Charging West Virginians

How utility and Public Service Commission actions continue to increase electricity bills

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ACKNOWLEDGEMENTS

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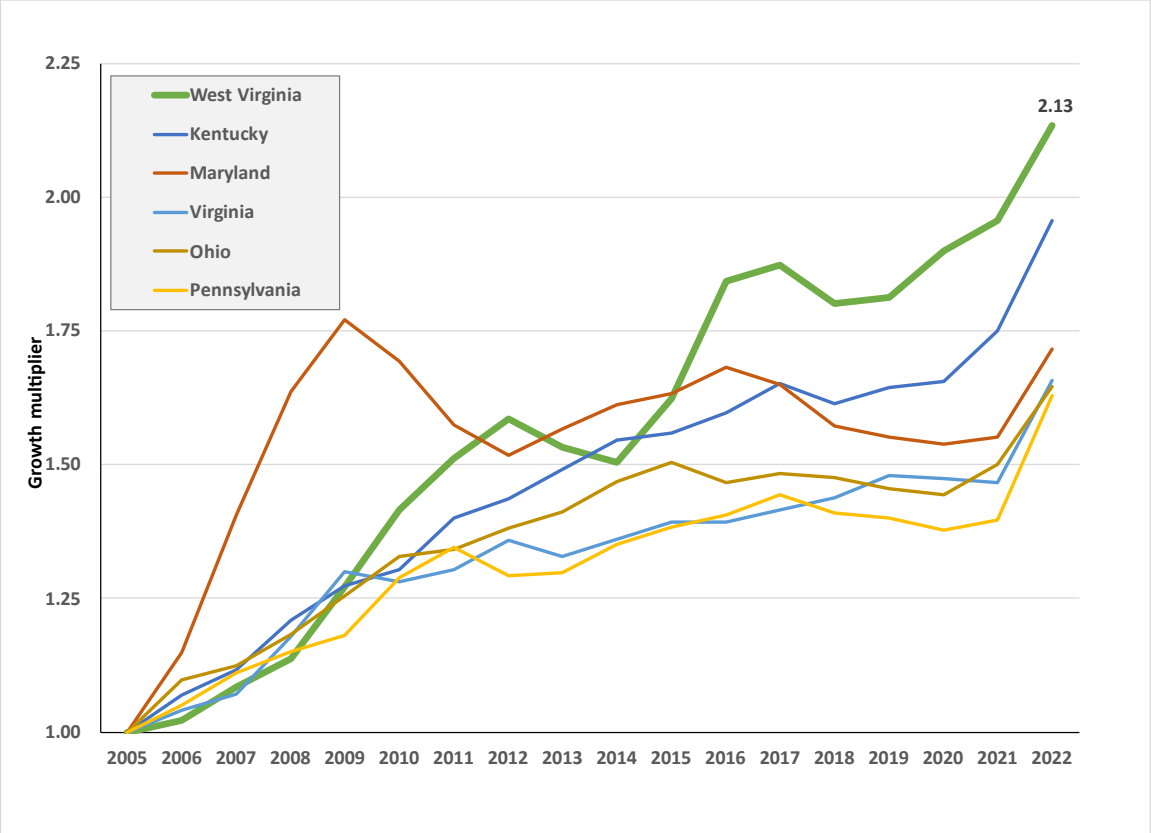
1. INTRODUCTION

For decades, West Virginians have benefitted from some of the lowest electricity rates in the country. However, West Virginians' electricity rates have more than doubled between 2005 and 2022, outpacing the increases in all five surrounding states (Figure 1) and in every other state in the country (Figure 2).

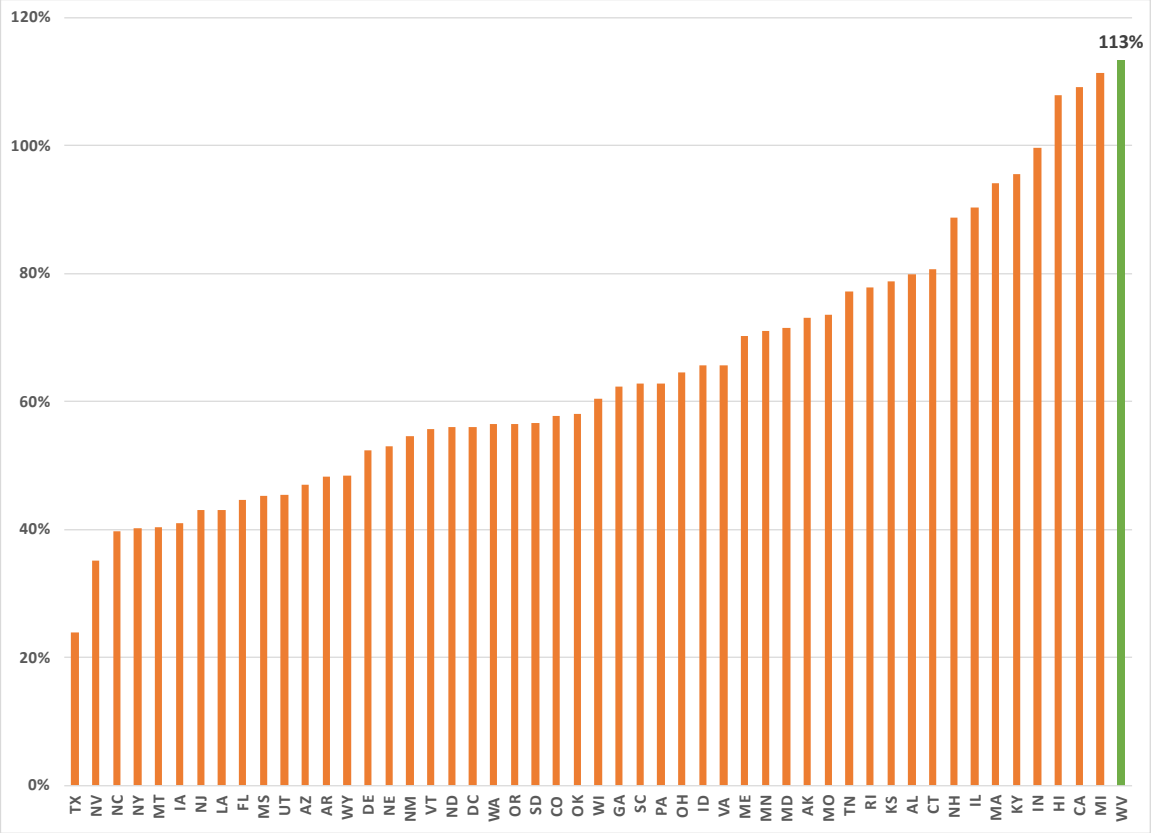
Electricity in West Virginia is generated almost exclusively from coal-fired power plants. Other states have taken steps to diversify their fuel mixes, but West Virginia has taken a different approach. Decisions made by utilities and the Public Service Commission (PSC) have facilitated the state's continued, near-exclusive reliance on coal. As detailed in this report, these decisions have had real-world consequences for West Virginians who pay more and more for their electricity.

Figure 1: Indexed growth of electricity rates for residential customers in surrounding states, 2005-2022



Sources: 2005-2021 data from EIA (2023a). 2022 data from EIA (2023b). Note: Rates in cents per kWh are calculated from EIA data in order to have comparable average rates across states.

Figure 2: Percent increase of electricity rates for residential customers in all states, 2005-2022



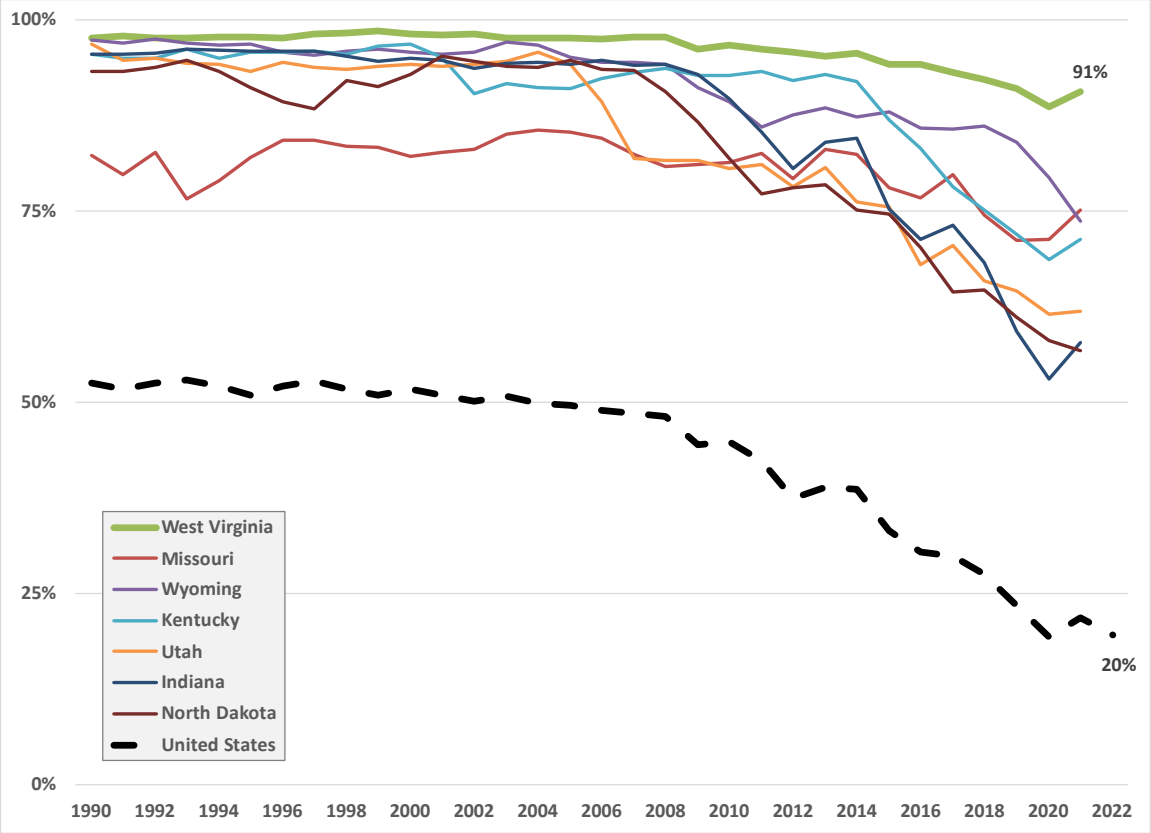
Sources: 2005 data from EIA (2023a). 2022 data from EIA (2023b). Note: Rates in cents per kWh are calculated from EIA data in order to have comparable average rates across states.

For many years, coal was used to generate more than half of the country's electricity; however, its use has declined sharply. In 2022, only 20 percent of the country's electricity was generated from coal. As illustrated by the black dashed line in Figure 3, widespread diversification of the country's electricity fuel mix started in earnest around 2008. Not shown in Figure 3 is that, for the first quarter of 2023, the share of the country's electricity generated by coal continued to decline to 17 percent (Wamsted and Feaster, 2023).

Energy diversification has been pushed by regulators and utilities around the country to make the power sector more resilient and to address climate change. An appropriately diversified generation mix ensures electricity security by mitigating risks associated with fuel supply disruptions and price fluctuations (International Energy Agency, 2020). In other words, diversification protects consumers.

Figure 3 further illustrates the extent that West Virginia is an outlier for its near-exclusive reliance on coal-fired power. With about 91 percent of its electricity supply coming from coal, West Virginia is the only state in the country that relies on coal for more than 75 percent of its generation. Almost all of the other six most coal-dependent states have significantly diversified their generation mixes.

Figure 3: Percent of electricity generated from coal for the United States and the most coal-dependent states, 1990-2022



Source: 1990-2021 data from EIA (2022c). 2022 data for the United States from EIA (2023d). Note: State data are not yet available for 2022.

FirstEnergy subsidiaries Monongahela Power ("Mon Power") and The Potomac Edison Company, as well as American Electric Power (AEP) subsidiaries Appalachian Power Company and Wheeling Power Company, own five aging coal-fired power plants. All five utility-owned plants were placed in service more than 40 years ago. Among the state's nine coal-fired power plants, only the Longview Power Plant—a non-utility, merchant power plant—is less than 30 years old (See Table 1).

Table 1: Initial operating years of West Virginia coal-fired power plants

Plant	Utility	Initial operating year	Age (years)
Mount Storm	Dominion Energy	1965	58
Fort Martin	FirstEnergy	1967	56
John E. Amos	AEP	1971	52
Mitchell	FirstEnergy	1971	52
Harrison	FirstEnergy	1972	51
Pleasants	Not utility-owned	1979	44
Mountaineer	AEP	1980	43
Grant Town	Not utility-owned	1992	31
Longview	Not utility-owned	2011	12

Source: EIA (2022a).

West Virginia's continued, near-exclusive reliance on generating electricity from an aging coal fleet is one reason why the cost of electricity for residential customers in West Virginia has risen so fast. Coal-fired power plants are more expensive to operate now, compared with decades ago, because

utilities are required to address some of the substantial public health and environmental impacts of burning coal. These impacts include, for example, air emissions as well as water impacts from the disposal of coal combustion residuals. Additionally, older coal units cost more to operate and maintain and are generally less efficient than newer generation sources (EIA, 2022b). Nationwide, coal units that retired in 2022 were, on average, 56 years old (EIA, 2023c). As illustrated in Table 1, the Fort Martin Power Plant has reached this age, and the John E. Amos, Mitchell, and Harrison plants are not far behind.

While West Virginia's power plants continue to age, its electric utilities have taken only limited steps to diversify their fuel mixes to take advantage of alternatives that outcompete coal plants on the PJM energy markets. Natural gas produced via fracking has led to the construction of numerous natural gas–fired power plants in the region, but none in West Virginia. Between 2011 and 2020, more than 100 coal-fired power plants were replaced or converted to natural gas nationwide. A significant number of these replacements or conversions happened in coal-producing Appalachian states, but none occurred in West Virginia. (EIA, 2020)

Renewable energy and storage have also become much more competitive in PJM energy markets. These dramatic technology improvements, coupled with federal incentives to address climate change, have led electric utilities in the region and across the country to aggressively diversify their fuel mixes to embrace renewables and storage. In West Virginia, however, utilities have not made significant investments in in-state renewables.

Recent legislation regarding coal-fired power plant closures

In its recently completed 2023 session, the legislature passed two bills making it more difficult for coal-fired power plants to close.

House Bill 3308, which became law in March 2023, prohibits utilities from closing a plant without explicit PSC approval. It establishes that: "A public electric utility may not retire, abandon, close, or otherwise permanently render incapable of operating, any electric generating plant or unit without the prior consent and approval of the commission."

Senate Bill 609, which also became law in March 2023, applies not just to utility plants, but to non-utility plants as well. This bill states: "No existing coal, oil, or natural gas fueled power plant shall undertake any decommissioning or deconstructing activities prior to obtaining approval from the [Public Energy Authority]..."

House Bill 3308 also allows electric utilities to refinance undepreciated generation utility plant balances via securitization, which would help address an impediment to closing inefficient, aging coal-fired power plants.

In fact, West Virginia utilities have followed the opposite path, doubling down on coal. In 2013, Mon Power and Potomac Edison acquired the Harrison Power Plant, and Appalachian Power and Wheeling Power acquired Unit 3 of the John E. Amos Power Plant. Both of these asset transfers shifted plant ownership from Ohio-controlled subsidiaries of FirstEnergy and AEP to West Virginia subsidiaries of the same parent companies. Additionally, in 2014, Wheeling Power acquired half of

the Mitchell Power Plant, all with PSC approval. Now, the PSC has raised the possibility of Wheeling Power acquiring the other half of the Mitchell Power Plant, and FirstEnergy is considering the potential acquisition of Pleasants Power Station, which is scheduled to close in 2023.

FirstEnergy has begun to analyze the possible purchase of the 1,300-MW Pleasants Power Station from Energy Transfer and Environmental Management (ETEM), a Texas-based company that acquired the plant from a former FirstEnergy subsidiary, Energy Harbor (formerly FirstEnergy Solutions). As of early April, Mon Power and Potomac Edison have identified several environmental, regulatory, and supply-related challenges concerning the potential transfer. They have also noted economic challenges with the recent return to low energy prices and low fuel prices and report that Energy Harbor intends to stop operating the unit as previously scheduled on May 31, 2023. Despite the conclusions of their initial analysis, Mon Power and Potomac Edison have proposed a ratepayer subsidy of Pleasants while they continue evaluating an acquisition. More specifically, they have proposed an immediate surcharge to cover the costs of reimbursing ETEM to keep the Pleasants Power Station in operable condition after Energy Harbor abandons its operating lease. Mon Power and Potomac Edison estimate that the surcharge would increase costs by $2.67 per month for residential customers using 1,000 kWh, $8.44 per month for commercial customers, and $4,416 for industrial customers—amounting to about $36 million over a 12-month period.[1] The immediate surcharge may be increased or decreased over time to ensure that customers pay all of the plant's expenses while Mon Power and Potomac Edison continue to evaluate a possible acquisition. This ratepayer subsidy is over and above the $12.5-million annual taxpayer subsidy approved by the legislature in 2019.[2]

PSC action has not stopped with its approval of the shifting of aging coal-fired power plants into the rate base for West Virginia customers. It has also taken unprecedented action and mandated that utilities run their coal-fired power plants at a 69 percent capacity factor.[3] The capacity factor is the ratio of the electricity actually generated compared with what could be generated at continuous full power operation.

On aggregate for West Virginia utilities' fleets of coal-fired power plants, this 69 percent capacity factor was only achieved twice in recent decades: in 1999 and 2003 (See Figure 4). Notably, after the West Virginia utilities joined PJM in the early 2000s, capacity factors at their coal-fired power plants have generally declined. Since 2009, the average capacity factor for the utilities' coal-fired power plants has been 53 percent, as indicated by the dashed line in Figure 4.

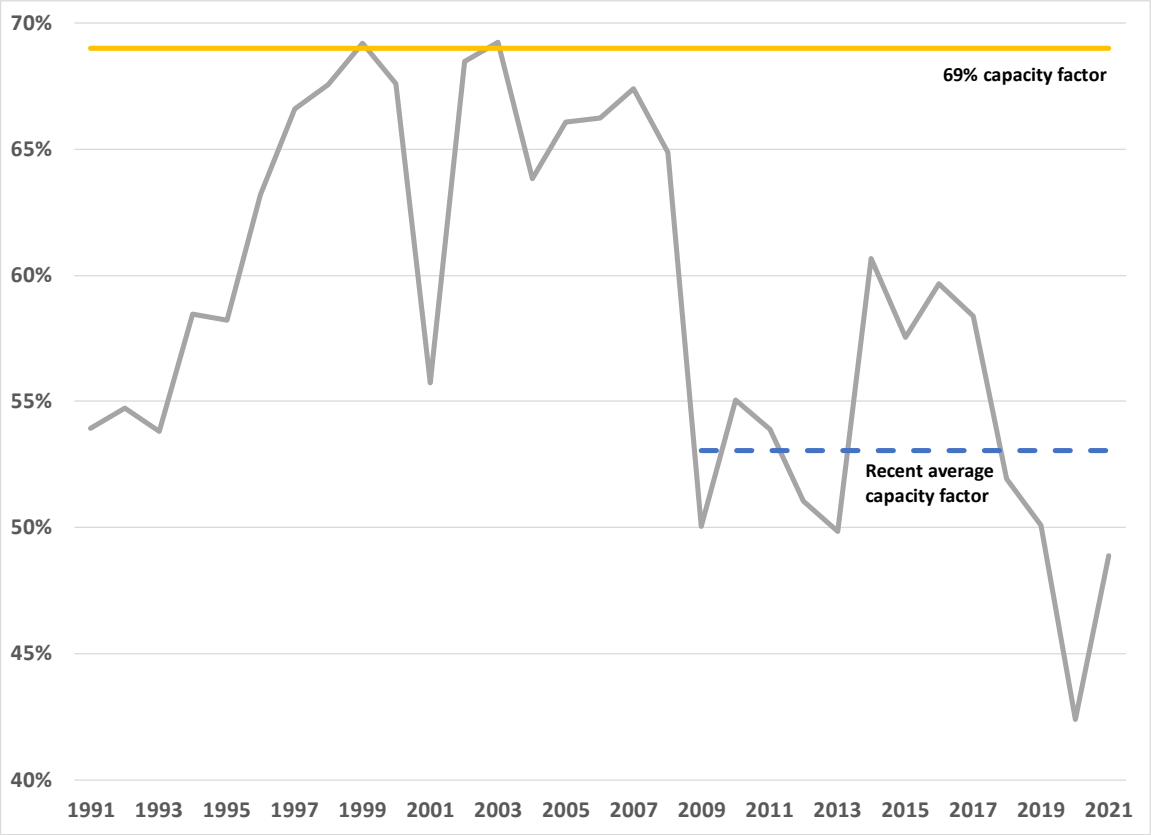
While decisions to run specific plants may be complex, and while recent studies have found that it is not uncommon for regulated utilities—which have captive ratepayers to foot the bill—to operate their coal plants uneconomically (Daniel et al., 2020), statewide average capacity factors provide a broad indication of the cost-effectiveness of West Virginia's coal-fired power plants versus alternatives. In general, a utility should run a plant more frequently if doing so is cheaper than purchasing electricity from the energy market. Competition from electricity generated from natural gas and renewables, and recently elevated coal prices and limited coal supply, have restricted the utilities' ability to achieve higher capacity factors on a consistent and economically sensible basis.[4]

As documented above, several types of PSC decisions impact electricity rates, including whether coal-fired power plants are acquired by West Virginia utilities, forced to run a certain percentage of the time, or prevented from closing. The PSC also approves tariffs for different customer classes, and West Virginia's residential customers are impacted by a tariff structure in which they pay more

[1] See PSC Case 22-0793-E-ENEC.
[2] https://www.wvlegislature.gov/Bill_Text_HTML/2019_SESSIONS/1X/signed_bills/house/HB207%20ENR_signed.pdf
[3] See PSC Case 21-0658-E-ENEC and Case 21-0339-E-ENEC. The PSC only explicitly directed AEP to run its coal-fired power plants at this capacity factor.
[4] See testimony of John Scalzo and Jeffrey Dial on Case 21-0339-E-ENEC.

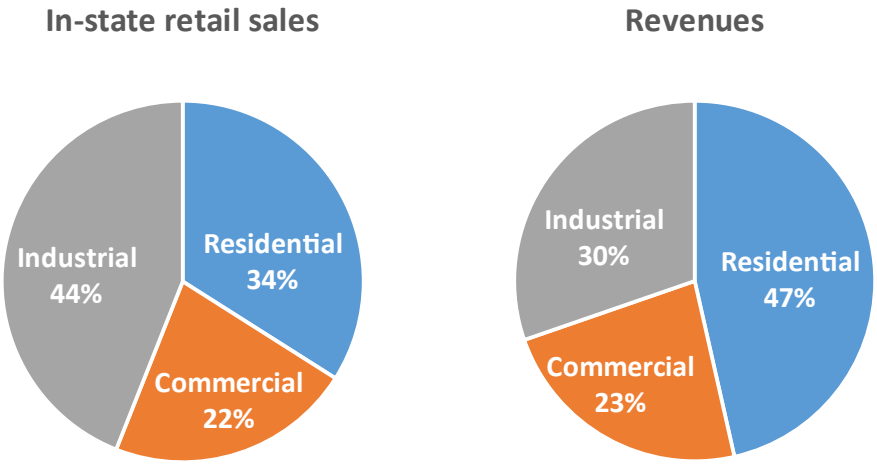
per kilowatt-hour (kWh) of electricity than commercial or industrial customers (EIA, 2022a). The result of this imbalance is that residential customers are responsible for an outsize share of total utility revenues. As illustrated in Figure 5, they account for only 34 percent of in-state electricity sales but are responsible for 47 percent of utility revenues. In contrast, industrial customers account for 44 percent of sales but are responsible for only 30 percent of revenues.

Figure 4: Capacity factor of utility-owned coal plants, 1991-2021



Sources: EIA (2022c & 2022d).

Figure 5: Utility in-state retail electricity sales and revenues by customer type, 2020



Source: EIA (2023a).

2. PUBLIC SERVICE COMMISSION CASES IMPACTING ELECTRICITY RATES

PSC decisions significantly impact electricity rates paid by West Virginia residents in several ways. As documented in Chapter 1, the PSC approved the recent acquisition of portions of several coal-fired power plants by West Virginia utilities, and the PSC mandated that certain utilities run their coal-fired power plants at a 69 percent capacity factor. Following the passage of two bills in the 2023 legislative session, the PSC can also block coal-fired power plant closures.

This chapter focuses on PSC rate case decisions, and in particular on Expanded Net Energy Costs (ENEC) cases. ENEC cases are rate proceedings that allow cost recovery for incurred costs associated with obtaining fuel, purchased power, transmission access, and construction. They allow utilities to recover prudently incurred costs that were underestimated or not contemplated in regular tariff filings. Historically, charges associated with ENEC cases make up approximately one-third of typical electricity bills in West Virginia (PSC, 2022a).

However, in their most recent ENEC cases, utilities have requested unprecedentedly high dollar amounts, which contribute a growing share to electricity bills. As shown in Table 2 and Table 3, ENEC requests between 2016 and 2021 are dwarfed by requests made in 2022. Last year, AEP's utilities sought approval for an additional $297.0 million in revenue—more than three times the average of the companies' previous ENEC requests. FirstEnergy's utilities sought approval for an additional $183.8 million in revenue. In both cases, the companies cited the high price and limited availability of coal as a major contributing factor to the record-high ENEC rate increase proposals.

Table 2: AEP ENEC cases, 2016-2022 (million $)

Case number	Year filed	Requested amount	Ordered amount
16-0239-E-ENEC	2016	$108.3	$55.1
18-0503-E-ENEC	2018	$91.3	$90.0
20-0262-E-ENEC	2020	$82.0	$50.1
21-0339-E-ENEC	2021	$73.0	$6.3
22-0393-E-ENEC	2022	$297.0	Pending

Sources: PSC Final Orders. Note: For Case 21-0339-E-ENEC, the PSC reopened the case in May 2022 and granted AEP a $93 million revenue increase, subject to a final determination based on the results of an ongoing staff prudence review. For Case 22-0393-E-ENEC, the PSC denied the $297.0 million request, but only because staff had not yet completed its prudence review.

Table 3: FirstEnergy ENEC cases, 2016-2022 (million $)

Case number	Year filed	Requested amount	Ordered amount
16-1121-E-ENEC	2016	$64.9	$25.0
18-1231-E-ENEC	2018	($100.9)	($77.5)
19-0785-E-ENEC	2019	($6.1)	No change
20-0665-E-ENEC	2020	($55.0)	($59.1)
21-0658-E-ENEC	2021	$19.6	$19.6
22-0793-E-ENEC	2022	$183.8	$91.9

Sources: PSC Final Orders.

While even in the abstract, these large ENEC requests seem alarming, their potential impact on people's electricity bills is hair-raising. For example, FirstEnergy's $183.8-million request represents a potential 10 percent increase in average monthly bills for residential customers[5]. AEP's $297.0-

[5] See 22-0793-E-ENEC.

million request represents a potential 12 percent increase in average residential bills[6]. These increases are largely attributed to the high price and limited availability of coal.

Other impactful PSC cases

While ENEC cases have an increasingly large impact on West Virginia ratepayers, nearly 100 individual PSC actions from 2012 to 2021 involve FirstEnergy and AEP subsidiaries and have directly involved or impacted residential electricity prices. These actions account for more than 40 individual cases.

Appendix A defines these case types, documents the timing of recent Final Orders along with electricity rates, and summarizes 42T cases.

A Final Order on AEP's recent ENEC request was issued on February 3, 2023. The PSC did not approve the utilities' request for fuel cost recovery, stating that PSC staff is still conducting a prudence review of the requested amount. Additionally, it clarified the intent of its previous directive for the companies to operate their coal-fired power plants at a 69 percent capacity factor was "to require the Companies to follow a power supply policy to maximize their use of fossil-fuel generation..." based on a stated assumption of the relative cost of generation from fossil fuels versus other resources.[7]

The PSC issued a Final Order for FirstEnergy's most recent ENEC request in December 2022, granting Mon Power and Potomac Edison exactly half of their requested increase. The PSC deferred ruling on the other half of the requested amount, subject to prudence review in next year's ENEC case.[8] In its Final Order, the PSC also directed Mon Power and Potomac Edison to submit a report evaluating the potential purchase of the Pleasants Power Plant by March 31, 2023. As mentioned previously, MonPower and Potomac Edison have proposed a temporary surcharge to cover the costs of reimbursing the current owner to keep the Pleasants Power Station running for one year while it completes an assessment of the potential acquisition—potentially increasing costs for residential customers by $2.67 per month, $8.44 per month for commercial customers, and $4,416 for industrial customers, totaling about $36 million over a 12-month period. If the utilities determine a purchase is warranted, they will likely pursue the purchase through a Petition for Consent and Approval at the PSC. As established by previous asset transfers and power plant purchases, like those described in Chapter 1, utilities in West Virginia are under no legal or statutory obligation to seek competitive bids for new energy resources.[9]

The following chapter describes the benefits of utilities engaging in competitive procurement processes to save ratepayers money, as opposed to engaging in asset transfers that do not necessarily result in the least-cost mix of resources.

[6] See 22-0393-E-ENEC
[7] See Final Order for Case #22-0393-E-ENEC at 6.
[8] If the deferred half of this year's ENEC amount gets approved in 2023, Mon Power and Potomac Edison customers will be responsible for paying a 4 percent carrying charge.
[9] See Cases 12-1571-E-PC and17-0296-E-PC.

3. COMPETITIVE PROCUREMENT

As established by previous asset transfers and power plant purchases, utilities in West Virginia are under no legal or statutory obligation to seek competitive bids for new energy resources.[10] This chapter describes the benefits and best practices for utilities engaging in competitive solicitation processes to save ratepayers money, as opposed to engaging in asset transfers between related entities that do not necessarily result in the least-cost mix of resources.

3.1 Not all competitive procurement is equal

Electric utilities utilize several different processes to procure energy resources These include single-source procurement, comprehensive single-source requests for proposals (RFPs), and all-source RFPs.

Single-source and comprehensive single-source RFPs are the historic status quo when it comes to competitive procurement within vertically integrated markets. Single-source procurement involves an internal evaluation of generation capacity requirements by utilities without any consideration of outside resource alternatives. A utility evaluates its needs and makes resource acquisition decisions internally. A comprehensive single-source RFP involves utilities issuing RFPs for specific amounts of different resource technologies. In other words, a utility may issue a comprehensive single-source RFP requesting bids for a specified capacity of solar, combined cycle gas, or other resources. Utilities may conduct separate procurement processes for each type of resource needed to meet the acquisition goal. (Wilson et al., 2020) While pricing necessarily is not final at the RFP stage, the bids are nonetheless indicative of local market conditions, which often vary from generic assumed costs for different technology options.

3.1.1 All-source requests for proposals

Across the country, an increasing number of regulators have taken steps to encourage utilities to integrate technology-neutral all-source competitive procurement practices that objectively evaluate the ability of different energy resources and technology mixtures to meet a utility's overall resource needs. The central idea is that a market-based portfolio of resources will meet utility needs at low cost and with an acceptable level of risk. (Kahrl, 2021) Additional benefits include ensuring a fair and objective acquisition of resources, encouraging a robust and innovative electricity market, and providing utilities and regulators the ability to easily integrate price and non-price factors into decision making processes (Tierney & Schatski, 2008).

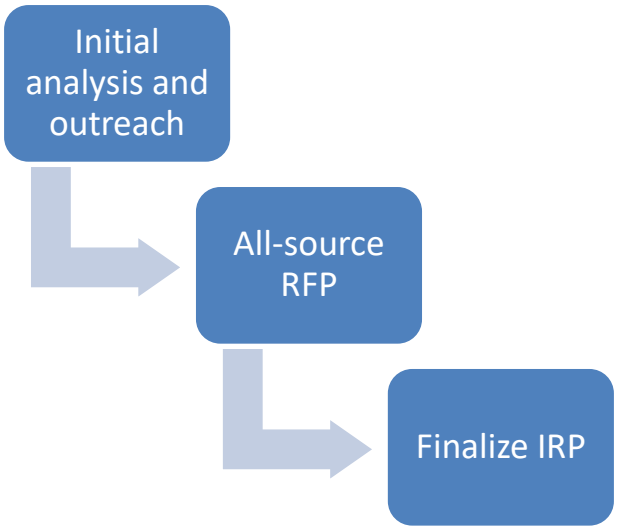
All-source RFPs involve utilities issuing RFPs for electricity resources without specifying the type of source. Respondents may propose dispatchable or intermittent generation sources as well as demand-side resources like specific energy efficiency programs. These RFPs specify the amount of generation capacity needed in a specified timeframe. Respondents provide pricing data, which could feed into a power supply study or be used directly for contracts to secure the resources. (Muscatine Power and Water, 2023) Most utilities that have used all-source procurement in their resource acquisition process have done so without regulatory requirement (Wilson et al., 2020).

As one example, the Northern Indiana Public Service Company (NIPSCO) has recently integrated a rigorous all-source RFP stage into its Integrated Resource Planning (IRP) process (See Figure 6). The IRP process begins with an extensive analysis of a range of generation scenarios, with general and specific criteria requirements for affordability, reliability, flexibility, diversity of resources, and compliance with state and federal law. Concurrent with its initial analysis, NIPSCO conducts outreach to stakeholders from regulatory, industry, consumer, and environmental groups to inform

[10] See Cases 12-1571-E-PC and17-0296-E-PC.

specific modeling scenarios. As part of its 2018 IRP update, NIPSCO developed an all-source RFP with the elements specified in Table 4.

Figure 6: NIPSCO's IRP process



Source: NIPSCO (2018a & 2018b).

Table 4: Elements of NIPSCO's request for proposals

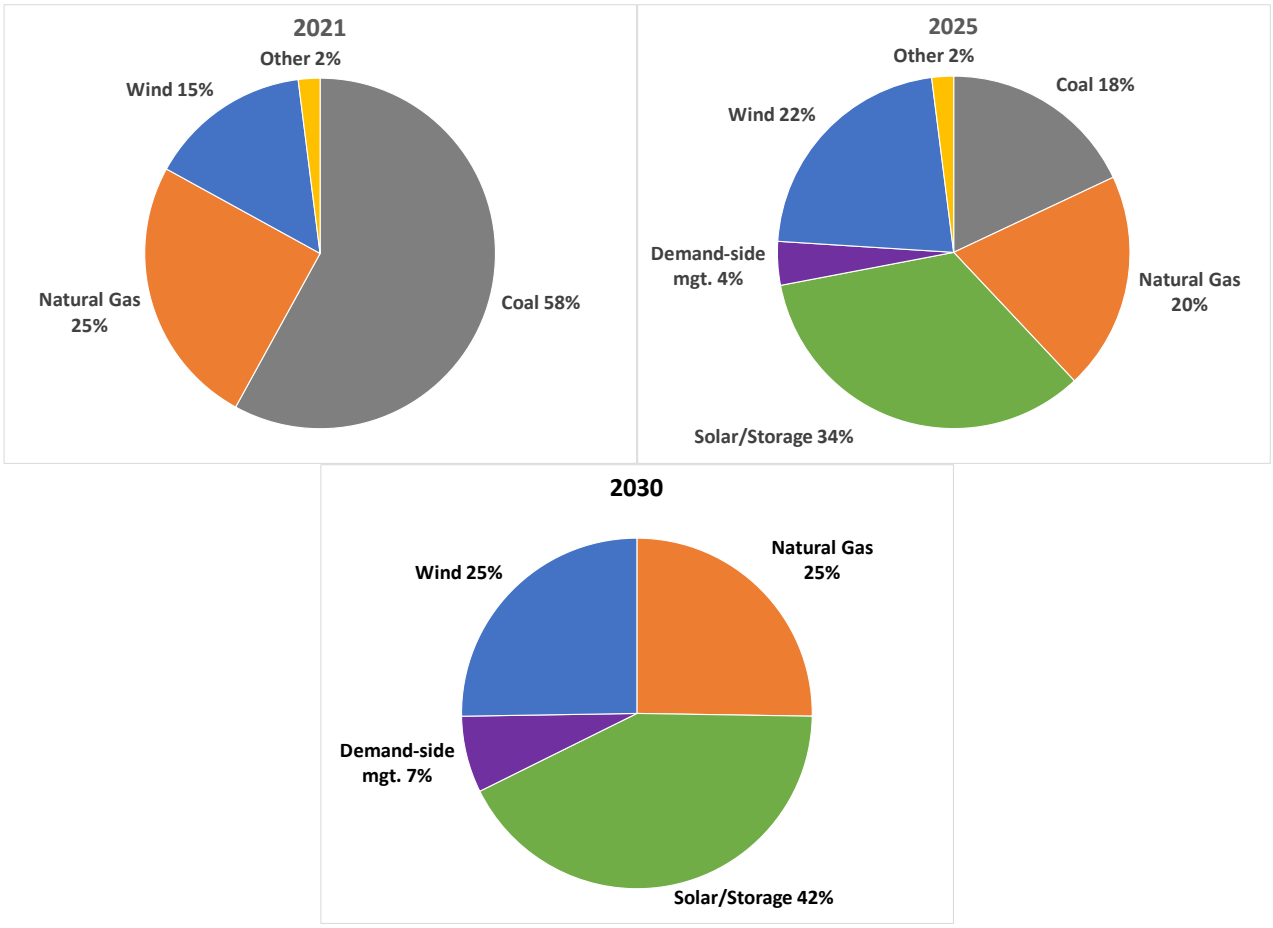
Item	Description
Technology	All solutions accepted.
Size	Minimum total need of 600 MW identified. Bids less than 600 MW can be integrated as part of the total need.
Ownership arrangements	Asset purchases or power purchase agreements. Resource must qualify as MISO internal generation or demand response.
Duration	Minimum contractual term of 5 years for internal generation and 1 year for demand response.
Deliverability	Must have established transmission delivery for MISO Zone 6. Must meet N-1-1 reliability criteria.
Pre-qualifications	RFP was marketed to a broad bidder audience. NIPSCO required credit-worthy counterparties to ensure ability to meet resource obligation.

Source: NIPSCO (2018a).

The RFP resulted in 90 qualified responses from different types of energy generation facilities, including natural gas combined cycle power plants, wind and solar farms, coal-fired power plants, energy storage facilities, demand response entities, and others. Based on the bids received, representative cost and performance characteristics were compiled into a portfolio optimization model to explore resource combinations that test the range of possibilities based on the RFP responses. Ultimately, a preferred portfolio was identified, and NIPSCO moved to finalize its IRP and to enter into contracts with electricity generation facilities. (NIPSCO, 2018a & 2018b)

As illustrated below, the generation portfolio that was developed in NIPSCO's most recent RFP relies on a balanced mixture of coal, natural gas, renewables, and demand-side management programs through 2025. By 2030, NIPSCO anticipates phasing out all coal-fired power and relying entirely on natural gas, wind, solar plus storage, and demand-side management programs to meet electricity supply needs. (NIPSCO, 2021)

Figure 7: NIPSCO's generation portfolio, 2021, 2025, 2030



Source: NIPSCO (2021).

3.2 Recommendations

The PSC should require electric utilities in West Virginia to integrate a rigorous all-source RFP process like that undertaken by NIPSCO and electric utilities in diverse markets around the country. At a minimum, all-source RFPs should include elements similar to those identified in Table 4. While it is logical to include all-source procurement as part of the utilities' regularly scheduled IRP updates, the PSC should also require all-source procurement as part of certain utility case filings, including Certificate of Convenience and Necessity cases and Petitions for Consent and Approval.

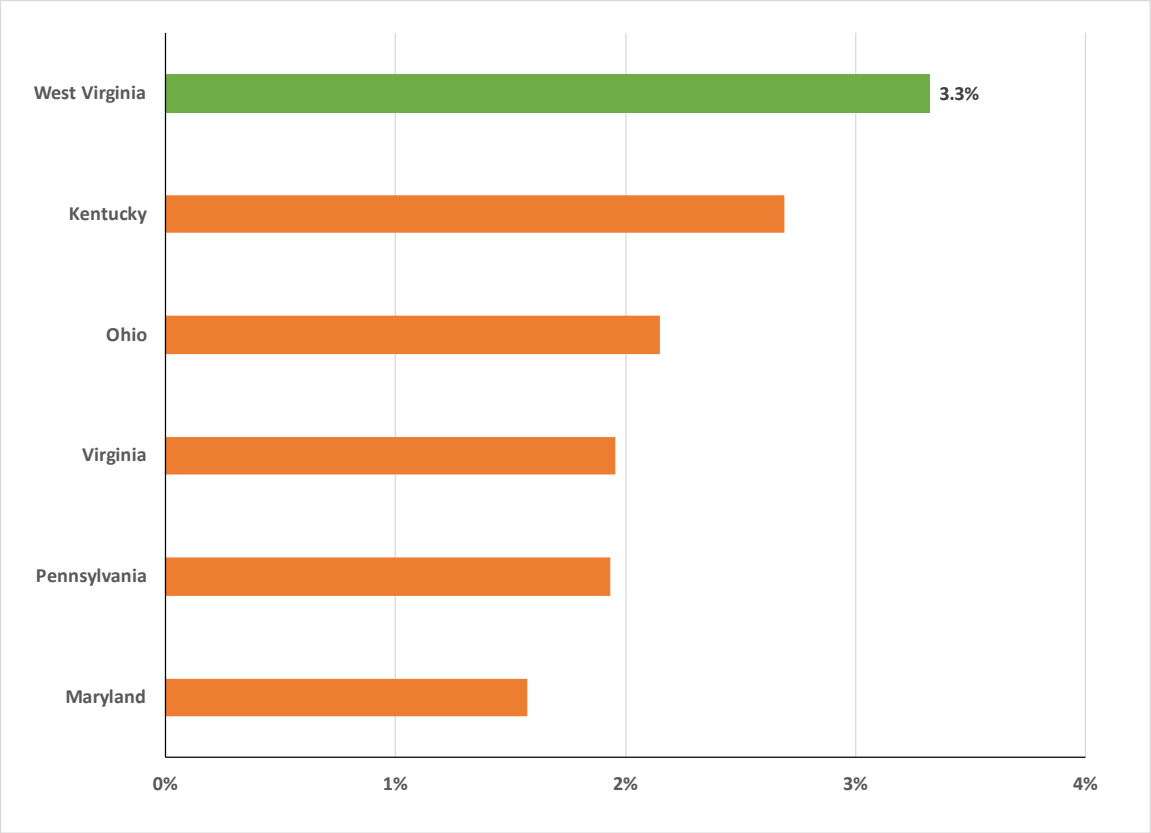
The PSC should also specify that any all-source procurement process undertaken by West Virginia's electric utilities should consider both supply- and demand-side resources. West Virginia has significant untapped demand-side resources, like energy efficiency programs that have worked in surrounding states.

4. OPPORTUNITIES TO IMPROVE ENERGY EFFICIENCY

Energy efficiency is a low-risk, low-cost energy resource that provides direct savings to consumers, encourages investment across other sectors of the economy, displaces the need for costly investments in new energy supply infrastructure, creates new employment opportunities, and reduces emissions of greenhouse gases and other harmful pollutants. For years, state legislatures and public service commissions across the country have recognized the value of energy efficiency as an energy resource and have adopted policies to facilitate its deployment.

But in West Virginia, utilities offer consumers very few energy efficiency programs compared to those offered by the same utility parent companies operating in other states. Indeed, historically low rates have not necessarily translated to low electricity bills for West Virginians. In 2021, the state had the second-highest residential electricity expenditures as a percent of median income—behind only Mississippi. As shown in Figure 8, West Virginia residents spend a higher percentage of their income on electricity than residents in all surrounding states. However, as documented in this chapter, recently passed federal legislation has the potential to provide significant energy efficiency investments in West Virginia.

Figure 8: Residential electricity expenditures as percentage of median household income, 2021



Sources: Median household income from Federal Reserve Bank of St. Louis (2022). Residential electricity expenditures from EIA (2023a).

4.1 Current West Virginia utility programs

Appalachian Power and Wheeling Power currently implement energy efficiency programs in West Virginia. The costs of administering energy efficiency and demand response programs are commonly recovered through rider rates on certain customer classes. A rider is a supplemental charge to specific customer classes for costs that are not recoverable through the base rates or ENEC cases.

In Appalachian Power and Wheeling Power territories, the energy efficiency and demand response riders are set at $0.001764 per kWh for residential customers and $0.000495 per kWh for commercial customers.[11] These rider rates produce approximately $10.5 million per year to fund multiple energy efficiency and demand response programs.

Since 2021, Appalachian Power and Wheeling Power have offered three energy efficiency programs, with a total budget of $3.75 million: income-qualified weatherization programs for single- and multi-family homes and a Home Performance Program, offering home energy audits and rebates on energy efficient home appliances and improvements. The weatherization programs are coordinated with state implementation of the Weatherization Assistance Program (discussed below in Section 4.2.1), with realized savings of approximately 3,500 kWh per household per year.[12] In recent years, these three programs, combined, realized gross annual savings of approximately 2,553 MWh.

Appalachian Power and Wheeling Power also have a single demand response program for residential customers, offering customers an incentive to allow the utility direct control of home cooling equipment during summer months. In 2021, the demand response program realized approximately 1,858 kW of avoided demand. Reducing peak demand in this manner should save ratepayers money.

No similar energy efficiency or demand response programs or riders exists within Mon Power and Potomac Edison territories. However, FirstEnergy's utility subsidiaries in Pennsylvania, New Jersey, and Maryland do offer energy efficiency programs.

Comparing efficiency savings across the country, West Virginia lags behind most other states. As reported by the American Council for an Energy-Efficiency Economy, West Virginia's 2021 incremental efficiency savings represented roughly 0.01 percent of total electricity used in the state, putting the West Virginia toward to the bottom of the rankings. In comparison, states with robust efficiency programs reported savings of 1-2 percent of total electricity sales. (Subramanian et al., 2022)

4.2 Recent federal investment in energy efficiency

Two historic pieces of federal legislation that passed in recent years have the potential to provide significant investments in energy efficiency in West Virginia. As shown in Table 5, the 2021 Infrastructure Investment and Jobs Act (IIJA) funds four programs that include energy efficiency. The 2022 Inflation Reduction Act (IRA) contains an additional five programs that will support energy efficiency efforts.

4.2.1 Weatherization Assistance Program

The Weatherization Assistance Program was established in 1970. It reduces energy costs for low-income households by increasing the energy efficiency of their homes. It is the largest residential whole-house energy efficiency program in the nation. Federal grants are provided to states, and states contract with organizations to perform the weatherization services. (U.S. Department of Energy, 2022a)

[11] See Case 12-1655-E-PC.
[12] Case 21-0332, Direct Testimony of Kevin C. Brown at 4, lines 8–10.

The IIJA includes an appropriation of $3.5 billion in formula grants for this program; of this total, $28.9 million has been allocated to West Virginia (U.S. Department of Energy, 2022b).

Table 5: Energy efficiency program funding in the IIJA and IRA (million $)

Program	Total	Estimated to West Virginia	Estimated to West Virginia for energy efficiency
Infrastructure Investment and Jobs Act			
Weatherization Assistance Program	3,500	28.9	28.9
Low Income Home Energy Assistance Program	500	4.3	0.7
Energy Efficiency Conservation Block Grants	550	3.3	0.7
Energy Efficiency and Renewable Energy Improvements at Public School Facilities	500	4.0	1.0
Subtotal, Infrastructure Investment and Jobs Act	**5,050**	**40.6**	**31.2**
Inflation Reduction Act			
High-Efficiency Electric Home Rebate Program	4,500	44.0	44.0
Home Energy Performance-Based Whole House Rebate Program	4,300	44.3	44.3
New Energy Efficient Home Credit	2,040	16.4	16.4
Energy Efficient Commercial Buildings Deduction	360	2.9	2.9
Green and Resilient Retrofit Program	1,000	8.0	0.8
Subtotal, Inflation Reduction Act	**12,200**	**115.6**	**108.4**
Total	**17,250**	**156.2**	**139.6**

Sources: Total funding from the IIJA and IRA except for the New Energy Efficient Home Credit and the Energy Efficient Commercial Buildings Deduction, which are from Blue Green Alliance (2022). Estimated funding based on sources and calculations described in the body of this report. Note: Totals may not match sums due to rounding.

4.2.2 Low Income Home Energy Assistance Program

The Low Income Home Energy Assistance Program (LIHEAP) provides assistance to low-income households to help meet their home energy costs. While most funds are distributed as direct cash payments or payments to utility companies on behalf of low-income households, a portion of the funding can be used for weatherization. In West Virginia, 15 percent of LIHEAP funds are set aside for weatherization. (LIHEAP Clearinghouse, 2022)

The IIJA includes an appropriation of $500 million in block grants for this program; of this total, $4.3 million has been allocated to West Virginia[13] (U.S. Department of Health and Human Services, 2022). Approximately $0.7 million of West Virginia's allocation, 15 percent of the total, is estimated to be used for energy efficiency improvements via weatherization.

4.2.3 Energy Efficiency Conservation Block Grants

The $550 million appropriated in the IIJA for Energy Efficiency Conservation Block Grants are directed not just to states, but also to specific counties and cities. These funds are used to implement strategies to reduce fossil fuel emissions, decrease total energy use, and improve efficiency. These grants fund a wide range of activities in addition to energy efficiency improvements

[13] This allocation assumes that the proportion of the first $100 million tranche allocated to West Virginia will stay the same for the remaining $400 million.

in buildings, such as onsite renewable energy projects and financing programs for renewable energy and zero-emission transportation. (U.S. Department of Energy, 2023)

The $3.3 million total allocation to West Virginia entities include $1.8 million to the State of West Virginia (U.S. Department of Energy, 2022c) and $1.5 million split between 10 specific counties and 10 specific cities (U.S. Department of Energy, 2022d). Each county and city will receive, on average, approximately $77,000. We estimate that, of the $3.3 million allocation, approximately $0.7 million will be used for energy efficiency planning and implementation.

4.2.4 Energy Efficiency and Renewable Energy Improvements at Public School Facilities

A fourth program in the IIJA provides competitive grants for energy efficiency and renewable energy improvements at public school facilities. The appropriation of $500 million is not allocated by state. We estimate that 0.8 percent of the total appropriation will be allocated to West Virginia, which is based on the weighted average of allocations to West Virginia for the other three IIJA programs.[14] This results in an estimated $4.0 million allocation to West Virginia, of which an estimated 25 percent, or $1.0 million would be spent on energy efficiency.

4.2.5 High-Efficiency Electric Home Rebate Program

Funding in the IRA is provided for the High-Efficiency Electric Home Rebate Program, which provides grants to state energy offices to develop and implement programs that includ rebates for heat pumps used for water heating, space heating, cooling, and clothes drying as well as other appliances such as electric stoves, cooktops, ranges, and ovens. Non-appliance upgrades are also included, such as insulation and air sealing. Up to 50 percent or 100 percent of the cost of an electrification project is covered, depending on household income.

Of the total of $4.5 billion appropriated in the IRA, $44.0 million has been allocated to West Virginia (U.S. Department of Energy, 2022e).

4.2.6 Home Energy Performance-Based Whole House Rebate Program

A second IRA program, the Home Energy Performance-Based Whole House Rebate Program, provides grants to state energy offices. These grants are to be used to develop and implement HOMES rebate programs. In contrast to the High-Efficiency Electric Home Rebate Program, which provides rebates for specific purchases and practices, this program provides rebates based on the amount of energy saved.

Of the total of $4.3 billion appropriated in the IRA, $44.3 million has been allocated to West Virginia (U.S. Department of Energy, 2022e).

4.2.7 New Energy Efficiency Home Credit

The IRA extended, increased, and modified the New Energy Efficient Home Credit. Tax credits of up to $5,000 can be taken for new homes or dwelling units that meet certain energy efficiency requirements.

The IRA includes an estimated $2.04 billion for this program (Blue Green Alliance, 2022). The amount of tax credits taken in West Virginia is not provided by a formula. We estimate that 0.8 percent of the total amount of tax credits will be taken in West Virginia. This results in an estimated $16.4 million of New Energy Efficient Home Tax Credits being taken in West Virginia.

[14] This estimate of 0.8 percent is also used for other programs when specific allocations are not available.

4.2.8 Energy Efficient Commercial Buildings Deduction

The IRA also includes the Energy Efficient Commercial Buildings Deduction, which enables building owners to claim a tax deduction for installing certain systems in buildings that reduce energy usage by at least 25 percent. Tenants may also be eligible if they make construction expenditures. (Blue Green Alliance, 2022)

The IRA includes an estimated $360 million for this program (Blue Green Alliance, 2022). The amount of tax deductions taken in West Virginia is not provided by a formula. We estimate that 0.8 percent of the total amount of tax deductions will be taken in West Virginia. This results in an estimated $2.9 million of Energy Efficient Commercial Buildings Tax Deductions being taken in West Virginia.

4.2.9 Green and Resilient Retrofit Program

A $1 billion appropriation in the IRA is provided to the U.S. Department of Housing and Urban Development, most of which is to be used for loans and grants to improve energy or water efficiency; enhance indoor air quality or sustainability; implement the use of zero-emission electricity generation, low-emission building materials or processes, energy storage, or building electrification strategies; or address climate resilience for affordable housing.

The appropriation is not allocated by state. We estimate that 0.8 percent of the total appropriation will be allocated to West Virginia. This results in an estimated $8.0 million allocation to West Virginia, of which an estimated 10 percent, or $0.8 million would be spent on energy efficiency.

4.3 Recommendations

The IIJA and the IRA are providing an unprecedented opportunity to help West Virginians dramatically improve energy efficiency and reduce electricity costs. As summarized in Table 5, the IIJA and the IRA include an estimated $31.2 million and $108.4 million, respectively, in energy efficiency funding for West Virginia. Capturing and effectively deploying this total of approximately $139.6 million in energy efficiency funding will require actions by a number of West Virginia entities.

Perhaps most important will be for the West Virginia Office of Energy to ensure that all formula grants assigned to the state are accepted and properly administered to maximize the benefits for West Virginia residents. The Office of Energy should also help get the word out to other entities that can directly take advantage of other programs, such as the state's school districts and developers of residential and commercial buildings.

5. POTENTIAL ECONOMIC IMPACTS OF INVESTING IN ENERGY EFFICIENCY

While the programs described in Chapter 4 will undoubtedly provide hardworking West Virginians with energy savings and the ability to reduce their electric bills, understanding the full potential impact, including job creation potential, for the entire suite of programs is difficult. However, the impacts for certain programs, like the Weatherization Assistance Program, which was established in 1970, are well-documented and provide critical information that can be used to estimate the economic benefits of the new funding in the IIJA and IRA.

Utilizing data collected from a national evaluation of the Weatherization Assistance Program by Oak Ridge National Laboratory (Tonn et al., 2014) and the IMPLAN model for West Virginia, we conducted an economic impact analysis of the $31.2 million in IIJA funding available to West Virginia for energy efficiency programs over the next five years. As summarized in Table 6, the West Virginia economy could expect to have an increase of economic activity of $92 million in output, which would support an average of 101 jobs over the next five years. These benefits are from implementation of the programs themselves.

Table 6: Economic impact of IIJA energy efficiency programs in West Virginia, 2023-2027 (million $, except employment)

Impact type	Output	Employment	Value-added	Labor income
Energy efficiency programs	$92.0	101	$44.5	$26.3
Household savings	$17.7	25	$10.1	$5.7
Five-year total	**$109.7**	**126**	**$100.7**	**$44.5**

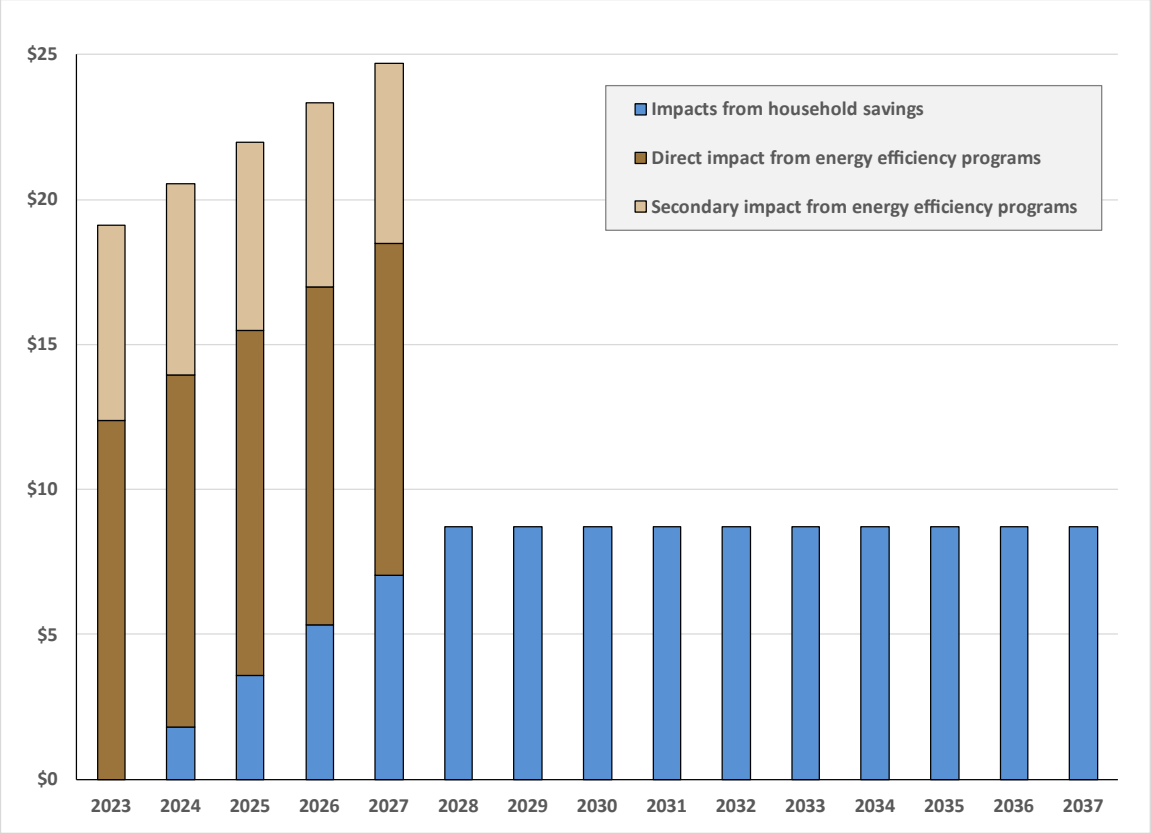
Source: Downstream Strategies analysis for this report. Note: Results are in 2023 dollars.

Energy efficiency programs also provide substantial energy savings to participating households. Again, utilizing data from the national evaluation of the Weatherization Assistance Program, we estimate that a $31.2-million federal investment in energy efficiency would result in approximately $17.7 million in regional increases in output (sales) during the first five years as the investment in energy efficiency grows. During this time, these savings on electricity bills would support an average of 25 jobs a year. These jobs would provide an estimated $5.7 million in labor income.

Not accounted for in Table 6 are the benefits that would extend past 2027. The programs outlined above will provide annual savings to households long after the projects are completed—an estimated $8 million per year. As these savings are spent in the local economy, the full impact from dollars saved is $8.7 million per year.

Figure 9 synthesizes the economic benefits in the first five years with those that continue afterword. The direct and secondary benefits of the energy efficiency programs themselves are shown as brown and beige bars, respectively, while the benefits stemming from household savings are shown as blue bars. As shown, unless these energy efficiency programs are extended, total impact peaks in 2027, when the new federal programs end.

Figure 9: Economic impact of IIJA energy efficiency programs in West Virginia, 2023-2037 (million $)



Source: Downstream Strategies analysis for this report. Note: Results are in 2023 dollars.

5.1 Sustaining the investment

West Virginians face high electricity costs, and electricity rates are continuing to rise (PSC, 2023). Although utilities offer very few energy efficiency programs for state residents, many new or expanded federal programs are now available to help West Virginians reduce their electricity bills. For these savings and their associated economic benefits to continue into the future, investments in energy efficiency will need to be sustained. The legislature, state agencies, the PSC, and West Virginia's electric utilities all have important roles to play.

The legislature can enact policies similar to those enacted in many other states that require or incentivize greater residential energy efficiency. One policy that has been proposed in recent years, for example, is the Local Energy Efficiency Partnership Act, introduced in 2023 as House Bill 2119.[15] This Act authorizes counties or municipalities to adopt programs to help residents finance energy efficiency projects without the use of taxpayer funds. Another example is the Energy Efficiency Jobs Creation Act, introduced as House Bill 2593 in 2023.[16] This Act requires electric utilities to implement cost-effective energy efficiency programs for its customers and to achieve year-by-year electricity savings.

State agencies also have an important role to play. Most immediately, agencies that qualify for grants from the IIJA and the IRA and other energy efficiency funding sources should ensure that

[15] https://www.wvlegislature.gov/Bill_Text_HTML/2023_SESSIONS/RS/bills/hb2119%20intr.pdf.
[16] https://www.wvlegislature.gov/Bill_Text_HTML/2023_SESSIONS/RS/bills/hb2593%20intr.pdf.

grant applications are submitted in a timely manner and that non-formula grant amounts are maximized. Further, state agencies should help disseminate information to other units of government that qualify for similar grants—such as boards of education that can apply for competitive grants for energy efficiency and renewable energy improvements at public school facilities.

The PSC plays a unique role, especially with regards to its decisions regarding utility-based energy efficiency programs. Rather than minimizing the number of efficiency programs offered to West Virginia ratepayers, it could require utilities to implement additional programs that would save participants money on their electricity bills. Notably, West Virginia's electric utilities already implement a variety of energy efficiency programs in other states; these programs, at a minimum, should be given strong consideration for adoption in West Virginia. The local economic benefits of energy efficiency programs documented in this chapter should be taken into account when considering these programs as part of a broader analysis of the benefits they bring to West Virginia.

Finally, West Virginia's electric utilities should think creatively about how to use this unique moment in time—when so many federal energy efficiency policies are rolling out—to significantly increase their residential energy efficiency programs in West Virginia. Lessons learned from programs implemented by the same utilities in other states should be identified and built upon. Whether or not the legislature takes action to require additional utility-based programs, the utilities can propose programs and the PSC can approve them.

6. CONCLUSIONS AND RECOMMENDATIONS

The West Virginia power sector is in a precarious position. Recent PSC and utility decisions to perpetuate a near-total reliance on electricity from coal-fired power plants have coincided with a period of increasing electricity rates. As demonstrated by the utilities' huge recent requests to raise residential electricity rates, West Virginia's power sector is quite vulnerable to volatile prices and supply shocks.

West Virginia is fortunate in that it has tremendous energy resources in addition to coal, and these other resources—including natural gas, renewable energy (wind, solar, hydropower), and energy efficiency—are relatively untapped. The PSC and West Virginia utilities should move quickly toward an energy strategy that leverages these resources, diversifies the fuel mix, and protects consumers from continued increases based on the state's overreliance on coal.

The PSC should also require electric utilities in West Virginia to use rigorous all-source RFPs, like vertically integrated utilities have done around the country. Truly objective evaluations of energy resources and technology mixes will encourage utilities to move toward a market-based portfolio of resources that can meet their needs while reducing costs and risks.

Further, the IIJA and the IRA offer once-in-a-generation opportunities for West Virginians to save money on their electric bills. The PSC, Office of Energy, and electric utilities should promote energy efficiency programs created or expanded through these federal laws. These programs offer electricity consumers the opportunity to save big while creating substantial economic opportunity for communities around the state. West Virginia's electric utilities should think creatively about how to use this unique moment in time—when so many federal energy efficiency resources are available—to significantly expand their residential energy efficiency programs in West Virginia. Further, the federal programs should be sustained over time so that they continue to put money back into the pockets of West Virginians.

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APPENDIX A: NON-ENEC PUBLIC SERVICE COMMISSION CASES

From 2012 to 2021, nearly 100 individual PSC actions that involve FirstEnergy and AEP subsidiaries—accounting for more than 40 individual cases—directly involve or impact consumer electricity prices. These cases can be divided into 10 categories (See Table 7).

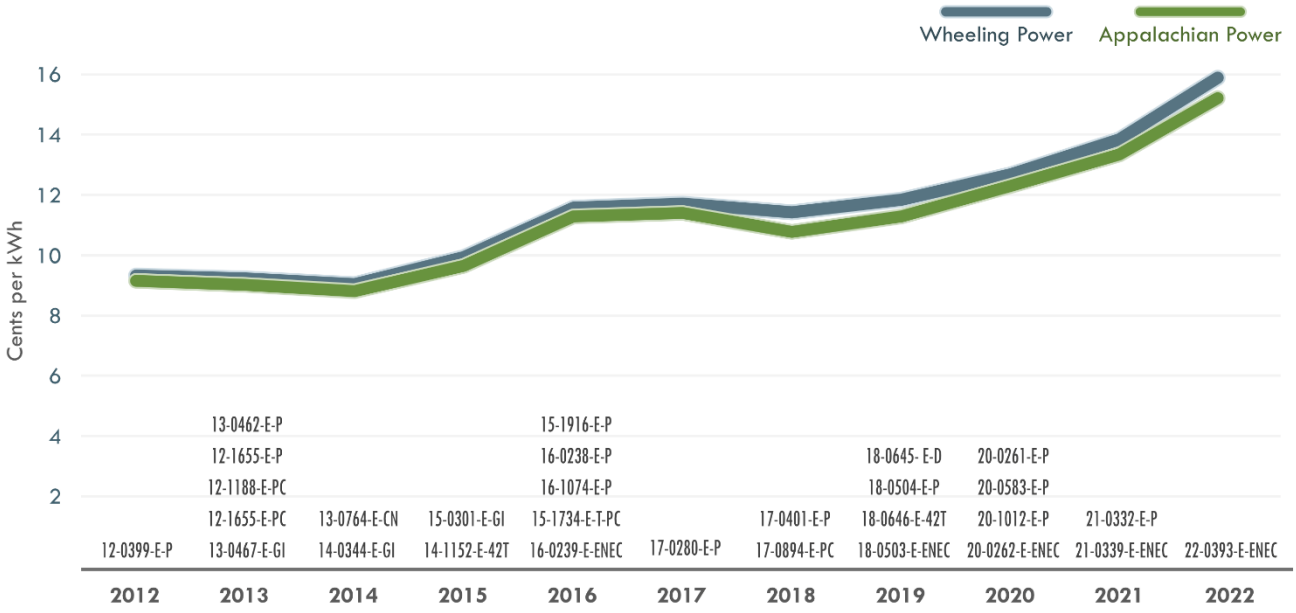
Table 7: Public Service Commission case types

Case type	Definition
Application to Increase Rates and Charges	Tariff filed with the Commission, bearing an effective date of usually 30 days thereafter, accompanied by Rule 42 accounting data. Includes all operation and maintenance costs including initial investment in facilities, equipment, structures and property; necessary working capital to provide utility service; and improvements and repairs on lines, plants, vehicles and other facilities. It also includes all federal, state and local taxes; depreciation expenses; return on investment for the company; staff salaries, benefits and pensions; rents; fees and interest payments on debt.
Modernization and Improvements Program	Modernization and Improvements program for coal-fired boilers and implementation of an associated cost recovery surcharge component under the provisions of W.Va. Code §24-2-11.
Formal Complaint	Any person, firm, association of persons, public officer, public or private corporation, municipality or county may complain to the PSC of anything done or omitted to be done by any public utility in violation of any of the provisions of the PSC law of the State of West Virginia.
Certificate of Convenience and Necessity	A public utility desiring to construct any plant, equipment, property, or facility for furnishing public utility service, or to obtain any franchise must file an application for a certificate that public convenience and necessity require such construction, etc.
Change in Depreciation Rates	A filing made by any public utility desiring to change its depreciation rates. Filing must be made at least 60 days prior to the last day of the month in which the accounts for which the effect of such change is first recorded.
Expanded Net Energy Costs	A special purpose rate proceeding for electric utilities that allows cost recovery for the prudently incurred costs associated with obtaining fuel, purchased power and transmission access costs, and specified construction costs.
General Investigation	Proceeding upon the PSC's own motion.
Petition for Permission	Application to transfer stock or a corporation, permission to charge a surcharge for certain reasons, permission to change office hours, or has a general use.
Petition for Consent and Approval	Petitions requiring consent of the Commission to enter into contracts between public utilities; for one utility to control or acquire property in another utility; when a utility desires to sell its franchises and permits and plant; merger or consolidation; purchase of stock or bonds by one utility in another utility; management contracts between utilities; exemption from the requirements of certain PSC laws; etc.
Tariff Filing	Tariff filing usually for new services of a utility, not necessarily affecting rates and charges of the utility.

Source: PSC (2022b).

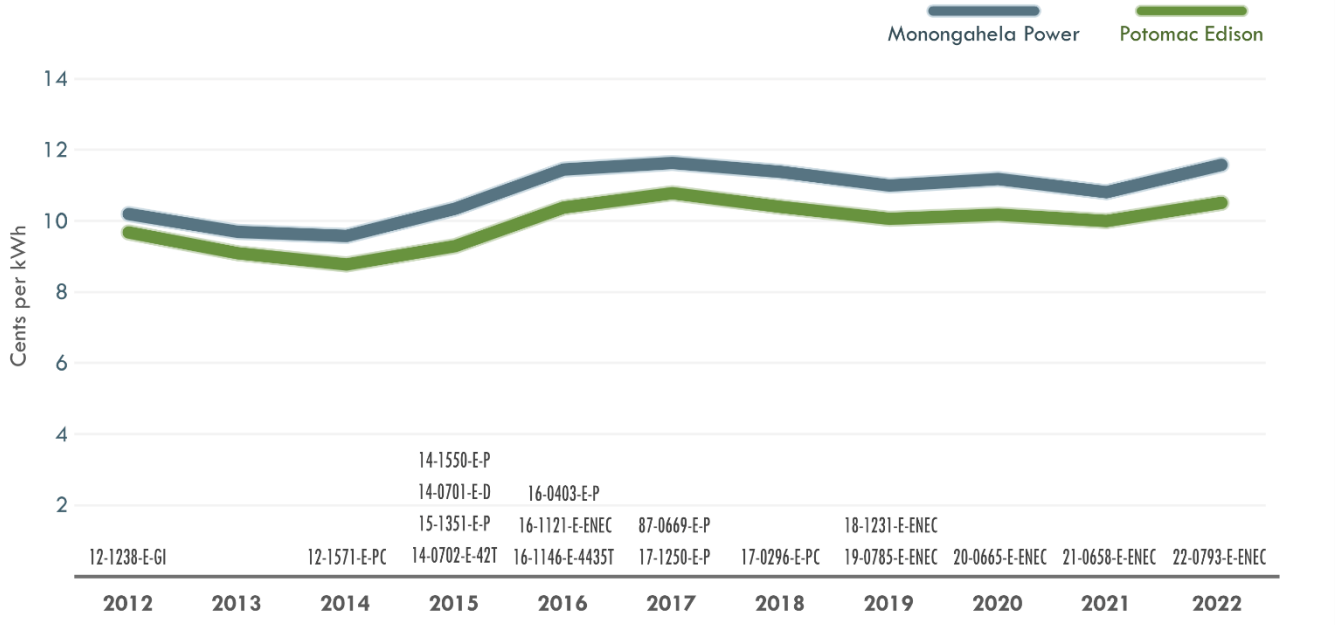
Figure 10 and Figure 11 illustrate changes in residential electricity rates and final orders issued on cases defined above from 2012 through 2022.

Figure 10: Residential electricity rates and impactful PSC cases, AEP, 2012-2021



Sources: PSC Final Orders; EIA (2023a).

Figure 11: Residential electricity rates and impactful PSC cases, FirstEnergy, 2012-2021



Sources: PSC Final Orders; EIA (2023a).

While ENEC cases have an increasingly large impact on West Virginia ratepayers (See Chapter 2); Applications to Increase Rates and Charges cases ("42T cases") have historically been the most important factor in the amount electric customers see on their bills.

42T cases involve filing a request for revised tariff sheets with the PSC. Tariff sheets account for all operation and maintenance costs, including initial investment in facilities, equipment, structures, and property; necessary working capital to provide utility service; and improvements and repairs on lines, plants, vehicles, and other facilities. They also include all federal, state, and local taxes; depreciation expenses; return on investment for the company; staff salaries, benefits and pensions; rents; fees; and interest payments on debt. Consumer costs related to expenses covered in 42T cases are often referred to as the base rate and make up approximately two-thirds of a typical electricity bill in West Virginia (PSC, 2022).

Between 2012 and 2021, the PSC filed three Final Orders related to 42T cases: two for AEP-owned utilities and one for FirstEnergy-owned utilities.

- **Case 14-1152-E-42T.** In this case, which impacted AEP-owned utilities, the PSC issued a 2015 Order granting a $123.5-million rate increase that included a base rate increase of $79.0 million and a Vegetation Management Program surcharge of $44.5 million annually. Nearly $94 million, or 76 percent of the total rate increase, was assigned to residential customers, resulting in a 16.1 percent overall increase in residential rates. Over $39 million of the increase went into effect immediately, with the remaining $25 million to be effective in mid-2016. The PSC approved $25 million of the rate increase to be treated as a deferred regulatory asset.[17]
- **Case 18-0646-E-42T.** In this case, also for AEP-owned utilities, the PSC issued a 2019 Order granting a $44.2-million base rate increase. More than $30.5 million, or 69 percent of the increase, was assigned to residential customers, representing a 4 percent increase to the residential base rate. The rate increase was effective immediately.
- **Case 14-0702-E-42T.** In this case, which impacted FirstEnergy-owned utilities, the PSC issued a 2015 Order granting a $15-million base rate increase and a Vegetation Management Program surcharge valued at $47.5 million per year, making the total annual revenue increase $62.5 million. Most of the increase was assigned to residential customers. The rate increase was effective immediately.

[17] A regulatory asset is a cost-of-service recovery the PSC permits a utility leave off its balance sheet for a period. Essentially, the $25 million is capitalized and depreciated over time.