Transforming America’s Energy Future

In Association With:

ADECA
Alabama Department of Economic and Community Affairs
Energy Division

Alabama Energy Profile

Developed by

DEDI
KENTUCKY DEPARTMENT for ENERGY DEVELOPMENT & INDEPENDENCE
The first edition of the Alabama 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 Alabama. 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 Alabama. Summary state-level statistics are provided in aggregate, as well as for specific sectors of the economy and individual commodities. Overall, Alabama was a net importer of energy in 2010, and maintained an industrial sector that was the leading consumer of energy resources.
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In 2010, total energy expenditures in Alabama were 21.5 billion dollars, an increase of 17% from 2009. Dividing these costs by economic sector, the transportation sector accounted for the largest amount of energy expenditures in 2010.

Analyzing energy expenditures by fuel type, the purchase of electricity was the highest concentration of expenditures in Alabama in 2010. Compared with 2009, total electricity expenditures displayed an increase of 10% in 2010.
In 2010, citizens, institutions, and firms in Alabama on average spent $0.13 on energy commodities and/or energy consumption to produce $1 of state gross domestic product. This energy expenditure level per dollar of economic output rose by 13% compared with 2009.

The state gross domestic product of Alabama was $167.7 billion in 2011. In that year, the state GDP of Alabama fell by 2% in inflation-adjusted 2010 dollars. Since the year 2000, the state gross domestic product of Alabama has risen by 14%.

In 2011, the population of Alabama was estimated to be around 4.8 million, with the majority of the population located in urban areas throughout the state. Since the year 2000, the population of Alabama has risen by approximately 8%.
In 2010, total energy consumption in Alabama was 1.96 quadrillion Btu, an increase of 7% from 2009. Dividing this consumption by economic sector, the industrial sector accounted for the largest amount of energy consumption in 2010.

Characterizing energy consumption by fuel type or commodity, the use of coal was the highest concentration of energy consumption in Alabama in 2010. Compared with 2009, the consumption of coal rose by 14% in 2010. *Alabama exported 501,743 Billion Btu of electricity in 2010, which is subtracted from the summation of in-state energy consumption.*
In 2010, net industrial energy consumption in Alabama was 567,406 billion Btu, an increase of 6% from 2009. Accounting for energy use across fuels, natural gas represented the largest amount of industrial energy consumption in 2010. *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.

Net commercial energy consumption in Alabama rose by 6% in 2010 to over 115,718 billion Btu. During 2010, electricity constituted the largest portion of commercial energy consumption and rose by 5% compared with 2009. *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.
Net residential sector energy consumption was 177,612 billion Btu in Alabama in 2010. This amount was an increase of 13% compared with 2009. Overall, residential energy consumption was led by electricity use in 2010. *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 2010, the transportation sector of Alabama consumed 485,514 billion Btu of energy commodities. This total reflected an increase of 4% in transportation energy consumption compared with the previous year. Unsurprisingly, gasoline was the largest source of transportation sector energy consumption in 2010.
### Alabama Energy Intensity

#### Commercial Energy Consumption Per Capita
- **Wyoming**: 113 MMBtu per capita, 1st rank
- **Alabama**: 57 MMBtu per capita, 33rd rank
- **Hawaii**: 29 MMBtu per capita, 50th rank

Alabama ranked 33rd lowest nationally for commercial energy consumption per capita in 2010, an increase of 4% compared with 2009. (MMBtu = 1 Million Btu).

#### Residential Energy Consumption Per Capita
- **North Dakota**: 99 MMBtu per capita, 1st rank
- **Alabama**: 87 MMBtu per capita, 12th rank
- **Hawaii**: 25 MMBtu per capita, 50th rank

Alabama’s residential sector consumed 87 Million Btu of energy per capita in 2010, an increase of 11% from 2009. Alabama ranked 12th highest by state.

#### Industrial Energy Consumption Per Capita
- **Louisiana**: 595 MMBtu per capita, 1st rank
- **Alabama**: 164 MMBtu per capita, 11th rank
- **New York**: 18 MMBtu per capita, 50th rank

Industrial energy consumption per capita in Alabama was 11th highest in the country in 2010. Compared with 2009, industrial energy use per capita rose by 5%.

#### Transportation Energy Consumption Per Capita
- **Alaska**: 295 MMBtu per capita, 1st rank
- **Alabama**: 101 MMBtu per capita, 13th rank
- **New York**: 54 MMBtu per capita, 50th rank

Transportation energy consumption per capita in Alabama rose by 2% in 2010. Alabama ranked 13th highest in the country for this metric.
Alabama Energy Intensity

**Alabama ranked 8th highest for energy consumption used to produce one dollar of state GDP in 2010. This measurement rose by 5% compared with 2009.**

<table>
<thead>
<tr>
<th>State</th>
<th>Btu / $US GDP</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Louisiana</td>
<td>17,493</td>
<td>1st</td>
</tr>
<tr>
<td>Alabama</td>
<td>11,513</td>
<td>8th</td>
</tr>
<tr>
<td>New York</td>
<td>3,303</td>
<td>50th</td>
</tr>
</tbody>
</table>

**Alabama’s commercial sector ranked 16th highest for the ratio of energy use to state GDP dollar in 2010, an increase of 4% from 2009.**

<table>
<thead>
<tr>
<th>State</th>
<th>Btu / $US GDP</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montana</td>
<td>2,095</td>
<td>1st</td>
</tr>
<tr>
<td>Alabama</td>
<td>1,591</td>
<td>16th</td>
</tr>
<tr>
<td>Hawaii</td>
<td>607</td>
<td>50th</td>
</tr>
</tbody>
</table>

**Industrial energy consumption per dollar of state GDP in Alabama was 9th highest in 2010. Compared with 2009, industrial energy intensity rose by 5%.**

<table>
<thead>
<tr>
<th>State</th>
<th>Btu / $US GDP</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Louisiana</td>
<td>11,636</td>
<td>1st</td>
</tr>
<tr>
<td>Alabama</td>
<td>4,616</td>
<td>9th</td>
</tr>
<tr>
<td>New York</td>
<td>307</td>
<td>50th</td>
</tr>
</tbody>
</table>

**Transportation sector energy intensity per state GDP dollar in Alabama rose by 2% in 2010. Overall, Alabama ranked 10th highest in the country for this metric.**

<table>
<thead>
<tr>
<th>State</th>
<th>Btu / $US GDP</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>4,415</td>
<td>1st</td>
</tr>
<tr>
<td>Alabama</td>
<td>2,852</td>
<td>10th</td>
</tr>
<tr>
<td>New York</td>
<td>923</td>
<td>50th</td>
</tr>
</tbody>
</table>
In 2011, citizens, institutions, and firms in Alabama consumed 88,589 gigawatt-hours of electricity. Compared with 2010, total electricity consumption fell by 3%. Dividing electricity consumption by economic sector, industrial customers were the largest consumers of electricity in Alabama in 2011.

Electric power facilities in Alabama generated over 157,169 gigawatt-hours of electricity in 2011. The use of coal represented the largest portion of this electricity, accounting for 57,056 gigawatt-hours. Overall, electricity generation rose by 3% versus the previous year.
At 18.4 MWh, Alabama ranked 5th highest nationally for total electricity consumption per capita in 2011, a decrease of 3% from 2010.

Residents of Alabama used on average 6.8 MWh of electricity in 2011. Representing a decrease of 8%, this amount ranked Alabama 2nd highest by state.

Industrial electricity consumption per capita in Alabama was 4th highest in 2011. Versus 2010, industrial electricity consumption per capita rose by 3%.

Alabama’s commercial electricity consumption per capita fell by 3% in 2011 to 4.7 MWh. Overall, Alabama ranked 17th highest in the country for this metric.
Alabama Electricity Intensity

Alabama ranked 2nd highest nationally for total electricity consumption per state GDP dollar in 2011. This amount fell by 1% to 0.53 kWh per dollar for the year.

In 2011, Alabama ranked 2nd highest for residential electricity use relative to one dollar of state GDP. This metric fell by 6% compared to 2010.

Industrial electricity consumption per state GDP dollar in Alabama was 3rd highest in the country in 2011. Versus 2010, industrial electricity intensity rose by 5%.

Alabama's commercial sector used 0.13 kWh of electricity to generate one dollar of economic output. A decrease of 1%, this ratio ranked the state 3rd highest.
In 2010, renewable energy production in Alabama was 231,591 billion Btu, a decrease of 13% from 2009. Dividing this production by fuel type, wood & biomass resources accounted for the largest amount of energy production in 2010.

Describing renewable electricity generation by fuel type or commodity, the production from hydroelectric facilities represented the largest portion of renewable electricity generation in Alabama in 2011. Compared with 2010, the electrical output of hydroelectric facilities rose by 8% in 2011. (Total biomass generation is divided between wood products - labeled Wood - and other biomass resources - labeled Biomass - such as landfill gas).
In 2010, natural gas consumption in Alabama was 537 billion cubic feet. Compared with 2009, total natural gas consumption rose by 16% on the year. Dividing natural gas use by economic sector, the electric power sector was the largest consumer of natural gas in Alabama in 2010. (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 Alabama was $6.65 per thousand cubic feet in 2010. Versus the previous year, this average annual price rose by less than 1%. 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.
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 (NOx) 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.

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 Alabama emitted 284,909 metric tons of sulfur dioxide, representing a decrease of 22% compared with 2008. Overall, the electric power sector of Alabama has decreased sulfur dioxide emissions by 44% since 1990.

Nitrogen oxides are a group of highly reactive regulated pollutants. In 2009, the electric power sector of Alabama emitted 52,587 metric tons of nitrogen oxides, representing a decrease of 53% compared with 2008. Overall, the electric power sector of Alabama has decreased nitrogen oxides emissions by 76% since 1990.

Carbon dioxide emissions from fossil fuel power plants are monitored at the State and Federal level. In 2009, the electric power sector of Alabama emitted 69,238,676 metric tons of carbon dioxide, a decrease of 17% compared with 2008. Overall, power plants in Alabama have increased carbon dioxide emissions by 31% since 1990.
Electricity usage in Alabama is billed in terms of cents per kilowatt-hour of electricity consumed, with differences in price by classification and electric utility. However, while the price of electricity varies from sector to sector and from one utility to another, the above data illustrates the average price of electricity delivered to each economic sector.

In 2011, the average price of electricity across economic sectors in Alabama was 9.21¢ per kilowatt-hour. With an increase of 4% versus 2010, this overall, weighted-average price ranked Alabama 21st highest in the country in terms of electricity. Since 2000, the average price of electricity in Alabama has risen by 64%.

Adjusting for inflation over time, the trends in the real cost of electricity in Alabama between 1970 and 2011 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 Alabama has risen by 26% since the year 2000. Additionally, in 2011 Alabama ranked 21st 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.