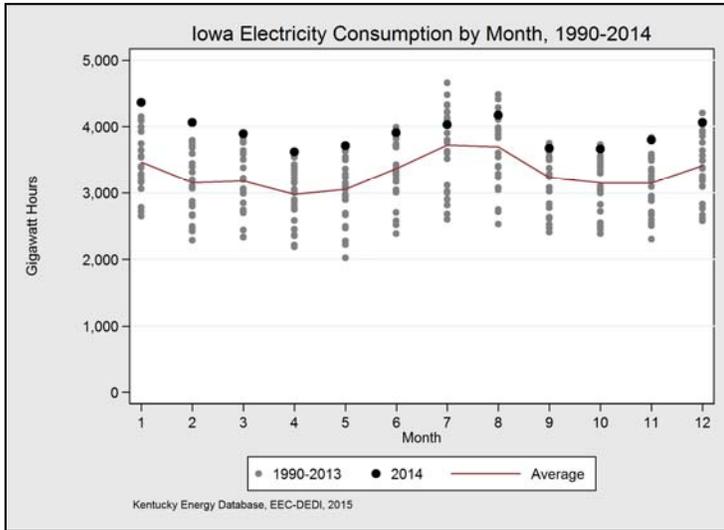
Fuel Type	GWh	Percent	1 Year Change
Total	57,123	100%	0.8%
Coal	34,209	60%	2.7%
Wind	16,295	29%	4.7%
Nuclear	4,152	7%	-22.0%
Natural Gas	1,476	3%	3.2%
Hydro	719	1.3%	-4.1%
Biomass	158	<1%	-0.1%



In 2014, Iowa consumed 46,949 gigawatt-hours of electricity. Compared with 2013, total electricity consumption rose by 1%. The industrial sector was the largest consumer of electricity in Iowa in 2014, with 20,367 GWh consumed.

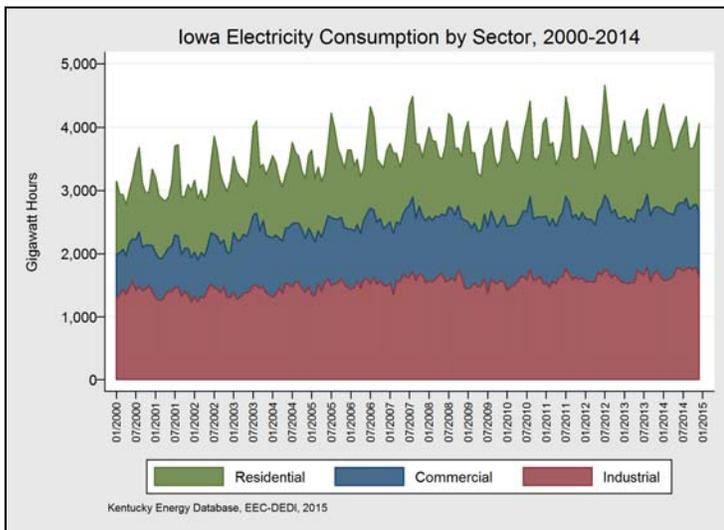
Electric power facilities in Iowa generated over 57,123 gigawatt-hours of electricity in 2014. The use of coal was the largest portion of electricity generation, accounting for 57,123 gigawatt-hours. The second-largest electricity producer was coal with 34,209 GWh of generation. Overall, electricity generation rose by 1% relative to the previous year.

IOWA ELECTRICITY

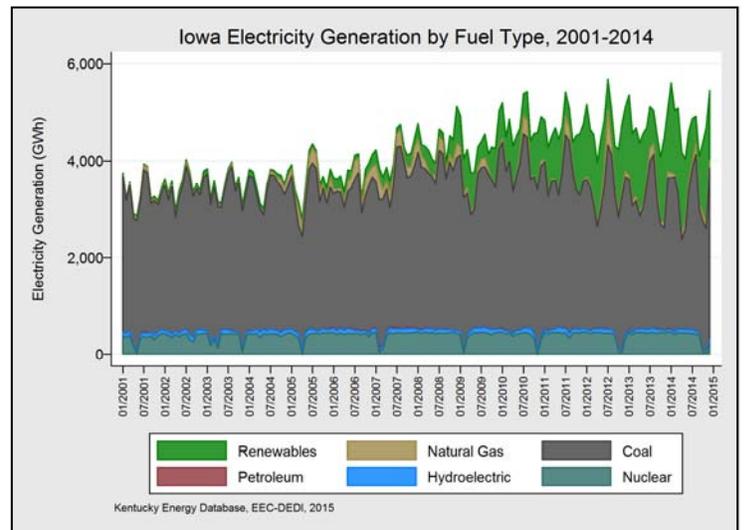


A number of factors including temperature, electricity price, and population cause fluctuations in electricity consumption. On average, the highest demand for electricity in Iowa occurs in summer and winter, with the hot summer months driving higher electricity demand than the cold winter months. Iowa experienced higher than average electricity demand throughout 2014.

Electricity demand has grown in Iowa for decades, as it has throughout the United States. However, the rate at which electricity demand grows has decreased over time, from an average of 6% per year in the 1960s to less than 1% today. In recent years, many states have experienced no growth or even decreases in electricity consumption.

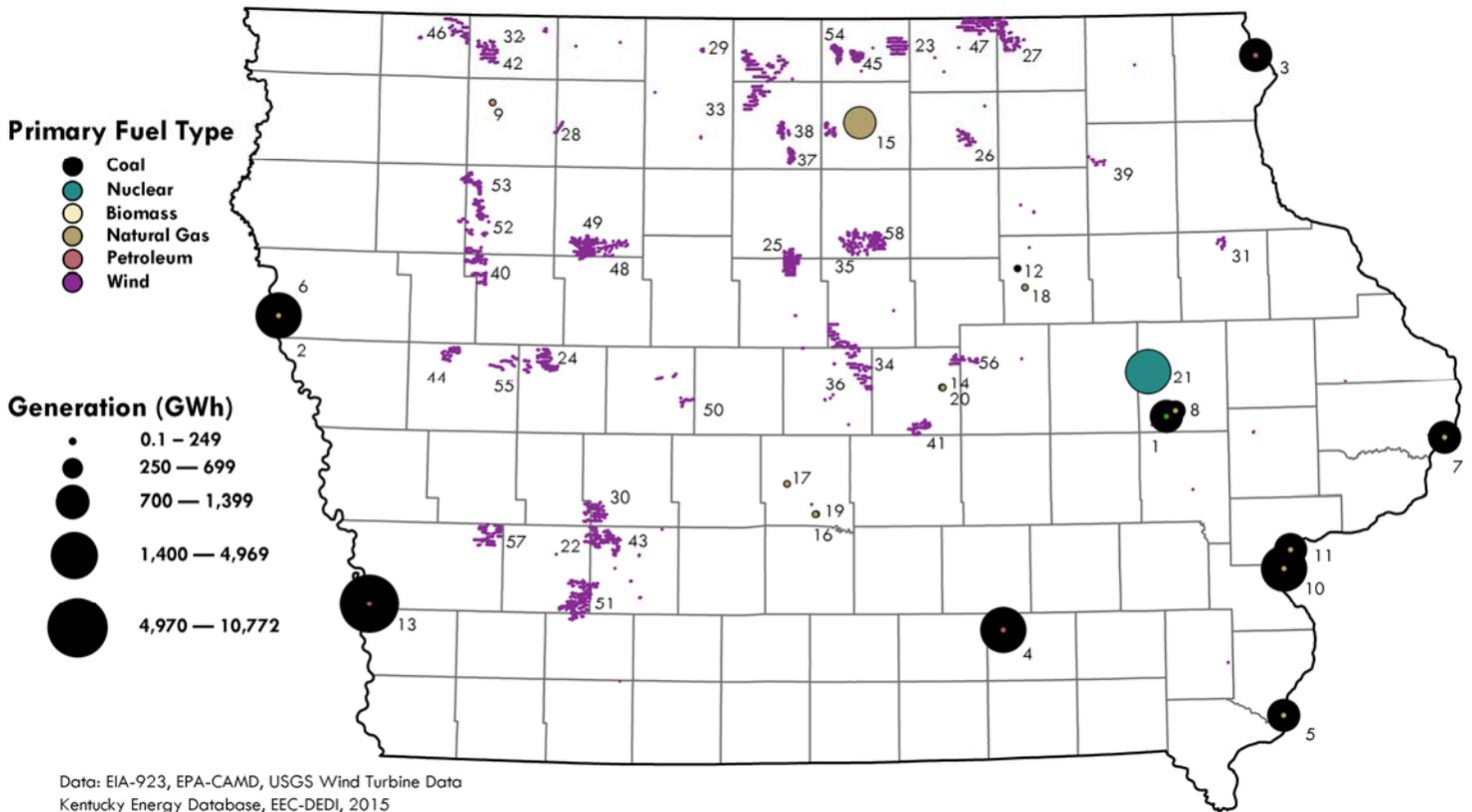


Industrial processes, the largest consumer of electricity in Iowa, tend to vary little seasonally. Conversely, residential electricity demand varies considerably and is highest in the winter and summer due primarily to temperature. The commercial sector oscillates seasonally, but to a lesser extent than homes do.



Whereas nuclear generation is fairly constant with the exception of regular shutdowns for maintenance, renewable generation facilities depend on the presence of their respective resources. Coal, natural gas, and petroleum tend to make up the difference between electricity demand and electricity generated by renewables, nuclear, and hydroelectric generation. Iowa has natural gas simple cycle turbines, which are flexible and can be quickly ramped during periods of peak electricity demand, but are only used when they are required because they are expensive to operate.

IOWA ELECTRICITY GENERATION

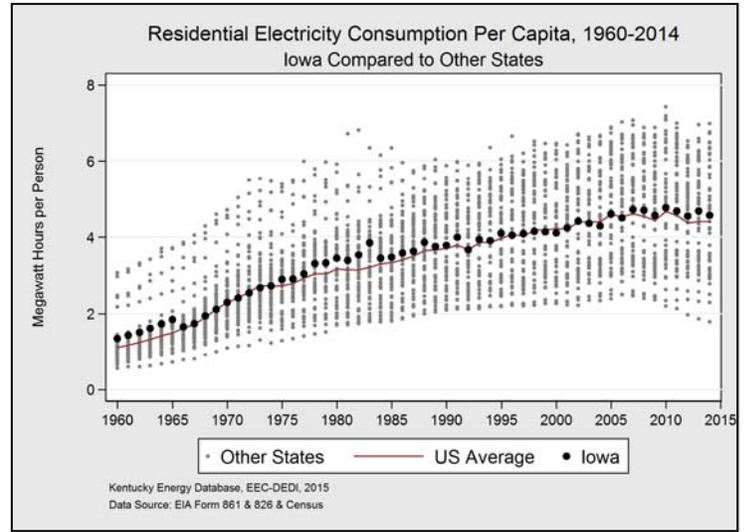
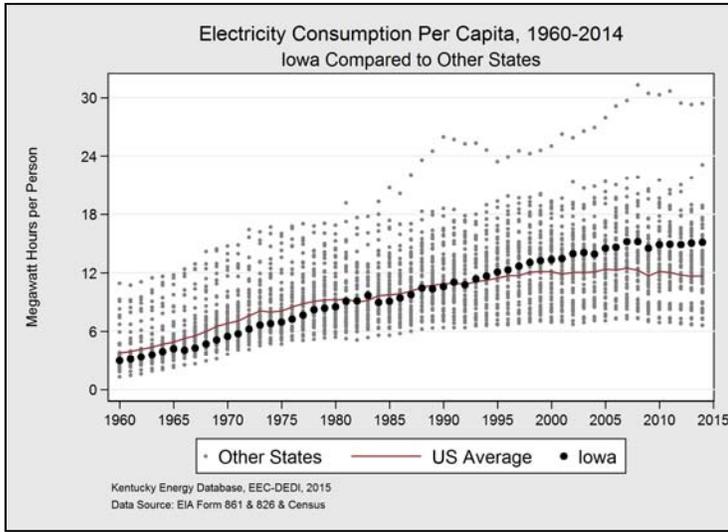


Number	Name	Online Year	Fuel Source	Owner
1	Archer Daniels Midland Cedar Rapids	1988	Coal/Biomass/NG	Archer Daniels Midland
2	George Neal South	1979	Coal/Fuel Oil	MidAmerican Energy Co.
3	Lansing	1977	Coal/Fuel Oil	Interstate Power and Light Co.
4	Ottumwa	1981	Coal/Fuel Oil	Interstate Power and Light Co.
5	Burlington	1968	Coal/NG	Interstate Power and Light Co.
6	George Neal North	1964	Coal/NG	MidAmerican Energy Co.
7	Milton L. Kapp	1967	Coal/NG	Interstate Power and Light Co.
8	Prairie Creek	1958	Coal/NG	Interstate Power and Light Co.
9	Earl F. Wisdom	1960	Coal/NG/Fuel Oil	Corn Belt Power
10	Louisa	1983	Coal/NG/Fuel Oil	MidAmerican Energy Co.
11	Muscatine Plant #1	1969	Coal/NG/Fuel Oil	Muscatine, Iowa
12	University of Northern Iowa	1927	Coal/NG/Fuel Oil	University of Northern Iowa
13	Walter Scott Jr.	1954	Coal/NG/Fuel Oil	MidAmerican Energy Co.
14	Marshalltown	1978	Fuel Oil	Interstate Power and Light Co.
15	Emery Station	2004	NG	Interstate Power and Light Co.
16	Greater Des Moines	2004	NG	MidAmerican Energy Co.
17	Sutherland	1961	NG	Interstate Power and Light Co.
18	Electrifarm	1975	NG/Fuel Oil	MidAmerican Energy Co.
19	Pleasant Hill	1990	NG/Fuel Oil	MidAmerican Energy Co.
20	Sycamore	1974	NG/Fuel Oil	MidAmerican Energy Co.

IOWA ELECTRICITY GENERATION

Number	Name	Online Year	Fuel	Owner
21	Duane Arnold Energy Center	1974	Nuclear	NextEra Energy
22	Adair Wind Farm	2008	Coal/Natural Gas	MidAmerican Energy
23	Barton Windpower, LLC	2009	Wind	Iberdrola
24	Carroll Wind Farm	2008	Wind	MidAmerican Energy
25	Century	2007	Wind	MidAmerican Energy Co.
26	Charles City Wind Farm	2007	Wind	MidAmerican Energy Co.
27	Crane Creek Wind Energy Center	2009	Wind	Wisconsin Public Service Corp
28	Crosswind Energy Project	2007	Wind	Crosswind Transmission, LLC
29	Crystal Lake 3, LLC	2009	Wind	Crystal Lake 3, LLC
30	Eclipse Wind Farm	2012	Wind	MidAmerican Energy Co.
31	Elk Wind Farm	2011	Wind	Elk Wind Energy, LLC
32	Flying Cloud Power Partners, LLC	2003	Wind	Iberdrola Renewables Inc.
33	FPL Energy Crystal Lake Wind, LLC	2009	Wind	FPL Energy Crystal Lake Wind, LLC
34	FPL Energy Story Wind, LLC	2008	Wind	FPL Energy Story Wind, LLC
35	Franklin County Wind Farm	2012	Wind	Franklin County Wind, LLC
36	Garden Wind, LLC	2010	Wind	Garden Wind, LLC
37	Hancock County Wind Energy Center	2002	Wind	FPL Energy Hancock County Wind, LLC
38	Hawkeye Power Partners, LLC	2002	Wind	Hawkeye Power Partners, LLC
39	Hawkeye Wind Farm	2012	Wind	Bethel Wind Energy, LLC
40	Intrepid	2004	Wind	MidAmerican Energy Co.
41	Laurel Wind Farm	2012	Wind	MidAmerican Energy Co.
42	Lost Lakes Wind Farm, LLC	2009	Wind	Lost Lakes Wind Farm, LLC
43	Morning Light Wind Farm	2013	Wind	MidAmerican Energy Co.
44	New Harvest Wind Project, LLC	2012	Wind	Iberdrola Renewables Inc
45	Northern Iowa Windpower II	2008	Wind	Iberdrola Renewables Inc
46	Osceola Windpower	2008	Wind	Osceola Windpower, LLC
47	Pioneer Prairie Wind Farm	2008	Wind	Pioneer Prairie Wind Farm I, LLC
48	Pocahontas Prairie Wind Farm	2012	Wind	Gamesa Wind U.S.
49	Pomeroy Wind Farm	2007	Wind	MidAmerican Energy Co.
50	Rippey Wind Farm	2012	Wind	Rippey Wind Energy, LLC
51	Rolling Hills Wind Farm	2011	Wind	MidAmerican Energy Co.
52	Storm Lake I	1999	Wind	Edison Mission Energy
53	Storm Lake II	1999	Wind	AES Wind Generation Inc.
54	Top of Iowa Windfarm	2001	Wind	Northern Iowa Windpower, LLC
55	Victory Wind Farm	2006	Wind	MidAmerican Energy Co.
56	Vienna Wind Farm	2012	Wind	MidAmerican Energy Co.
57	Walnut Wind Farm	2012	Wind	MidAmerican Energy Co.
58	Whispering Willow Wind Farm	2009	Wind	Interstate Power and Light Co.

IOWA ELECTRICITY INTENSITY

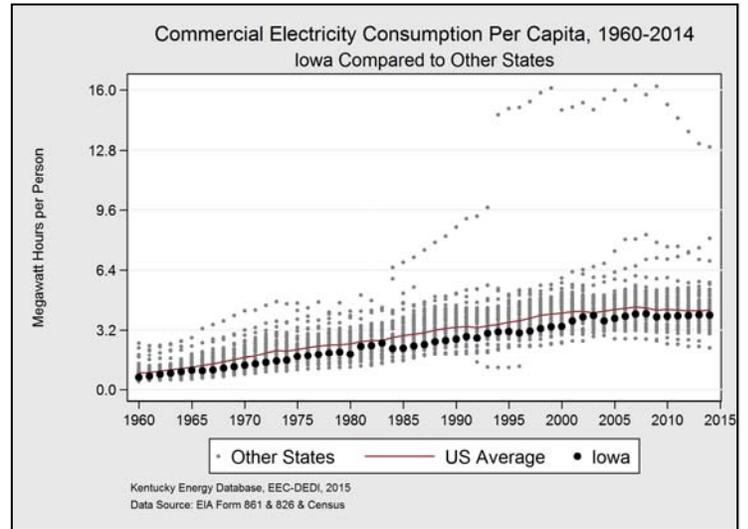
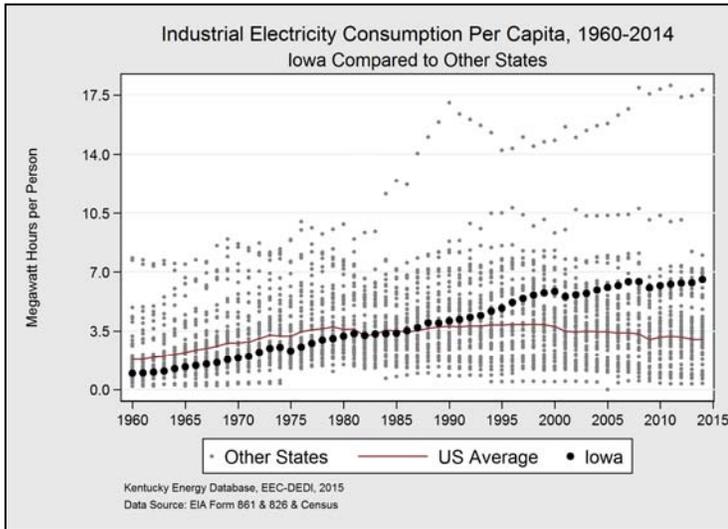


State	MWh	Rank
Wyoming	29.4	1st
Iowa	15.1	13th
Hawaii	6.6	50th

State	MWh	Rank
North Dakota	7.0	1st
Iowa	4.6	29th
Hawaii	1.8	50th

At 15.1 MWh, Iowa ranked 13th highest nationally for total electricity consumption per capita in 2014, an increase of less than 1% from 2013.

Homes in Iowa used on average 4.6 MWh of electricity in 2014, 29th lowest of all states. Residential electricity consumption per capita decreased by 2% since 2013.



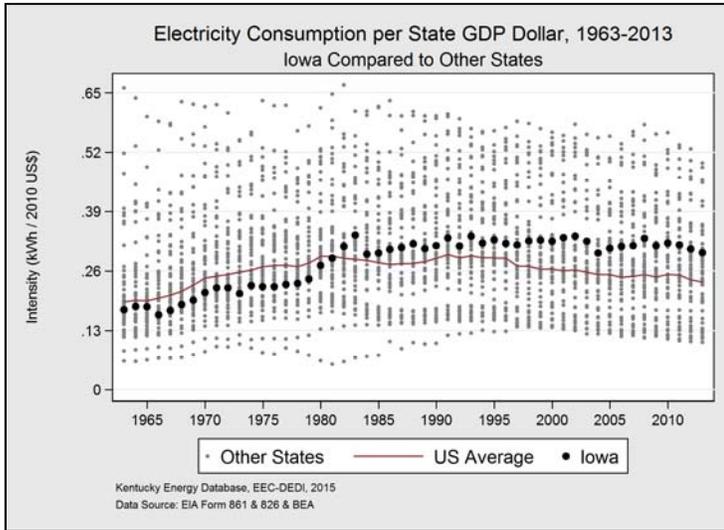
State	MWh	Rank
Wyoming	17.8	1st
Iowa	6.6	8th
Maryland	0.6	50th

State	MWh	Rank
North Dakota	8.1	1st
Iowa	4.0	32nd
Hawaii	2.2	50th

Industrial electricity consumption per capita in Iowa was 8th highest in 2014. Relative to 2013, industrial electricity consumption per capita rose by 3%.

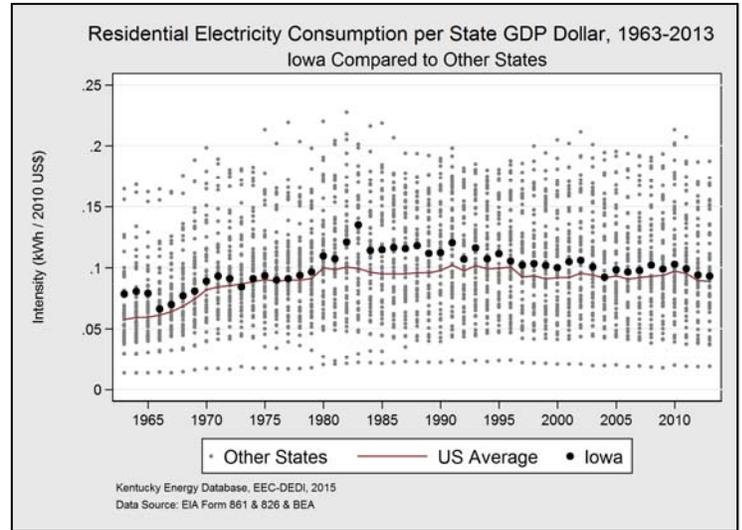
Iowa's commercial electricity consumption per capita fell by 1% in 2014 to 4 MWh. Overall, Iowa ranked 32nd lowest in the country for this metric.

IOWA ELECTRICITY INTENSITY



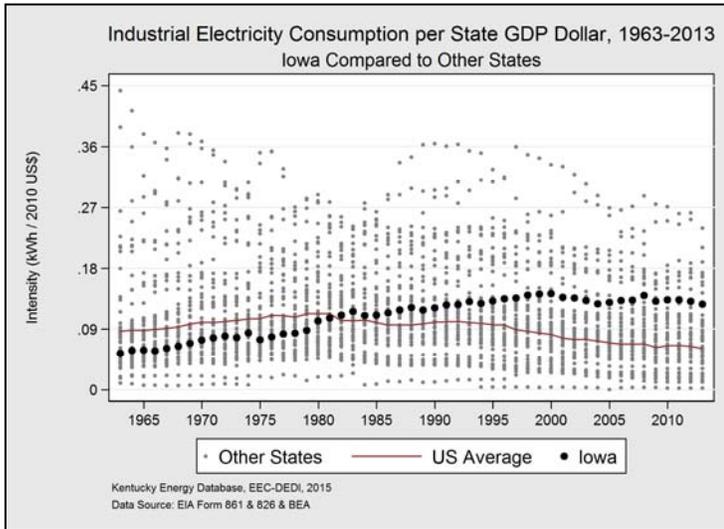
State	kWh/\$GDP	Rank
Mississippi	0.50	1st
Iowa	0.30	16th
Alaska	0.11	50th

Iowa ranked 16th highest nationally for total electricity consumption per state GDP dollar in 2013. This amount fell by 3% to 0.3 kWh per dollar for the year.



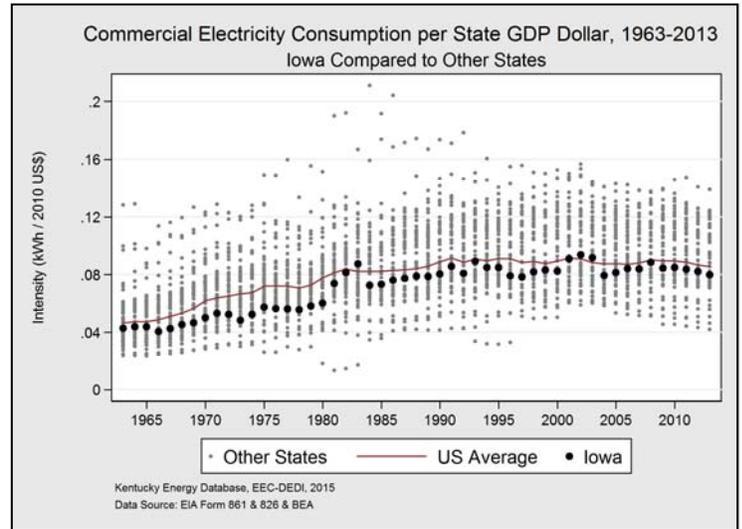
State	kWh/\$GDP	Rank
Mississippi	0.19	1st
Iowa	0.09	28th
Hawaii	0.04	50th

In 2013, Iowa ranked 28th lowest for residential electricity use relative to one dollar of state GDP. This metric fell by 1% compared to 2012.



State	kWh/\$GDP	Rank
Wyoming	0.24	1st
Iowa	0.13	11th
New York	0.01	50th

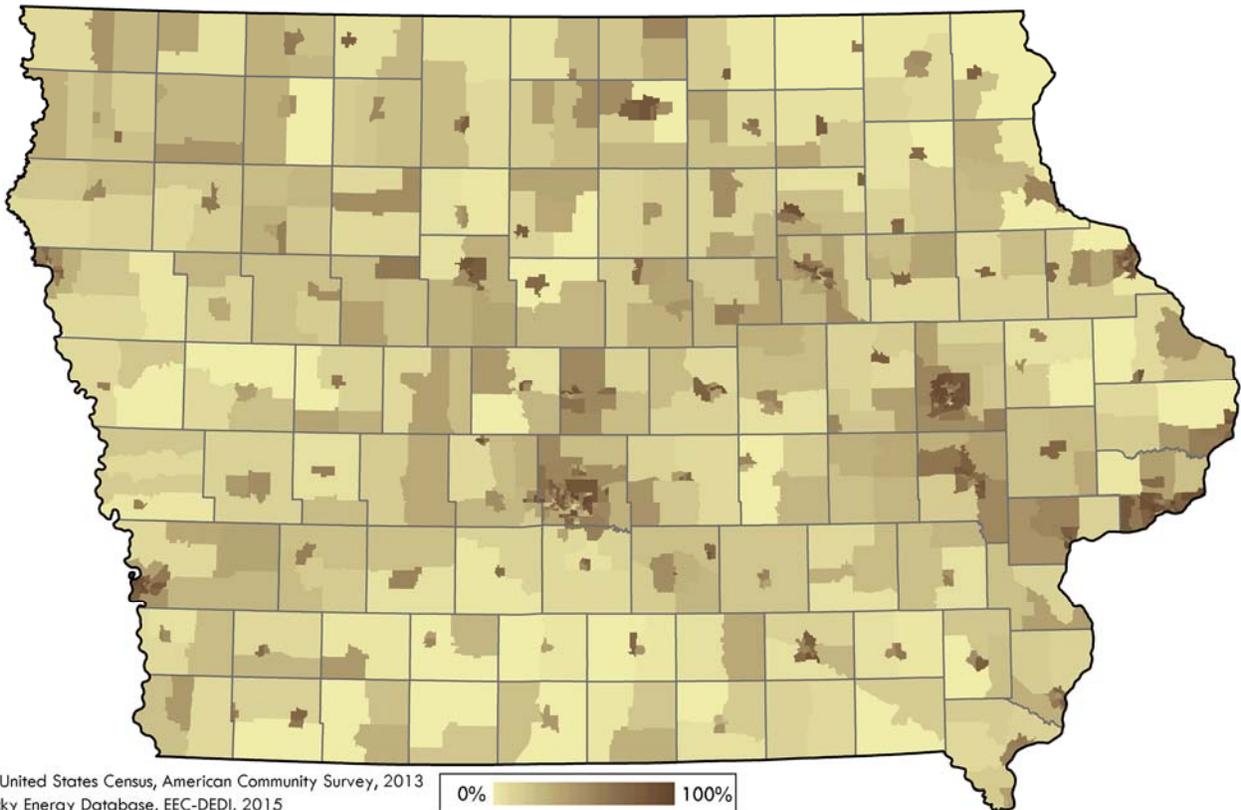
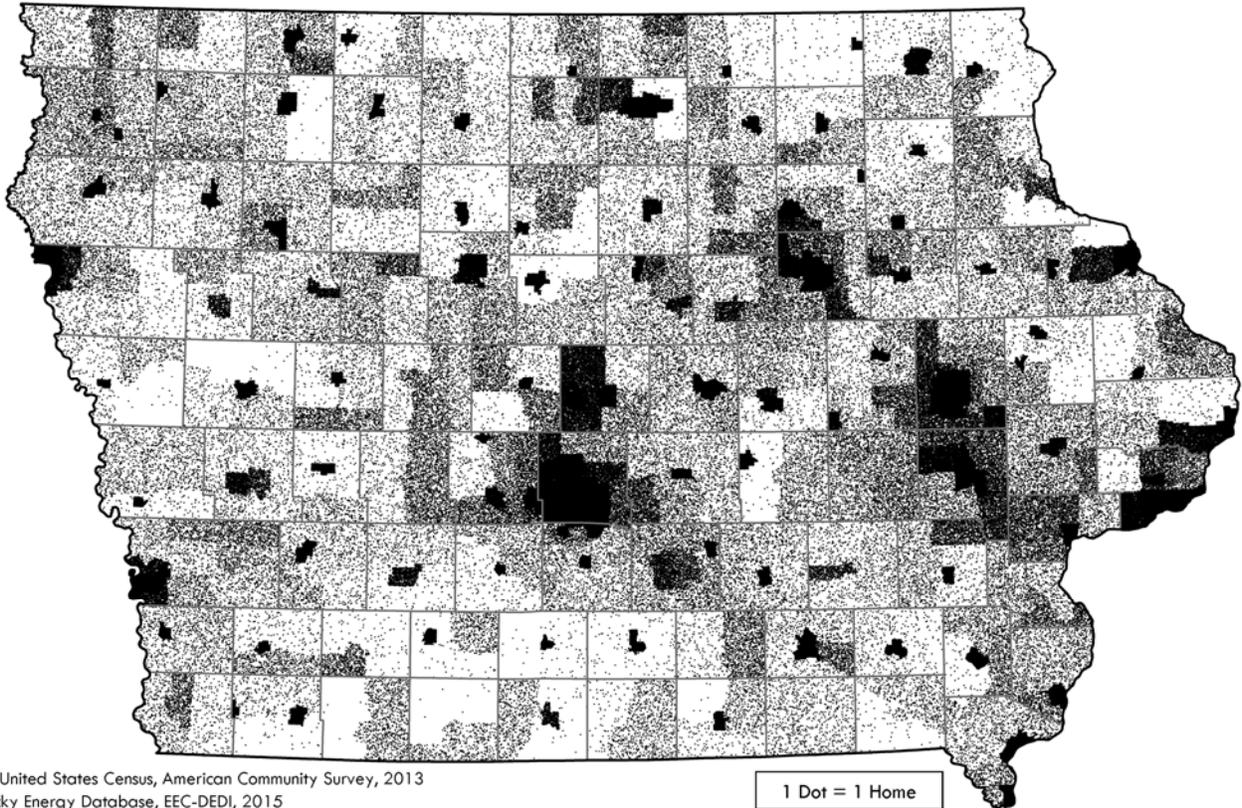
Industrial electricity consumption per state GDP dollar in Iowa was 11th highest in the country in 2013. Versus 2012, industrial electricity intensity fell by 4%.



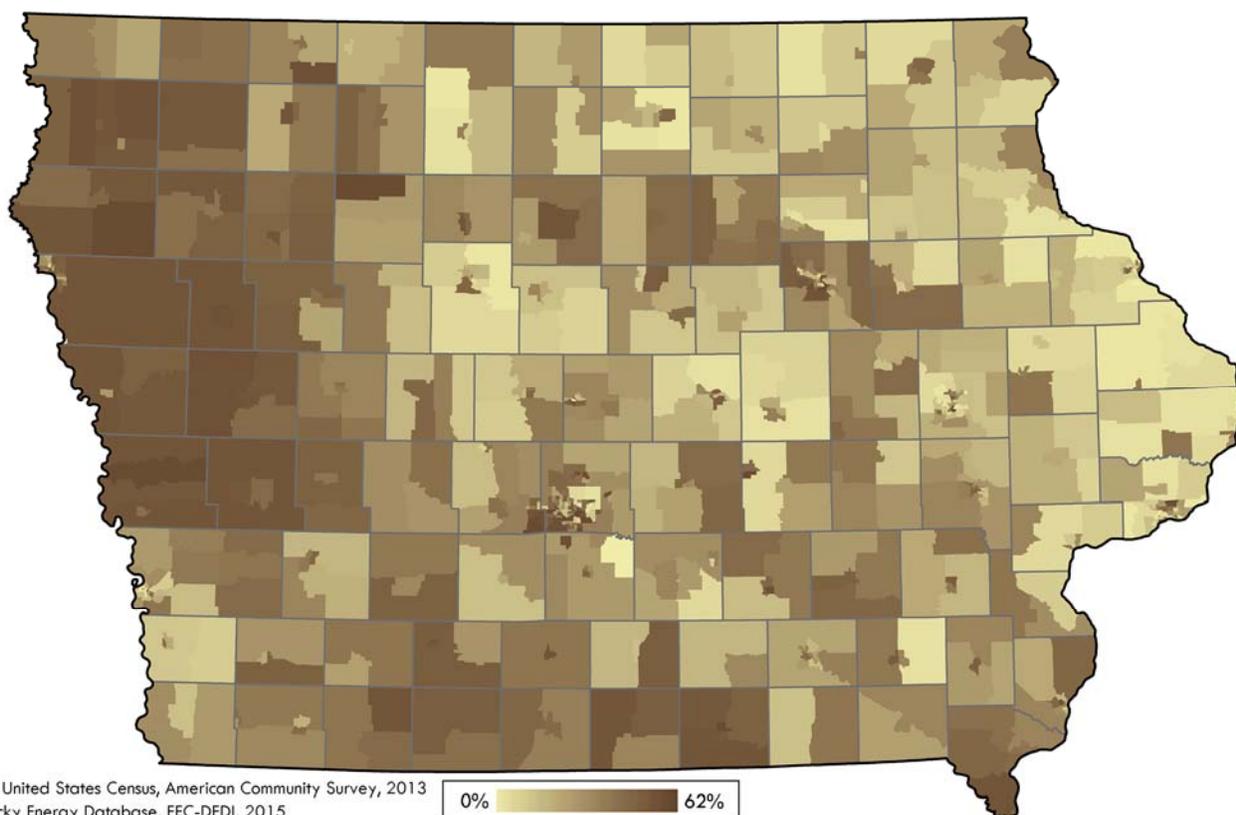
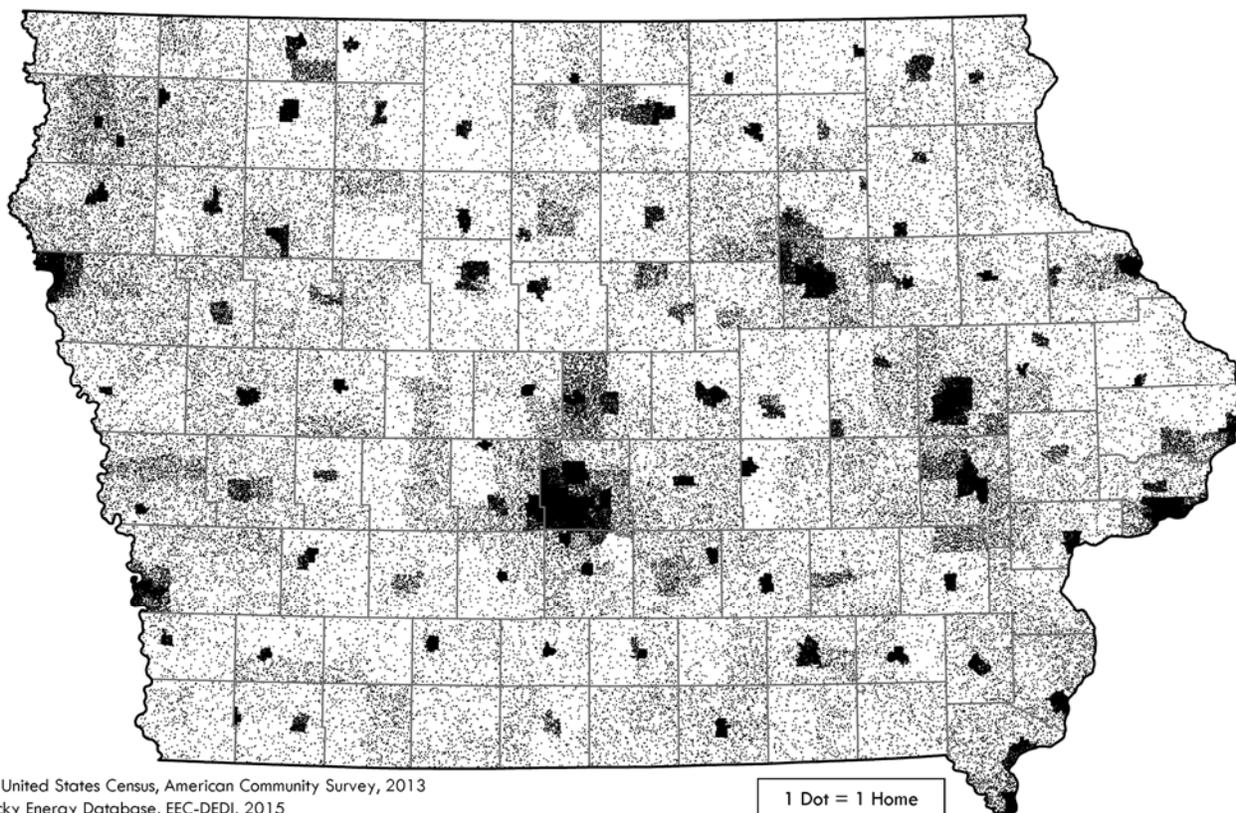
State	kWh/\$GDP	Rank
Mississippi	0.14	1st
Iowa	0.08	32nd
Massachusetts	0.04	50th

Iowa's commercial sector used 0.08 kWh of electricity to generate one dollar of economic output, a decrease of 3%. This ratio ranked the state 32nd lowest of all states.

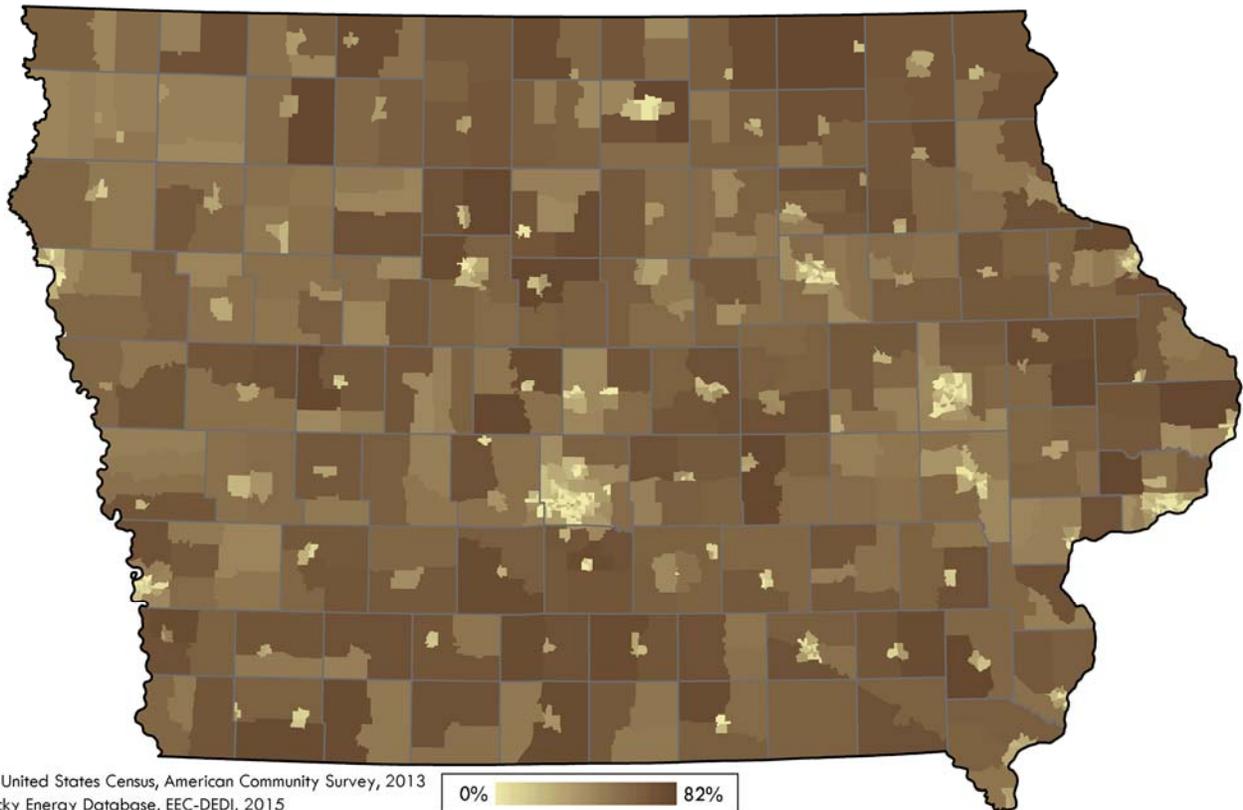
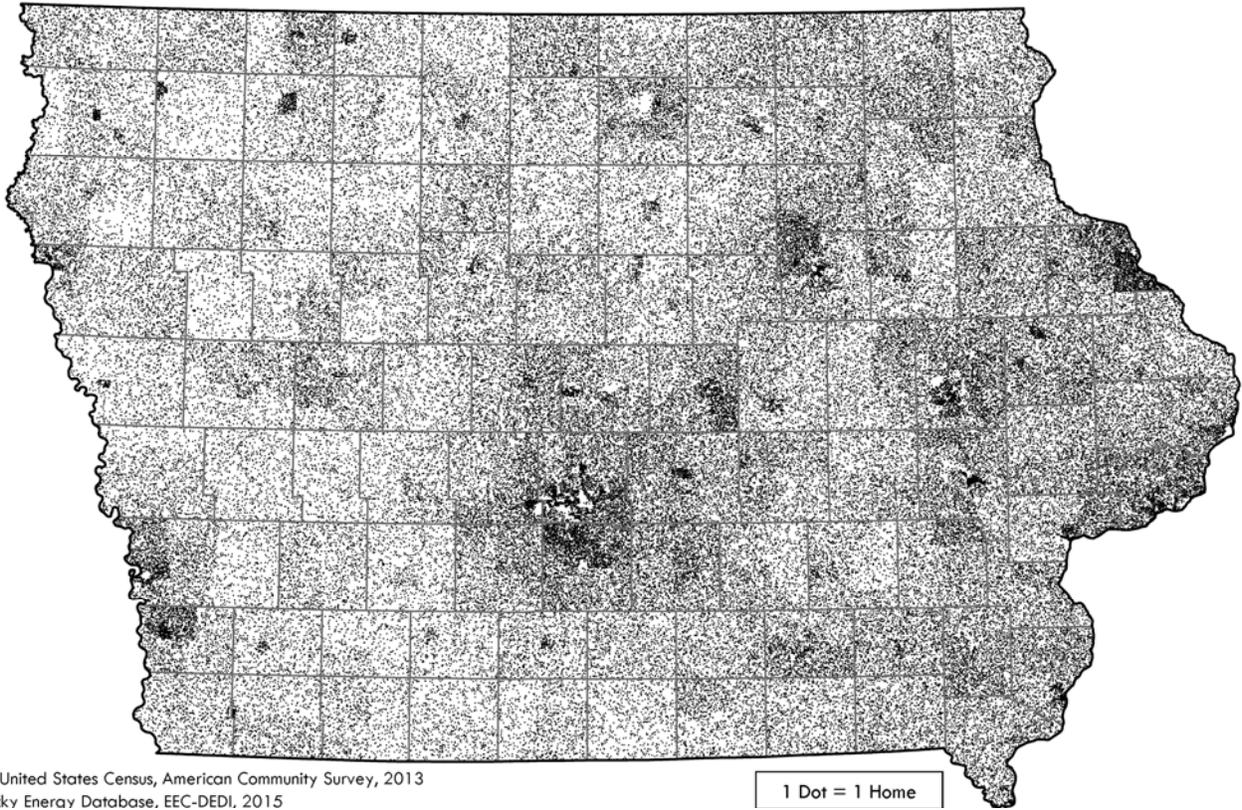
IOWA HOMES HEATING WITH NATURAL GAS



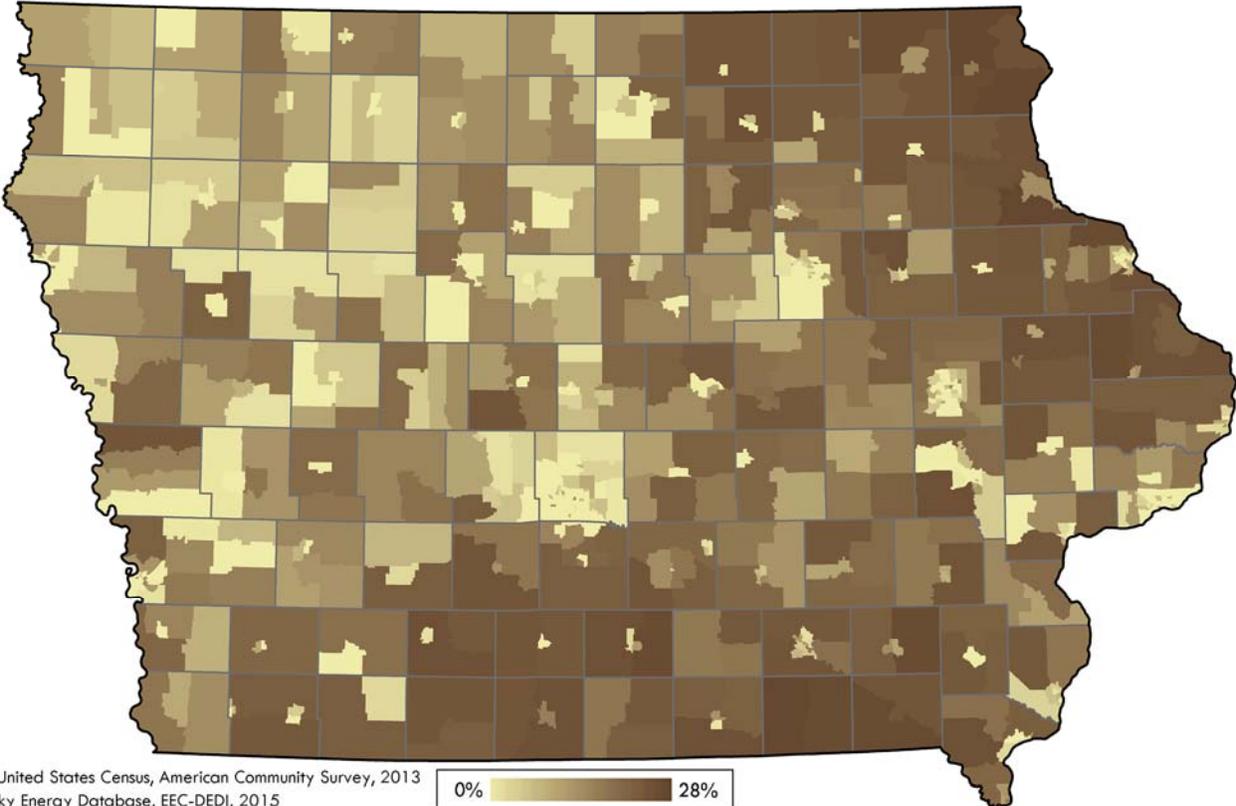
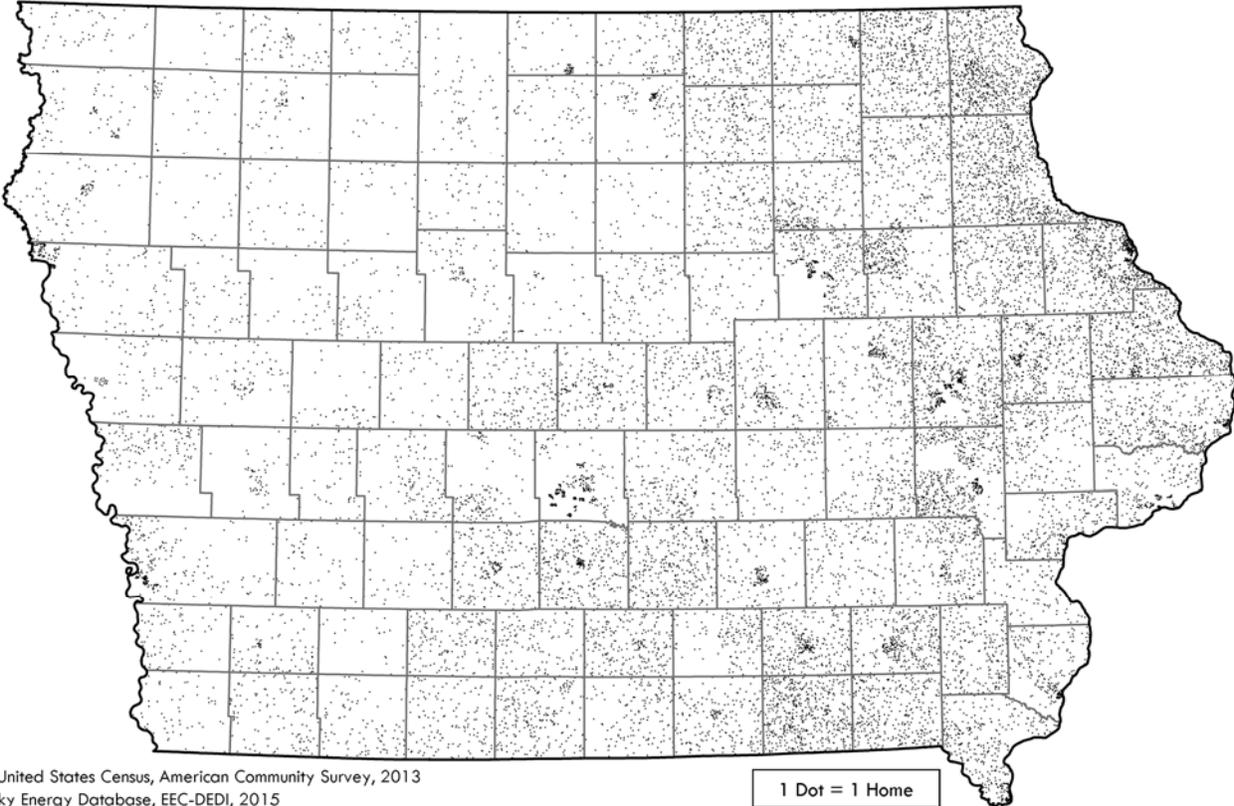
IOWA HOMES HEATING WITH ELECTRICITY



IOWA HOMES HEATING WITH PROPANE



IOWA HOMES HEATING WITH WOOD



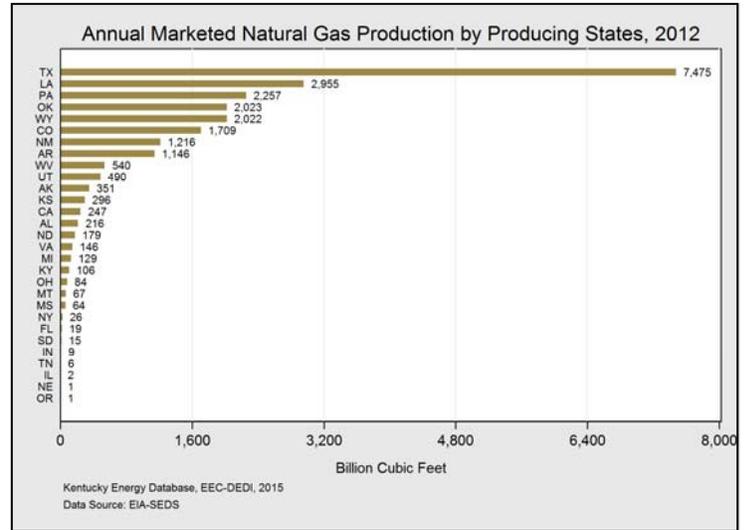
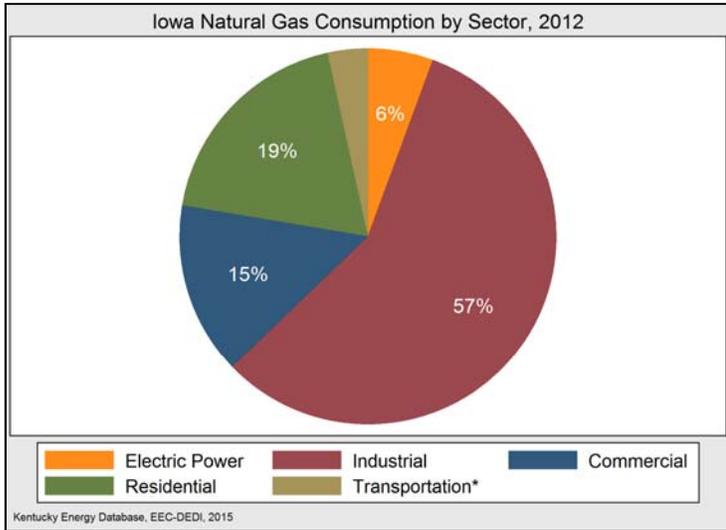
IOWA HOME HEATING FUELS

County	Total	Natural Gas		Electricity		Propane		Wood		Oil or Keresene	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Iowa Total	1,226,547	787,823	64.2%	227,748	18.6%	163,183	13.3%	20,147	1.6%	9,933	0.8%
Adair	3,295	1,641	49.8%	674	20.5%	823	25.0%	57	1.7%	26	0.8%
Adams	1,745	766	43.9%	306	17.5%	566	32.4%	24	1.4%	30	1.7%
Allamakee	5,862	2,118	36.1%	753	12.8%	1,829	31.2%	805	13.7%	178	3.0%
Appanoose	5,534	2,181	39.4%	1,794	32.4%	1,232	22.3%	218	3.9%	8	0.1%
Audubon	2,684	1,319	49.1%	637	23.7%	561	20.9%	57	2.1%	70	2.6%
Benton	10,079	5,482	54.4%	1,693	16.8%	2,151	21.3%	318	3.2%	297	2.9%
Black Hawk	52,276	37,106	71.0%	11,302	21.6%	2,767	5.3%	342	0.7%	210	0.4%
Boone	10,574	6,196	58.6%	1,855	17.5%	2,148	20.3%	185	1.7%	26	0.2%
Bremer	9,258	5,800	62.6%	1,157	12.5%	1,926	20.8%	217	2.3%	101	1.1%
Buchanan	8,187	4,665	57.0%	1,287	15.7%	1,701	20.8%	331	4.0%	135	1.6%
Buena Vista	7,615	4,505	59.2%	1,996	26.2%	955	12.5%	38	0.5%	67	0.9%
Butler	6,189	3,077	49.7%	1,305	21.1%	1,427	23.1%	209	3.4%	118	1.9%
Calhoun	4,356	2,460	56.5%	729	16.7%	1,038	23.8%	54	1.2%	32	0.7%
Carroll	8,626	4,910	56.9%	1,775	20.6%	1,656	19.2%	51	0.6%	133	1.5%
Cass	6,081	3,621	59.5%	1,160	19.1%	1,172	19.3%	60	1.0%	23	0.4%
Cedar	7,665	4,090	53.4%	937	12.2%	2,104	27.4%	220	2.9%	125	1.6%
Cerro Gordo	19,967	14,421	72.2%	3,050	15.3%	2,049	10.3%	122	0.6%	45	0.2%
Cherokee	5,354	2,862	53.5%	1,268	23.7%	1,046	19.5%	24	0.4%	107	2.0%
Chickasaw	5,364	2,690	50.1%	691	12.9%	1,585	29.5%	179	3.3%	158	2.9%
Clarke	3,672	1,367	37.2%	1,039	28.3%	995	27.1%	124	3.4%	31	0.8%
Clay	7,148	3,952	55.3%	1,794	25.1%	1,223	17.1%	56	0.8%	34	0.5%
Clayton	7,707	3,228	41.9%	973	12.6%	2,301	29.9%	821	10.7%	261	3.4%
Clinton	20,008	13,002	65.0%	2,836	14.2%	3,003	15.0%	456	2.3%	341	1.7%
Crawford	6,300	2,391	38.0%	2,090	33.2%	1,512	24.0%	90	1.4%	137	2.2%
Dallas	26,262	16,907	64.4%	6,053	23.0%	2,465	9.4%	128	0.5%	109	0.4%
Davis	3,115	888	28.5%	494	15.9%	1,121	36.0%	550	17.7%	21	0.7%
Decatur	3,106	1,173	37.8%	699	22.5%	890	28.7%	244	7.9%	25	0.8%
Delaware	7,129	3,411	47.8%	928	13.0%	2,209	31.0%	364	5.1%	50	0.7%
Des Moines	16,993	11,457	67.4%	3,108	18.3%	1,980	11.7%	239	1.4%	30	0.2%
Dickinson	7,981	5,049	63.3%	1,778	22.3%	1,063	13.3%	65	0.8%	3	0.0%
Dubuque	37,366	26,906	72.0%	4,426	11.8%	3,898	10.4%	787	2.1%	833	2.2%
Emmet	4,119	2,670	64.8%	531	12.9%	780	18.9%	45	1.1%	39	0.9%
Fayette	8,328	4,267	51.2%	1,116	13.4%	2,289	27.5%	300	3.6%	218	2.6%
Floyd	7,007	4,255	60.7%	1,054	15.0%	1,247	17.8%	224	3.2%	79	1.1%
Franklin	4,358	2,172	49.8%	931	21.4%	1,012	23.2%	34	0.8%	152	3.5%
Fremont	2,965	1,349	45.5%	430	14.5%	1,016	34.3%	59	2.0%	63	2.1%
Greene	3,969	2,075	52.3%	696	17.5%	971	24.5%	65	1.6%	71	1.8%
Grundy	5,073	2,922	57.6%	628	12.4%	1,404	27.7%	61	1.2%	13	0.3%
Guthrie	4,641	2,397	51.6%	863	18.6%	1,106	23.8%	126	2.7%	48	1.0%
Hamilton	6,395	3,860	60.4%	866	13.5%	1,532	24.0%	37	0.6%	25	0.4%
Hancock	4,648	2,541	54.7%	719	15.5%	1,161	25.0%	66	1.4%	81	1.7%
Hardin	7,061	4,308	61.0%	1,165	16.5%	1,280	18.1%	118	1.7%	86	1.2%
Harrison	5,996	2,329	38.8%	2,053	34.2%	1,288	21.5%	143	2.4%	53	0.9%
Henry	7,493	3,877	51.7%	1,374	18.3%	1,908	25.5%	241	3.2%	15	0.2%
Howard	3,884	1,370	35.3%	530	13.6%	1,617	41.6%	192	4.9%	106	2.7%
Humboldt	4,222	1,931	45.7%	982	23.3%	1,198	28.4%	47	1.1%	21	0.5%
Ida	3,182	1,479	46.5%	1,109	34.9%	426	13.4%	47	1.5%	39	1.2%
Iowa	6,745	3,452	51.2%	1,094	16.2%	1,624	24.1%	200	3.0%	116	1.7%
Jackson	8,479	4,448	52.5%	776	9.2%	2,136	25.2%	663	7.8%	325	3.8%

IOWA HOME HEATING FUELS

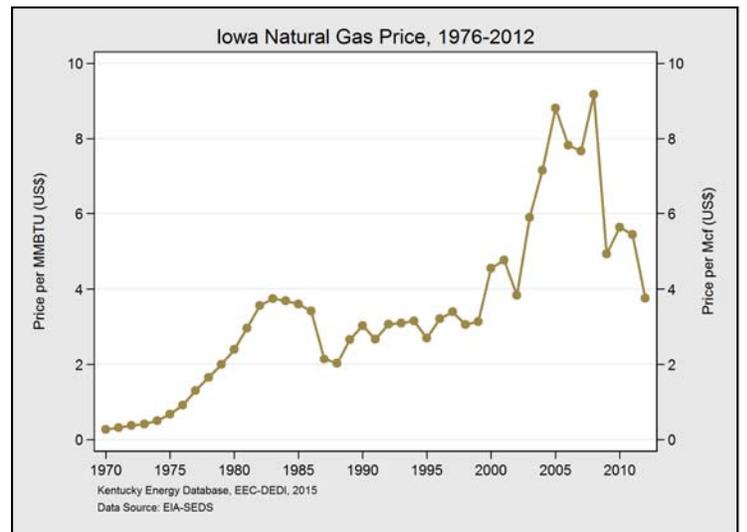
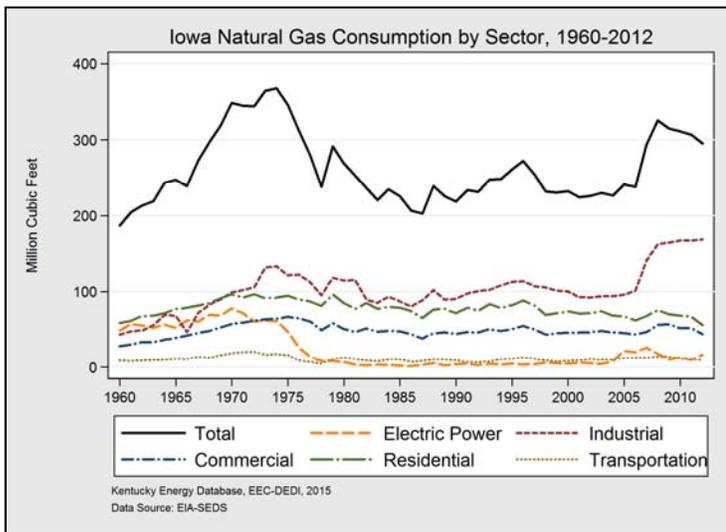
County	Total	Natural Gas		Electricity		Propane		Wood		Oil or Kerosene	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Jasper	14,826	8,564	57.8%	2,622	17.7%	3,107	21.0%	253	1.7%	78	0.5%
Jefferson	6,919	3,474	50.2%	1,379	19.9%	1,601	23.1%	354	5.1%	42	0.6%
Johnson	54,005	40,220	74.5%	9,452	17.5%	2,969	5.5%	557	1.0%	115	0.2%
Jones	8,063	3,359	41.7%	1,151	14.3%	2,741	34.0%	461	5.7%	77	1.0%
Keokuk	4,354	1,622	37.3%	968	22.2%	1,458	33.5%	170	3.9%	67	1.5%
Kossuth	6,728	3,580	53.2%	868	12.9%	1,873	27.8%	75	1.1%	254	3.8%
Lee	14,241	8,014	56.3%	3,746	26.3%	1,860	13.1%	401	2.8%	88	0.6%
Linn	86,052	68,374	79.5%	11,515	13.4%	4,043	4.7%	746	0.9%	225	0.3%
Louisa	4,381	2,022	46.2%	712	16.3%	1,493	34.1%	104	2.4%	17	0.4%
Lucas	3,734	1,585	42.4%	754	20.2%	1,024	27.4%	244	6.5%	46	1.2%
Lyon	4,425	2,033	45.9%	769	17.4%	1,191	26.9%	49	1.1%	118	2.7%
Madison	6,092	2,654	43.6%	886	14.5%	1,994	32.7%	243	4.0%	60	1.0%
Mahaska	9,073	5,092	56.1%	2,184	24.1%	1,482	16.3%	172	1.9%	59	0.7%
Marion	12,691	7,762	61.2%	1,964	15.5%	2,522	19.9%	360	2.8%	10	0.1%
Marshall	15,350	9,504	61.9%	2,511	16.4%	2,783	18.1%	222	1.4%	125	0.8%
Mills	5,375	2,593	48.2%	709	13.2%	1,888	35.1%	76	1.4%	41	0.8%
Mitchell	4,389	2,066	47.1%	542	12.3%	1,461	33.3%	236	5.4%	32	0.7%
Monona	3,981	1,627	40.9%	973	24.4%	989	24.8%	81	2.0%	233	5.9%
Monroe	3,361	1,530	45.5%	478	14.2%	1,158	34.5%	137	4.1%	0	0.0%
Montgomery	4,553	2,695	59.2%	926	20.3%	739	16.2%	106	2.3%	26	0.6%
Muscatine	16,410	12,173	74.2%	2,088	12.7%	1,797	11.0%	236	1.4%	31	0.2%
O'Brien	6,098	3,508	57.5%	1,794	29.4%	678	11.1%	44	0.7%	16	0.3%
Osceola	2,676	1,091	40.8%	597	22.3%	890	33.3%	17	0.6%	40	1.5%
Page	6,415	3,755	58.5%	1,199	18.7%	1,096	17.1%	134	2.1%	106	1.7%
Palo Alto	3,948	2,090	52.9%	879	22.3%	895	22.7%	14	0.4%	34	0.9%
Plymouth	9,867	4,986	50.5%	2,832	28.7%	1,586	16.1%	92	0.9%	82	0.8%
Pocahontas	3,227	1,441	44.7%	772	23.9%	851	26.4%	33	1.0%	87	2.7%
Polk	173,164	126,712	73.2%	39,664	22.9%	4,018	2.3%	292	0.2%	274	0.2%
Pottawattamie	36,460	27,687	75.9%	5,089	14.0%	2,802	7.7%	266	0.7%	119	0.3%
Poweshiek	7,488	3,428	45.8%	1,795	24.0%	1,959	26.2%	114	1.5%	108	1.4%
Ringgold	2,074	511	24.6%	506	24.4%	785	37.8%	144	6.9%	65	3.1%
Sac	4,435	2,149	48.5%	1,017	22.9%	1,039	23.4%	33	0.7%	124	2.8%
Scott	67,049	54,071	80.6%	8,668	12.9%	3,244	4.8%	222	0.3%	191	0.3%
Shelby	5,083	2,506	49.3%	1,534	30.2%	818	16.1%	54	1.1%	124	2.4%
Sioux	11,623	6,256	53.8%	3,523	30.3%	1,379	11.9%	87	0.7%	139	1.2%
Story	35,196	25,316	71.9%	7,008	19.9%	2,215	6.3%	211	0.6%	103	0.3%
Tama	6,794	3,483	51.3%	774	11.4%	1,988	29.3%	230	3.4%	159	2.3%
Taylor	2,764	941	34.0%	709	25.7%	920	33.3%	104	3.8%	63	2.3%
Union	5,339	2,866	53.7%	1,434	26.9%	695	13.0%	171	3.2%	27	0.5%
Van Buren	3,023	645	21.3%	511	16.9%	1,385	45.8%	343	11.3%	67	2.2%
Wapello	14,534	9,831	67.6%	2,247	15.5%	1,825	12.6%	338	2.3%	16	0.1%
Warren	17,378	9,376	54.0%	3,496	20.1%	3,873	22.3%	359	2.1%	108	0.6%
Washington	8,948	4,619	51.6%	1,771	19.8%	1,982	22.2%	280	3.1%	43	0.5%
Wayne	2,589	960	37.1%	692	26.7%	724	28.0%	143	5.5%	16	0.6%
Webster	15,458	11,356	73.5%	1,851	12.0%	1,909	12.3%	98	0.6%	23	0.1%
Winnebago	4,591	2,260	49.2%	739	16.1%	1,384	30.1%	69	1.5%	106	2.3%
Winneshiek	8,042	3,418	42.5%	1,273	15.8%	2,425	30.2%	538	6.7%	240	3.0%
Woodbury	38,654	25,915	67.0%	9,131	23.6%	2,309	6.0%	200	0.5%	342	0.9%
Worth	3,197	1,775	55.5%	352	11.0%	880	27.5%	97	3.0%	20	0.6%
Wright	5,367	2,985	55.6%	1,190	22.2%	1,065	19.8%	34	0.6%	33	0.6%

IOWA NATURAL GAS



Sector	MMCF	Percent	1 Year Change
Total	295,183	100%	-3.8%
Industrial	168,897	57%	1.0%
Residential	55,855	19%	-16.8%
Commercial	43,777	15%	-15.6%
Electric Power	16,509	6%	66.9%
Transportation	10,145	3.4%	-6.2%

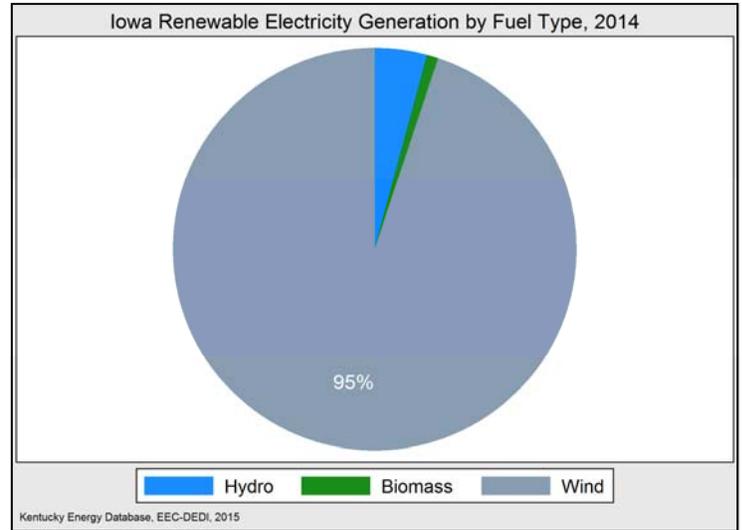
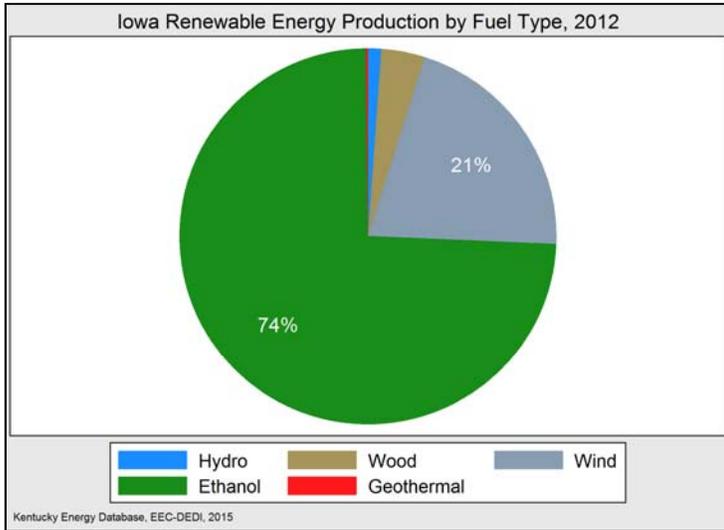
Iowa registered no significant natural gas production in 2012 according to the EIA SEDS database. As a result, Iowa was a net importer of natural gas supplies for the year. The top three states by natural gas production in 2012 were Texas, Louisiana, and Pennsylvania, with Texas by far the single largest producer of the commodity.



In 2012, natural gas consumption in Iowa was 295 billion cubic feet. Compared with 2011, total natural gas consumption fell by 4% on the year. The industrial sector was the largest consumer of natural gas in Iowa in 2012. (Natural gas consumption by the transportation sector is the summation of direct, vehicle fuel use and natural gas used by transmission and distribution pipelines).

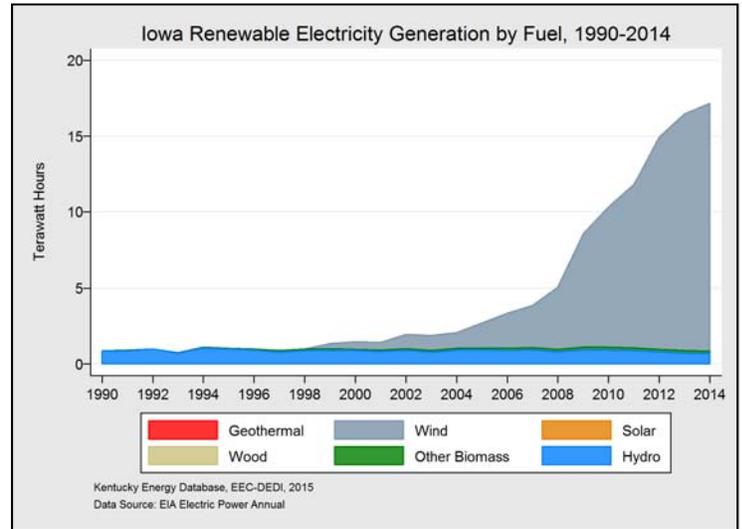
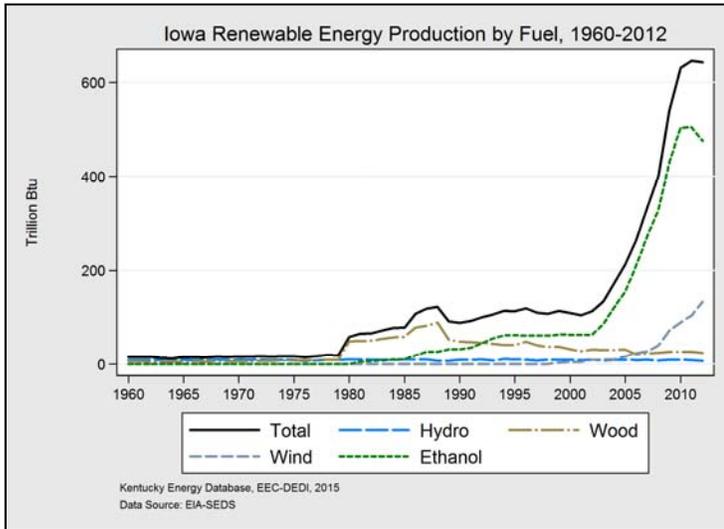
The average city gate price of natural gas in Iowa was \$5.87 per thousand cubic feet in 2012. Relative to the previous year, this average annual price fell by 15%. The city gate price of natural gas is typically reported at the connection where a natural gas distribution company or utility takes control of natural gas delivered by a pipeline or transmission company.

IOWA RENEWABLE ENERGY



Fuel Type	Billion Btu	Percent	1 Year Change
Total	642,571	100%	-0.5%
Ethanol	265,441	41%	-6.3%
Fuel Losses	189,621	30%	-6.3%
Wind	133,533	21%	28.3%
Wood & Biomass	24,105	4%	-8.0%
Hydro	7,291	1.1%	-18.9%
Geothermal	1,281	<1%	-5.7%

Fuel Type	Gigawatt Hours	Percent	1 Year Change
Total	17,172	100%	4.2%
Wind	16,295	95%	4.7%
Hydro	719	4%	-4.1%
Biomass	158	1%	-0.1%

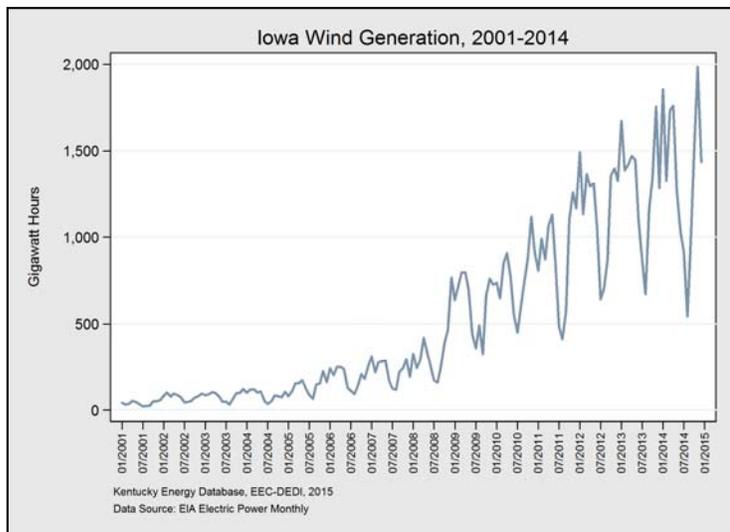


In 2012, renewable energy production in Iowa was 642,571 billion Btu, a decrease of 1% from 2011. Dividing this production by fuel type, ethanol resources accounted for the largest amount of energy production in 2012.

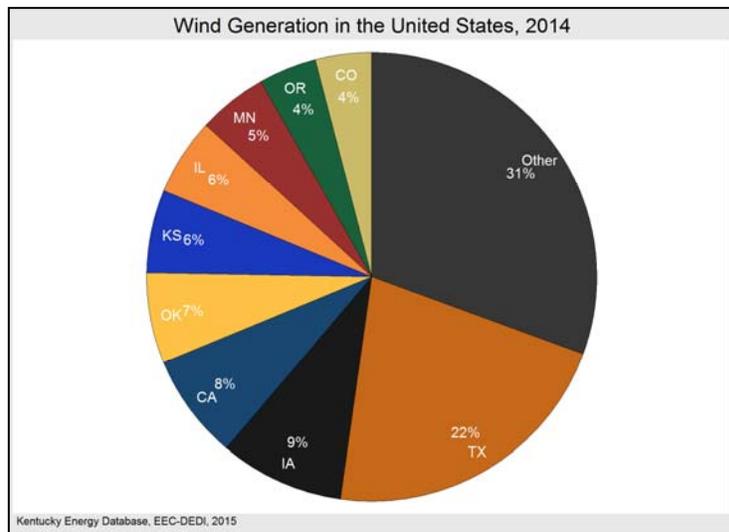
*Ethanol & Ethanol Co-Products include distillers grain, corn oil, and other by-products that are rendered following fuel ethanol distillation.

Wind facilities were the largest portion of renewable electricity generation in Iowa in 2014. Compared with 2013, the electrical output of wind facilities rose by 5% in 2014. (Total biomass generation is divided between wood products, labeled Wood, and other biomass resources, labeled Biomass, such as landfill gas).

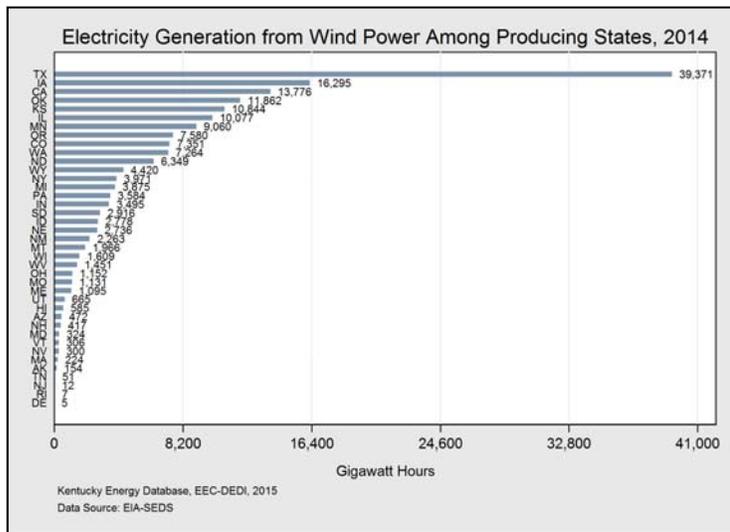
IOWA WIND ENERGY



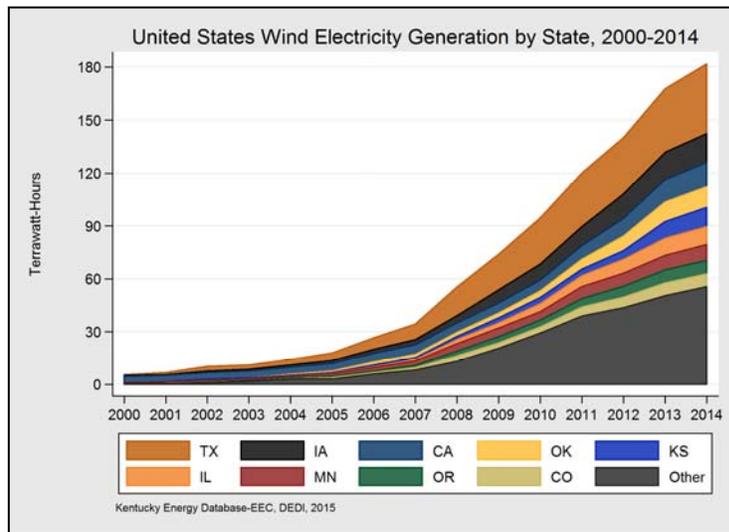
Electricity generation from wind varies seasonally, with less generation in the months between June and September. On average, wind generation in August is less than half of wind generation in November.



Iowa was the second-largest producer of wind-based generation in 2014, behind only Texas. Fully 9% of United States electricity generation from wind originated in Iowa in 2014.

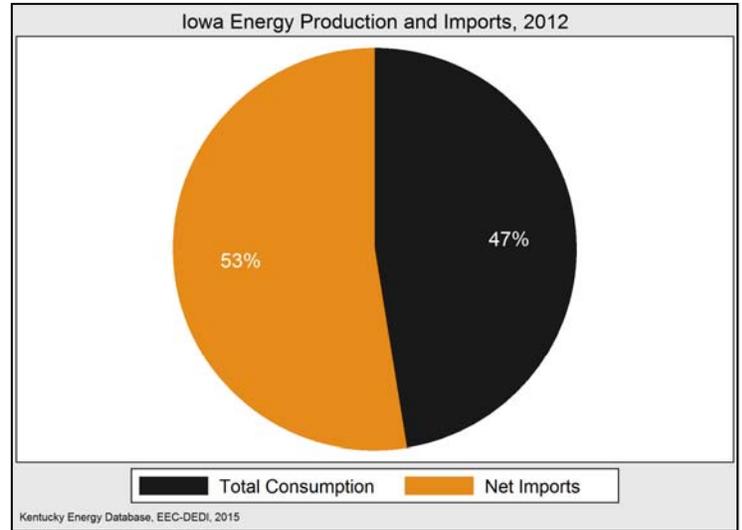
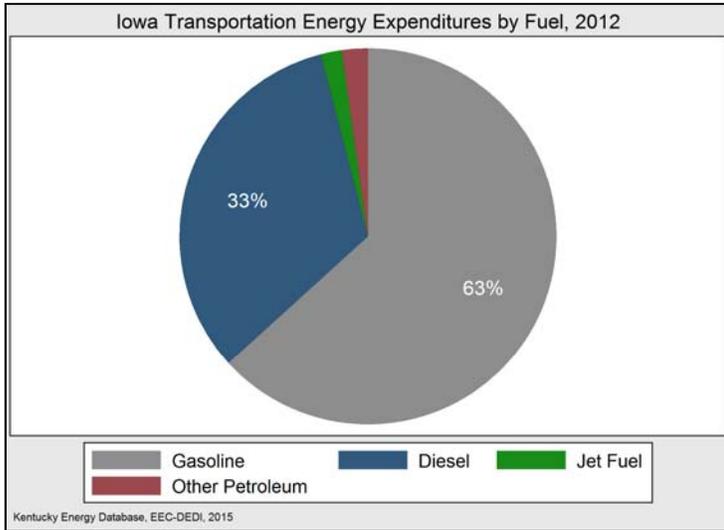


In 2014, 39 states registered electricity generated from wind resources. Most electricity generated from wind is in the Midwest and the states bordering the Pacific Ocean.



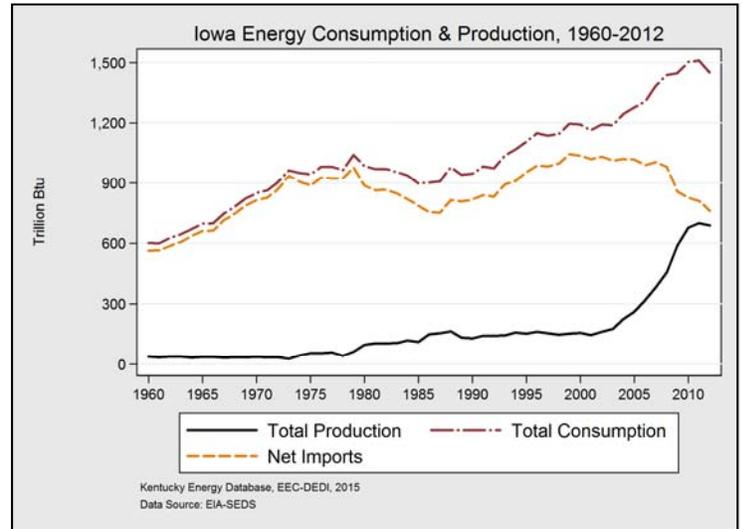
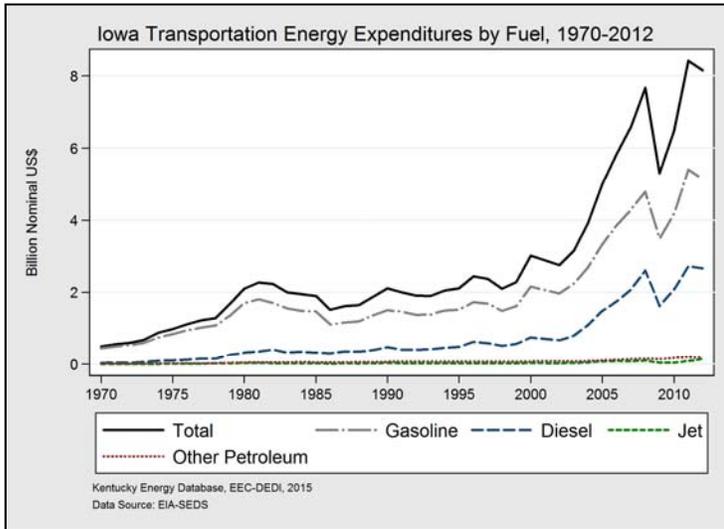
Wind generation has increased by 228% since 2008 throughout the United States. On average, wind-based electricity generation has increased by 31% each year since 2008.

IOWA ENERGY EXPENDITURES



Fuel Type	Billion Btu	Percent	1 Year Change
Total	8,150	100%	-3.2%
Gasoline	5,153	63%	-4.7%
Diesel	2,664	33%	-2.0%
Other Petroleum	180	2%	-7.3%
Jet Fuel	146	2%	68.9%
Aviation Gas	7	<1%	-30.5%

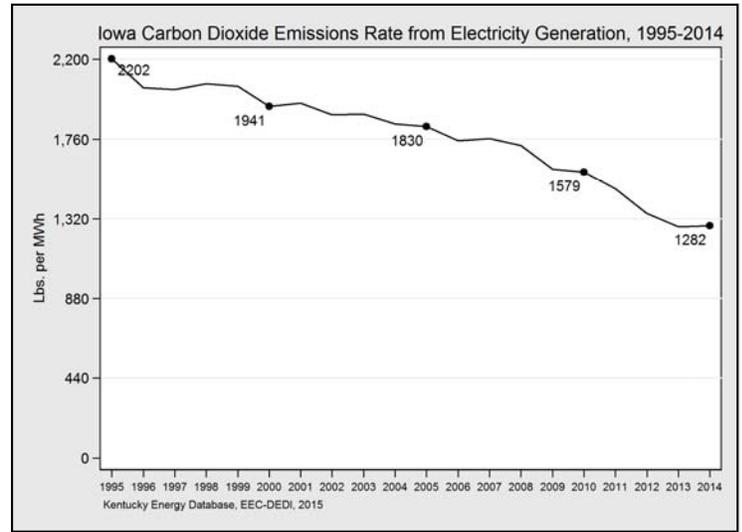
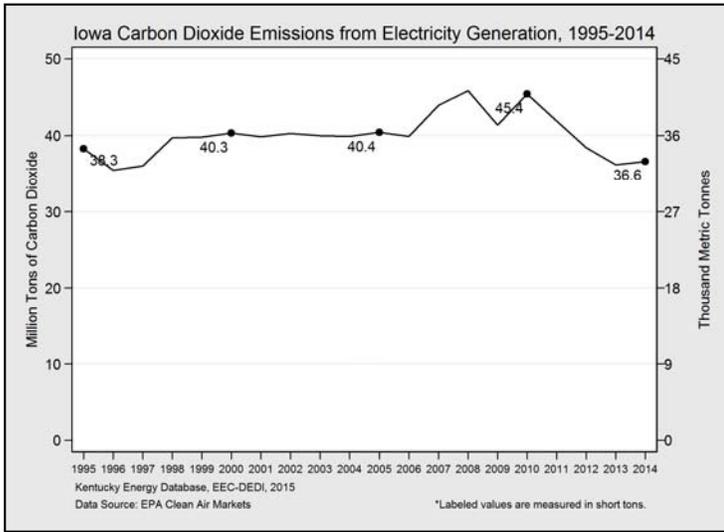
Energy	Billion BTU	Percent
Consumption	1,449,575	100.0%
Production	688,123	47.5%
Imports	761,452	52.5%



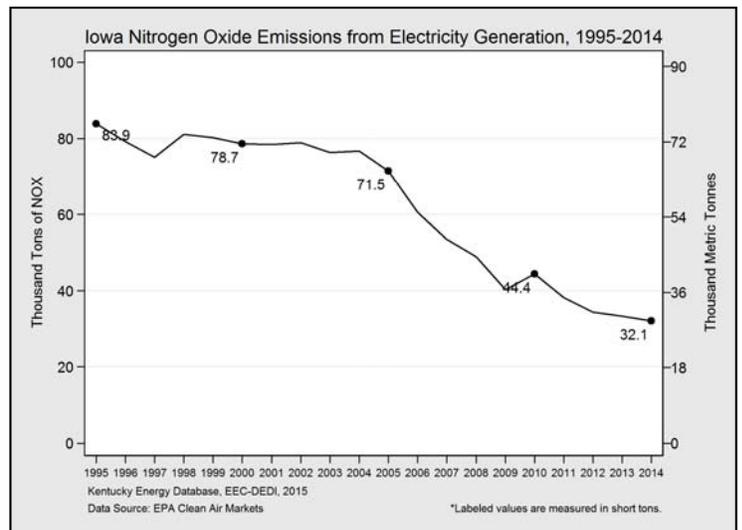
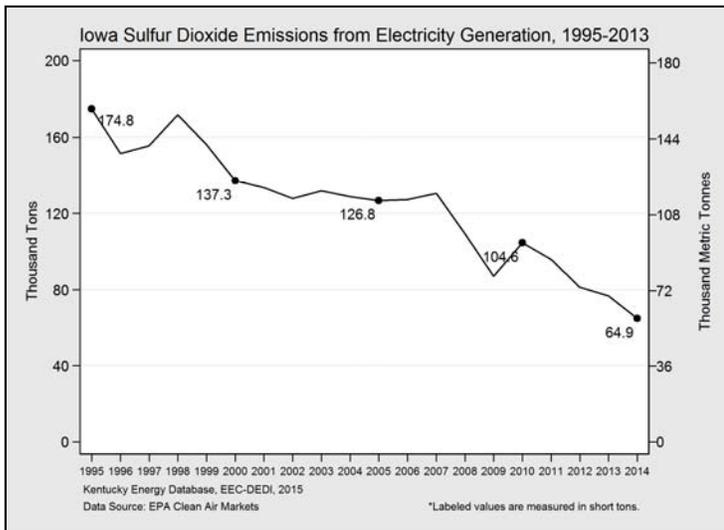
Transportation energy expenditures were approximately \$8,150 million in Iowa in 2012, a decrease of 3% compared with 2011. Overall, transportation energy expenditures were led by gasoline use in 2012, with 63% of energy expenditures. Diesel costs were 33% of transportation energy expenditures in Iowa in 2012.

In 1960, Iowans imported virtually all of the energy they required from out of state and primarily in the form of fossil fuels like petroleum, coal, and natural gas. While Iowa is still a net-importer of energy in 2014, increasing production of ethanol and electricity generated from wind have substantially reduced energy imports and increased Iowa's energy security and independence.

IOWA POWER PLANT EMISSIONS



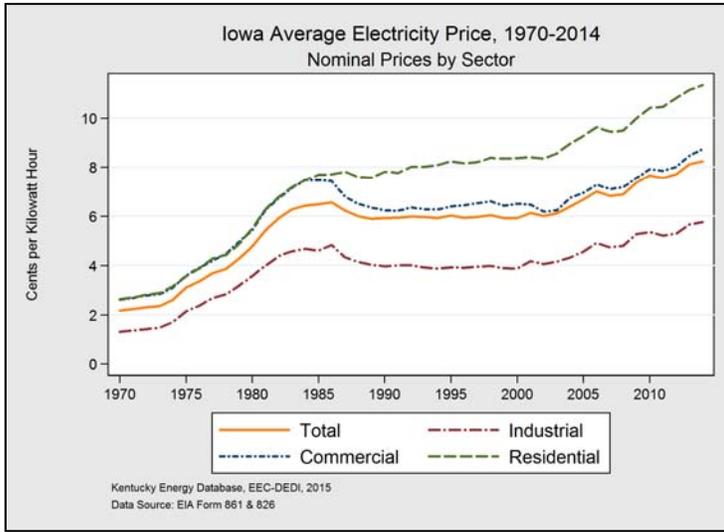
Emission	Tons	Since 1995
Carbon Dioxide	36,606,108	-4.35%
Sulfur Dioxide	64,908	-62.86%
Nitrogen Oxides	32,136	-61.68%



In 2014, power plants in Iowa emitted 36.6 million short tons of carbon dioxide, an increase of 1% compared with 2013. In terms of mass emissions, power plants emit almost the same amount of carbon dioxide as they did in 1995, decreasing only by 4%. However, as electricity generation from carbon-neutral wind power has increased, the amount of carbon dioxide emitted per unit of energy produced has decreased substantially, by 42% 2,202 lbs per MWh in 1995 to 1,282 in 2014.

In 2014, power plants in Iowa emitted 64,908 tons of sulfur dioxide, a decrease of 63% since 1995. These same plants emitted 32,136 tons of nitrogen oxides, a decrease of 62% since 1995.

IOWA ELECTRICITY PRICES

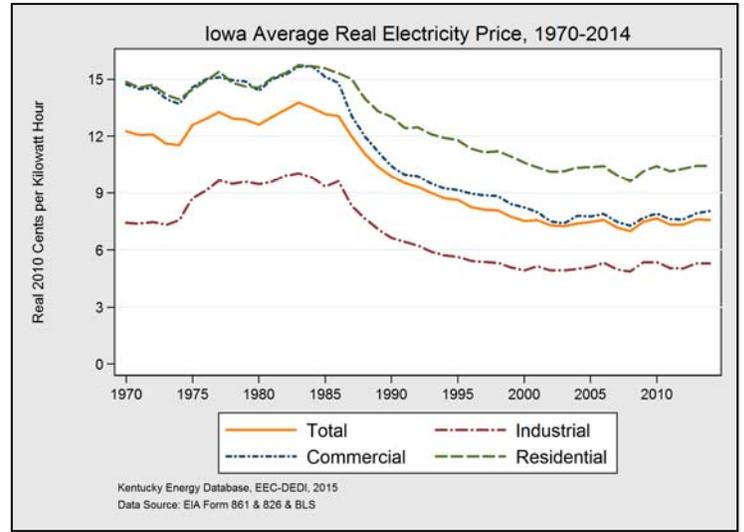


Sector	Cents / kWh	Since 2000
Average	8.24	39%
Industrial	5.77	48%
Commercial	8.74	34%
Residential	11.35	36%

Prices and percent changes above are displayed in nominal prices for the period 1970-2010.

Electricity usage in Iowa is billed in terms of cents per kilowatt-hour of electricity consumed, with differences in price by sector and electric utility. However, while the price of electricity varies from sector to sector and from one utility to another, the above data illustrate the average price of electricity delivered to each economic sector.

In 2014, the average price of electricity across economic sectors in Iowa was 8.24¢ per kilowatt-hour. With an increase of 2% versus 2013, this overall, weighted-average price ranked Iowa 42nd lowest in the country. Since 2000, the average price of electricity in Iowa has risen by 39%.



Fuel Type	Real Cents / kWh	Since 2000
Average	7.58	1%
Industrial	5.31	8%
Commercial	8.04	-2%
Residential	10.44	-2%

Prices and percent changes above have been adjusted for inflation and are shown in real 2010 prices.

In inflation-adjusted rates, the cost of electricity in Iowa between 1970 and 2014 can be placed in context to the adjacent, nominal graphic. The real price of electricity in Iowa has risen by 1% since the year 2000. In 2014 Iowa ranked 42nd lowest in the nation for the real price of electricity.

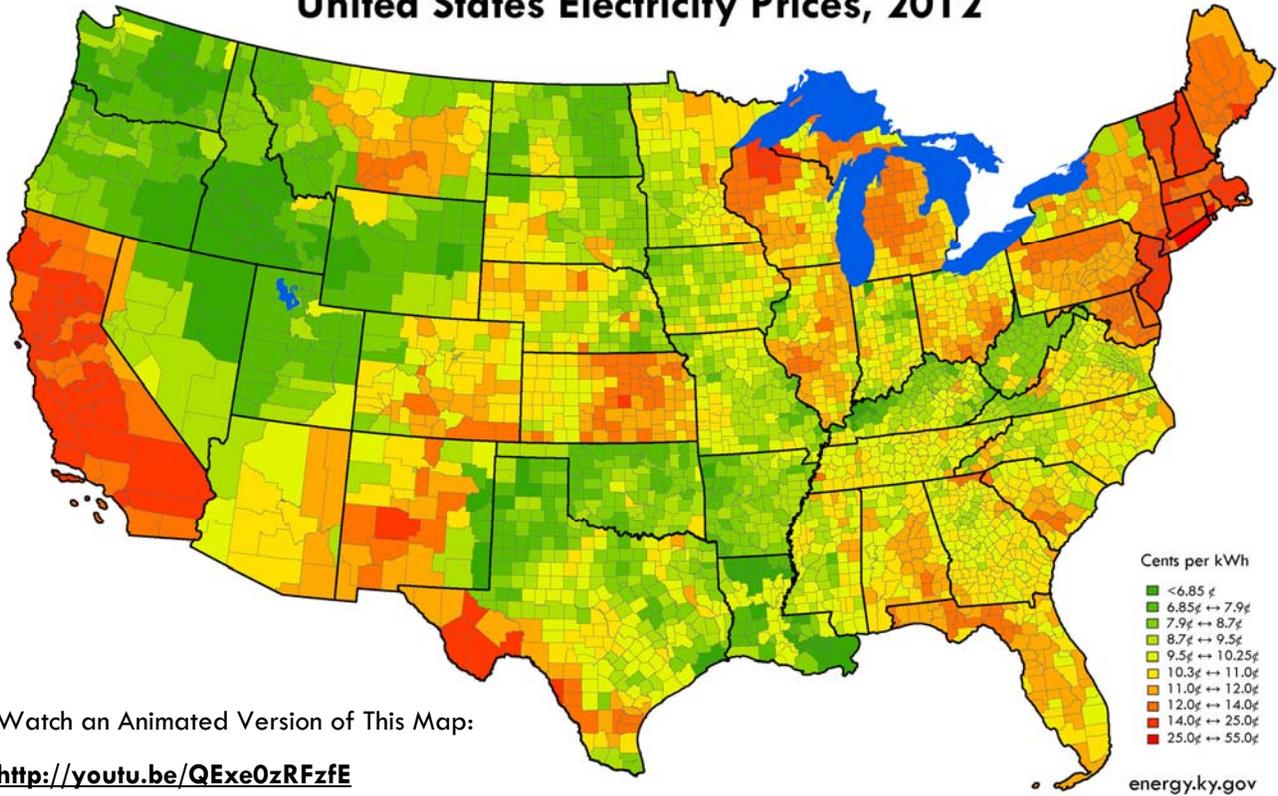
Since 1990, the two most influential factors explaining the changes in electricity prices have been the type of generation portfolio developed within a state, and the price of inputs for the electric power sector. Specifically, these factors involve the type of generation technology (i.e. coal, gas,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

AVERAGE PRICE OF ELECTRICITY BY STATE

Rank	State	Primary Source	2014 Price (Cents per kWh)	Inflation Adjusted 1 Year Change	Inflation Adjusted 5 Year Change
1	Washington	Hydroelectric	7.15	-0.4%	-1.9%
2	West Virginia	Coal	7.65	-5.0%	+4.1%
3	Wyoming	Coal	7.78	+1.2%	+15.8%
4	Arkansas	Coal	7.85	-1.4%	-6.2%
5	Idaho	Hydroelectric	7.95	+2.7%	+10.6%
6	Oklahoma	Coal	8.10	+1.9%	+5.6%
7	Louisiana	Natural Gas	8.11	-0.4%	+4.0%
8	Kentucky	Coal	8.13	+5.9%	+12.9%
9	Iowa	Coal	8.24	-0.3%	+1.2%
10	Utah	Coal	8.41	+1%	+12.4%
11	North Dakota	Coal	8.49	+1.8%	+15.9%
12	Montana	Coal	8.62	-1.4%	+3.0%
13	Oregon	Hydroelectric	8.78	+2.9%	+6.2%
14	Nebraska	Coal	8.80	-0.4%	+10.6%
15	Illinois	Nuclear	8.87	+9.0%	-11.6%
16	Indiana	Coal	8.97	+2.1%	+6.5%
17	Texas	Natural Gas	8.99	+0.6%	-17.6%
18	South Dakota	Hydroelectric	9.06	+0.7%	+11%
19	Missouri	Coal	9.06	-0.6%	+11.6%
20	Virginia	Nuclear	9.25	+0.8%	-6.3%
21	Alabama	Natural Gas	9.30	+1.3%	-4.7%
22	North Carolina	Coal	9.32	-0.1%	-0.4%
23	Tennessee	Coal	9.50	+1.3%	-1.1%
24	South Carolina	Nuclear	9.56	+2.8%	+2.8%
25	Minnesota	Coal	9.63	-0.6%	+7.1%
26	Mississippi	Natural Gas	9.66	+3.7%	-1.2%
27	Ohio	Coal	9.67	+3.7%	-2.9%
28	New Mexico	Coal	9.69	+3.1%	+8.4%
29	Nevada	Natural Gas	9.76	+6.0%	-14.8%
30	Georgia	Coal	9.94	+2.4%	+2.1%
31	Colorado	Coal	10.04	+0.7%	+9.3%
32	Kansas	Coal	10.04	+3.2%	+13.9%
33	Arizona	Coal	10.24	-0.9%	-3.0%
34	Pennsylvania	Coal	10.29	+2.9%	-3.0%
	United States	Coal	10.45	+1.8%	-3.7%
35	Wisconsin	Coal	10.73	-0.9%	+3.6%
36	Florida	Natural Gas	10.87	+3.6%	-14.4%
37	Michigan	Coal	11.10	-3.1%	+6.9%
38	Delaware	Natural Gas	11.33	+1.4%	-15.6%
39	Maryland	Coal	12.12	+2.2%	-16.1%
	District of Columbia	Natural Gas	12.17	+0.9%	-15.1%
40	Maine	Natural Gas	12.66	+4.9%	-12.5%
41	New Jersey	Nuclear	14.01	+0.5%	-12.7%
42	Vermont	Nuclear	14.58	-0.9%	+3.5%
43	California	Natural Gas	15.23	+2.8%	+4.1%
44	New Hampshire	Nuclear	15.25	+4.7%	-8.8%
45	Massachusetts	Natural Gas	15.34	+3.9%	-10.2%
46	Rhode Island	Natural Gas	15.57	+10%	-0.9%
47	New York	Natural Gas	16.25	+2.3%	-5.2%
48	Connecticut	Nuclear	16.98	+6.4%	-14.9%
49	Alaska	Natural Gas	17.58	+4.6%	+5.5%
50	Hawaii	Petroleum	33.53	-0.9%	+43.0%

AVERAGE PRICE OF ELECTRICITY BY STATE

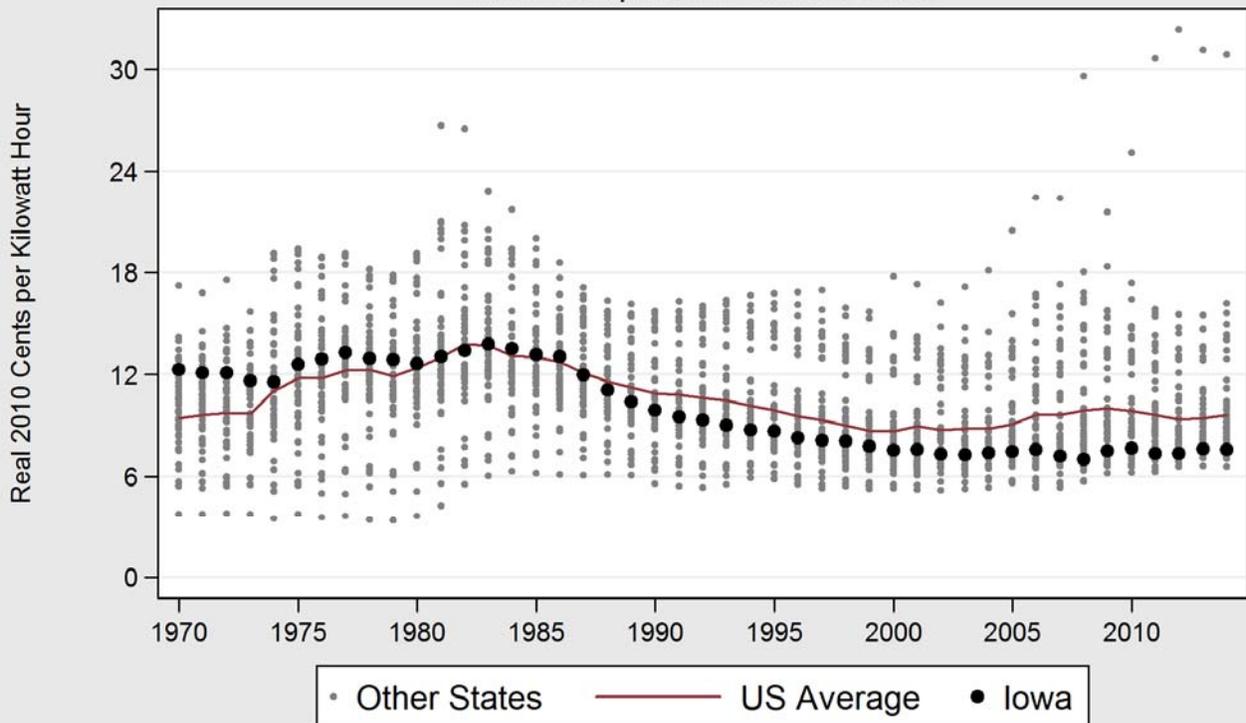
United States Electricity Prices, 2012



Watch an Animated Version of This Map:

<http://youtu.be/QExe0zRFzfe>

Iowa Average Real Electricity Price, 1970-2014 Iowa Compared to Other States



Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA Form 861 & 826 & BLS-CPI



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