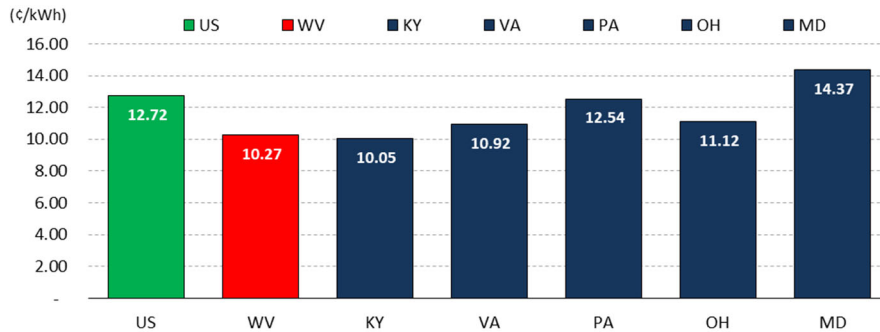




Introduction

West Virginia ranks in the top 10 states burning fossil fuels for power production, with 92% of its installed capacity being coal and natural gas. West Virginia’s electricity retail rates are currently the 14th lowest in the United States, averaging 10.27 cents per kWh. Despite relatively low rates, there is some argument that the state’s rising electricity rates are due to resistance to renewable penetration and continued reliance on coal for electricity. On the contrary, reliance on coal has kept prices stable in West Virginia over the last 20 years compared to other states. This paper shows that any volatility in the retail rates occurs due to nationwide price oscillations in natural gas as well as the policy considerations in electricity markets, i.e., regulated versus deregulated electricity markets.

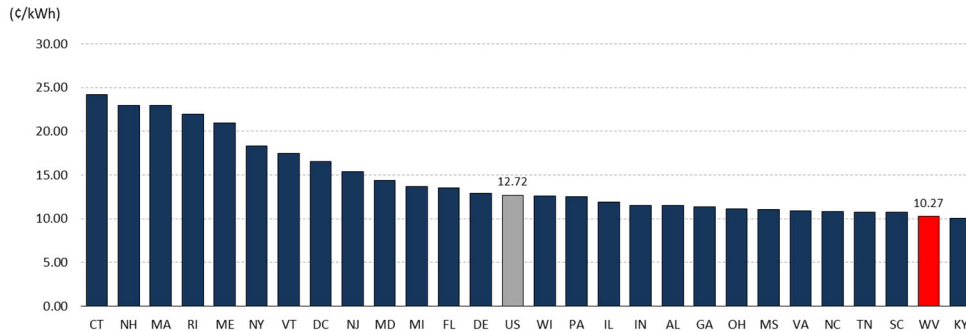
EXHIBIT 1 - 2023 WEST VIRGINIA RETAIL ELECTRICITY PRICE COMPARISON-ALL SECTORS



Source: U.S. Department of Energy, Energy Information Administration

Historically, the state’s electricity rates have consistently been ranked among the most affordable, often placing as the first, second, or third lowest among the 26 states east of the Mississippi River.¹ While coal and gas remain the predominant resources for energy consumption—being cheaper due to supply proximity—the policies and ownership profile of generation assets also play an essential role in determining the stability and characteristics of electricity retail pricing in the state.

EXHIBIT 2 - 2023 AVERAGE ELECTRICITY RETAIL RATES FOR STATES EAST OF THE MISSISSIPPI



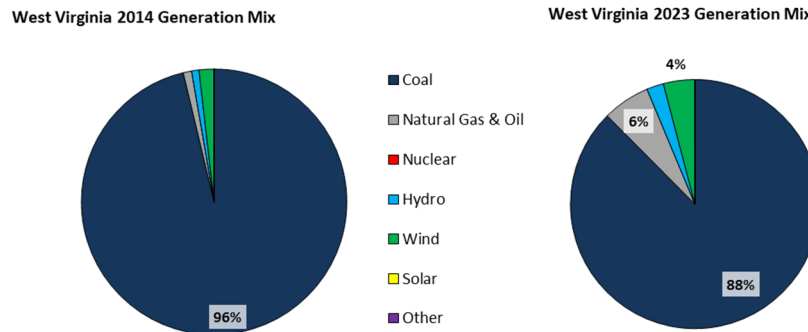
Source: Energy Information Administration

¹ Annual Electricity Sales Data, EIA

West Virginia's Reliance on Coal

West Virginia is endowed with abundant reserves of both coal and natural gas, positioning it as the second-largest producer of coal and the third-largest producer of marketed natural gas in the United States. Despite the gradual rise of natural gas in the electricity mix, coal remains the dominant source of electricity generation. Over the past decade, coal's share of electricity generation has declined from 96% to 88% (**EXHIBIT 3**). However, renewable energy remains limited, and natural gas accounts for only 6% of the state's electricity generation.

EXHIBIT 3 - WEST VIRGINIA'S GENERATION MIX IN 2014 AND 2023

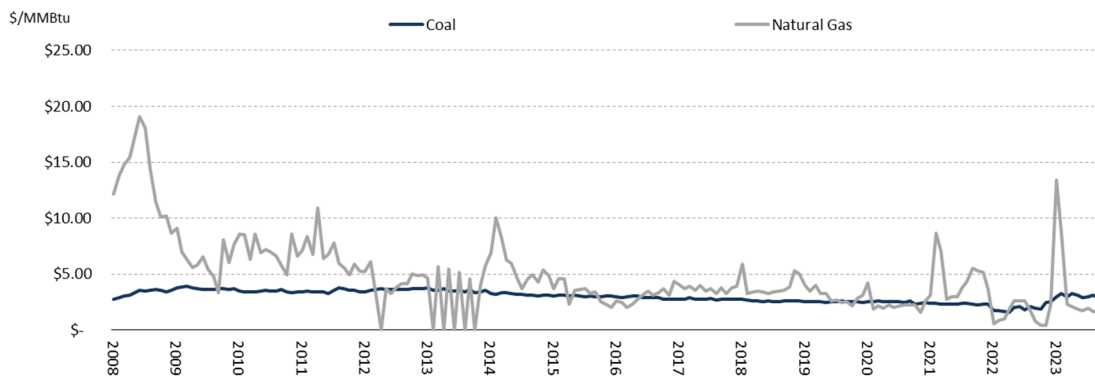


Source: U.S. Department of Energy, Energy Information Administration

Historically, West Virginia has enjoyed some of the lowest retail electricity rates in the nation. This has been primarily due to its proximity to coal reserves and the state's heavy reliance on coal production and coal-fired generation. Similar trends are observed in neighboring states (e.g., Kentucky) with significant coal production, where electricity retail rates also tend to be lower than the national average. While West Virginia is also a producer of natural gas, it does not utilize gas in power generation to a significant extent. Unlike coal, which is regionally priced based on quality and grade, natural gas is a homogeneous commodity, with its prices more influenced by national and international market trends.

Natural gas prices have been historically volatile in comparison to coal, which has had barely any fluctuations in the past couple of decades (**EXHIBIT 4**). Any change seen in coal prices in the last couple of years is directly related to the winter storms and the global energy crisis affecting energy commodity prices around the world.

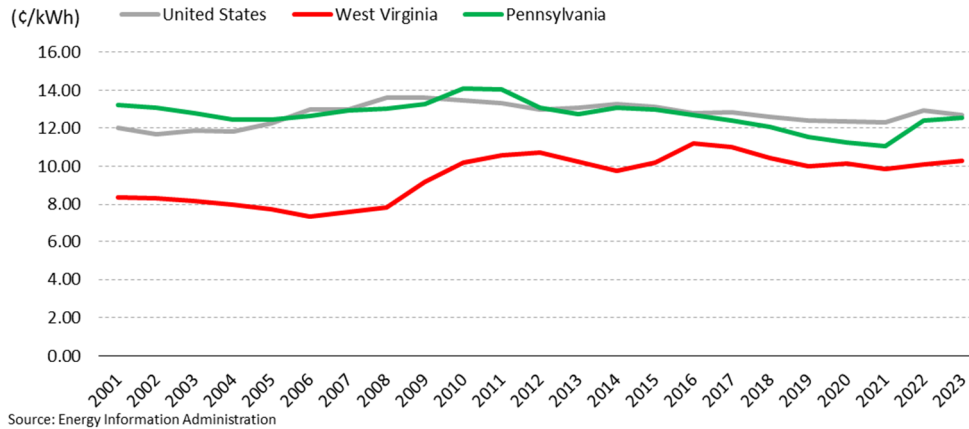
EXHIBIT 4 - MONTHLY DELIVERED PRICES OF COAL AND NATURAL GAS FOR WEST VIRGINIA



Source: Energy Information Administration

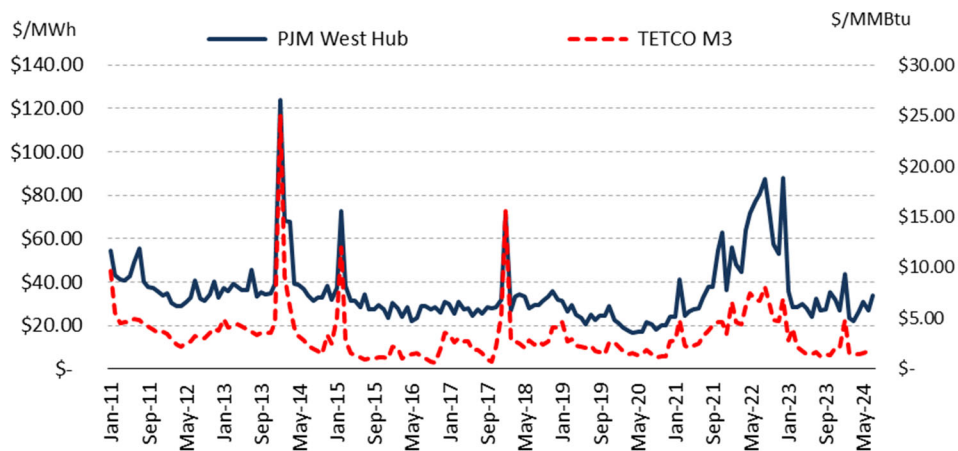
EXHIBIT 5 shows the average electric retail rate (adjusted for inflation) for West Virginia, Pennsylvania, and the United States average since 2001. After rising in 2009-11 and then again in 2016, primarily due to investments in emission control equipment to comply with federal environmental regulations, West Virginia electric retail rates have been falling from their 2016 peak of 11.2 cents/kWh. Also, since 2010, West Virginia electric retail rates have been very stable, fluctuating within a one-cent band between 10 and 11 cents per kWh.

EXHIBIT 5 - HISTORICAL AVERAGE ELECTRICITY RETAIL RATES OF WEST VIRGINIA, PENNSYLVANIA, AND THE UNITED STATES



West Virginia electric **retail** rates have remained stable over the past few decades. However, West Virginia belongs to the PJM region, and PJM **wholesale** electricity prices have shown tremendous volatility and high correlation with regional and national natural gas prices. As shown in **EXHIBIT 6**, this volatility is closely linked to natural gas prices, with electricity prices following similar upward and downward trends in response to changes in natural gas prices.

EXHIBIT 6 - PJM WHOLESALE ELECTRICITY PRICE VS. NATURAL GAS HUB (TETCO M3) PRICING



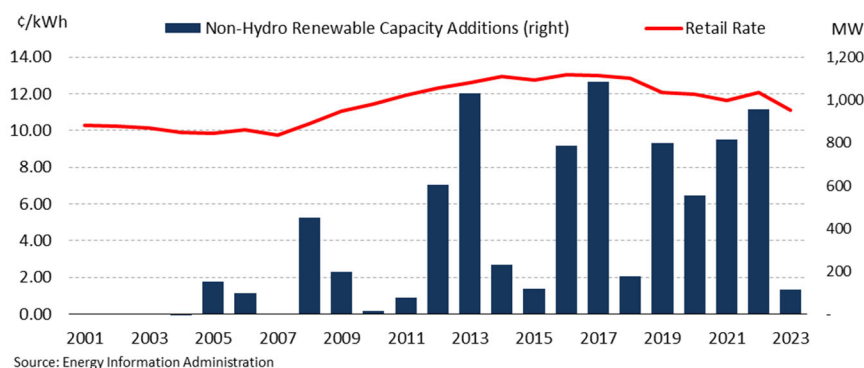
PJM natural gas prices are also highly correlated with natural gas prices at other natural gas pricing hubs like Henry Hub in Southwestern Louisiana, as natural gas is a heavily traded homogeneous commodity across the country. As a result, PJM natural gas prices and, in turn, wholesale power prices are greatly dependent on events affecting natural gas supply or demand that occur outside of the power market. On

the other hand, due to the much smaller trade volume and unique characteristics of Appalachian and, more specifically, West Virginia thermal coal, West Virginia delivered coal prices are less impacted by events occurring outside the West Virginia coal region. On the other hand, utilities in states neighboring West Virginia, like Pennsylvania and Maryland, have closed many of their coal-fired power plants and increased their PJM power market purchases, exposing them to increased electricity price volatility due to the large influence of volatile natural gas prices on the power market’s cost of electricity.

Renewable Transition and Retail Rates

In states like Iowa and Kansas, the addition of renewable energy capacity has been a significant driver of economic growth and energy diversification. However, this expansion, particularly wind and solar, has also led to an increase in electricity rates. In Kansas, for example, the prices spiked in 2012-2013 and remained high as wind capacity addition increased by 1.5 GW in those years (**EXHIBIT 7**). The rise in rates is mainly due to the need to recoup the substantial capital investments required for the development and integration of renewable energy projects.

EXHIBIT 7 - KANSAS ELECTRICITY RETAIL RATE AND NON-HYDRO RENEWABLE CAPACITY ADDITION



When utilities and energy developers invest in new renewable energy capacity, the upfront costs can be considerable despite the heavy subsidies the industry enjoys through federal tax credits like Production or Investment Tax Credits. These include not only the cost of the technology itself—such as wind turbines or solar panels—but also the expenses related to infrastructure upgrades, grid integration, and transmission. To recover these investments, utilities often pass all of the costs onto consumers through higher electricity rates.

In Iowa and Kansas, which have aggressively pursued wind energy development, the initial capital outlay has led to higher retail rates. These increases are designed to ensure that the utilities can maintain financial viability while continuing to invest in clean energy. Over time, as these investments are paid down and renewable technologies continue to mature, it is expected that rates will decrease. However, in some cases, like Florida, they remain stable or continue to increase as growth in demand leads to further renewable expansion.

Deregulation and Impact on Retail Rates

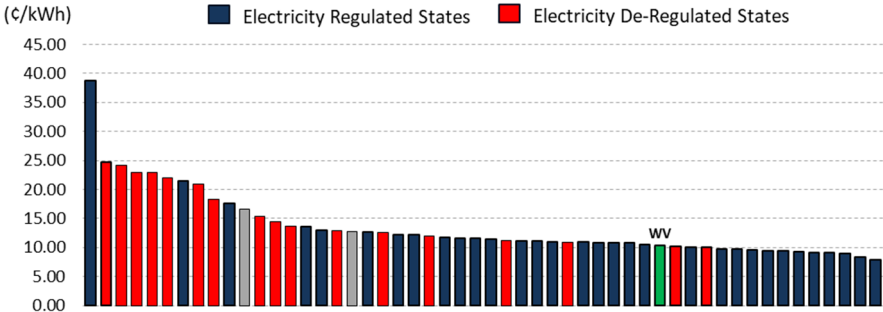
While the transition from coal and expanding renewables is an essential facet of retail rates, state policy and the ownership of generation assets are critical factors in determining long- and short-term trends in retail rates.

Policy decisions play a crucial role in shaping retail electricity prices, influencing everything from the structure of the energy market to the cost of generation and distribution. Regulations at both federal and state levels determine how utilities can recover costs, the types of energy resources that are prioritized,

and the incentives available for different forms of energy production. Policies that promote renewable energy or mandate emission reductions lead to increased capital or operating costs for utilities, which are passed on to consumers in the form of higher electricity rates. Conversely, policies that support fossil fuels or limit regulatory burdens help keep prices lower, particularly in regions with abundant coal or natural gas resources like West Virginia.

One of the most significant policy decisions in the U.S. electricity industry was the deregulation of electricity generation. Traditionally, the entire electricity supply chain (generation, transmission, and distribution) was regulated by state or federal agencies. However, starting in 1996, states started to exclude electric generation from regulation, hoping that increased competition between independent power producers and regulated utilities would reduce the overall cost of electricity to consumers. Today, about 20 states have some form of deregulated or restructured system, while the majority of states still rely on regulated monopolies. **EXHIBIT 8** shows the 2023 average retail rate ranking of regulated vs. deregulated states. West Virginia, highlighted in green, continues to regulate electric generation within the state.

EXHIBIT 8 - 2023 RETAIL PRICE OF ELECTRICITY IN REGULATED AND DE-REGULATED STATES



Source: Energy Information Administration

Conclusion

In conclusion, West Virginia's energy landscape is characterized by a unique blend of traditional and evolving dynamics. The state's substantial coal and natural gas reserves have long underpinned its role as a primary energy producer, contributing to some of the lowest retail electricity rates in the nation. Additionally, due to its regulated electricity market structure, a large share of in-state electric generation by regulated utilities, and its significant reliance on price-stable generating resources like coal-fired power plants, West Virginia electric retail ratepayers enjoy the second-lowest electric retail rates east of the Mississippi. Additionally, PJM’s latest capacity auction results highlight the value of in-state regulated utility-owned generating resources. While other states will likely see double-digit rate increases due to the record-high capacity prices of the 2025/26 PJM capacity auction, West Virginia ratepayers will see no or a minimal rate increase as most of the state’s utilities did not participate in the auction as they own and operate sufficient power plants to meet their demand. Maintaining West Virginia’s power plant fleet will be paramount to ensuring West Virginia ratepayers continue to enjoy one of the country's lowest electricity rates.

October 2024