

Dr. Philip O'Connor: A Legacy of Leadership and a Powerful Force for Change

"Just go!" he once said. "I have learned that General Patton was right when he said... 'A good plan violently executed now is better than a perfect plan executed next week.'"

And with that, Dr. Phil O'Connor, less than one week before his passing, not only pushed for the opportunity to further emphasize the importance of the retail electric supply industry, he displayed perfectly in just two sentences his passion for the industry and his deep desire to facilitate change.

A Vision and a Voice

Dr. O'Connor was an incredible intellect and a respected voice for the Retail Energy Supply Association (RESA) and we are honored to have the opportunity to learn from and work with him. In his time working with RESA, he worked tirelessly to promote the benefits of restructured markets – and few knew more about the industry than he.

But his was a long and winding road. Dr. O'Connor began his career in politics, serving as political aide, advisor and strategist, and eventually went on to manage two winning gubernatorial campaigns. His political experience led him to the Illinois Department of Insurance and eventually to the Illinois Commerce Commission, where the seeds of his passion for the energy industry were planted.

As chairman of the Illinois Commerce Commission in the early 1980s, he was the first utility regulator to promote regulatory reform and move toward transition to a competitive electricity industry.

In the decades after, Dr. O'Connor became nationally recognized as an expert and leading advocate for the competitive electricity industry and for consumers' right to choose. He even spent a year working in the U.S. Embassy in Baghdad, Iraq, as advisor to the Iraqi Ministry of Electricity, helping to determine electricity needs in Iraq.

The Great Price Divergence

"Big change is coming," said Dr. O'Connor in a 2016 interview with Engie Energy's Market Monitor Blog. "...one-third of all electricity in the country has been produced

and consumed in markets where there is customer choice. We know it works, we know it can be done, and we know there is a huge divergence in price trends.”

Now just over two years after that interview, RESA is honored to release Dr. O’Connor’s final white paper entitled, “The Great Divergence in Competitive and Monopoly Price Trends,” which he co-wrote with Muhammad Khan. Because of this research, we start to get a clearer picture of the reasons behind the price disparities among monopoly states and competitive markets.

His ultimate goal was to use what we’ve learned to create future reforms that adapt regulation to modern conditions. It’s what Dr. O’Connor spent years working toward and it’s what he believed consumers need and deserve.

“Big change is coming,” he said. And we believe him.

The Great Divergence in Competitive and Monopoly Electricity Price Trends

By Philip R. O'Connor, Ph.D. and Muhammad Asad Khan

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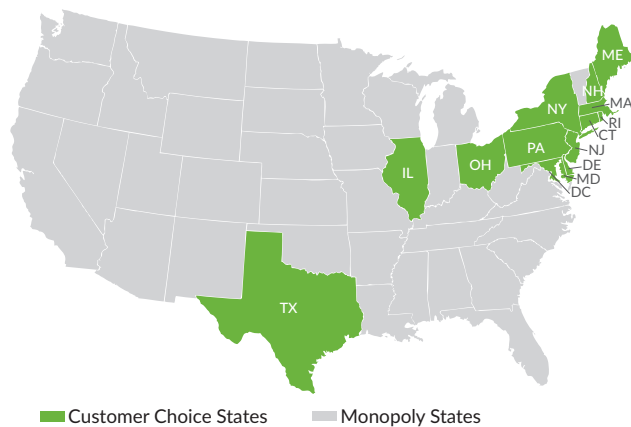
ONE-THIRD OF A TRILLION DOLLARS

That is how much more electricity consumers paid for power in traditional vertical monopoly states over the past decade than if percentage price change trends in those states had been the same as those in electricity choice jurisdictions. This Great Divergence cries out for an explanation.

TWO PARALLEL REGULATORY SYSTEMS

For the past two decades, two different electricity regulatory regimes have existed side-by-side. Thirty-five states in the contiguous United States largely have adhered to the traditional vertically integrated monopoly model.¹ Seven of those thirty-five continue to regulate rates in the conventional way while permitting only highly restricted access to regional power markets, mainly for a portion of large customers.² Fourteen other jurisdictions, thirteen states and the District of Columbia, allow for in-depth retail electricity competition in which almost all customers are served at market prices and in which utilities divested their generation assets or devolved them to competitive affiliates.³ These competitive retail markets account for one-third of the nation's electricity generation and consumption. With the notable exception of Texas, market-based electricity supply pricing and consumer choice of electricity supplier is concentrated in the northeastern quadrant of the country (Figure 1).

Figure 1: 14 Competitive Retail Markets Have One-Third of U.S. Power Consumption



PRICE LEVEL DIFFERENCES V. DIFFERENCES IN DIRECTION

Electricity prices are the result of a myriad of variables that can differ in value across place and time. Localized conditions include load factor and seasonal usage patterns,

generation fuel mix, transmission congestion, taxation and wage levels, weather and regulatory decisions that allocate costs among customer classes.

Other factors, such as the national economy and prices of various fuels will tend to be more similar across the country.

Some critics of retail competition point to higher average prices of electricity service in most of the fourteen competitive jurisdictions than in many of the monopoly states. However, this ignores the reality that for decades prior to the introduction of choice, most of the current fourteen competitive jurisdictions had higher average prices than did the current group of monopoly states. These price differences prevailed in an era of nearly identical regulatory models in every state.

The challenge, therefore, is not to explain differences in nominal price levels, but to explain the substantial differences in directionality of electricity price trends that have become evident between choice jurisdictions and the monopoly group of states.

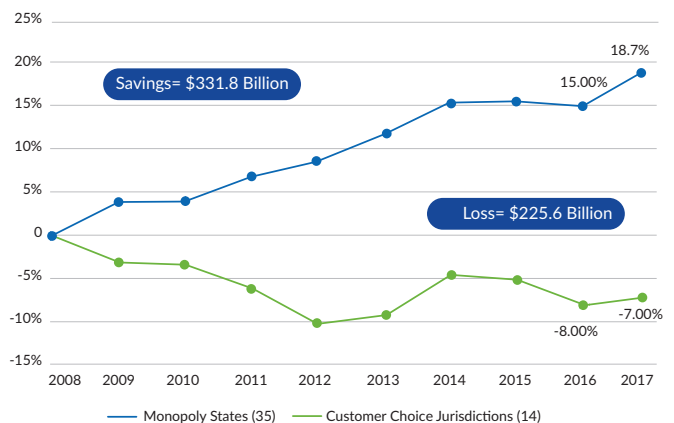
A DECADE OF DIVERGENT PRICE PATHS

U.S. Energy Information Administration (EIA) data allow for a comparison of trends in weighted average nominal prices between the monopoly group of states and the competitive jurisdictions.⁴

The All-Sector annual weighted average price⁵ in the thirty-five monopoly states was 18.7% higher in 2017 than in 2008 (Figure 2). In contrast, the All-Sector annual weighted average price for the competitive retail markets was 7% lower than in 2008.

Figure 2: All-Sector Weighted Average

% Price Change - 25.7% Spread



Weighted average prices in the individual customer segments have experienced divergent trends consistent with All-Sector prices.

- The residential weighted average price in the monopoly states was 22.3% higher in 2017 than in 2008 compared to just a 2.4% increase in the choice jurisdictions (Figure 3).
- The commercial weighted average price increased by 16.3% in the monopoly states but declined by 11.7% in the choice jurisdictions (Figure 4).
- The industrial weighted average price in the monopoly states rose by 11.8% yet declined by 21.1% in the competitive markets (Figure 5).

Figure 5: Industrial Weighted Average

% Price Change - 32.9% Spread

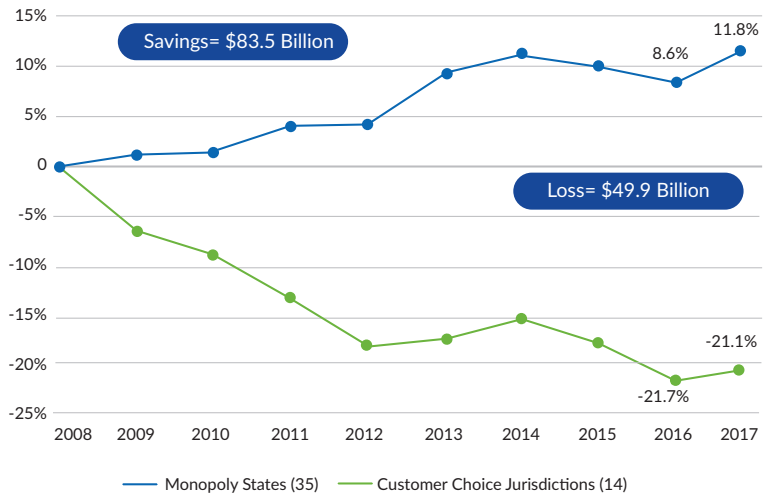
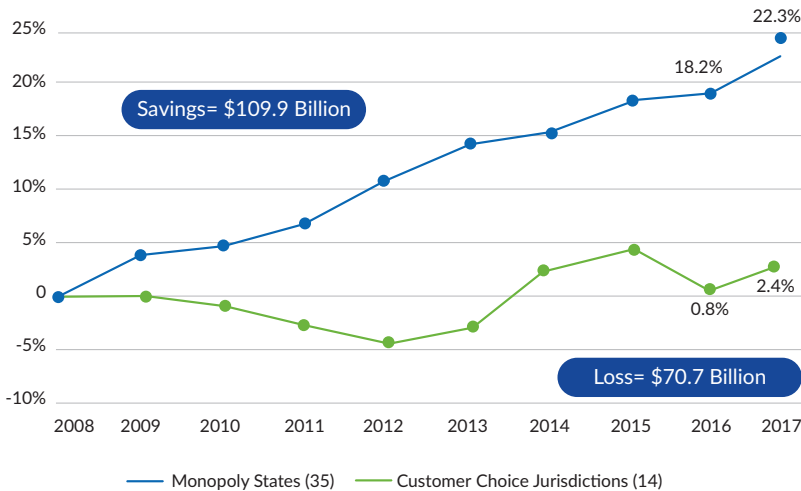


Figure 3: Residential Weighted Average

% Price Change - 19.9% Spread



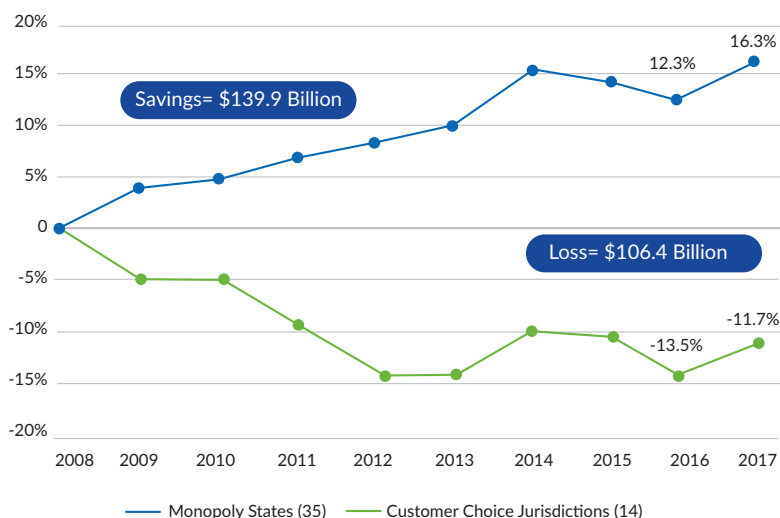
The dollar implications of such spreads in price paths are large. If 2008-2017 annual percentage price changes in the thirty-five monopoly states had tracked with percentage price changes in the fourteen competitive jurisdictions, all consumers in the monopoly states would have paid one-third of a trillion dollars (\$331.8 billion) less.

By major customer class, the savings would have been \$109.9 billion for Residential, \$139.9 billion for Commercial and \$83.5 billion for Industrial.⁶

The flip side is that if the same price trend patterns that occurred in the monopoly group had also prevailed in the competitive jurisdictions, the hypothetical cost to electricity customers in the fourteen choice markets would have been higher by \$225.6 billion for All-Sector, \$70.7 billion for Residential, \$106.4 billion for Commercial and \$50 billion for Industrial.

Figure 4: Commercial Weighted Average

% Price Change - 28% Spread



DIVERGENT DIRECTIONS AND STATE RANKINGS

The large difference in percentage changes in weighted average prices between the monopoly and competitive choice jurisdictions is not the result of a few large states skewing the results in one direction or the other. Rather, when the states are ranked by percentage change in each state's average All-Sector

tend to cluster in the lower range and the monopoly states tend to occupy the higher parts of the rankings (Figure 6). A similar clustering is evident when states are ranked by percentage changes in average prices for the three major customer segments, Residential (Figure 7), Commercial (Figure 8), and Industrial (Figure 9).

Figure 6: All-Sector % Price Change State Rankings 2008-17

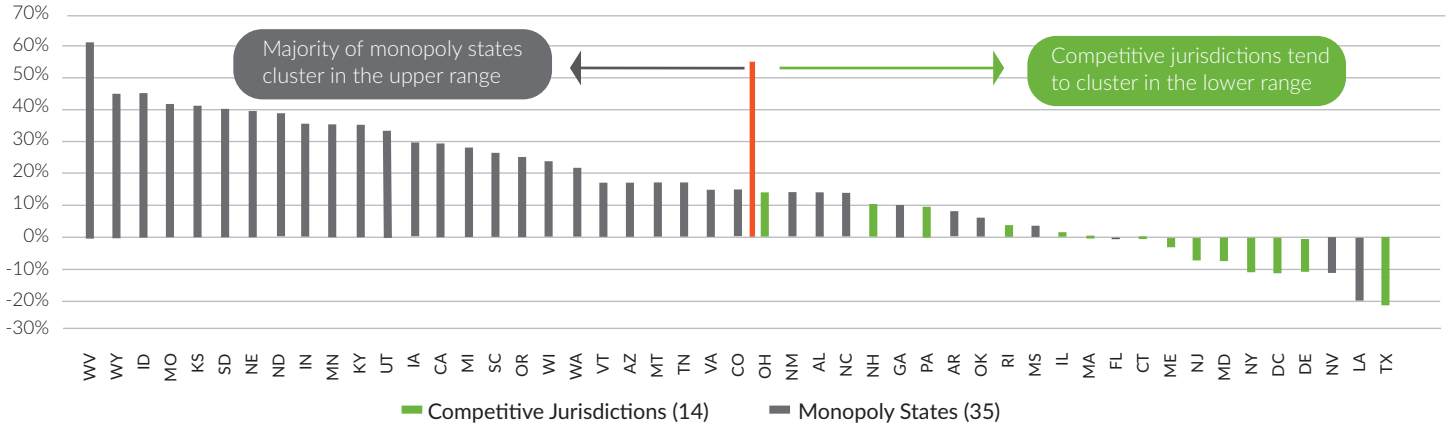
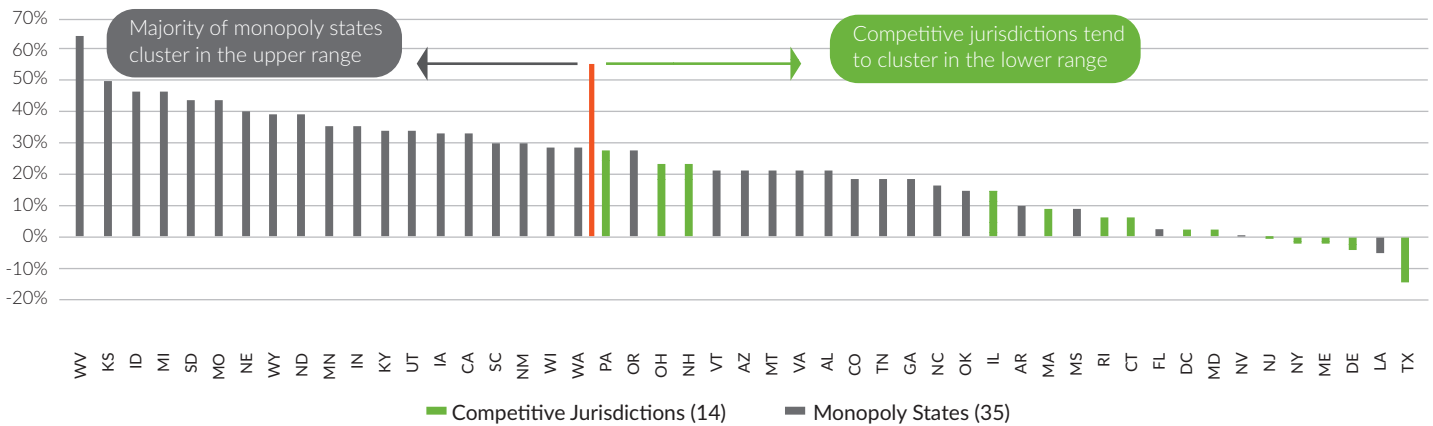


Figure 7: Residential % Price Change State Rankings 2008-17



price between 2008 and 2017, the competitive jurisdictions

(Figure 8) and Industrial (Figure 9).

Figure 8: Commercial % Price Change State Rankings 2008-17

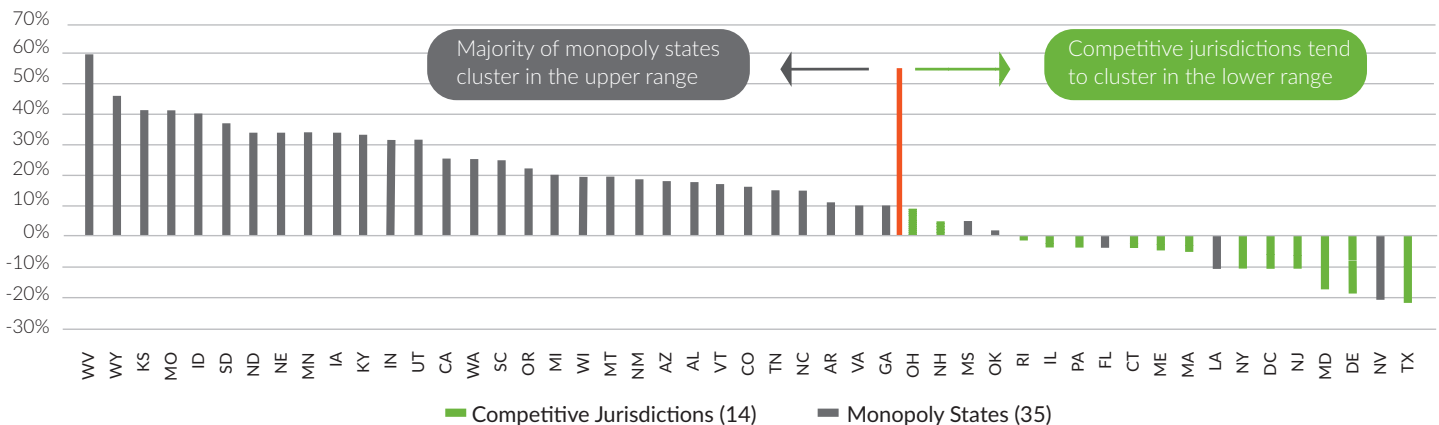
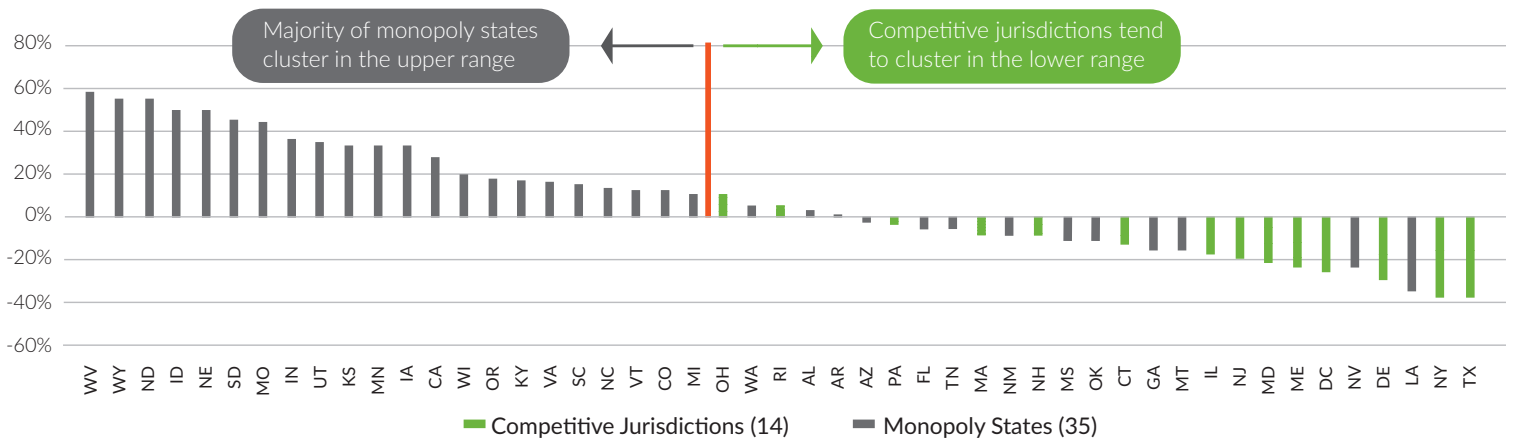


Figure 9: Industrial % Price Change State Rankings 2008-17



CONVERGENCE BEGETS DIVERGENCE

Over the past decade, the electricity world has come to be characterized by the convergence of unprecedented conditions, the most significant being persistently flat load and the shale gas revolution.

These new conditions appear to be playing out with different consequences in monopoly and competitive markets. Traditional monopoly and classic rate-of-return regulation tend toward rigidity while competitive markets are inherently more flexible in mediating these new conditions.

1. Flat Load and Fixed Costs

After decades of strong annual growth in electricity consumption, by the late 1960s load growth started to slow. In the period 2000-2008, average annual load growth was just 1%. In this period, which coincided with the transitional years from monopoly to full customer choice in the competitive markets, grid sales volume rose in the aggregate by 10.6% in the thirty-five monopoly states and by 6.3% in the fourteen competitive jurisdictions.

Over the past decade, 2008-2017, grid-served load has been flat or slightly negative. 2017 electricity consumption in the contiguous United States was nearly 2.2% lower than in 2007. Both the group of thirty-five monopoly states and the group of fourteen choice jurisdictions saw load decline, at 2.5% and 1.6%, respectively. Only in 2014 was load just slightly greater than in 2007.⁷

While directionality of sales volume has been largely the same in both the monopoly and competitive groups, the ways in which system costs are addressed have been

fundamentally different. In competitive markets, only delivery service provided by the local wires utility is regulated on a cost-of-service, rate-of-return basis. In traditional monopoly states, and for the most part in the hybrid states, top-to-bottom price regulation remains in force. As a general matter, owners of generation assets in competitive markets must seek recovery of fixed costs and return of and on capital in competition with other regional producers.⁸

It should be no surprise that in a decade of flat or declining load, traditional regulation would exert upward pressure on prices because power plant investment must be compensated even if there is weak demand. In competitive markets, weak demand will tend to exert downward pressure on prices for generation. Central to the Great Divergence is that the monopoly model increases price precisely because there is weak demand.

2. The Shale Gas Revolution and Power Plant Utilization

“Fracking” has produced huge quantities of natural gas at low prices. Monopoly states and choice jurisdictions both have had access to natural gas at comparable prices over the past decade as the shale gas phenomenon has developed.

In both the monopoly and the choice groups, there has been a substantial shift in electricity production fuel mix from coal toward natural gas. In this respect, the trends in both groups have been similar. Between 1997 and 2008, there was a gradual increase in the market share of gas-fired generation and a corollary gradual decline for coal-fired production. Between 2008 and 2017, the trends accelerated in both groups. In the competitive jurisdictions, coal’s market share declined from 47.6% in 1997 to 42% in 2008 and then down to just 24.8% in 2017. At the same time, the market share of

gas in the competitive group rose from 21.8% in 1997 to 24.9% in 2008 and then 34.7% in 2017 (Figure 10). By contrast, coal's dominance in the monopoly states was at 55.7% in 1997, eased to 51.5% in 2008 and then fell to 32.7% in 2017, roughly equal to the share for natural gas (Figure 11).

oly states than in competitive jurisdictions (Figure 12).⁹ The average capacity factor in the monopoly states declined from 52.2% in 1997 to 42% in 2016 (the most recent year for which EIA data are available). That is a one-fifth decrease (19.5%) compared to the much more modest decline in average capacity factor in the competitive markets from 49.4% in 1997 to 45.8% in 2016, a proportional decline of 7.3% or about

one-fourteenth. Plant utilization, as measured by capacity factor, has declined in far greater proportion in the group of monopoly states than in competitive markets, due in great part to the shift from coal toward gas. However, as long as rate-based capacity is considered “used and useful”—even if underutilized— full cost recovery is accorded, with consumers absorbing those costs. In contrast, underutilized or uneconomic capacity in competitive markets will tend to experience adverse financial consequences under the same conditions. The difference is that investors, not customers, are the ones bearing the risk of changing market fundamentals.

Figure 10: Generation Mix in Competitive Jurisdictions

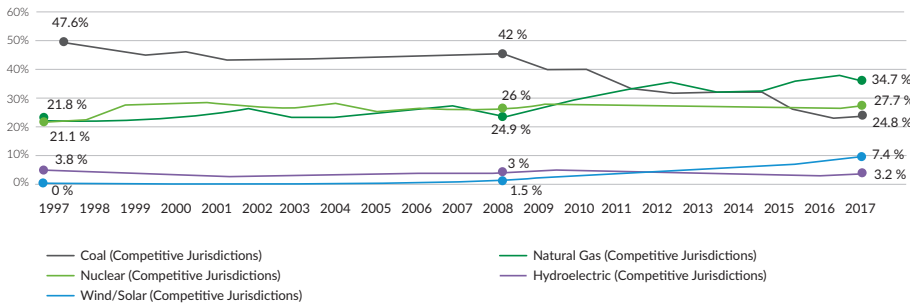
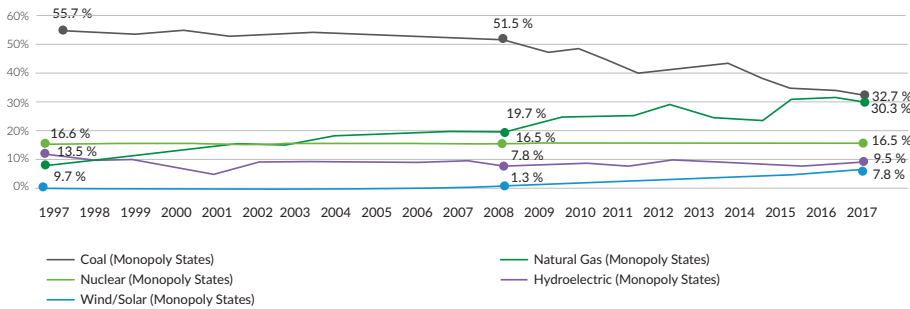


Figure 11: Generation Mix in Monopoly States



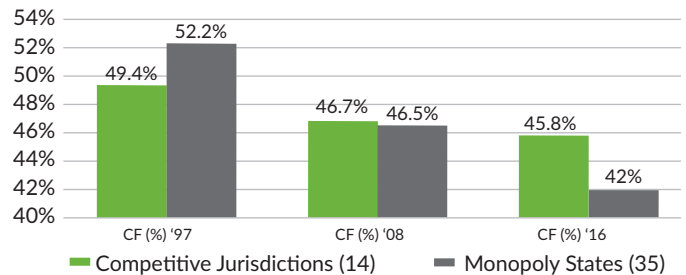
Over the same time periods, trend lines for wind and solar together have been nearly identical in both groups of states, rising from a negligible position in 1997 to more than 7% in 2017. The market share for nuclear remained steady at about 16.5% in monopoly states over the entire 1997-2017 period. In choice jurisdictions, nuclear market share has stayed steady at over 26% after a noticeable increase in the late 1990s as the final tranche of nuclear plants came on line and nuclear generation performance also improved.

The explanation of the Great Divergence between the monopoly states and competitive jurisdictions is not to be found in the similar trend lines moving from coal to gas and negligible differences in patterns of renewables and nuclear resources. There is, however, a knock-on effect that may partially explain the Great Divergence in price direction. Monopoly regulation and competitive markets accord fundamentally different treatment to power plant utilization.

The decline in power plant portfolio capacity factor has been larger, both nominally and proportionally, in the monop-

Figure 12: Capacity Factors

Significant Decline in Monopoly States



WHAT NOW?

The differing responses of competitive and monopoly regimes to flat load and the implications of the shale gas revolution as well as the effect of merit order dispatch in organized wholesale markets and competitive pressures to improve efficiency may well provide a fulsome explanation for the Great Divergence. If a widely accepted explanation can be arrived at, that could be the foundation for future reforms that adapt regulation to modern conditions.

ABOUT THE AUTHORS

Philip O'Connor, Ph.D. is President of PROactive Strategies, a Chicago energy and insurance regulatory consulting firm. He is a former Chairman of the Illinois Commerce Commission, and Illinois Director of Insurance. As a utility regulator in the 1980s, Phil was an early advocate of competitive electricity markets. In 2017 he authored the RESA-published Restructuring Recharged: The Superior Performance of Competitive Electricity Markets 2008-2016 available at https://www.resausa.org/sites/default/files/RESA_Restructuring_Recharged_White%20Paper_0.pdf.

Muhammad Asad Khan, is a Master's student in the Engineering Management program at Northwestern University and an analyst for Clean Energy Blockchain Network. Previously, Asad was a Deputy Manager for the LalPir Power Ltd thermal plant, formerly an AES Corp. project, in Pakistan. He earned his bachelor's degree in Electrical Engineering from The University of Engineering and Technology in Lahore, Pakistan.

ENDNOTES

¹ Alaska and Hawaii, which operate under the traditional monopoly model, are excluded from the analysis due to their unusual geographic situations. In any event, their small load would have little effect on the results.

² The seven "hybrid" states that allow for limited customer choice enacted laws during the same period 1996-2001 that the fourteen choice jurisdictions did but never fully implemented them. These are Arizona, California, Michigan, Montana, Nevada, Oregon and Virginia. The great majority of customers in the seven hybrid states are in the same position as counterparts in the 35 traditional monopoly states, taking service from the local monopoly utility on the basis of broad-based tariffs set on traditional rate base, rate-of-return regulation.

³ Customer choice states customarily have excluded municipal and rural cooperative electric utilities from requirements to provide customers with access to competitive supply. Their relative portion in terms of statewide load is small in most cases. Customers in investor-owned utility service areas who do not choose a competitive, non-utility provider are generally served with market priced supply acquired through competitive procurement processes by utilities, except in Texas where a competitive provider assignment approach is used.

⁴ Because the portion of load in the group of thirty-five monopoly states provided with retail market access is trivial and the portion of total load exempted from choice in competitive markets is modest (mainly municipal and rural cooperatives), states can be fairly used as the units of analysis. Further, the seven "hybrid" states with highly restricted market access tend to perform much as do traditional monopolized states.

⁵ The analysis in this article uses weighted average prices to compare the two groups of states, competitive and monopoly. To standardize the basis for prices, weighted average prices take account of sales volumes in each state in the two groups by combining all revenue and dividing by all consumption.

⁶ The three subset customer classes do not sum exactly to All-Sector values since EIA also reports data from electricity used in Transportation and Other categories which are both included in the All-Sector figures but are not represented individually in this analysis.

⁷ EIA's July 2018 Electric Power Monthly with data through May 2018 shows a 3.7% increase in retail sales in the United States over the first five months of 2017. Most of the increase was accounted for by the 8.2% surge in residential usage.

⁸ Methods of doing so include Regional Transmission Organization capacity auctions, bilateral capacity contracts and energy-only sales.

⁹ Some portion of the average decline in overall capacity factor for utility scale plants is likely attributable to the growing role of renewables—mainly wind and solar—which are both intermittent and characterized by relatively low capacity factors.

