

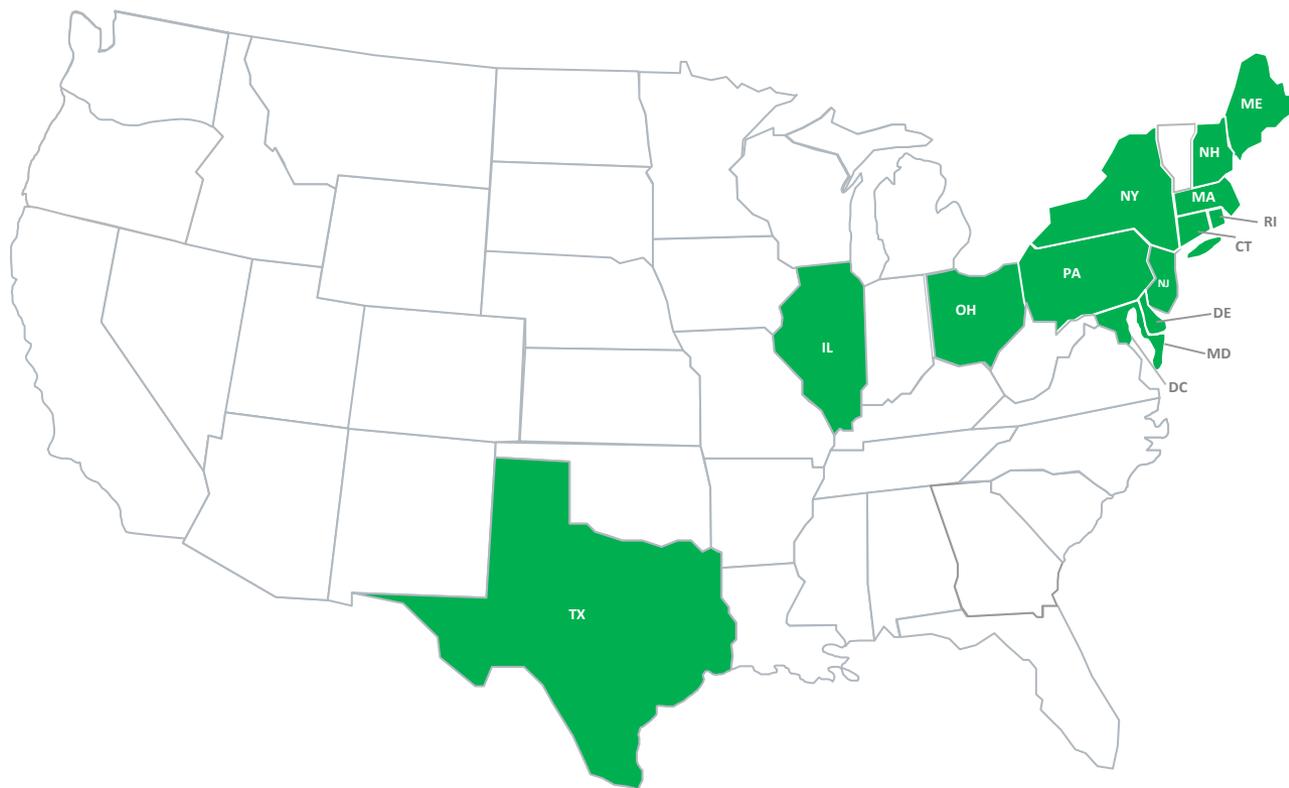


Great Divergence (September 2017), All Charts Update

July 2019

14 Customer Choice Jurisdictions

These 14 jurisdictions (13 states plus Washington DC) each have enabled Retail Choice for Nearly All Customers. These jurisdictions represent nearly 1/3 of all electricity consumption in the continental US



 Competitive Jurisdictions

Traditional States

Figure 3 (page 13) of Restructuring Recharged (April 2017) and Figure 1 (page 4) of Great Divergence (September 2018)
Updated through CY2018

These 14 competitive jurisdictions shown in green (13 states plus Washington DC) account for one-third of U.S. electricity power production and consumption. The designation of “competitive jurisdiction” in this paper is defined as a jurisdiction that:

- Enables nearly all classes of customers to be able to choose a retail supplier without cumbersome restrictions or limitations, and,
- That the utilities in these jurisdictions have divested all (or nearly all) of their generation assets and are therefore primarily wires-only delivery service companies. Consequently, the generating assets in these states are not included in the rate-base of these delivery service utilities and are therefore competing within the wholesale power market parameters in place for business revenues.

It should be noted that several other states—including California, Michigan, Arizona, Oregon, Nevada, Virginia and Montana—allow limited portions of total load to be served competitively at retail, while denying the great majority of customers a choice of supplier. These hybrid states are regulated largely under the traditional monopoly model and are treated accordingly in this paper (see note below concerning the ‘hybrid’ states). The primary focus of this whitepaper examines the various aspects and outcomes of these 14 jurisdictions (combined) vs. the 35 monopoly states (combined) on a whole host of measures including generator builds, performance and capacity factors, pricing performance by rate class, switching activity and the like.

Figure 3 (page 13) of Restructuring Recharged (April 2017) and Figure 1 (page 4) of Great Divergence (September 2018)

Updated through CY2018

Continued...

The Transitional Decade 1998-2007

Each of the 14 competitive jurisdictions proceeded at different speeds and in different ways during the transitional decade. 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.

By 2008, in competitively restructured states:

- Most utility generation had been divested to unaffiliated firms or devolved to competitive generation affiliates, resulting in nearly half of all productive capacity in the country being owned and operated by a diverse array of non-utility companies;
- Utilities had been compensated for “stranded” investment in uneconomic generation;
- Large numbers of retail suppliers were offering competitively priced supply;
- Millions of customers, especially in the commercial and industrial classes, had embraced supplier choice;
- Nearly a majority of consumption in the 14 customer choice markets was satisfied by non-utility suppliers;
- Default service programs, mainly for residential and small business customers not choosing an alternative supplier, were functioning well, providing competitively priced supply, usually procured by utilities in the market and divorced from traditional rate-of-return price regulation; and
- Billions of dollars in new generation investment was made at similar paces in both monopoly and competitive states.

Figure 3 (page 13) of Restructuring Recharged (April 2017) and Figure 1 (page 4) of Great Divergence (September 2018)

Updated through CY2018

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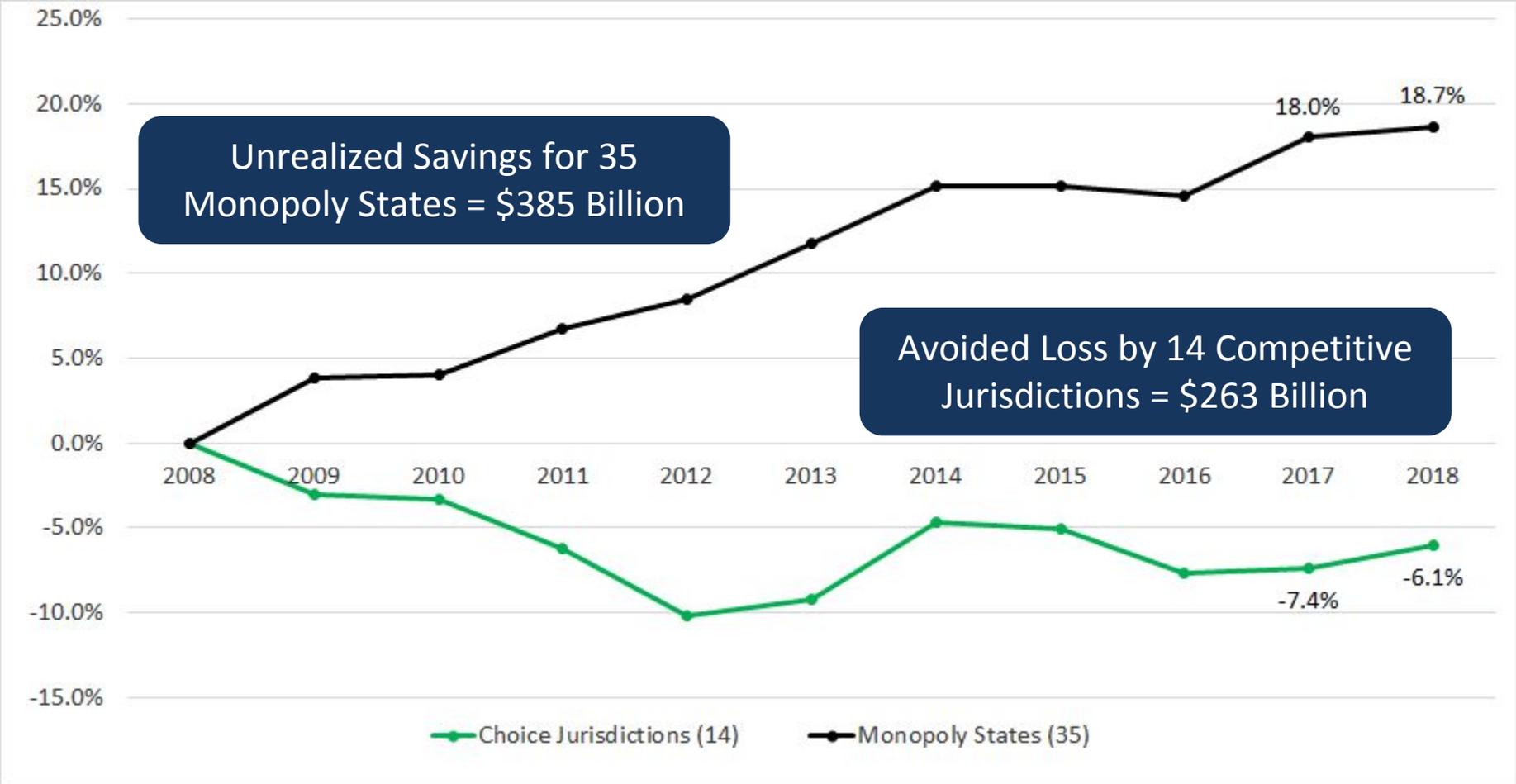
The 'Hybrid' States

Hybrid states are as varied in their approaches to limiting retail customer choice as are the choice states in the details of their market-based programs (perhaps even more so). In all cases, however, there is strong evidence of considerable customer demand for market access that is permitted to be satisfied under the rules. In Michigan, for example, more than twice as much load than the 10% permitted to access choice is enrolled in choice "queues." Industrial and commercial customers in Arizona, California and Oregon have eagerly participated in legislative and regulatory proceedings considering expanded market access. In Nevada, the constitutional amendment adopted by a 72% voter majority in the November 2016 election was originally promoted for the ballot by large customers dissatisfied with utility and regulatory obstacles to electricity retail competition. However, in November 2018 that measure was voted down in large part due to Nevada Energy (utility) opposition. Meanwhile, as of this writing (June 2019), other states are contemplating various forms of competitive markets such as Indiana, South Carolina, Florida and Louisiana.

All-Sector Weighted Average Percentage Price Change, Choice vs. Monopoly States, 2008-2018

% Price Change – 24.8% Spread

Source: EIA-861M



The information presented in this document represent the views of RESA as an organization and may not necessarily reflect the views of any particular RESA member.

A DECADE OF DIVERGENT PRICE PATHS

Figure 2 (page 4) of The Great Divergence (September 2018)

Updated through CY2018

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. The All-Sector annual weighted average price in the thirty-five monopoly states was 18.7% higher in 2018 than in 2008. In contrast, the All-Sector annual weighted average price for the competitive retail markets was 6.1% lower than in 2008.

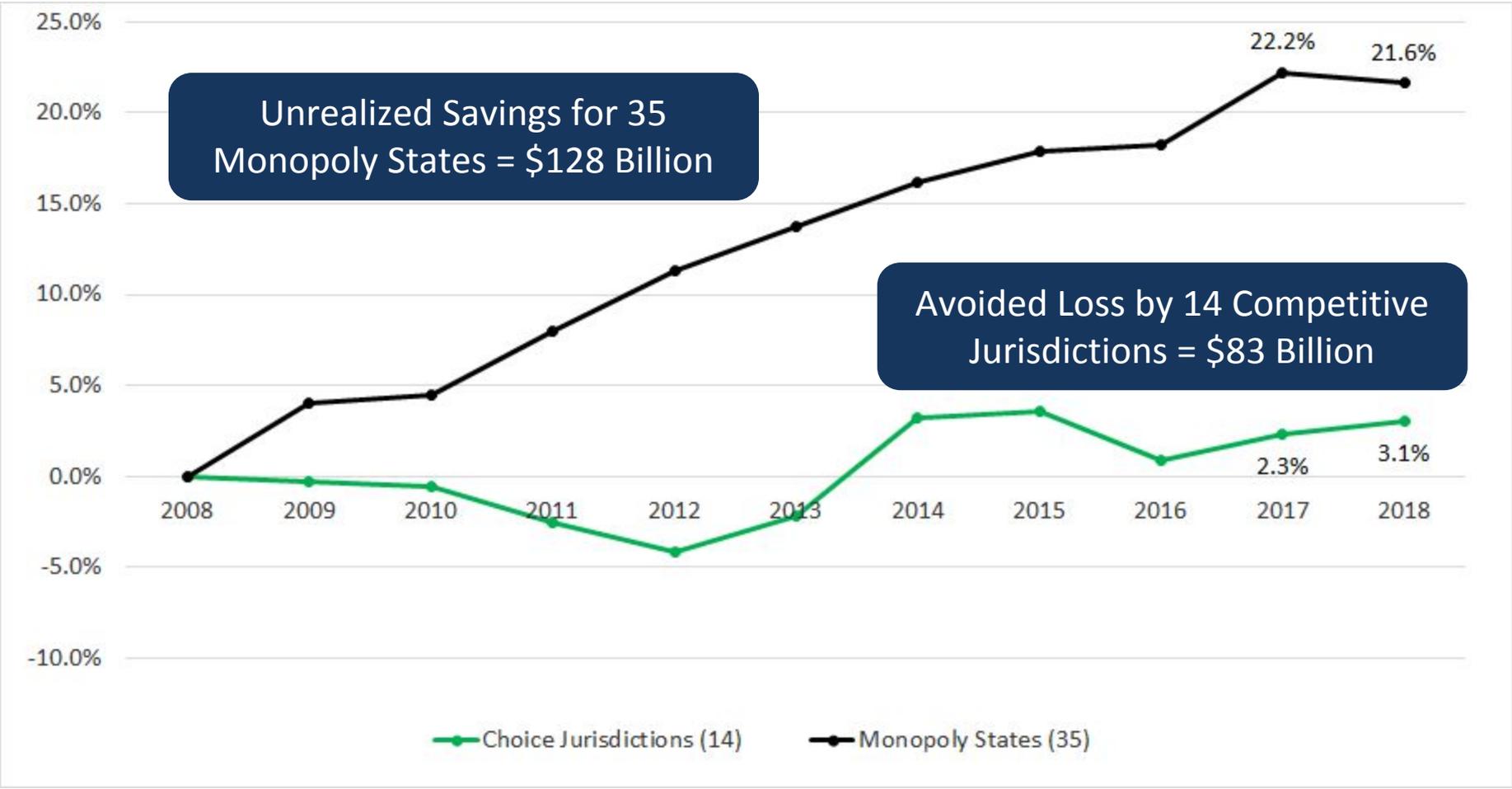
The dollar implications of such spreads in price paths are large. If 2008-2018 annual percentage price changes in the thirty-five monopoly states had tracked with percentage price changes in the fourteen competitive jurisdictions, all consumers in the monopoly states *would have saved* one-third of a trillion dollars (\$385 billion). By major customer class, the savings (in the monopoly states) would have been \$128.3 billion for Residential, \$161.4 billion for Commercial and \$97.2 billion for Industrial.*¹

*1: 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 \$263.1 billion for All-Sector. By major customer class, the avoided cost in the competitive jurisdictions is \$82.7 billion for Residential, \$123.4 billion for Commercial and \$58.5 billion for Industrial.

Residential Weighted Average Percentage Price Change, Choice vs. Monopoly States, 2008-2018

% Price Change – 18.5% Spread

Source: EIA-861M



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A DECADE OF DIVERGENT PRICE PATHS

Figure 3 (page 5) of The Great Divergence (September 2018)

Updated through CY2018

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. The Residential annual weighted average price in the thirty-five monopoly states was 21.6% higher in 2018 than in 2008. In contrast, the residential annual weighted average price for the competitive retail markets was only 3.1% higher than in 2008.

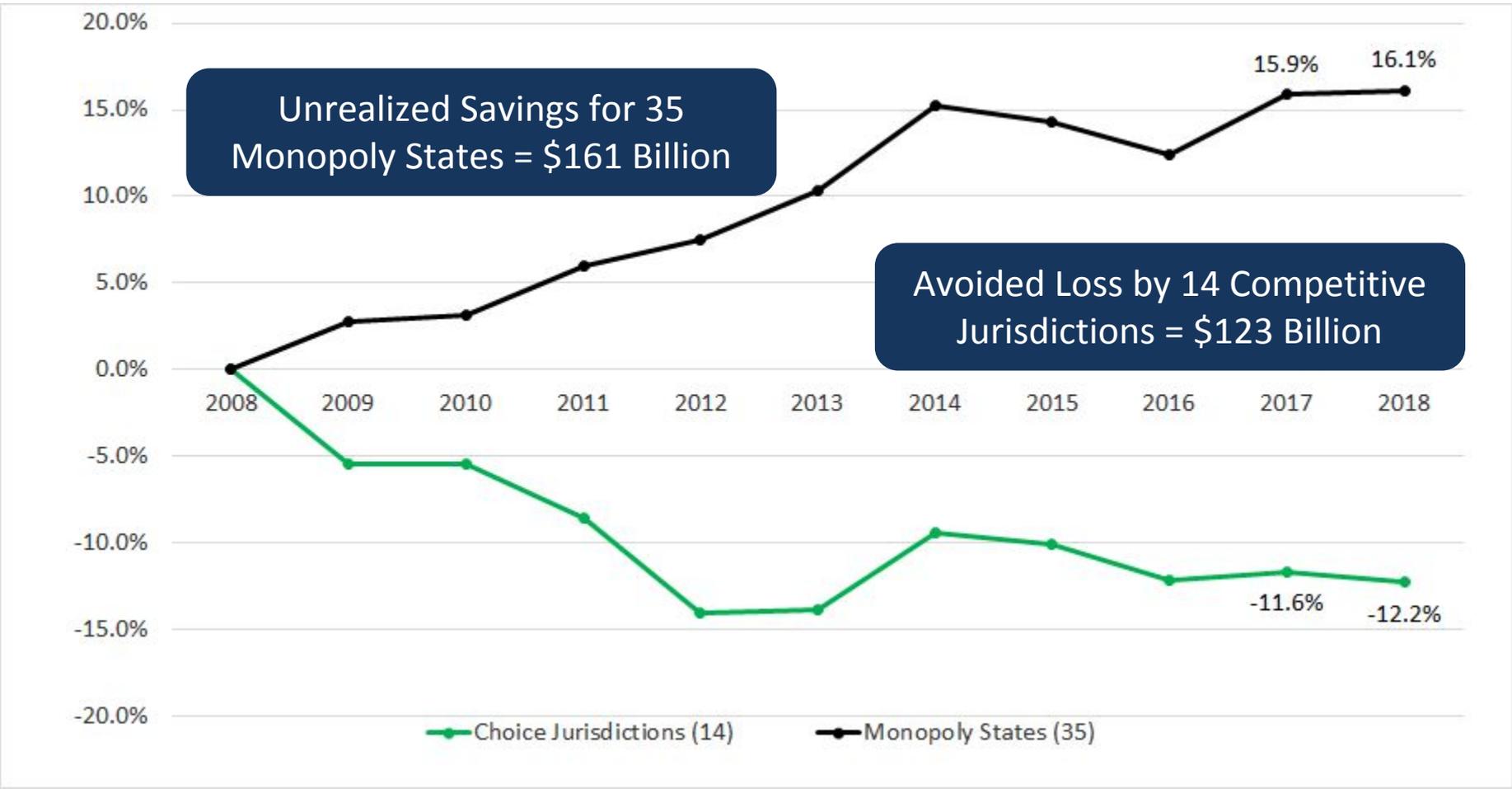
The dollar implications of such spreads in price paths are large. If 2008-2018 annual percentage price changes for residential customers in the thirty-five monopoly states had tracked with residential percentage price changes in the fourteen competitive jurisdictions, then residential customers in the monopoly states *would have saved* **\$128.3 billion**.^{*1}

*1: 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 incremental cost to residential electricity customers in the fourteen choice markets would have been higher by **\$82.7 billion**.

Commercial Weighted Average Percentage Price Change, Choice vs. Monopoly States, 2008-2018

% Price Change – 28.3% Spread

Source: EIA-861M



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A DECADE OF DIVERGENT PRICE PATHS

Figure 4 (page 5) of The Great Divergence (September 2018)

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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. The Commercial annual weighted average price in the thirty-five monopoly states was 16.1% higher in 2018 than in 2008. In contrast, the commercial annual weighted average price for the competitive retail markets was 12.2% lower than in 2008.

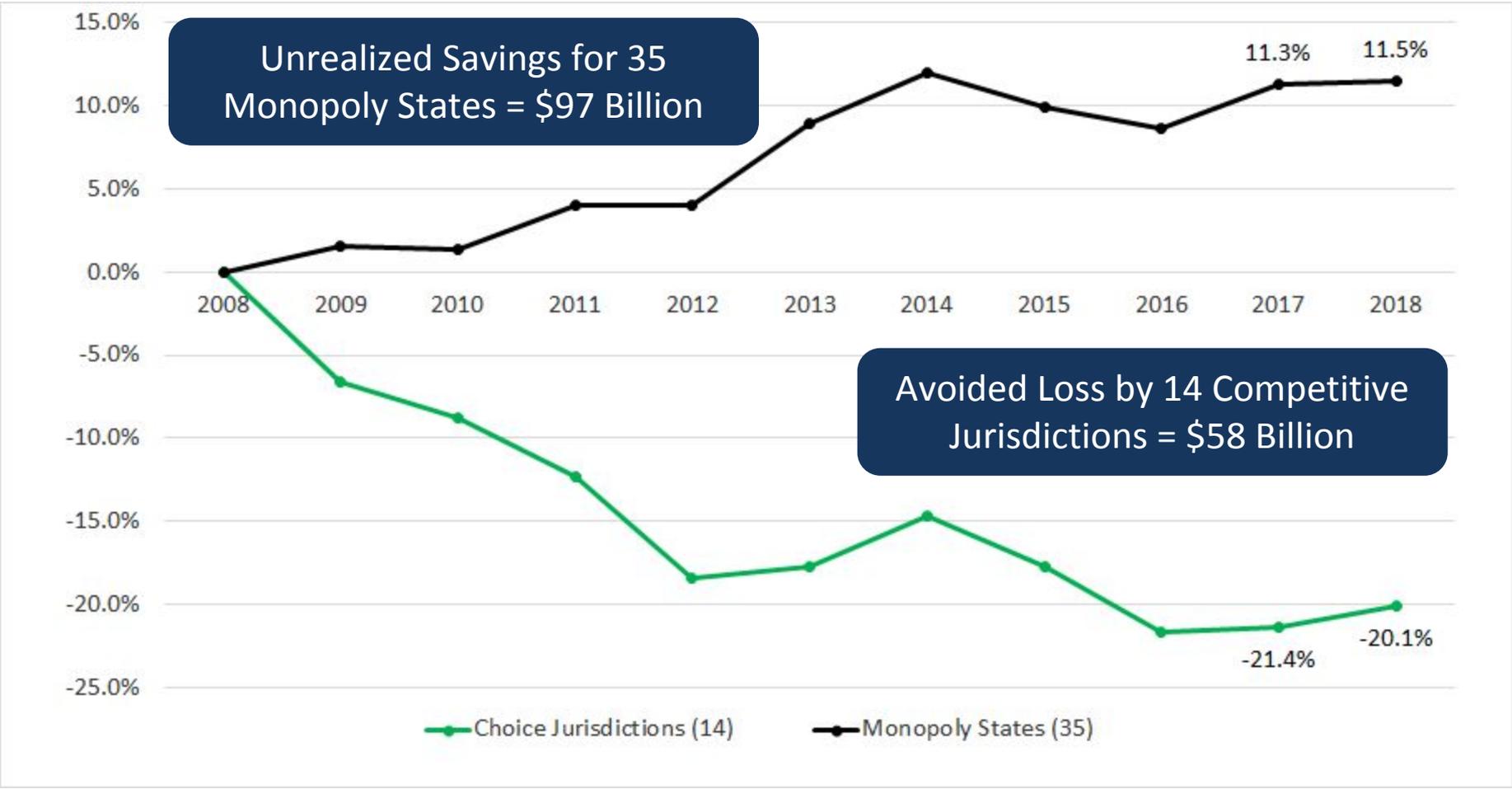
The dollar implications of such spreads in price paths are large. If 2008-2018 annual percentage price changes for commercial customers in the thirty-five monopoly states had tracked with commercial percentage price changes in the fourteen competitive jurisdictions, then commercial customers in the monopoly states *would have saved* **\$161.4 billion.**^{*1}

*1: 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 incremental cost to commercial electricity customers in the fourteen choice markets would have been higher by **\$123.4 billion.**

Industrial Weighted Average Percentage Price Change, Choice vs. Monopoly States, 2008-2018

% Price Change – 31.6% Spread

Source: EIA-861M



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A DECADE OF DIVERGENT PRICE PATHS

Figure 5 (page 5) of The Great Divergence (September 2018)

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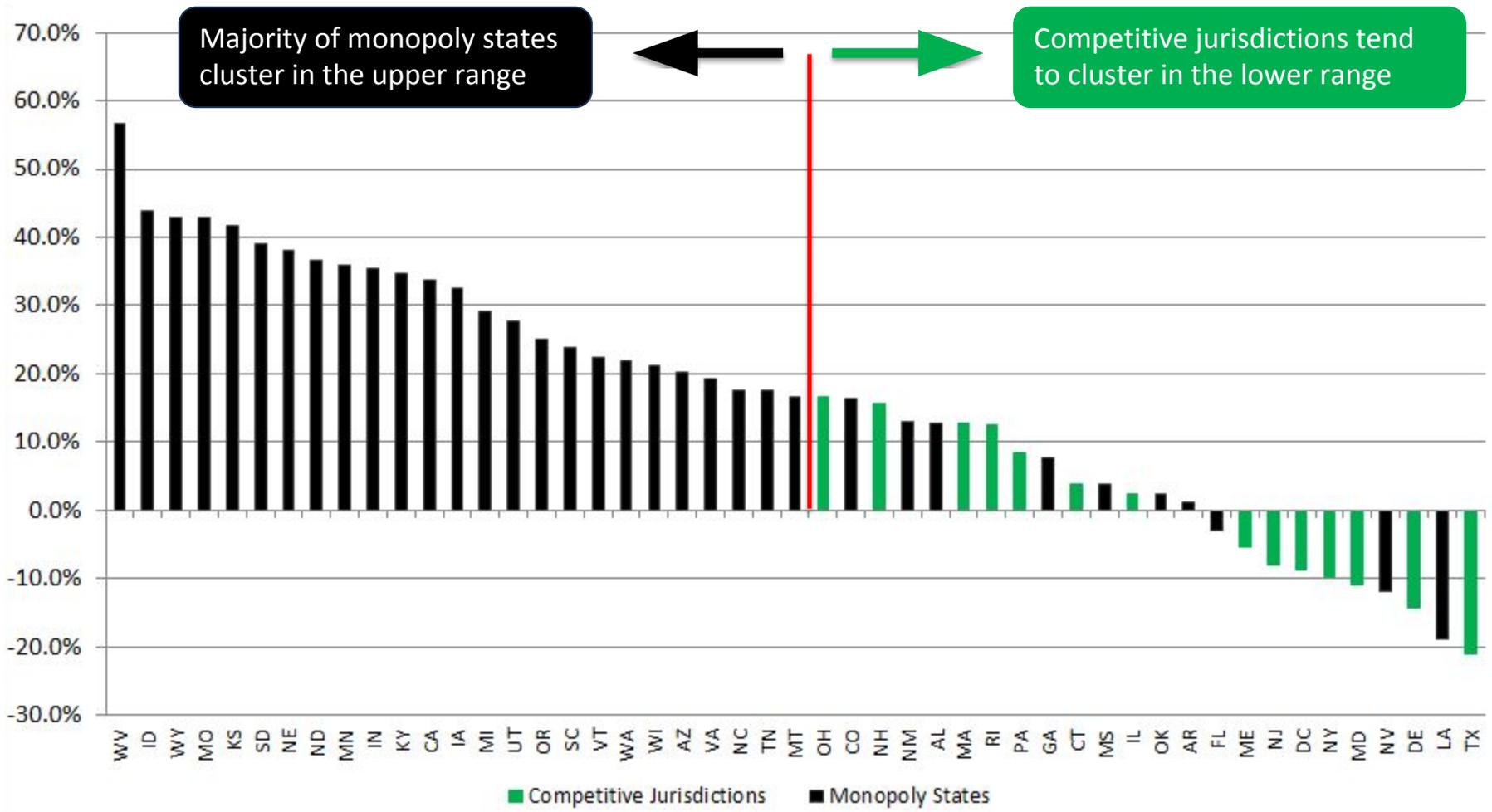
U.S. Energy Information Administration (EIA) data allow for a comparison of trends in weighted average nominal prices between the monopoly group of states and the competitive jurisdictions. The Industrial annual weighted average price in the thirty-five monopoly states was 11.5% higher in 2018 than in 2008. In contrast, the industrial annual weighted average price for the competitive retail markets was 20.1% lower than in 2008.

The dollar implications of such spreads in price paths are large. If 2008-2018 annual percentage price changes for industrial customers in the thirty-five monopoly states had tracked with industrial percentage price changes in the fourteen competitive jurisdictions, then industrial customers in the monopoly states *would have saved \$97.2 billion*.^{*1}

*1: 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 incremental cost to industrial electricity customers in the fourteen choice markets would have been higher by **\$58.5 billion**.

All Sector Price % Price Change by State, 2008-2018

Source: EIA-861M



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DIVERGENT DIRECTIONS AND STATE RANKINGS

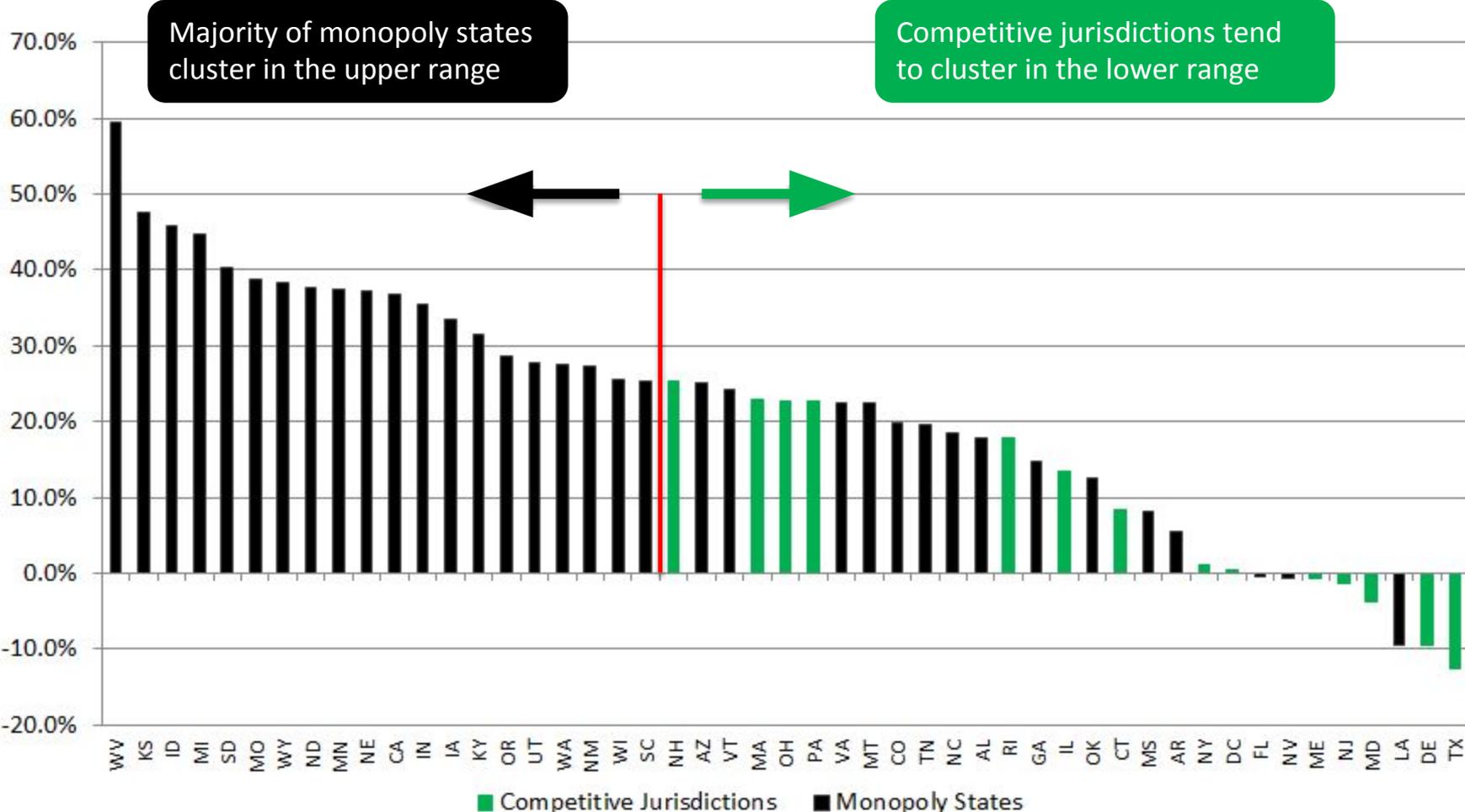
Figure 6 (page 6) of The Great Divergence (September 2018)

Updated through CY2018

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 price change over this period, the competitive states tend to cluster in the lower range and the monopoly states tend to occupy the higher parts of the rankings. It is interesting to observe that the largest 25 all-sector price changes over this time period are all monopoly states. Additionally, all 14 of the competitive jurisdictions reside on the right hand side of this chart. Furthermore, **50% (7/14)** of the competitive jurisdictions had price decreases over the period compared to **9% (3/35)** of the monopoly states.

Residential Price % Price Change by State, 2008-2018

Source: EIA-861M



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DIVERGENT DIRECTIONS AND STATE RANKINGS

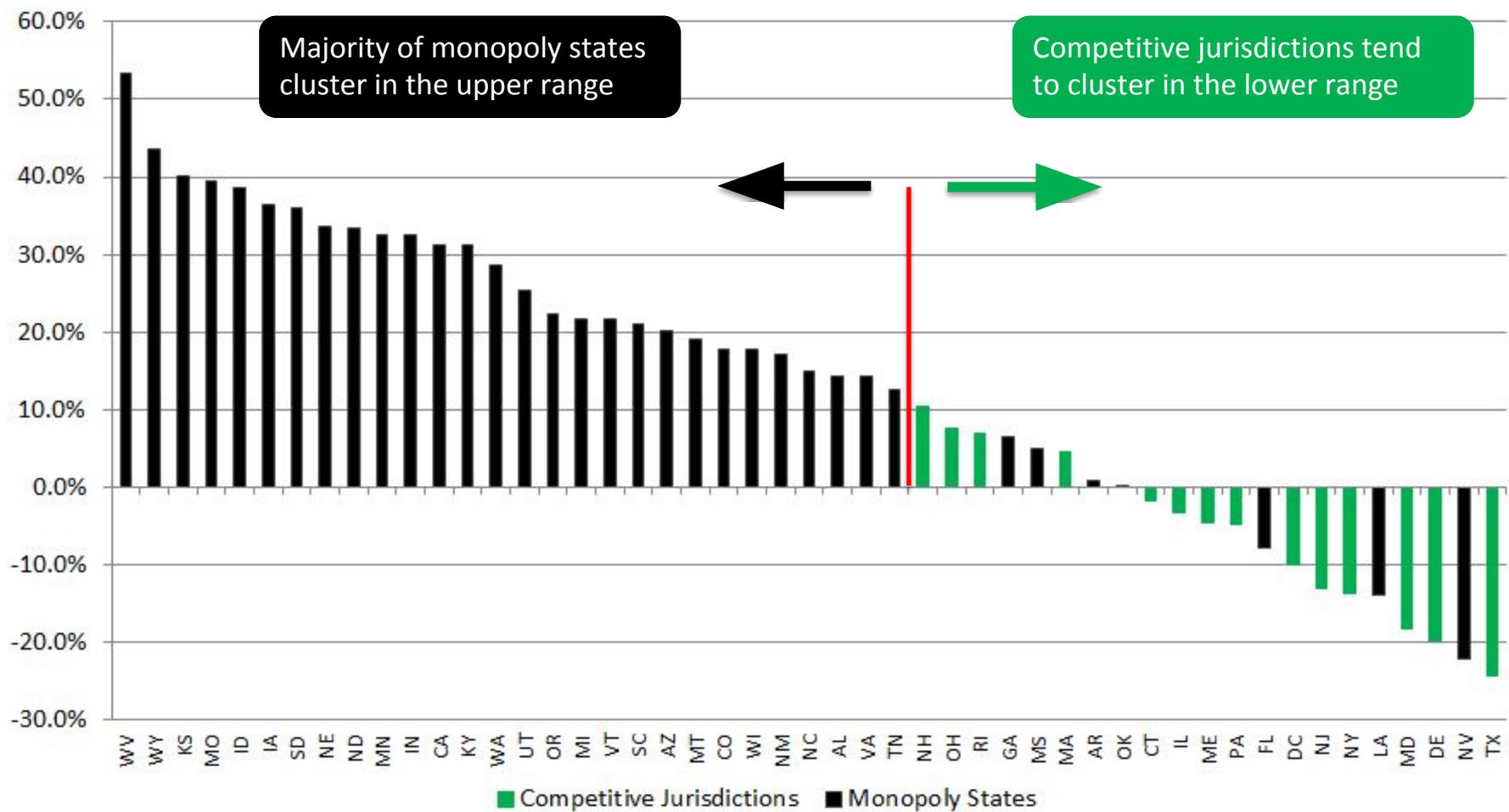
Figure 7 (page 6) of The Great Divergence (September 2018)

Updated through CY2018

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 Residential price change over this period, the competitive jurisdictions tend to cluster in the middle and lower ranges and the monopoly states tend to occupy the higher parts of the rankings. It is interesting to observe that the largest 20 Residential price changes over this time period were all experienced in monopoly states. By contrast, 10 of the lowest 17 states exhibiting the lowest price change increases on the right hand side of this chart are competitive jurisdictions. Furthermore, **50% (7/14)** of the competitive jurisdictions had Residential price decreases over the period compared to **9% (3/35)** of the monopoly states.

Commercial Price % Price Change by State, 2008-2018

Source: EIA-861M



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DIVERGENT DIRECTIONS AND STATE RANKINGS

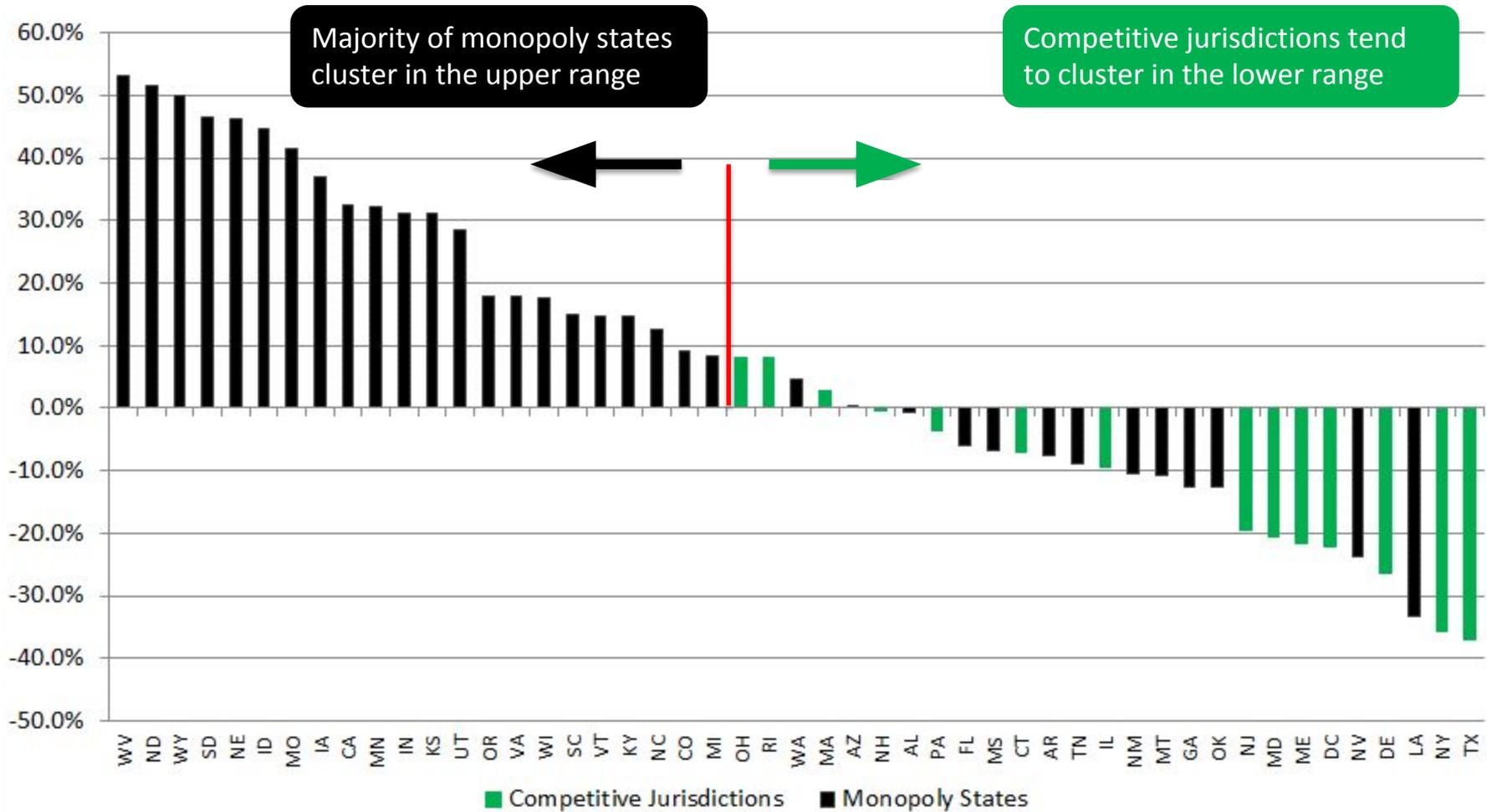
Figure 8 (page 6) of The Great Divergence (September 2018

Updated through CY2018

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 Residential price change over this period, the competitive jurisdictions tend to cluster in the middle and lower ranges and the monopoly states tend to occupy the higher parts of the rankings. It is interesting to observe that the largest 20 Residential price changes over this time period were all experienced in monopoly states. By contrast, 10 of the lowest 17 states exhibiting the lowest price change increases on the right hand side of this chart are competitive jurisdictions. Furthermore, **50% (7/14)** of the competitive jurisdictions had Residential price decreases over the period compared to **9% (3/35)** of the monopoly states.

Industrial Price % Price Change by State, 2008-2018

Source: EIA-861M



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DIVERGENT DIRECTIONS AND STATE RANKINGS

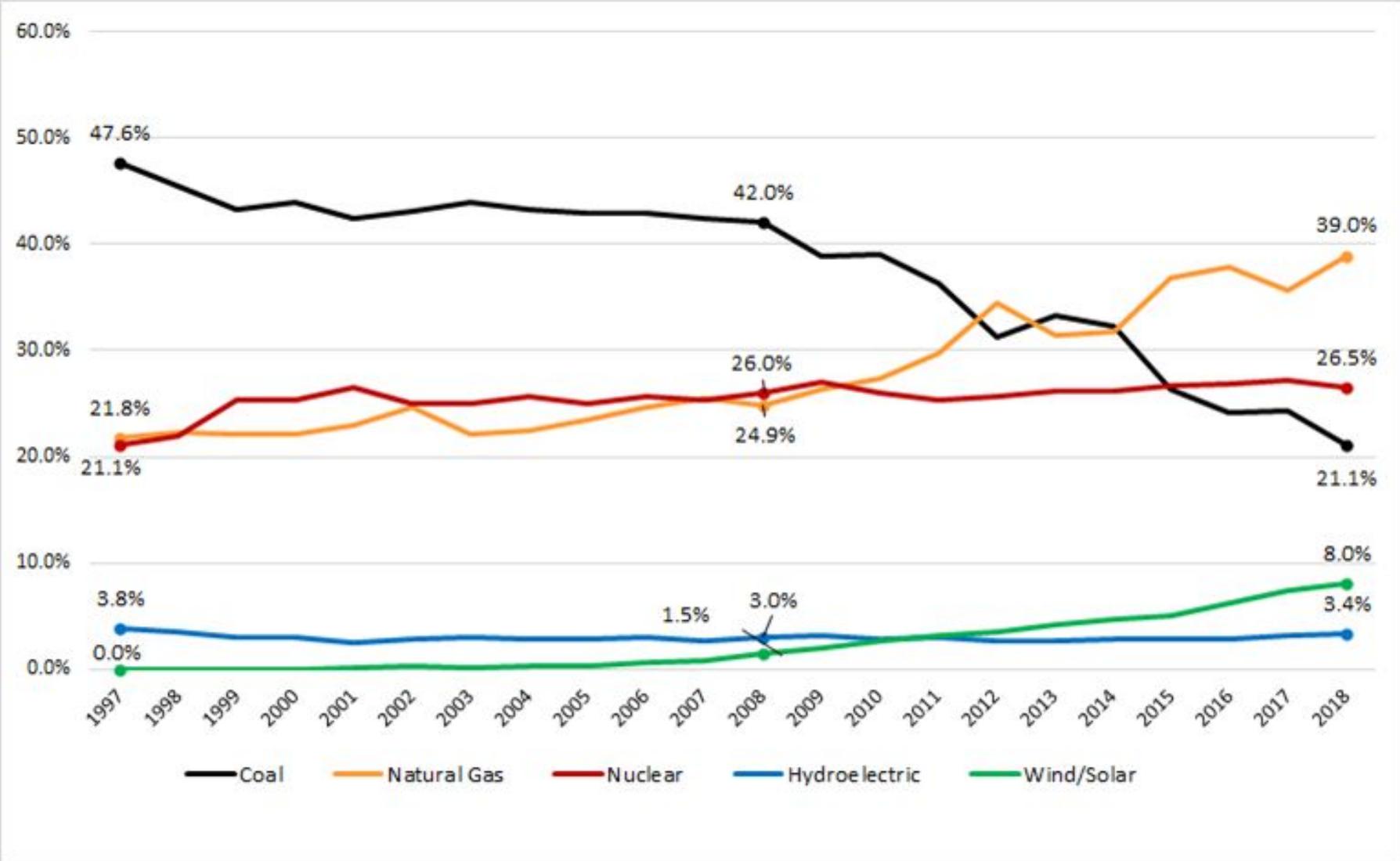
Figure 9 (page 7) of The Great Divergence (September 2018)

Updated through CY2018

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 Industrial price change over this period, the competitive jurisdictions tend to cluster in the middle and lower ranges and the monopoly states tend to occupy the higher parts of the rankings. It is interesting to observe that the largest 22 Industrial price changes over this time period were all experienced in monopoly states. By contrast, 10 of the lowest 20 states exhibiting the lowest price change increases on the right hand side of this chart are competitive jurisdictions. Furthermore, **71% (10/14)** of the competitive jurisdictions had Industrial price decreases over the period compared to **29% (10/35)** of the monopoly states.

Generation % by Energy Type in the 14 Competitive Jurisdiction, 1997-2018

Source: EIA-861M



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Figure 10 (page 8 of The Great Divergence (September 2018)) **Updated through CY2018**

Figure 10 shows the 1997-2018 comparative changes in the market share of electricity production from the major sources in the 14 competitive jurisdictions. Since the commencement of the customer choice era and the shale gas revolution, gas has been on track to ultimately overtake coal in terms of both installed capacity and production. This has been true in both the competitive jurisdictions and in the monopoly states.

In 1997 (and in the competitive jurisdictions), coal accounted for **47.6%** of generation, while natural gas plants constituted **21.8%**. By year-end 2018, coal's share of summer generation was **21.1%** compared to **39.0%** for natural gas (again in the competitive jurisdictions). Figure 10 shows that 2012 was the first year in which natural gas-fired electric power production exceeded that produced by coal in the competitive jurisdictions. This flip has occurred in the monopoly states too but not until 2018.

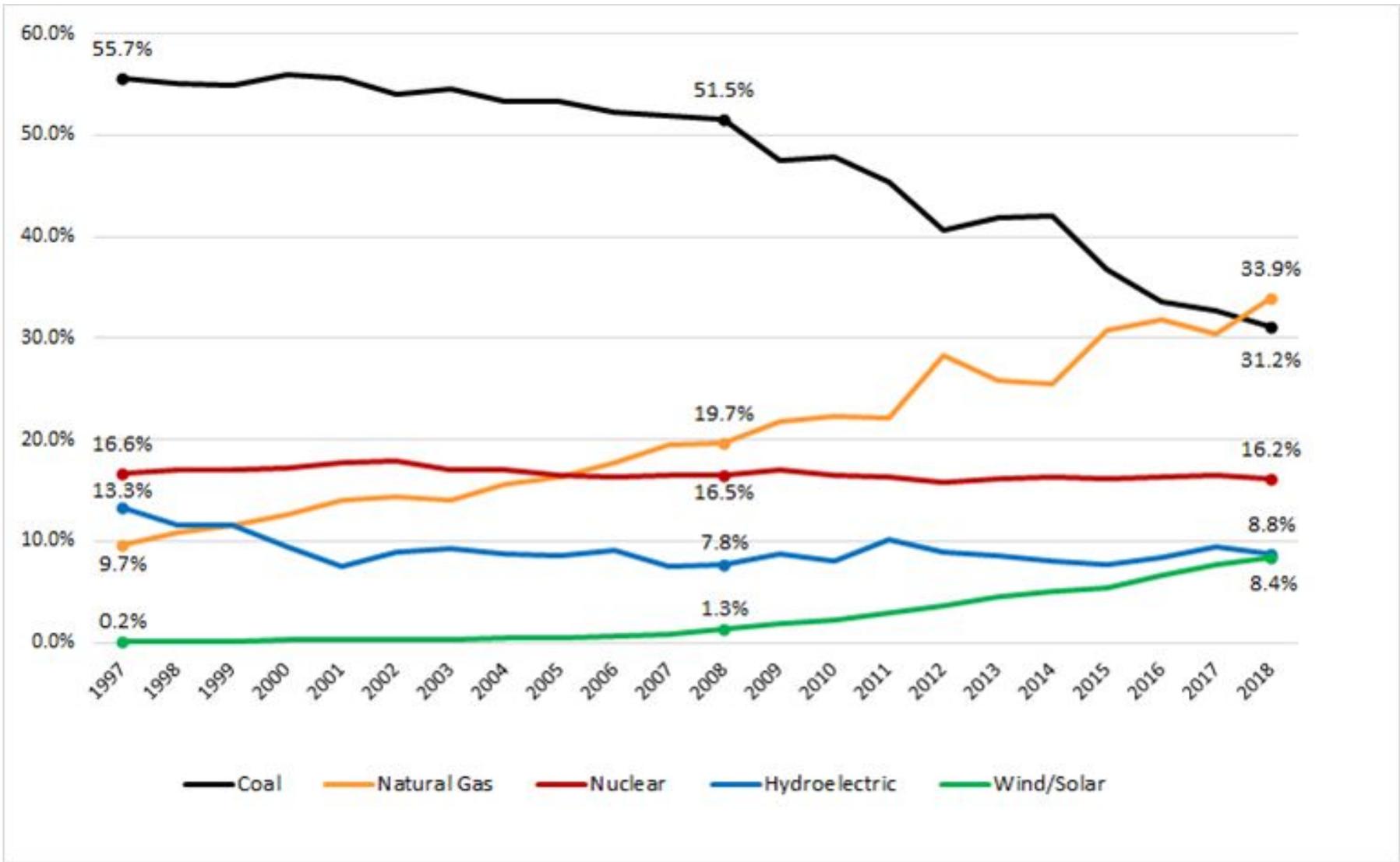
However, electricity customers in competitive retail jurisdictions have experienced the benefits of low gas prices more promptly and effectively than have those in monopoly states. There are several reasons:

- A greater share of generating capacity in monopoly states is accounted for by coal than in the customer choice markets where gas and nuclear are more prominent.
- In competitive markets, consumers pay only for the economic value of existing generating capacity, with prices set in open and transparent competitive auctions.
- In the 14 choice markets, generating capacity is installed or taken out of service based on investor perceptions of the competitive economics. In the 35 monopoly states utilities build, contract or retire generating capacity under regulatory protocols that generally require consumers to pay for capacity irrespective of economic efficiency.
- Financial markets have demonstrated a willingness to make billions of dollars in equity investment and low-cost debt available for non-utility generation, contradicting the claim that only regulated monopoly could attract capital at favorable rates.
- Customers, especially commercial and industrial which account for more than 60% of consumption, have the flexibility to adjust contract terms and prices to take advantage of market developments.

Additionally, as the relative shares of electricity production from gas and coal plants flipped, there has been a steady contribution of nuclear and a strong recent upswing in the role of renewables (wind/solar).

Generation % by Energy Type in the 35 Monopoly States, 1997-2018

Source: EIA-861M



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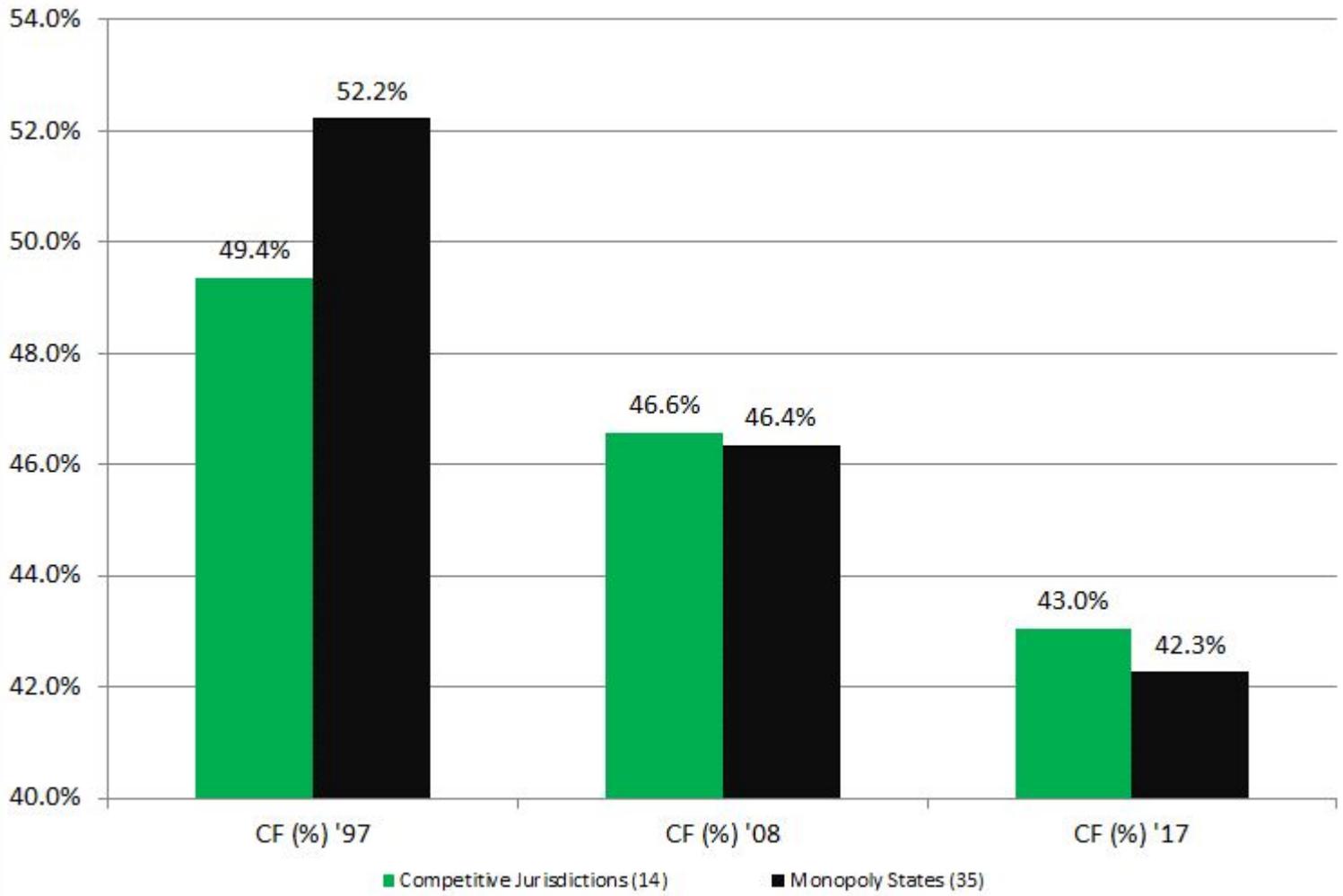
Figure 11 (page 8 of The Great Divergence (September 2018))
Updated through CY2018

Figure 11 shows the 1997-2018 comparative changes in the market share of electricity production from the major sources in the 35 monopoly states. Since the commencement of the customer choice era and the shale gas revolution, gas has been on track to ultimately overtake coal in terms of both installed capacity and production. This has been true in both the competitive jurisdictions and in the monopoly states.

In 1997 (and in the monopoly states), coal accounted for **55.7%** of generation, while natural gas plants constituted **9.7%**. By year-end 2018, coal's share of summer generation was **31.2%** compared to **33.9%** for natural gas (again in the monopoly states). Figure 11 shows that 2018 was the first year in which natural gas-fired electric power production exceeded that produced by coal in the monopoly states. This flip has had occurred earlier in the competitive jurisdictions (2012).

Change in Capacity Factor, 1997, 2008, and 2017 (Generation Output/Potential Output)

Source: EIA-860, EIA-923



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Figure 12 (page 8) of The Great Divergence (September 2018)
Updated through CY2018

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 monopoly states than in competitive jurisdictions as shown in this figure. The average capacity factor in the monopoly states declined from 52.2% in 1997 to 42.3% in 2017 (the most recent year for which EIA data are available). That is about a one-fifth decrease (9.9%) compared to the much more modest decline in average capacity factor in the competitive markets from 49.4% in 1997 to 43.0% in 2017, a decline of 6.4% or a proportional decline of about one-eighth. 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, in the monopoly model, 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 generation 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.