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Short-Term Energy Outlook Supplement: Summer 2013 Outlook for Residential Electric Bills

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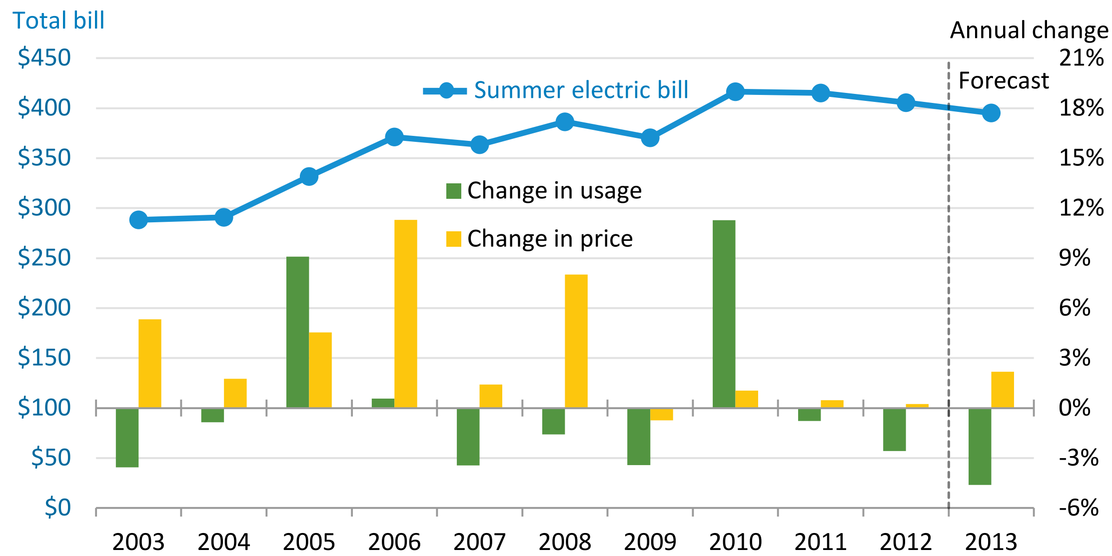
Outlook for Summer Residential Electric Bills

The U.S. Energy Information Administration's (EIA) June 2013 *Short-Term Energy Outlook* (*STEO*) forecasts the summer 2013 average U.S. residential electric bill will total $395 over the three-month period of June, July, and August, which is $10 (2.5 percent) lower than the average U.S. bill during summer 2012 (Figure 1). A projected 4.6-percent decline in average electricity retail sales per customer (usage) this summer, because of forecast milder temperatures, is offset in part by a projected 2.2-percent increase in average U.S. retail electricity prices.

Figure 1. U.S. summer residential electric bill



Note: Summer residential total bill is measured as electricity usage for the 3-month period June-August multiplied by the average residential electricity price during those months. Electric bill and price data are not adjusted for inflation.
Source: Forms EIA-861 and EIA-826 databases, June 2013 *Short-Term Energy Outlook*.

Table 1 shows projections from the June 2013 *STEO* for the United States and Census divisions[1] for average residential electricity usage, average residential electricity price, and the average electric bill for the summer months of June, July, and August when air conditioning is most frequently in use. EIA expects residential bills will be lower this summer in all areas of the country except the West South Central and Mountain states, where summer-over-summer increases in retail electricity prices outweigh lower projected electricity usage.

[1] See Appendix for a map showing Census regions and divisions.

Table 1. Average summer residential electricity usage, prices, and bills

	2008	2009	2010	2011	2012	Forecast 2013	Change from 2012
United States							
Usage (kWh)	3,229	3,119	3,471	3,444	3,355	**3,200**	-4.6%
Price (cents/kWh)	11.96	11.87	12.00	12.06	12.09	**12.35**	2.2%
Summer bill ($)	$386	$370	$416	$415	$405	**$395**	-2.5%
New England							
Usage (kWh)	2,044	1,908	2,227	2,121	2,182	**2,092**	-4.1%
Price (cents/kWh)	17.95	17.37	16.14	15.85	15.53	**15.72**	1.2%
Summer bill ($)	$367	$331	$359	$336	$339	**$329**	-2.9%
Mid-Atlantic							
Usage (kWh)	2,439	2,202	2,644	2,531	2,550	**2,434**	-4.6%
Price (cents/kWh)	16.40	15.87	16.66	16.39	15.70	**16.04**	2.2%
Summer bill ($)	$400	$349	$440	$415	$400	**$390**	-2.5%
East North Central							
Usage (kWh)	2,731	2,495	3,073	2,975	3,038	**2,767**	-8.9%
Price (cents/kWh)	10.91	11.31	11.94	12.17	12.04	**12.58**	4.4%
Summer bill ($)	$298	$282	$367	$362	$366	**$348**	-4.9%
West North Central							
Usage (kWh)	3,251	3,070	3,558	3,517	3,548	**3,275**	-7.7%
Price (cents/kWh)	9.67	10.15	10.74	11.16	11.46	**11.73**	2.3%
Summer bill ($)	$314	$312	$382	$393	$407	**$384**	-5.5%
South Atlantic							
Usage (kWh)	4,017	3,960	4,411	4,277	4,001	**3,864**	-3.4%
Price (cents/kWh)	11.14	11.57	11.39	11.48	11.62	**11.62**	0.0%
Summer bill ($)	$447	$458	$502	$491	$465	**$449**	-3.4%
East South Central							
Usage (kWh)	4,401	4,225	4,901	4,750	4,491	**4,296**	-4.3%
Price (cents/kWh)	9.71	9.80	9.90	10.28	10.29	**10.55**	2.5%
Summer bill ($)	$428	$414	$485	$488	$462	**$453**	-1.9%
West South Central							
Usage (kWh)	4,541	4,637	4,830	5,231	4,790	**4,640**	-3.1%
Price (cents/kWh)	12.68	11.06	10.86	10.64	10.30	**10.84**	5.2%
Summer bill ($)	$576	$513	$525	$557	$494	**$503**	1.9%
Mountain							
Usage (kWh)	3,360	3,240	3,340	3,322	3,446	**3,372**	-2.1%
Price (cents/kWh)	10.55	10.82	11.25	11.29	11.52	**11.80**	2.4%
Summer bill ($)	$355	$351	$376	$375	$397	**$398**	0.2%
Pacific							
Usage (kWh)	2,121	2,075	2,006	2,022	2,080	**1,996**	-4.0%
Price (cents/kWh)	12.47	13.20	12.94	13.22	13.93	**14.00**	0.5%
Summer bill ($)	$265	$274	$260	$267	$290	**$279**	-3.5%

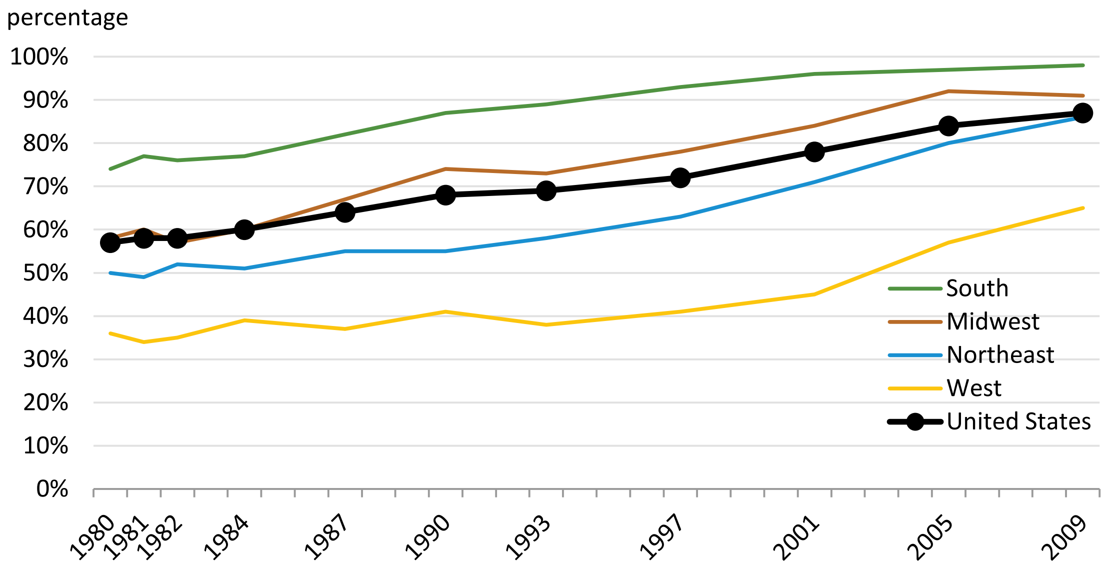
Notes: kWh = kilowatthours. Average usage amounts represent total residential retail electricity sales per customer during the 3-month period of June-August of each year. Prices and average bills are not adjusted for inflation.
Source: U.S. Energy Information Administration forms EIA-861 and EIA-826 databases, June 2013 *Short-Term Energy Outlook*.

Residential Electricity Usage Outlook

Temperature-related changes in electricity usage often explain most of the year-to-year differences in summer electric bills. In recent years, U.S. retail sales of electricity during the summer months have become more sensitive to changes in temperature, primarily because of the increasing prevalence of air conditioning in U.S. homes.

As recently as 1993, only 68 percent of all U.S. housing units had either central or wall/window-mounted air conditioning equipment (Figure 2). The latest results from the 2009 EIA Residential Energy Consumption Survey show that 87 percent of U.S. households now have some form of air conditioning equipment. This growth occurred in every Census region and across all housing types (single family homes, apartments, and mobile homes). Wider use of air conditioners has coincided with a population shift to hotter and more humid areas,[2] and a housing boom in which the vast majority of new homes are built with air conditioning as standard equipment.[3]

Figure 2. Proportion of homes with air conditioning by Census region and U.S. average



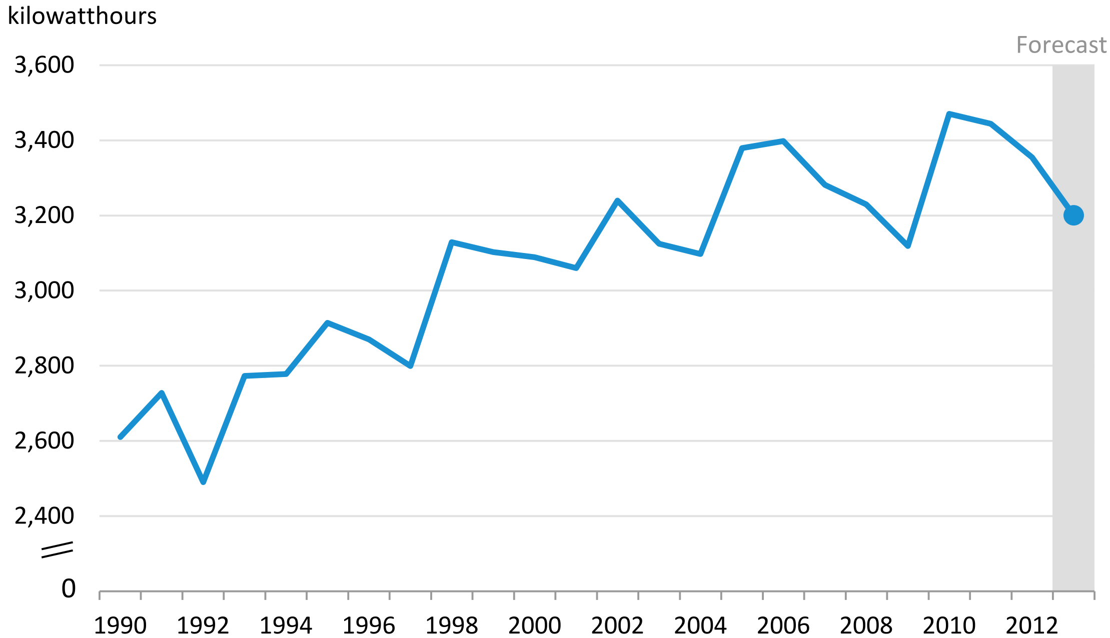
Note: Data are only available for labeled years.
Source: U.S. Energy Information Administration *2009 Residential Energy Consumption Survey* report "Air conditioning in nearly 100 million homes"

EIA collects retail electricity market data from electric utilities and other energy providers on two surveys: Form EIA-861, "*Annual Electric Industry Report*" and Form EIA-826, "*Monthly Electric Utility Sales and Revenue Report*." These surveys provide information about total retail electricity sales, revenues, and customers for the residential, commercial, industrial, and transportation sectors. Average electricity usage per residential customer can be calculated by dividing total retail residential electricity sales by the total number of retail residential customers.

[2] EIA *Today in Energy*, November 16, 2012, "Population shifts across U.S. regions affect overall heating and cooling needs."
[3] EIA *2009 Residential Energy Consumption Survey* Table HC7.3.

The average level of summer electricity usage grew from 2,610 kilowatthours (kWh) in 1990 to 3,355 kWh in 2012 (Figure 3). Until about 2005, annual growth in summer residential electricity usage averaged about 1.4 percent per year, as more homes adopted air conditioning and purchased additional televisions, personal computers, and other appliances and electronics.

Figure 3. Average summer residential electricity usage



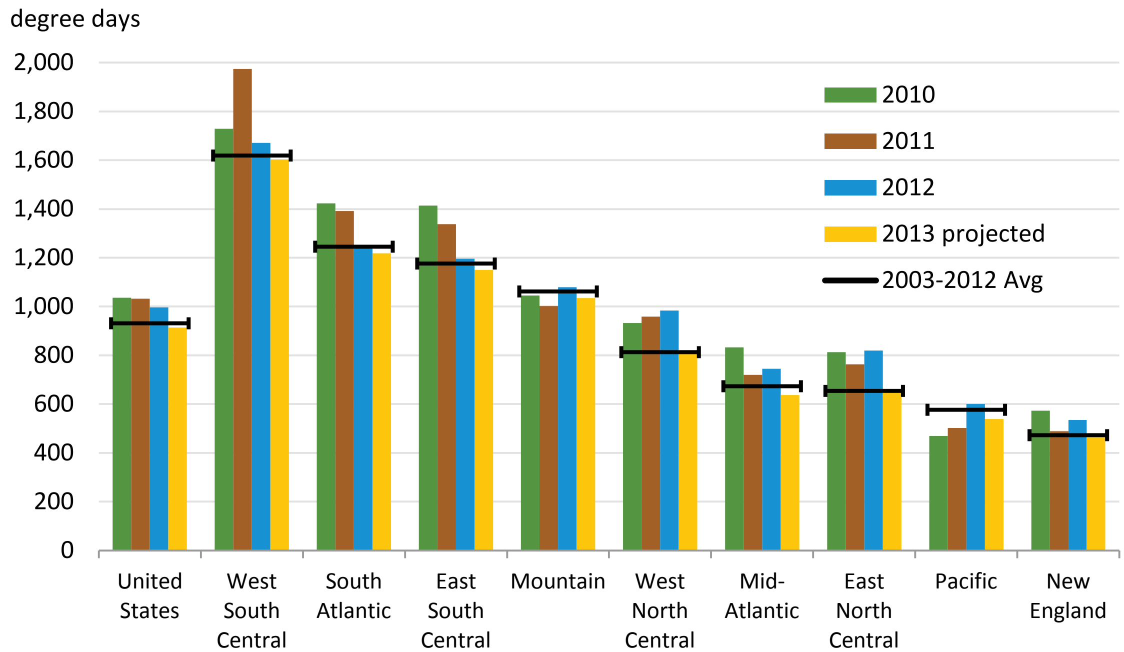
Note: Usage represents average retail sales per customer over the three-month period for June-August of each year. Data have not been normalized for weather.
Source: U.S. Energy Information Administration forms EIA-861 and EIA-826 databases, June 2013 *Short-Term Energy Outlook*.

In recent years, however, annual growth in summer usage appears to have slowed slightly. Efforts to conserve energy (such as improved insulation and the increasing efficiency of air conditioning equipment, appliances, and light bulbs) may be one of the drivers contributing to the slower growth. The recent recession, which generally lowered household incomes, may also have slowed the growth rate for additional appliances and electronics.

While factors such as efficiency improvements and economic conditions can affect the level of residential electricity usage, especially over the long run, differences in temperature are a primary driver of year-to-year fluctuations in residential sales. Temperature effects on summer energy consumption are often described using cooling degree days, which represent the cumulative positive differences over a given time period between average daily temperatures and a baseline 65-degree temperature. State, Census division, or national cooling degree day measures are weighted by the population of the component climate zones.

The past three summers have been especially warm (Figure 4). According to data from the National Oceanic and Atmospheric Administration (NOAA), average U.S. cooling degree days during the summers of 2010 and 2011 were the second and third highest totals since recordkeeping began in 1895. The West South Central states were particularly hot during the summer of 2011, when Texas experienced its hottest average temperatures on record.[4] The summer of 2012 was also much warmer than normal, and many cities throughout the United States achieved record-high temperatures.

Figure 4. Summer cooling degree days by Census division and U.S. average



Note: Data represent the total degree days over the 3-month period of June-August of each year. Census division and U.S. degree days are calculated by applying contemporaneous population weights to state-level data.
Source: National Oceanic and Atmospheric Administration, Climate Prediction Center

NOAA's Climate Prediction Center projects summer 2013 temperatures will be much closer to the average levels over the previous 10 summers. Cooling degree days for the United States over the three-month period June-August are expected to total 915, which would be 8.2 percent below the total for last summer and 1.8 percent less than the 2003-12 summer average. NOAA expects states in the Midwest and Northeast will experience the largest declines in cooling degree days compared with last summer.

The milder temperatures expected this summer should reduce the need for air conditioning, leading to lower electricity usage nationwide. EIA's June 2013 *STEO* is forecasting U.S. residential electricity usage will average 3,200 kWh per customer this summer, 4.6 percent lower than usage last summer. Residential customers in the East North Central Census division should see the largest decline in electricity usage (8.9 percent), as temperatures fall back closer to average after the hot summer of 2012.

[4] National Oceanic and Atmospheric Administration, September 8, 2011, "U.S. experiences second warmest summer on record"

Residential Electricity Price Outlook

Electric bills also change over time as utilities and energy providers adjust the retail rates charged to customers. The structure of these electricity rates varies widely throughout the United States, depending on how the local electricity market is regulated. In most areas of the country, electricity rates are determined by regulatory commissions. Some states have deregulated their retail electricity markets, allowing customers to choose the company producing the electricity while the traditional utility continues its role of delivering power to the consumer. These states deregulated the industry with the intention that a competitive marketplace would lead to lower retail electricity rates.

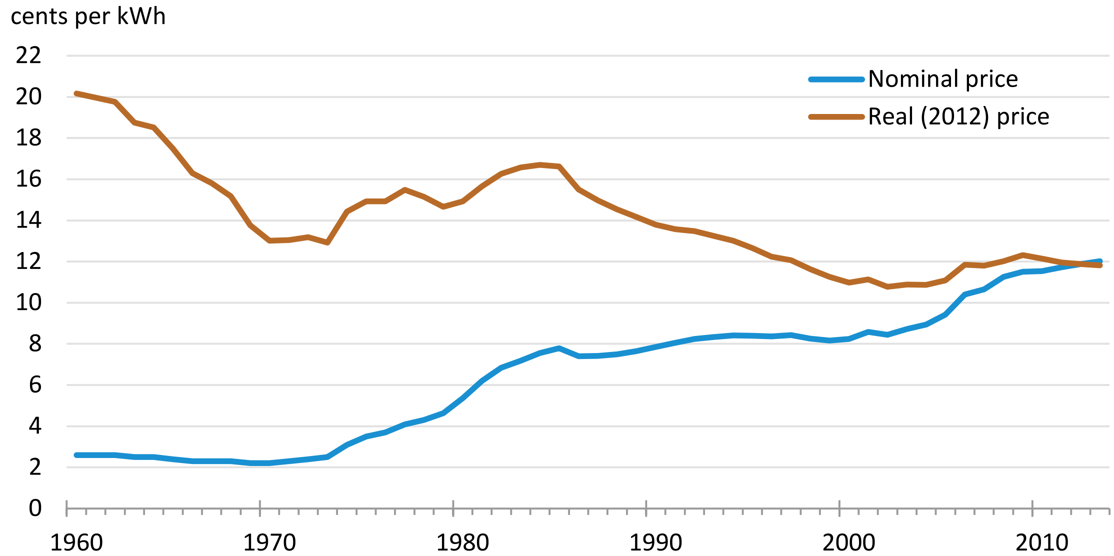
Most residential customers are not charged a simple price per kWh of electricity usage. In order to provide more transparency and to facilitate retail choice in deregulated states, utilities and energy suppliers generally break out the charges on a residential electric bill into various components that reflect the cost of producing and delivering electricity. These costs can be grouped into three general categories: generation, transmission, and distribution.

The generation cost component of retail rates accounts for nearly 60 percent of the typical residential bill.[5] The costs of fuels used for power generation can be especially volatile and are an important determinant of trends in retail electricity rates. In areas of the country where retail rates are regulated, state regulatory commissions review requests by retail electricity providers before approving the pass-through of changes in costs. There can be a lag of one to twelve months or more between changes in costs and the resulting effect on retail rates, although rate adjustments resulting from fuel costs often occur more rapidly.

EIA does not collect information from individual utilities on the various components of retail rates. Instead, average retail electricity prices are calculated by dividing the total retail electricity revenue by the total retail electricity sales. The annual U.S. retail residential electricity price averaged 11.88 cents/kWh in 2012. Retail electricity prices have generally risen over time as have the prices of most other retail goods and services. The retail electricity price has grown by about 40 percent over the past decade; however, after adjusting for inflation, the real annual price in 2012 was at about the same level as in 1998 and almost 30 percent lower than the real price in 1984 (Figure 5).

[5] See EIA's report Electricity Explained: Factors Affecting Electricity Prices.

Figure 5. Average annual U.S. residential electricity price, 1960-2013

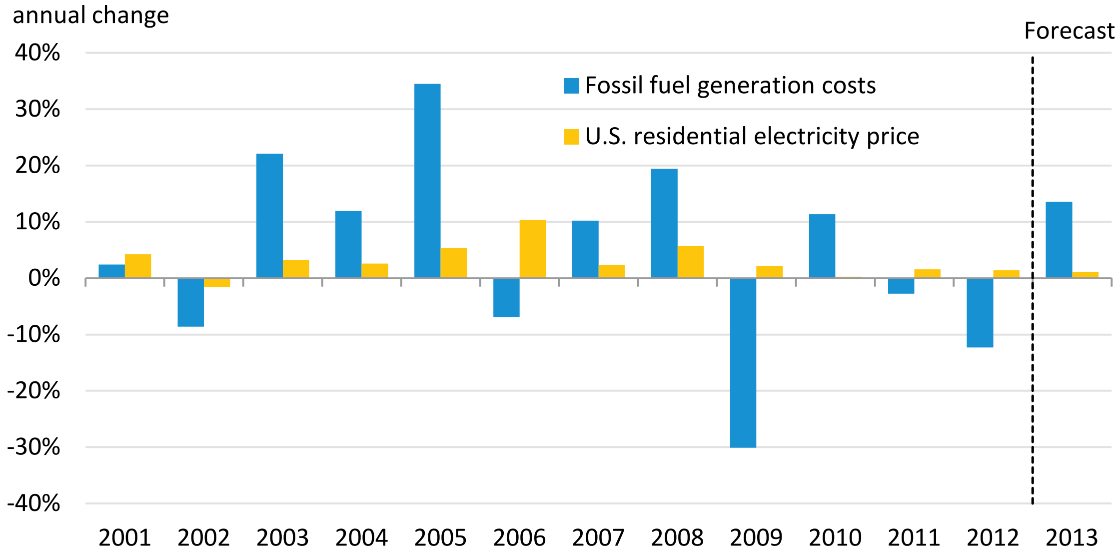


Note: Real price calculated by indexing annual nominal prices to the 2012 price using the Consumer Price Index.
Source: U.S. Energy Information Administration *Short Term Energy Outlook* Real Prices Viewer.

Volatility in fuel costs is a primary driver of year-over-year changes in electricity rates, although the timing of this correlation can be complicated by regulatory approval of retail electricity rates. Figure 6 compares changes in the annual costs of fossil fuels used for electricity generation with the annual change in U.S. average residential electricity prices. Between 2004 and 2005, power generators experienced an increase of 34 percent in fossil fuel costs. Some of this rise in generation costs was passed on to residential customers that same year, but the full effect was not felt until 2006 when the average U.S. residential price rose by 10 percent.

In contrast, fossil fuel costs fell by 30 percent in 2009. This decline in generation costs, which partially offset rising distribution and transmission costs, has kept the annual growth in retail electricity prices quite low in recent years. Average U.S. residential electricity prices during the summer of 2012 were relatively unchanged from the previous summer. However, residential electricity prices declined in the northeastern United States last summer, falling by 4.2 percent in the Mid-Atlantic states and 2.0 percent in New England. These declines were offset by slight price increases in other areas of the country.

Figure 6. Annual change in U.S. average residential electricity price and fossil fuel costs

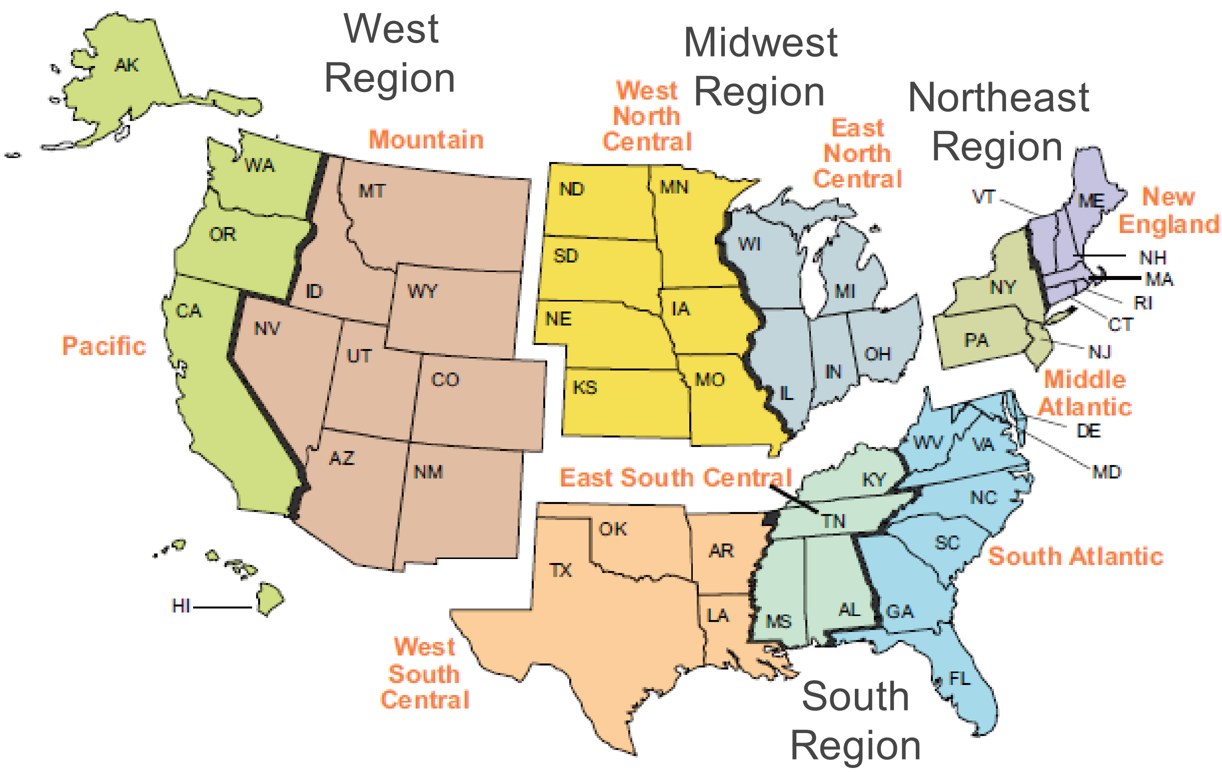


Note: Fossil fuel costs represent the costs of coal, natural gas, and petroleum liquids delivered to the electric power sector.
Source: U.S. Energy Information Administration *Electric Power Annual* and June 2013 *Short-Term Energy Outlook*.

While EIA expects fossil fuel prices to increase by about 14 percent in 2013, the effect on residential rates is unlikely to be fully passed through to customers for another year or more. Prices during the summer of 2013 should be slightly higher than last year as some utilities, especially in deregulated states, begin to pass through the higher costs of generation. During the summer months of June-August 2013, the U.S. residential price is expected to average 12.35 cents/kWh, which is 2.2 percent higher than the average price last summer.

Appendix

Figure 7. Census regions and divisions



Note: Map not to scale.
Source: U.S. Energy Information Administration *Annual Energy Outlook 2013* Appendix F.