AFFORDABLE AND RELIABLE

Creating competitive electricity markets to deliver consumers affordable, reliable, and low-emission electricity

Wayne Winegarden

PRI ELECTRICITY REALITY REPORT

Affordable and Reliable:
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Executive Summary

Under the traditional monopoly model, a public utility generates, transmits, and distributes electricity to all the customers in its government-designated region. The monopolist is also responsible, with the blessing of the local regulator, for making all necessary infrastructure investments. This monopoly model has significant disadvantages compared to markets that empower competition.

Monopoly pricing systems do not adequately incent efficiency improvements that enhance service and reduce costs. Further, monopoly utilities use a cost-plus pricing system to set rates. Cost-plus pricing obliges customers to cover the expenditures associated with all investments, even the ill-fated ones, so long as the decision was reasonable and consistent with the actions of *a prudent utility*. This creates a "heads I win, tails you lose" investment environment for monopoly utilities where customers bear the investment risks through higher utility bills rather than the utility bearing these risks through lower profits. There are several examples of customers suffering these adverse consequences from cost-plus pricing.

- Customers of South Carolina Electric & Gas (SCE&G) were forced to cover billions of dollars in costs for the construction of nuclear reactors that were never completed and generated no electricity because state regulators ruled that SCE&G could pass these costs along.[1] It is important to note that these cost over-runs are not indicative of the technology but are an indictment of the cronyism inherent to the monopoly regulation model.
- Customers of the Southern Company had to pay increased costs to partially cover the billions of dollars in a failed integrated gasification combined cycle (IGCC) technology at the Kemper power plant in Mississippi.[2]
- The cost overruns at the Vogtle nuclear power plant will increase the costs for ratepayers yet could still increase the project's expected earnings from $7.4 billion to $12.6 billion over the decades-long life of the two new reactors.[3]
- Customers' bills in Virginia will increase "by more than double the amount that regulator[s] initially expected" in order for Dominion Energy to comply with the Virginia Clean Economy Act.[4]

Regulated monopolies are also subject to the problem of cronyism that creates pressure for inflated rate increases and, sometimes, incents outright corruption. For instance,

- In Illinois, federal prosecutors accused ComEd [Commonwealth Edison) – a subsidiary of Exelon – of a bribery scheme that sought to curry [then-House Speaker] Michael Madigan's favor by directing $1.3 million in payments to the speaker's associates. ComEd acknowledged it stood to benefit by more than $150 million from that legislation.[5]
- In Ohio, FirstEnergy Corporation admitted that it conspired with public officials to ensure the passage of a ratepayer-funded bailout for older generation assets. The settlement agreement required the company to pay $230 million in criminal penalties, which is the largest ever imposed by the U.S. Attorney's Office for the Southern District of Ohio, for bribing Ohio officials.[6]

Competitive markets for generation, which started emerging during the 1990s, create positive incentives to improve service, address the adverse consequences from cost-plus pricing, and reduce the problem of regulatory capture and cronyism. In contrast to monopoly markets, competitive wholesale markets empower independent power producers and suppliers to compete in the generation side of the business. The restructured electricity networks utilize market forces to facilitate which supplier will provide the generation services to meet customer demand.[7]

To promote competition at the wholesale level, there are seven regional transmission organizations (RTOs) and independent system operators (ISOs) that geographically cover most of the United States, excluding the Southeast, Southwest, and Northwest. RTOs and ISOs manage the wholesale markets where competitive generators sell electricity to entities that often resell that electricity to the ultimate consumer.

In addition to wholesale competition, 13 states plus Washington D.C. also empower retail competition.[8] Retail competition allows customers to choose the electricity supplier that offers the desired combination of price, reliability, and (in some cases) generation source. The 14 jurisdictions that have adopted retail electricity competition include:

- Connecticut
- Delaware
- Illinois
- Maine
- Maryland
- Massachusetts
- New Hampshire
- New Jersey
- New York
- Ohio
- Pennsylvania
- Rhode Island
- Texas
- Washington, D.C.

There is a growing body of evidence demonstrating that wholesale and retail competition create significant customer benefits. Competitive markets enable power generation providers to offer electricity across a broader region and to more customers, improving the incentives and ability to produce electricity more efficiently. The competitive model also improves the incentives to invest in productive generation assets by ensuring that utilities bear the consequences (both good and bad) from their investment decisions. Thanks to these positive incentives, customers benefit from better pricing and more efficient electricity services.

Competition leads to better prices for customers. According to the Energy Information Administration (EIA), wholesale electricity prices established in competitive markets have been generally declining or flat over the last five years (2018 being the exception). Reviewing the pricing data compiled by the independent market monitor for three key competitive wholesale markets – PJM Interconnection (PJM, or the RTO that manages the wholesale market for the mid-Atlantic region), New England, and New York (subdivided into the New York City and Lower Hudson Valley markets) demonstrates that wholesale electricity prices[9] in competitive markets are trending downward and were at or near 6-year lows as of 2020, which is the latest data available. Specifically, compared to 2015 prices:

- Prices in the New England ISO were 44.3 percent lower as of 2020[10]
- Prices in the Lower Hudson Valley zone of the New York ISO were 26.0 percent lower as of 2020[11]
- Prices in the New York City zone of the New York ISO were 44.8 percent lower as of 2020,[12] and
- Prices in PJM were 41.7 percent lower as of 2020 and at $21.40/MWh were the lowest prices of the competitive markets examined.[13]

Numerous studies confirm that competitive wholesale markets create long-term pricing benefits. For instance, Chen (2020) found that "enhancing competition for wholesale transactions through a regional organized market, depending on details, is likely to lower wholesale costs, provide nonincumbent generators with easier access to the system, and improve power system efficiency and flexibility."[14] Clack (2020) examined the benefits from expanding capacity in the southeast region with and without setting up an RTO for the southeast states. The modeling exercise found that "setting up an RTO was the most economic option for the southeast with cumulative savings in the electric sector of $383.7 billion by 2040 compared to the IRP [baseline] scenario".[15]

In addition to the pricing benefits enabled by wholesale competition, retail competition is associated with more affordable pricing. Once fully implemented, the 14 jurisdictions that fully adopted competitive retail electricity markets saw declining prices for all customers compared to the continued rise in prices for all customers in the monopoly markets. Importantly, these benefits were available for all types of customers – commercial, industrial, and residential.

The price benefits are widely shared by states with retail choice as well. Four of the five states with the lowest price increases between 1996 and 2020 (Pennsylvania, Illinois, New Jersey, and New York) and five of the ten states with the lowest price increases (plus Texas), were competition states. Alternatively, the ten states with the largest increases in retail electricity prices were all monopoly states (Hawaii, Wisconsin, Kentucky, Idaho, Washington, Alaska, Montana, Minnesota, Wyoming, and Oregon).

Competition improves reliability and efficiencies. Due to the wider geographical coverage, increased generation options, and market-established prices competitive wholesale markets managed by RTOs or ISOs create reliability benefits. As the Brattle Group noted, these efficiencies arise because "the regional scheduling and dispatch of the transmission and generation allows the RTO or ISO to improve transmission availability and better manage unexpected facility failures on the system. This results in higher reliability without the need for increased investment in additional transmission or generation assets."[16] Studies have also found that variable operating costs for electricity generation declined in the states that adopted competition but did not in the plants that were unaffected by the changes.[17]

Similar benefits also exist at the retail level. While not without limitations, two common measures of reliability are the system average interruption frequency index, or SAIFI (a measure of the frequency of a sustained interruption), and the system average interruption duration index, or SAIDI (a measure of the duration of a sustained recovery).[18] A lower SAIFI/SAIDI measure indicates greater reliability. Based on these metrics, the 14 jurisdictions with retail electricity competition have more reliable distribution than the monopoly states. The SAIFI in the jurisdictions with retail competition was 10.4 percent lower than the SAIFI in the monopoly states and the SAIDI in the jurisdictions with retail competition was 6.5 percent lower than the SAIDI in the monopoly states.

Competition is associated with larger reductions in carbon-dioxide emissions. Competitive wholesale markets are better positioned to promote lower-emission energy sources. Recognizing both the environmental and pricing benefits, nine former commissioners and chairs of the Federal Energy Regulatory Commission (FERC) argued in a letter to Congress that RTOs and ISOs "provide compelling platforms for renewable energy development and are achieving considerable consumer benefit."[19] According to these commissioners, "the approach FERC has championed for over two decades to ensure a well-functioning and dynamic grid is organized wholesale markets. There is no longer any doubt that these markets are reliable, resilient and highly attractive to innovative new technologies and clean energy resources."[20]

Judged against actual emissions, the jurisdictions with retail competition are reducing emissions at a faster rate than the monopoly jurisdictions as well. Carbon-dioxide emissions in the competitive jurisdictions declined on average 12.1 percent between 2008 and 2018 (the latest data available) compared to an average decline of 7.3 percent in the monopoly states. These faster declines are consistent with the positive incentives created by competitive markets that empower consumers to express their electricity preferences that include receiving power from lower-emission sources.

These data indicate that empowering wholesale and retail competition enables price savings, reliability improvements, and a more desirable generation infrastructure over the long-term. Since affordable and reliable electricity is an essential economic input, empowering more competition at the wholesale and retail levels will improve a state's overall economic competitiveness. Due to these stark differences in outcomes, establishing robust competitive markets in the states that are still relying on the traditional monopoly utility model is an essential reform.

Introduction

Electricity regulations should ensure customers have access to affordable and reliable electricity, while generating the lowest feasible emissions. These goals are generally uncontroversial. The controversy arises with respect to how these goals can be achieved.

The outdated belief is that monopolies should generate, transmit, and distribute electricity to retail customers, which is the traditional market structure for the delivery of electricity. Monopolies are rightly viewed as harmful to consumers. But, proponents of this model claim that the electricity market is different, and the traditional structure is necessary because utilities are natural monopolies. A natural monopoly arises when there are exceptionally large fixed-costs to start a business and then the costs to produce additional goods and services continually decline as the business gets larger – the larger the business gets, the cheaper its costs of production become.

In the case of utilities, advocates are arguing that creating all the infrastructure to bring electricity to homes and businesses is expensive. Consequently, it is exceptionally costly and wasteful for competitive businesses to reproduce this infrastructure once an initial firm has made these investments. The traditional answer to this problem is to grant a local utility a monopoly on the generation, transmission, and distribution of electricity in their government defined local market. The state government will then regulate the monopoly provider intensively, which is supposedly the best way to achieve the goals of producing affordable and reliable electricity. Essentially, the regulator is attempting to replicate the outcome that would otherwise be established by a competitive industry. The legacy of this theory is evident in the approximately one-third of states that still lack meaningful wholesale competition and the three dozen states that still prohibit full retail competition in their markets.

> A natural monopoly arises when there are exceptionally large fixed-costs to start a business and then the costs to produce additional goods and services continually decline as the business gets larger – the larger the business gets, the cheaper its costs of production become.

Monopoly producers operate without the fiscal discipline and positive consumer incentives created by robust competitive markets. The incentive to innovate or learn from mistakes is blunted because neither the government nor the utility suffer the consequences from making incorrect decisions. Ratepayers do. Due to such flaws, there is a growing realization that an actual competitive environment for the generation and retail delivery of electricity is necessary to improve service and affordability.

Wholesale Electricity Markets

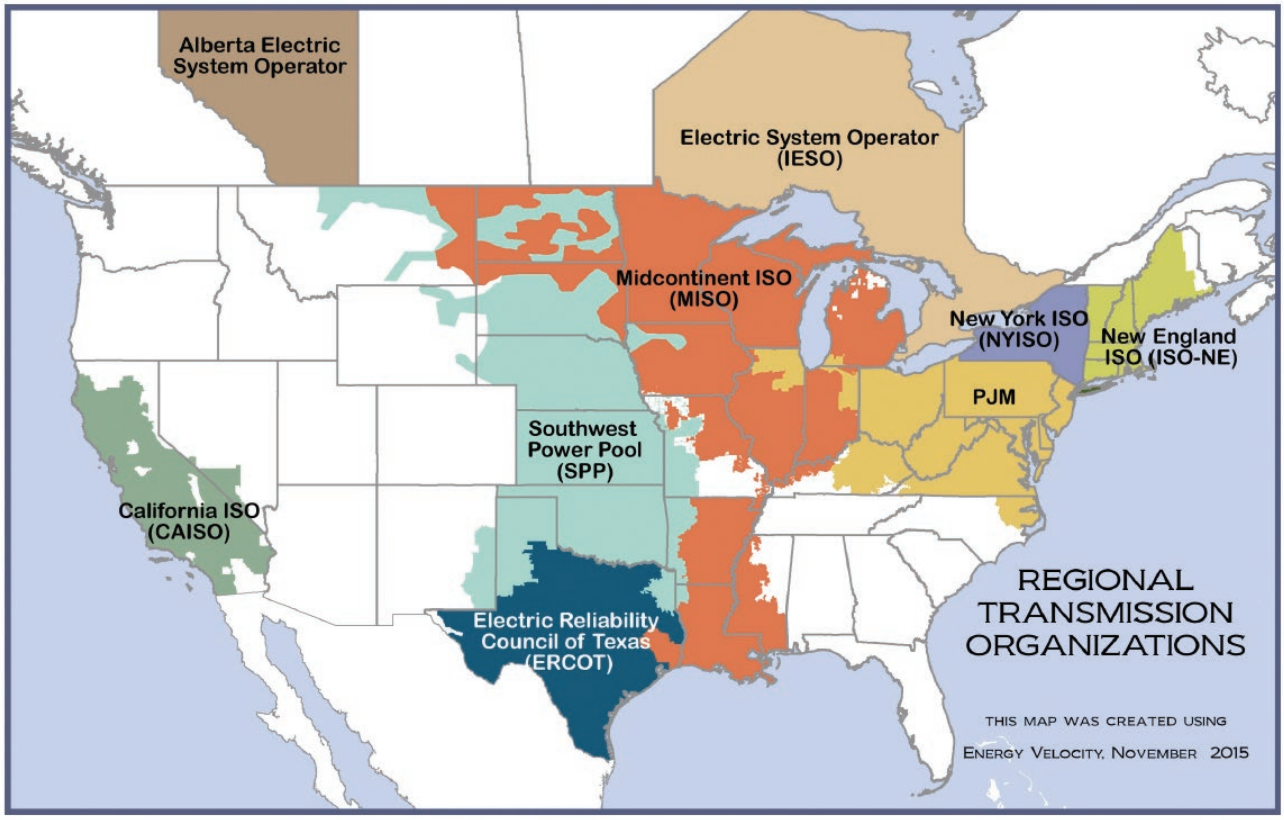
Due to the complexity of the electricity markets, it is important to differentiate between the wholesale and retail electricity markets. As PJM Interconnection explains,

> electricity is bought, sold, and traded in wholesale and retail markets, which operate similarly to wholesale and retail markets for other products. The purchase and sale of electricity to re-sellers (entities that purchase goods or services with the intention to resell them to someone else) is done in the wholesale market, while the purchase and sale of electricity to consumers [commercial, industrial, and residential consumers] is done in the retail market.
>
> Organized wholesale electricity markets were created to address ever-increasing electricity prices and to encourage innovation through free-enterprise competition. … The wholesale market begins with generators, which, after securing the necessary approval, connect to the grid and generate electricity. The electricity produced by generators is bought by an entity that will often, in turn, resell that power to meet end-user demand. These resale entities will generally buy electricity through markets or through contracts between individual buyers or sellers. In some cases, utilities may own generation and sell directly to end-use customers. …
>
> After electricity is bought by resell or "supply" entities in the wholesale market, it can be sold to end-users in the retail market. As an illustration, an end user in a home may pay a local electric utility company for the electricity that it uses each month. The purchase and sale of electricity in this instance is happening in the retail market.
>
> Many consumers have options for purchasing electricity. They can choose from their local utility or a number of competitive retailers to find the service that best fits their needs. These resellers (retail electricity providers) purchase electricity though wholesale electricity markets before they resell it to consumers (and, if they are a regulated utility, resell electricity at retail rates set by state regulators).[21]

Competitive wholesale markets are generally managed by Regional Transmission Organizations (RTOs)/ Independent System Operators (ISOs). RTOs and ISOs are nonprofit corporations that use governance models developed by the Federal Energy Regulatory Commission (FERC) to coordinate wholesale power exchanges across the electric grid. According to the Energy Information Administration (EIA) RTOs and ISOs operate as "independent, membership-based, non-profit organizations that ensure reliability and optimize supply and demand bids for wholesale U.S. power."[22] They were developed in the 1990s in response to FERC's policy to "encourage competitive generation through requiring open access to transmission."[23] Approximately two-thirds of the country is within one of the seven RTO/ISO regions, with the Southeast, Northwest, and Southwest the only regions not covered by an RTO/ISO, see Map 1.

The purpose of creating competition at the wholesale level – or firms that purchase electricity from generators with the goal of re-selling it to the final customer – was to "ensure that electricity consumers pay the lowest price possible for reliable service."[24] As will be discussed below, there is growing evidence that wholesale competition is achieving this purpose. Consequently, there are compelling reasons for the remaining states that have not yet embraced organized wholesale markets to join and/or form an RTO/ISO.

MAP 1. North American RTO/ISO Coverage



Source: https://energyfreedomco.org/f1-RTOmap.php.

Retail Electricity Markets

Separate from wholesale market competition, reforms adopted in the early 2000s by several states created a competitive model for selling retail electricity to customers. Retail delivery refers to the final sale of electricity to commercial, industrial, and residential consumers. Quilici et. al. (2019) note that "all states that have restructured their electricity markets to provide full retail competition (commercial, industrial and residential) are part of either an ISO or RTO."[25] Thus, competitive wholesale markets and competitive retail markets are necessarily intertwined.

The evidence emerging from the 13 states and the District of Columbia (14 jurisdictions in all) that have full competitive retail markets for electricity is demonstrating that competition at the retail level further enhances the consumer benefits enabled by competitive wholesale markets. These jurisdictions with full retail choice include:[26]

- Connecticut
- Delaware
- Illinois
- Maine
- Maryland
- Massachusetts
- New Hampshire
- New Jersey
- New York
- Ohio
- Pennsylvania
- Rhode Island
- Texas
- Washington, D.C.

While the actual structures vary between the competitive retail states, what they all have in common is the ability of customers to choose their retail electricity provider amongst multiple competitive firms. Expanding competition at the retail level creates important consumer benefits that include better pricing and more reliable service compared to monopoly providers.

To the detriment of consumers, the drive to promote greater competition in energy markets has stagnated since the last wave in the early 2000's. As a result, it is important to document the weaknesses of the traditional monopoly market and the relatively higher consumer benefits competitive electricity markets offer to expand the number of consumers benefiting from competitive electricity markets.

THE EMPTY CASE FOR MONOPOLY MARKETS

Advocates of a monopoly model claim that monopoly producers provide cheaper, more reliable energy. Further, advocates will claim that a benefit from the monopoly model is "the regulated utility model allows states to exercise full control and self-determination over important energy policy issues like energy supply mix, generation siting, economic development, and the transition to low- and zero-carbon technologies."[27] Such arguments are simply inconsistent with the evidence.

The traditional monopoly approach has clear disadvantages. Summarizing these problems, Alfred Kahn notes that

> the real defect of regulation is that rates set under it are based necessarily on averages—over time and among groups of customers. Ideally, the system would confront each customer with the proper price signals. And production efficiency is best realized when investors bear responsibility for investment decisions.
>
> Policy makers confronting pressures to undo the restructuring of the electricity industry would be well advised to base their decisions on the longer-term benefits that will flow from properly implementing competitive markets, rather than on adventitious circumstances driving market prices temporarily above or below regulated rates.[28]

The inability to establish meaningful prices leads to disincentives that ultimately harm customers. For instance, utilities that are granted local monopolies operate on a cost-plus basis. Cost-plus pricing in a monopoly market means that prices reflect the current operation costs plus the historical investments made by the utility. Those costs will include uneconomical investments so long as the investments were approved by the regulator. This difference is critical with respect to the incentives of the industry. Businesses operating a cost-plus business have no incentive to implement innovations that will reduce customers' costs or improve service – in fact, the easiest way to earn revenues is to operate with bloated costs and then apply a percentage margin to this unnecessarily large cost structure.

The cost-plus pricing model also creates the untoward outcome that customers bear the investment risks through higher utility bills. This stands in stark contrast to the typical market incentives under competition where investors rightly bear the risk of capital investments.

Monopoly utilities will also make investments based on the desires expressed by regulators, not based on the expectation that the investments will improve customer service. Focusing on pleasing the regulator, not the customer, ensures the monopoly utility that they will earn an adequate return on their capital. As a result, the prices charged by traditional monopoly utilities will not reflect the actual potential economic value of the product, it will simply reflect the operation costs that result from regulator-approved capital investments. Nevertheless, it is the obligation of customers to cover the costs of all investments, even the ill-fated ones so long as the decision was reasonable and consistent with the actions of a prudent utility. This creates a "heads I win, tails you lose" investment environment for monopoly utilities.

As described by NERA (2008),

> if a utility operating under a monopoly market structure decided to build a nuclear plant that resulted in a large but prudent cost overrun, while the neighboring utility decided on a coal plant that was built within budget, rates for the two utilities could differ sharply. This is not typical of functioning markets, and it is difficult for customers, particularly industrial competitors, to accept such arbitrary pricing.
>
> Regulated prices are based on cost of service, and to the extent that different utilities make different investment decisions, prices for proximate utilities may be very different.[29]

These adverse incentives cause investments in the monopoly markets to have a higher chance of being inefficient and susceptible to large cost over-runs. Such outcomes are not mere speculation either. There are many examples of customers in states that rely more heavily on the monopoly model having to bear significant cost burdens from costs that are more appropriately borne by investors. For example,

- Customers of South Carolina Electric & Gas (SCE&G) had to cover billions of dollars in costs for the construction of nuclear reactors that were never completed and generated no electricity because state regulators ruled that SCE&G could pass these costs along.[30]
- The Kemper power plant in Mississippi was supposed to be a world leader in "clean coal" technology by leveraging a multibillion-dollar integrated gasification combined cycle technology.[31] The project was supposed to be in service by May 2014, at a cost of $2.4 billion. The project was still not in service as of June 2017, and the cost had ballooned to $7.5 billion, a 212.5 percent cost over-run. In 2018 the Mississippi public service commission unanimously approved a settlement that still allowed some of the capital costs for the failed project to be collected from ratepayers and mandated that Mississippi Power run the Kemper Project on natural gas only. These rate increases were in addition to the millions of dollars of subsidies the project received from taxpayers.
- Cost overruns at the Vogtle nuclear power plant are now estimated to be $5 billion.[32] Georgia law allows the monopoly utility to apply its mark-ups to total costs (regardless of whether these costs are over-budget), which increases the project's expected earnings from $7.4 billion to $12.6 billion over the decades-long life of the two new reactors under construction, if accepted by the regulator as expected. These costs would then be passed along to customers. It is important to note that these cost over-runs are not indicative of the technology being cost-prohibitive but are an indictment of the cronyism inherent to the monopoly regulation model.[33]

- The investments Dominion Energy will make to comply with the Virginia Clean Economy Act will cause customers' bills to increase "by more than double the amount that regulator[s] initially expected".[34] While intertwined with the costs associated with green energy mandates, these types of cost over-runs are normal under a monopolist market structure. The Virginia example raises an important issue. Many advocates of the monopoly model claim that regulated monopolies can reduce greenhouse gas emissions more effectively. The data do not support such a supposition.

It is important to note that other state mandates can mute the benefits enabled by competition. For instance, many of the competitor states (such as New York and Massachusetts) impose "green-energy" policies such as renewable portfolio standards, cap and trade regulations, and other energy mandates that force more generation from low-emission sources. Other competitive states (such as Ohio and Texas) do not. In a previous analysis I demonstrated that many of these green-energy policies are harmful and free market policies are better positioned to reduce emissions while promoting affordable energy.[35]

With respect to the question of electricity competition, the Virginia example demonstrates that the problems of inefficient investment incentives are just as applicable to investments in low-emission energy sources as they are to traditional energy sources. In states with competition, consumers can choose alternative energy providers should the green-energy investments cause electricity to be too expensive or too unreliable. This discipline can help states find the balance that consumers prefer (under the assumption that other green-energy policies do not prohibit such an outcome). The absence of this market discipline hinders the ability of monopoly states to strike the right balance with respect to implementing an efficient low-emission energy infrastructure.

Another disadvantage of the monopolist market structure is the problem of regulatory capture, which is a type of cronyism. Sometimes this cronyism leads to inflated rate increases, but other times it incents outright corruption. For instance, in Illinois,

> federal prosecutors accused ComEd [Commonwealth Edison) of a years long bribery scheme that sought to curry [former House Speaker Michael] Madigan's favor in advancing legislation relaxing state regulation of ComEd's rates by directing $1.3 million in payments to the speaker's associates. ComEd acknowledged it stood to benefit by more than $150 million from that legislation.[36]

Cronyism is not just an Illinois problem either. FirstEnergy Corporation in Ohio announced a settlement agreement to pay a $230 million criminal penalty for bribing Ohio officials, the largest ever imposed by the U.S. Attorney's Office for the Southern District of Ohio.[37] In the settlement, the company admitted that it conspired with public officials to ensure the passage of a ratepayer-funded bailout for older generation assets.[38] As part of the settlement,

> The utility cooperated with federal investigators to disclose paying millions through dark money groups to state officials, including former Ohio House Speaker Larry Householder and former Public Utilities Commision of Ohio (PUCO) Chairman Sam Randazzo. The company acknowledged using 501(c)(4) organizations, which are registered lobbying entities, to conceal the nature, source and control of payments in the pursuit of the nuclear legislation.[39]

Another argument in favor of the monopolist model, emphasized by the advocacy group Power for Tomorrow, points to the debacle in Texas during the winter of 2020-21. During this debacle, millions of families in Texas lost service during a blistering cold snap where "at least 111 Texans died".[40] According to Texas health officials,

> the majority of people died from hypothermia, but health officials also attributed deaths to motor vehicle wrecks, "carbon monoxide poisoning, medical equipment failure, exacerbation of chronic illness, lack of home oxygen, falls and fire."
>
> Among those who lost their lives in the frigid weather was an 11-year-old boy in the Houston area who died in his home as temperatures dropped into the single digits. In San Antonio, a man froze to death outside his house after he likely fell on his way to a dialysis appointment. And in Abilene, a man reportedly froze to death in his reclining chair.[41]

Many of these deaths were avoidable with reliable electricity. Since Texas is a competitive state, it was alleged that the unnecessary crisis was proof that the competitive model is inferior. Their arguments misrepresent the problems that led to the Texas power outages, however. The outages and failures were unrelated to the underlying market structure. In fact, as Neely (2021) explained, based on the results from a study by Rice University's Baker Institute,

> while most of the state is open to retail electric choice, certain areas remain under the old monopoly model, with either a municipally owned utility or a co-op providing exclusive electric services. The study looked at how much of the generation outages during Winter Storm Uri were from competitive generators and how much was from regulated entities. When outages in these monopoly-regulated areas are compared to that of competitive areas, the study found that "the resource entities that remain fully regulated performed less well even excluding a strong outlier."[42]

These results are also consistent with the reality that, while Texas bore the brunt of the outages, generator outages and rotating blackouts affected nearby monopoly states as well. On February 15, the 14-state Southwest Power Pool (SPP, or the entity that manages the wholesale electricity market in the Plains states) balancing authority area, declared an Energy Emergency Alert Level 3 and began directing its member utilities to implement controlled outages to prevent more widespread uncontrolled outages within its region.[43] While SPP is responsible for the operation of regional, bulk transmission system, nearly all states within SPP regulate their electric utilities as monopoly service providers, and therefore are primarily responsible for maintaining resource adequacy.[44] This evidence shows that vertically integrated utilities like wholesale electric markets suffered under the weather-related event, discrediting claims by some that a competitive regulatory model was somehow to blame.

Rather than the competitive structure, one of the drivers of the outage crisis in Texas during the winter of 2021 was insufficient weatherization. As the *Houston Chronicle* documents,

> Ten years ago, plunging temperatures forced rolling blackouts across Texas, leaving more than 3 million people without power as the Super Bowl was played outside Dallas.

> Now, with a near identical scenario following another Texas cold snap, Texas power regulators are being forced to answer how the unusually cold temperatures forced so much of the state's power generation offline when Texans were trying to keep warm.
>
> To start, experts say, power generators and regulators failed to heed the lessons of 2011 — or for that matter, 1989. In the aftermath of the Super Bowl Sunday blackout a decade ago, federal energy officials warned the grid manager, the Electric Reliability Council of Texas or ERCOT, that Texas power plants had failed to adequately weatherize facilities to protect against cold weather.[45]

This inadequate weatherization of the infrastructure persists and was a major driver of the crisis. Also unique to Texas is the state's isolation from the national grid. This isolation made it impossible to import electricity from neighboring states. These problems are unrelated to the underlying market structure,[46] which indicates that the Texas incident was not about the market model of the state but a systemic failure of the entire energy value chain.

Fixing Texas' problems, as Gimon (2021) noted, requires better risk management policies and investments that harden the grid to greater weather extremes.[47] Considering the increased frequency of extreme weather events, policymakers must

> balance the imperative for using the grid as a tool for decarbonization while maintaining high levels of reliability.
>
> In its 2020 report on reliability NERC pointed to the assorted risks emanating from increased investment in wind and solar facilities. These generation resources have variable output and performance, and government subsidies can distort energy market pricing. Still, they are expected to increase in share of power capacity and production, although there is some public opposition to essential transmission improvements. Wind, solar, batteries, electric vehicles represent geopolitical exposure stemming from international supply chain risks and disruptions….
>
> Even as Texas adds new sources of generation, the challenge is to figure out how to facilitate the flow of wind, solar and storage while ensuring reliability during the hottest summers and coldest winters. Fossil fuels and nuclear are too important to dismiss. In an intriguing mandate to the PUCT to study and act on dispatchable generation, the Texas Legislature recognized the need to plan for the future with these resources in mind. High demand periods lead to financial consequences that cannot be minimized, otherwise power systems are not economically sustainable. New technology is desirable – smart meters, distributed energy resources like rooftop solar, flexible energy storage and much more. The challenge is to enable these attractive technologies to more fully enhance reliability.[48]

The Benefits Created by Competitive Wholesale and Retail Markets

In contrast to the adverse incentives in monopoly markets, replacing monopolies with competitive markets would improve consumers' welfare. From a theoretical perspective, there are many reasons to expect competitive electricity markets to provide customers with more efficient services relative to monopoly markets. Most importantly, when an efficient competitive process is established, prices reflect current market realities.

If a power generator operating in a competitive market makes uneconomical investments, it is the investors who bear the risks, not the customers. Further, the need to attract customers and earn a profit incents the retail electricity providers to push for operational efficiencies that reduce the cost to produce electricity.

Competitive electricity markets also have advantages with respect to other important considerations, such as greenhouse gas emissions. Energy sources have different trade-offs between costs, reliability, and emissions that will vary by location. Customers will also have different needs and desires across these attributes. Competition provides a means for customers to express these desires to the utilities leading to a more efficient balance of these considerations. Further, since there is evidence that there is a strong demand for low-emission energy sources if they are available, competitive markets incent suppliers to meet this demand in an economical and efficient manner.

Due to the incentive differences between monopoly and competitive markets, customers in states with competitive electricity markets should see more efficient prices, more reliable service, and lower-emission generation assets. And this is precisely what the evidence shows.

Before considering the evidence, it is useful to note that the other industries that have transitioned from monopoly providers to a competitive environment also experienced the same benefits. For instance, the introduction of competition into the airline and telecommunications industries meaningfully improved consumer welfare by decreasing price and improving the quality of service. For the airline industry, according to Alfred Kahn, often referred to as the "father of airline deregulation,"[49]

> the two most important consequences of deregulation have been lower fares and higher productivity.
>
> **Fares**. Between 1976 and 1990, average yields per passenger mile—the average of the fares that passengers actually paid—declined 30 percent in real, inflation-adjusted terms….
>
> **Productivity**. The other major accomplishment of deregulation has been the improvement in airline productivity. Deregulation fostered this improvement by removing the previous detailed restrictions on airline prices and on where they can fly. Decontrol of prices allowed airlines to fill their planes by offering large numbers of heavily discounted fares for seats that

> would otherwise go unused. Decontrol of routes permitted them to plan their operations as they see fit. And deregulation has compelled improvements in efficiency through the intense pressures of the price competition it unleashed.[50]

With respect to competition in the telecommunications industry, Hausman and Taylor noted that,

> telecommunications regulatory history has demonstrated that policies such as those imposed by the FCC [Federal Communications Commission] and DOJ [Department of Justice] produced significant consumer harm. Regulatory attempts to mimic competitive outcomes are vastly inferior to the observed competition among landline, cable, and wireless providers.[51]

MORE EFFICIENT WHOLESALE MARKETS

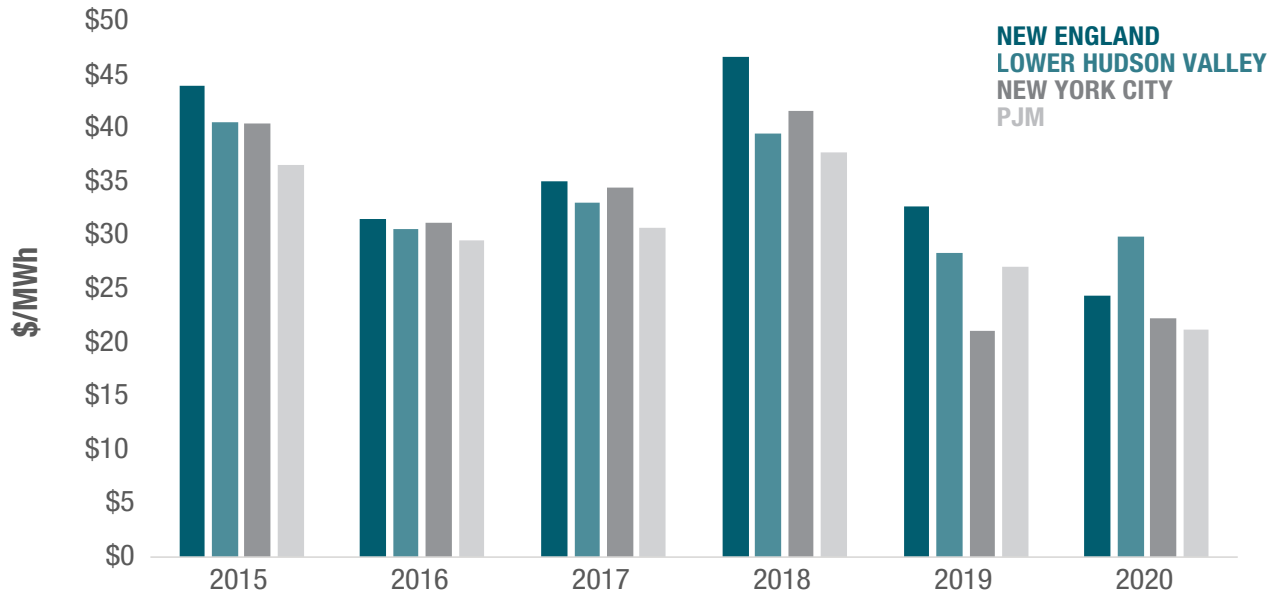
Whether it is wholesale or retail competition, there is strong evidence that competition drives down costs for customers – just like with the airline and telecommunications markets.

Starting with the wholesale markets, the improved competitive structure enabled by RTOs and ISOs creates significant consumer benefits. As nine former commissioners and chairs of the Federal Energy Regulatory Commission (FERC) noted, "organized regional wholesale power markets, known as RTOs and ISOs, provide compelling platforms for renewable energy development and are achieving considerable consumer benefit."[52] According to these commissioners, "the approach FERC has championed for over two decades to ensure a well-functioning and dynamic grid is organized wholesale markets. There is no longer any doubt that these markets are reliable, resilient and highly attractive to innovative new technologies and clean energy resources."[53]

Consistent with expectations, data from the Energy Information Administration (EIA) demonstrated that 2020 electricity prices in the competitive wholesale markets "were generally lower than in 2019, although prices in the western states trended higher in the last half of the year. Compared with 2019 prices, these wholesale hub prices in 2020 ranged from 5% lower in the California Independent System Operator (CAISO) market to 45% lower in the Electric Reliability Council of Texas (ERCOT) market. Monthly wholesale electricity prices were also generally less volatile in 2020 than in 2019."[54] Importantly, this is not a one-off price decline. In the five years through 2020, competitive wholesale prices declined in three years (2020,[55] 2019,[56] and 2016[57]), were generally stable in 2017[58] (prices were higher in California and Texas), and only generally rose in 2018.[59]

The pricing data compiled by the independent market monitors for three key competitive wholesale markets – PJM, New England, and New York (subdivided into the New York City and Lower Hudson Valley markets) – confirms this pattern of declining wholesale prices in competitive markets. Figure 1 presents the locational marginal prices for these markets. The locational marginal prices reflect the value of electricity at different pricing nodes, accounting for load, generation, and the physical limits of the transmission system. As Figure 1 demonstrates, wholesale electricity prices in competitive markets have been trending downward and were at or near 6-year lows as of 2020, which is the latest data available.

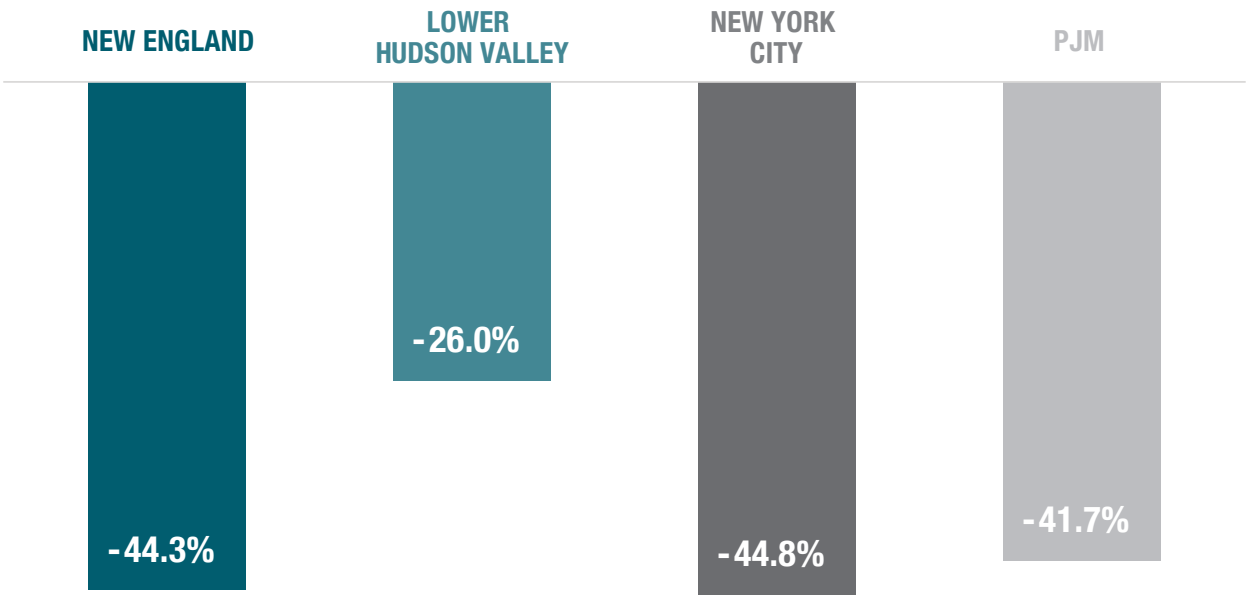
FIGURE 1. Wholesale Electricity Markets in Select Competitive Regions, 2015 – 2020



Source: Independent market monitor reports

Compared to 2015 prices, prices in the New England ISO were 44.3 percent lower as of 2020;[60] prices in the Lower Hudson Valley zone of the New York ISO were 26.0 percent lower as of 2020;[61] prices in the New York City zone of the New York ISO were 44.8 percent lower as of 2020;[62] and prices in PJM were 41.7 percent lower as of 2020 and at $21.40/MWh were the lowest prices of the competitive markets examined.[63] Figure 2 summarizes the price declines in each one of these competitive markets.

FIGURE 2
Percentage Change in Wholesale Electricity Markets in Select Competitive Regions, 2015 – 2020



Source: Independent market monitor reports

Beyond the better pricing, competitive markets also promote greater efficiency. According to the Midcontinent ISO (MISO), by improving energy reliability, enabling more efficient use of current generate assets, and reducing the need for investing in additional assets, MISO created $3.6 billion in annual benefits in 2019 alone, over $26 billion since 2009.[64] These results are similar to the findings of other RTOs and ISOs. PJM estimates that their "operations, markets and planning result in annual savings of $3.2 - $4 billion."[65] The California Independent System Operator manages the Western Energy Imbalance Market (EIM), which is a real-time energy market that serves large parts of the western U.S., including states that are not served by an RTO or ISO. According to the EIM, the cost savings, increased integration of renewable energy, and improved operational efficiencies have generated nearly $1 billion in benefits since November 2014.[66]

Independent analyses confirm the results reported by the RTOs. For instance,

- In an evaluation of the comparative benefits from establishing a RTO in the southeast region, particularly with respect to efficiently implementing low-emission generation technologies, Chen (2020) found that "enhancing competition for wholesale transactions through a regional organized market, depending on details, is likely to lower wholesale costs, provide nonincumbent generators with easier access to the system, and improve power system efficiency and flexibility."[67]
- Clack (2020) examined the benefits from expanding capacity in the southeast region with and without setting up an RTO for the southeast states. The modeling exercise found that "setting up an RTO was the most economic option for the southeast with cumulative savings in the electric sector of $383.7 billion by 2040 compared to the IRP [baseline] scenario."[68]
- The Brattle Group (2019) evaluated the benefits to customers in North Carolina if Duke Energy joined an organized regional wholesale power market finding (preliminarily) "that Duke's participation in a Regional Transmission Organization (RTO)-operated regional market could provide benefits to customers in North Carolina up to almost $600 million a year."[69]
- A 2010 Charles River Associates cost-benefit analysis prepared for FERC found that "the net benefits for the collective SPP /Entergy region if Energy and Cleco Power join the SPP RTO...[are] $1,290 million over the 2013 to 2022 period."[70]

While these studies conclude that consumers significantly benefit from competitive wholesale markets managed by RTOs and ISOs, it is widely believed that additional confirmation is needed. Toward this end, policy groups from across the political spectrum have sent a letter to the chairmen and ranking members of the House and Senate Committees with responsibility for energy asking to "direct the Government Accountability Office (GAO) or other independent oversight organization to undertake a detailed and objective study of the cost of electricity in the United States."[71] While stating there is "substantial evidence that RTOs reduce production costs," analysis is incomplete and it is "more important than ever that policymakers investigate the impacts of wholesale market policies on retail customers now."

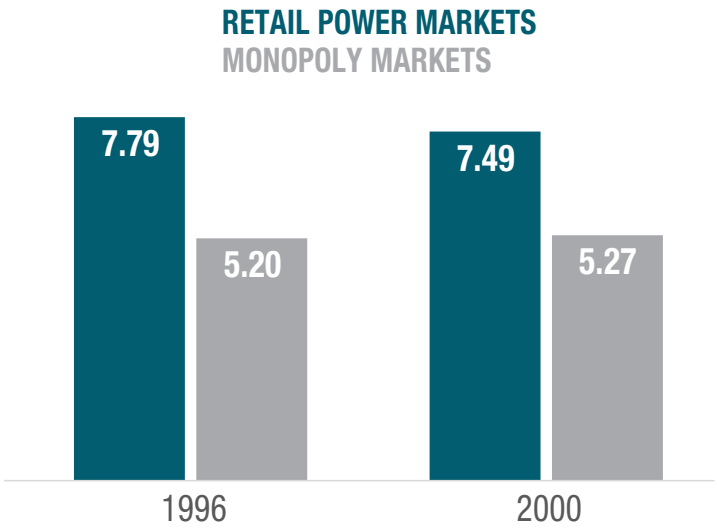
BETTER RETAIL PRICING

With respect to the argument of cheaper retail energy, it is important to understand that the states that transitioned to competitive energy markets in the early 2000s were also the states that had higher electricity costs. Figures 3 through 6 compare the average of electricity prices in the 14 retail competition jurisdictions to the average of electricity prices in the remaining states that do not have competitive retail markets. The comparisons include the average prices for all customers (Figure 3), as well as the average prices paid by commercial (Figure 4), industrial (Figure 5), and residential (Figure 6) customers. The analysis evaluates prices for the years 1996 and 2000, which is the period just before the transition to retail competition began.

Figure 3 illustrates that the states that adopted retail competition had higher prices than the states that did not embrace competition. In 1996, the average electricity prices in the states that would adopt retail competition was 7.79-cents per kwh, or 49.8 percent higher than the prices in the states that would not adopt competition (5.20-cents per kwh). As of 2000 the price discrepancy remained. Prices in the states that would adopt retail competition was 7.49-cents per kwh, or 42.0 percent higher than the prices in the states that would not adopt competition (5.27-cents per kwh).

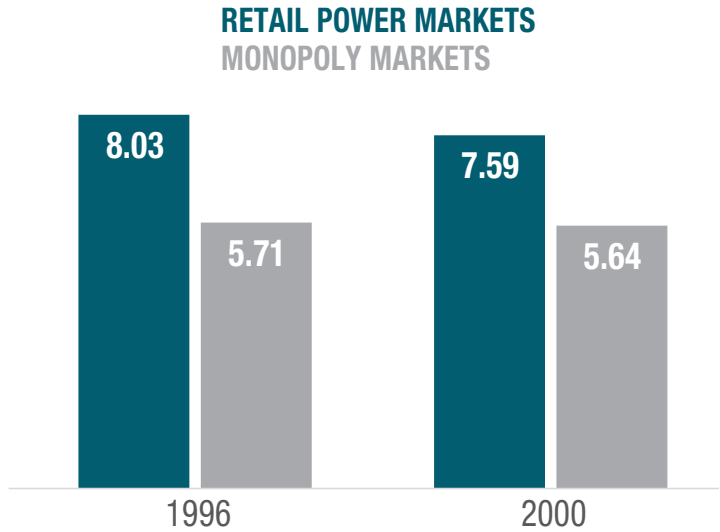
Figure 4 presents the comparison for the prices paid by commercial customers. In 1996, the average electricity prices for commercial customers in the states that would adopt retail competition was 8.03-cents per kwh, or 40.7 percent higher than the prices in the states that would not adopt competition (5.71-cents per kwh). As of 2000 the prices for commercial customers in the states that would adopt retail competition was 7.59-cents per kwh, or 34.6 percent higher than the prices in the states that would not adopt competition (5.64-cents per kwh).

FIGURE 3. Retail Electricity Prices, All Customers Current Competitive States Compared to Monopoly States, 1996 and 2000, (cents per kilowatthour)



Source: Author calculations based on EIA data

FIGURE 4. Retail Electricity Prices, Commercial Customers Current Competitive States Compared to Monopoly States, 1996 and 2000, (cents per kilowatthour)

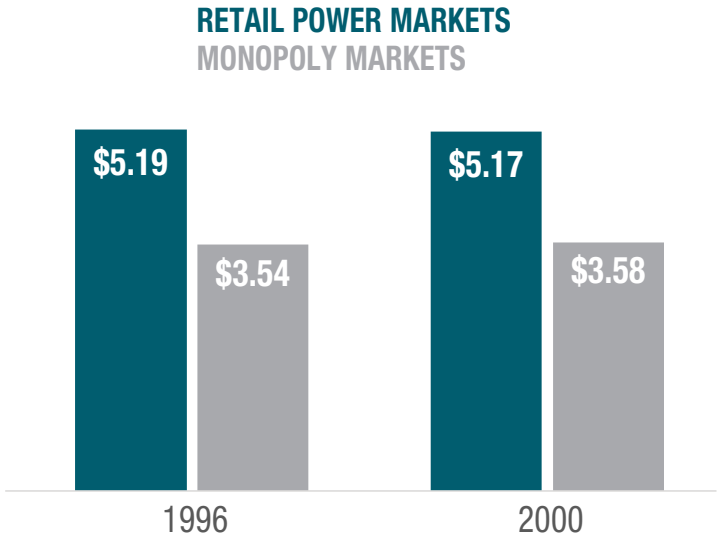


Source: Author calculations based on EIA data

Figure 5 presents the comparison for the prices paid by industrial customers. In 1996, the average electricity prices for industrial customers in the states that would adopt retail competition was 5.19-cents per kwh, or 46.4 percent higher than the prices in the states that would not adopt competition (3.54-cents per kwh). As of 2000 the prices for commercial customers in the states that would adopt retail competition were 5.17-cents per kwh, or 44.4 percent higher than the prices in the states that would not adopt competition (3.58-cents per kwh).

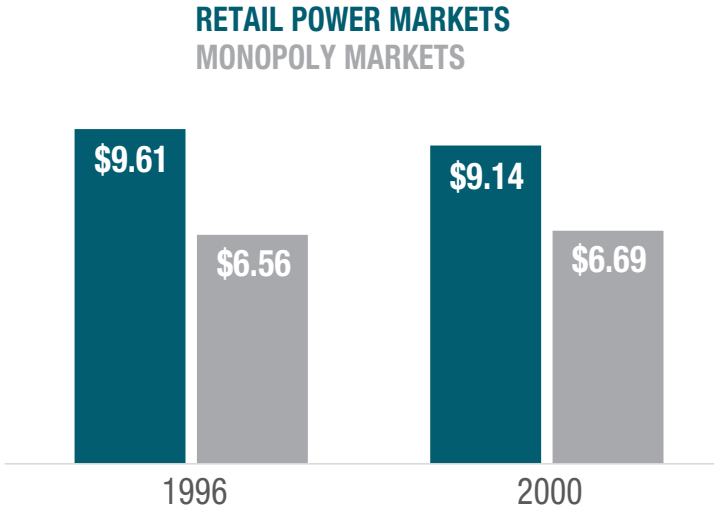
Figure 6 presents the comparison for the prices paid by residential customers. In 1996, the average electricity prices for residential customers in the states that would adopt retail competition was 9.61-cents per kwh, or 46.6 percent higher than the prices in the states that would not adopt competition (6.56-cents per kwh). As of 2000 the prices for residential customers in the states that would adopt retail competition was 9.14-cents per kwh, or 36.6 percent higher than the prices in the states that would not adopt competition (6.69-cents per kwh).

FIGURE 5. Retail Electricity Prices, Industrial Customers Current Competitive States Compared to Monopoly States, 1996 and 2000



Source: Author calculations based on EIA data

FIGURE 6. Retail Electricity Prices, Residential Customers Current Competitive States Compared to Monopoly States, 1996 and 2000



Source: Author calculations based on EIA data

Figures 3 through 6 demonstrate that all customers in the states that adopted retail competition faced higher costs than the customers in the states that did not adopt retail competition, which was an important driver for these states to consider new market structures. It is not useful, consequently, to judge the success of retail competition based on whether these states have lower costs. Instead, a better metric of success is the average growth in prices in the retail states relative to the monopoly states starting from when the competitive environments were fully functioning. Not surprising, the states that transitioned away from monopoly utilities to a competitive market for retail electricity services have seen smaller growth in prices compared to the states that continue to shun retail choice.

The transition away from the monopoly structure in the retail choice states took time. As O'Connor (2017) noted,

> Each of the 14 competitive jurisdictions proceeded at different speeds and in different ways during the transitional decade [1998 – 2007]. By 2007, phase-ins of customer class eligibility and the collection of stranded-cost charges had reached their prescribed end points in most states. The transitional decade witnessed a cautious, stepwise approach that set the stage for ongoing evolution and growth in competitive retail markets. Regulation would continue to adapt to this new model.[72]

The 2007/2008 demarcation is, consequently, the material breakpoint with respect to whether the growth in retail electricity prices for all types of customers – industrial, commercial, and residential – varies between competitive states and monopoly states. As Figures 7 through 10 demonstrate, the transition to competitive electricity markets meaningfully changed the growth in prices in competitive states that was not evident in the monopoly states. This different outcome provides compelling evidence that customers will benefit from lower prices once a transition to an efficient competitive market has been completed.

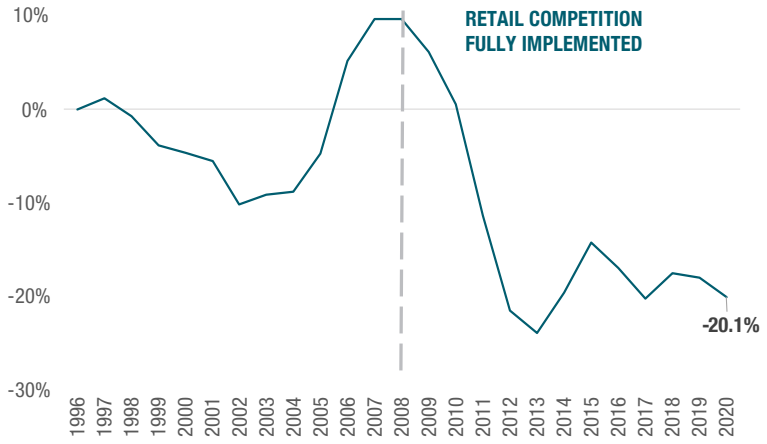
Figure 7 compares the difference between the cumulative growth in the retail electricity prices for all customers in the 13 states plus Washington, D.C. that have adopted retail electricity competition and the remaining retail monopoly states. The period covers the 13-year period prior to the full transition to the retail competitive market (1996 through 2007) and the 13 years that the retail competitive environment has been effective (2008 through 2020).

Figure 7 demonstrates that the growth in prices in the states that adopted retail competition were growing slightly faster than the remaining states, particularly starting in 2001. Once the transition to competition was complete, a meaningful difference in the growth of prices is evident between the two sets of states such that, over the entire period, prices grew 20.1 percent slower in the jurisdictions with retail competition compared to the monopoly states. Looking at the percent change in prices during the period of fully implemented retail competition (i.e., since 2008), prices declined slightly in the competitive jurisdictions (-0.3 percent) compared to continued growth in the monopoly states (+20.7 percent). Thanks to this slower growth, over the entire period prices grew 50.5 percent in the competitive jurisdictions compared to 70.6 percent in the monopoly jurisdictions.

This significant change in the growth of prices between the two groups is precisely what you would expect from the adoption of retail competition. Figures 8 through 10 demonstrate that the pattern of slower price growth was applicable to all types of customers – commercial, industrial, and residential.

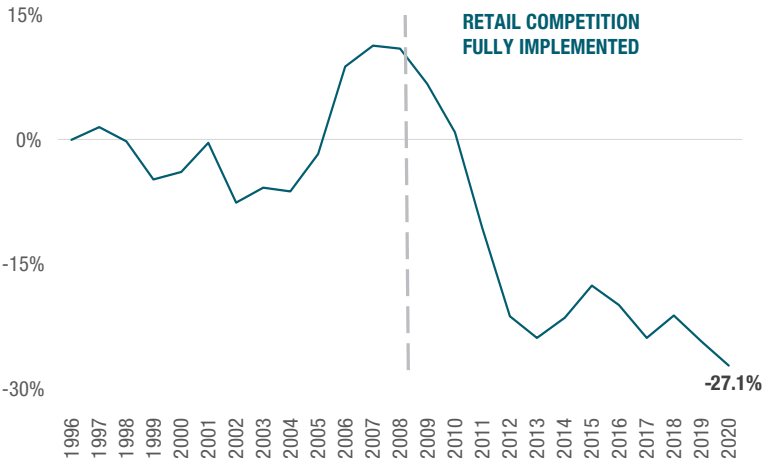
Figure 8 demonstrates that commercial customers have benefited from retail competition to a greater extent than the average customer. Price growth between the two categories of jurisdictions was similar prior to the introduction of competition. Following the implementation of competition, commercial customers in the jurisdictions with retail competition have seen prices decline 7.6 percent, which is in stark contrast to the 20.2 percent growth in electricity prices for commercial customers in monopoly states. Thanks to the decline in prices, total price growth over the entire 1996 through 2020 period were 27.1 percent less in the competitive jurisdictions than the price growth that occurred in the monopoly states.

FIGURE 7. The Difference between the Cumulative Change in Retail Electricity Prices – in Competitive States Compared to Monopoly States, All Customers, 1996 – 2020



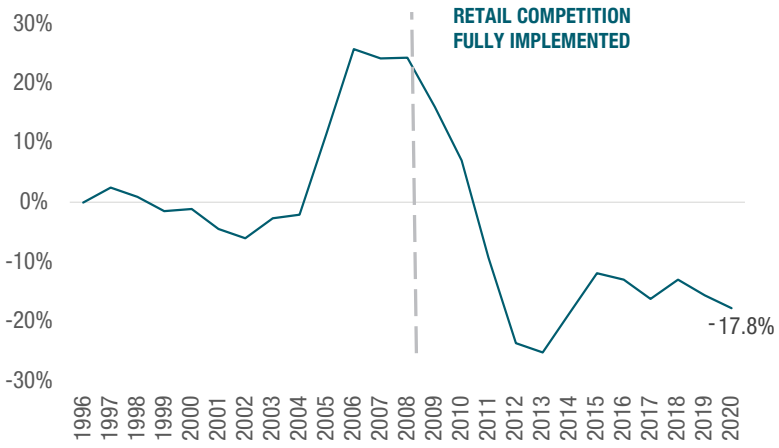
Source: Author calculations based on EIA data

FIGURE 8. The Difference between the Cumulative Change in Retail Electricity Prices – in Competitive States Compared to Monopoly States, Commercial Customers, 1996 – 2020



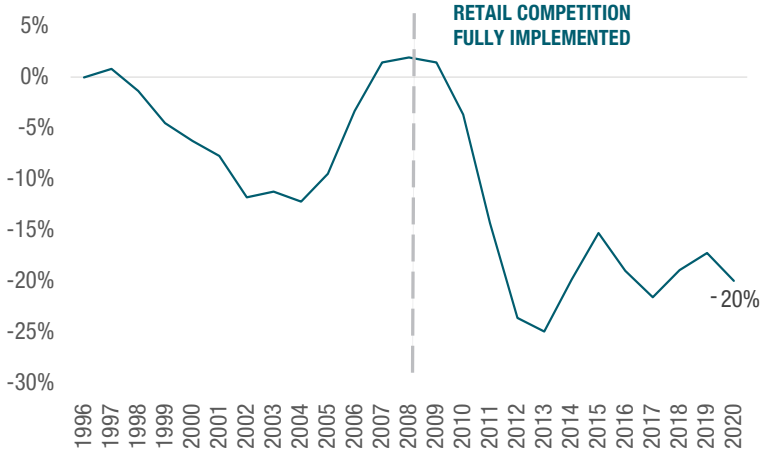
Source: Author calculations based on EIA data

FIGURE 9. Cumulative Change in Retail Electricity Prices, Industrial Customers
Current Competitive States Compared to Monopoly States, 1996 - 2020



Source: Author calculations based on EIA data

FIGURE 10
Cumulative Change in Retail Electricity Prices, Residential Customers
Current Competitive States Compared to Monopoly States, 1996 - 2020



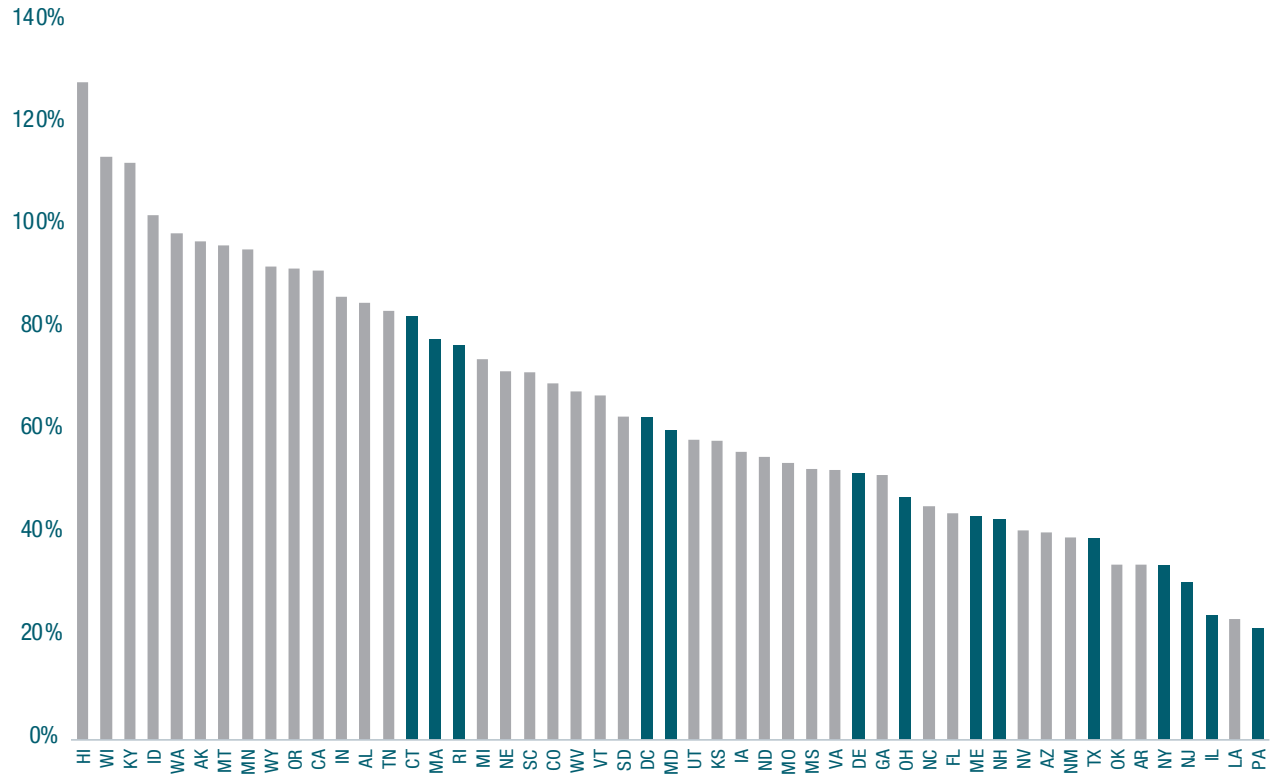
Source: Author calculations based on EIA data

Figure 9 shows that industrial customers experienced similar price patterns. Before the implementation of competition, retail prices in the competitive jurisdictions for industrial customers rose 74.2 percent compared to an increase of 49.8 percent in the monopoly states. Following the implementation of competition, industrial customers have seen prices decline 16.8 percent in the jurisdictions with retail competition, which is in stark contrast to the 8.7 percent growth in electricity prices for the industrial customers in monopoly states. As a result of these trends, the growth in prices between 1996 and 2020 in the competitive jurisdictions were 17.8 percent lower compared to the growth in prices in monopoly states.

Figure 10 demonstrates that the switch to competition also benefited residential customers. Prior to competition, residential customers in both categories of jurisdictions saw similar price increases (+39.0 percent in the retail competition jurisdictions compared to +37.0 percent in the monopoly states), which were less than the price increases for other customers (e.g., commercial and industrial). After competition was effective, prices increased for all residential customers. However, the price increases for residential customers living in jurisdictions with competitive markets (+9.2 percent) were significantly smaller than the price increases for residential customers living in monopoly states (+25.4 percent). In fact, residential customers in monopoly states have seen the largest increase in prices since 2008 whereas residential customers in competition jurisdictions have seen relatively modest price increases. Due to these trends, overall, the price increases in competitive jurisdictions between 1996 and 2020 were 20.0 percent less than the price increases that occurred in monopoly states.

Importantly, these results were not driven by a few outliers. Figure 11 presents the cumulative change in retail electricity prices for all customers between 1996 and 2020 by state. The states that have adopted retail competition are denoted by black bars. As Figure 11 demonstrates, four of the five states with the lowest price increases (Pennsylvania, Illinois, New Jersey, and New York) and five of the ten states with the lowest price increases (plus Texas), were states with retail competition. Alternatively, the ten states with the largest increases in retail electricity prices were all monopoly states (Hawaii, Wisconsin, Kentucky, Idaho, Washington, Alaska, Montana, Minnesota, Wyoming, and Oregon).

FIGURE 11. Cumulative Change in Retail Electricity Prices, All Customers by State, 1996 through 2020



Source: Author calculations based on EIA data

COMPETITIVE MARKETS ENSURE GREATER RELIABILITY COMPARED WITH MONOPOLIES

Another benefit created by competition is improved reliability. Competitive wholesale markets managed by RTOs or ISOs create significant reliability benefits for customers due to the wider geographical coverage, increased generation options, and market-established prices. Competition also improves overall efficiencies. For instance, in a review of the literature on the restructuring of U.S. electricity markets, Bushnell, Mansur, and Novan (2017) found that wholesale competition created significant efficiency benefits.[73] Specifically, Bushnell et al. found,

> Studies have demonstrated that expansion of RTO footprints has increased trade and improved coordination among power plants.
>
> Variable operating costs at regulated investor-owned plants in restructuring states declined in the 1990s, but not at municipal owned plants unaffected by the prospect of restructuring. Deregulation of nuclear power plants lead to substantial increases in their availability and output.
>
> Deregulation of coal-fired power plants lead to substantial decreases in their fuel prices.[74]

A 2019 study by the Brattle Group confirmed these results concluding that these efficiencies arise because

> the regional scheduling and dispatch of the transmission and generation allows the RTO or ISO to improve transmission availability and better manage unexpected facility failures on the system. This results in higher reliability without the need for increased investment in additional transmission or generation assets."[75]

Similar benefits also exist at the retail level. While not without limitations, two common measures of reliability are the system average interruption frequency index, or SAIFI, and the system average interruption duration index, or SAIDI.[76]

The EIA defines the SAIFI "as a measure of how often the average customer experiences a sustained interruption (of over 5 minutes)" over the reporting year. It is calculated as the ratio of the total number of customers that experienced an interruption of more than 5 minutes relative to the total number of customers. The lower the SAIFI, the more reliable the electricity system. Figure 12 demonstrates that the average SAIFI data for competitive jurisdictions including Major Event Days (MED) was 9.4 percent lower than the average SAIFI for monopoly states. Adjusting the data to exclude MED such as extreme weather events, competitive jurisdictions had 8.6 percent fewer service interruptions compared to monopoly states.

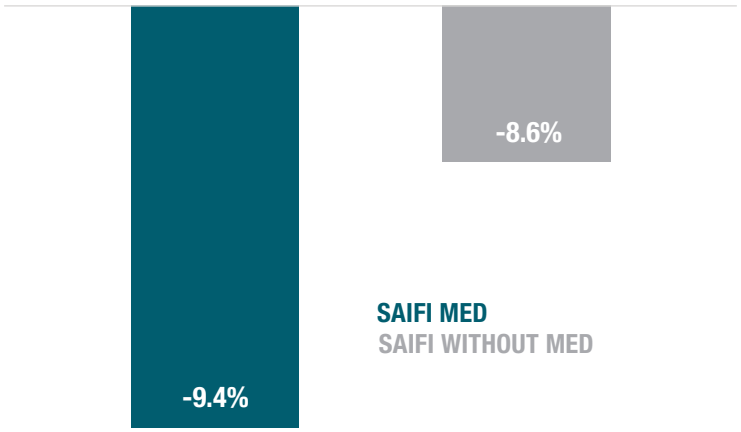
While the SAIFI measures the number of customers that are impacted, it does not provide insights regarding the duration of those outages. Clearly, an outage that lasts longer is more disruptive than an outage of a shorter duration. The SAIDI accounts for this consideration by measuring total number of customer minutes that are interrupted over the year relative to the total number of customers. Figure 13 presents this data for 2019. Figure 13 demonstrates that the average duration of the outages was 6.1 percent shorter in the monopoly states compared to the competitive jurisdictions, which increases after adjusting for MED (9.4 percent shorter).

Combined, Figures 12 and 13 support the notion that the quality of service in competitive states is superior to the quality of service in monopoly states. Further, as the analyses maintained by the Retail Energy Supply Association indicate, this discrepancy is not a one-time result, but a consistent quality advantage of the competitive states compared to the monopoly states.[77]

One limitation of these measures is that they do not discriminate between losses of power due to failures of the transmission lines (long-distance high-voltage transportation) from losses of power due to failures of the distribution lines (shorter distance lower-voltage transportation). From a generation perspective, it is interesting to view the reliability difference with respect to the transmission lines only.

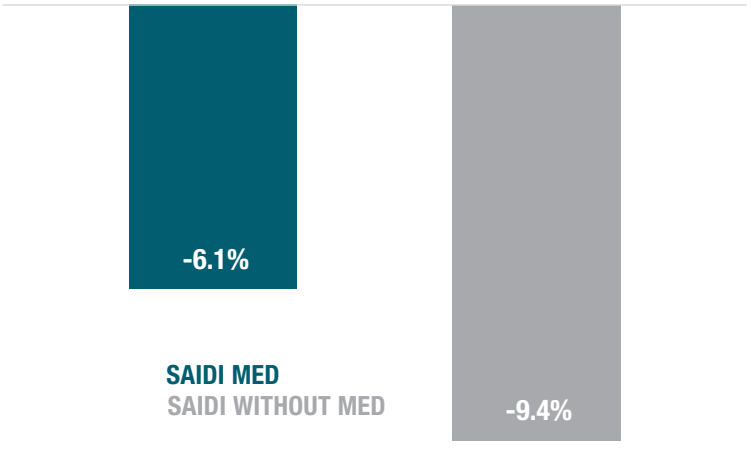
The EIA provides estimates of the SAIDI and SAIFI measures excluding the loss of supply (LOS), which are power outages caused by transmission lines. This measure filters out the disruptions caused by transmission lines. Taking the difference between the measures with and without LOS provides information regarding the frequency and duration of interruptions caused by transmission lines. Comparing the states based on whether the state is served (or mostly served) by an RTO or ISO demonstrates that the states served by RTOs have less frequent (a modified SAIFI measure that is 6.6 percent less) and shorter (a modified SAIDI measure that is 13.1 percent shorter) service interruptions than the states without an RTO or ISO.

FIGURE 12. System Average Interruption Frequency Index (SAIFI)
Competitive States Compared to Monopoly States, 2019



Source: Author calculations based on EIA data

FIGURE 13. System Average Interruption Duration Index (SAIDI)
Competitive States Compared to Monopoly States, 2019



Source: Author calculations based on EIA data

COMPETITIVE MARKETS HELP DELIVER SUPERIOR ENVIRONMENTAL BENEFITS COMPARED WITH MONOPOLIES

Competitive markets are also better positioned to implement efficient low-emission technologies due to the same positive incentives that lead to lower price increases and higher quality electricity generation. Competitive suppliers can neither ignore consumers' desires about low emissions technologies nor their desires about cost and reliability. Therefore, the electricity suppliers operating in competitive markets have an incentive to efficiently balance these considerations. Those suppliers who can balance them better will gain customers, those who cannot lose customers. These positive incentives do not exist for utilities operating in monopoly markets. Instead of balancing the needs of customers, monopoly utilities serve the need of regulators, and consequently lack the same incentives to serve customers' needs.

The evidence appears to be consistent with these incentives. When evaluating the impact of competition on the ability for commercial and industrial customers to increase their use of low-emission energy sources, the REBA Institute in collaboration with the Brattle Group, found that "allowing customers to choose their suppliers (such as in states with retail choice) has the highest technical potential for expanding access [to low-emission technologies] to the most C&I customers (potentially up to 100 percent) and lowering the cost of renewable energy procurement up to 11 percent" compared to customers who cannot choose their suppliers.[78]

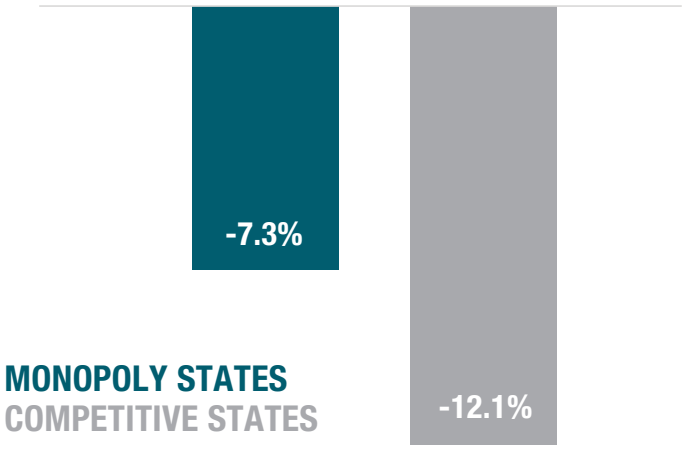
Competition at the wholesale level is also associated with improved emission outcomes. As Chen (2020) concluded,

> In terms of renewables development and integration, participation in RTOs and EIMs offer advantages. Interconnection and the ability to connect far-flung but cheap renewables with customers through transmission is an advantage of RTOs. For example, RTO regions have seen more wind generation development compared to comparably wind-rich regions outside of RTOs. Markets with large geographic reach can improve the flexibility of the power system, which is important in the long run as more variable renewables come online.[79]

Data from the EIA confirm these results. Figure 14 compares the average percentage change in carbon-dioxide emissions between 2008 and 2018 (the latest data available) in the retail competitive jurisdictions compared to the monopoly states. While emissions in the monopoly states declined 7.3 percent on average, emissions declined a larger 12.1 percent in the jurisdictions with retail competition. These data are consistent with the incentives for electricity suppliers in competitive markets.

FIGURE 14. Change in State Energy Related Carbon-dioxide Emissions Competitive States Compared to Monopoly States, 2008 Compared to 2018

Source: Author calculations based on EIA data



Conclusion

Economic theory has a generally unfavorable view of monopolies, and for good reason. Monopolies are associated with decreased consumer welfare, higher costs, and less innovation. The justification that electricity markets are different, and therefore an exception to this general economic principle, are simply incorrect. Instead, just as with the airline and telecommunications industries, wholesale and retail electricity services are not a natural monopoly. The evidence demonstrates that consumers benefit when traditional monopolies are replaced by competitive electricity markets.

Local utility monopolies operate on a cost-plus investment basis that makes customers, not investors, responsible for the costs of errant investments so long as the regulator has blessed the project. This incents local utilities to serve the needs of regulators, not customers. The problems of regulatory capture, bloated operations, and operational inefficiencies are the expected result.

> “Energy suppliers in competitive markets must serve the needs of customers.

In contrast with these adverse incentives, energy suppliers in competitive markets must serve the needs of customers. Otherwise, these businesses will lose revenues and, if not corrected, eventually go out of business. This market discipline leads to greater operational efficiencies and improved services for customers.

These beneficial theoretical outcomes are consistent with the experiences of the states that have adopted competition. The competitive states have, on average, experienced slower price growth, fewer power outages, and are reducing greenhouse gas emissions at a faster clip than the states that are still relying on the traditional monopoly model.

Since affordable and reliable electricity is an essential economic input, these market efficiencies improve the state’s overall economic competitiveness. Due to these stark differences in outcomes, establishing robust competitive markets in the states that are still relying on the traditional monopoly utility model is an essential reform.

Endnotes

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9 Wholesale electricity prices are measured as the locational marginal prices that reflect the value of electricity at different pricing nodes, accounting for load, generation, and the physical limits of the transmission system.

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