



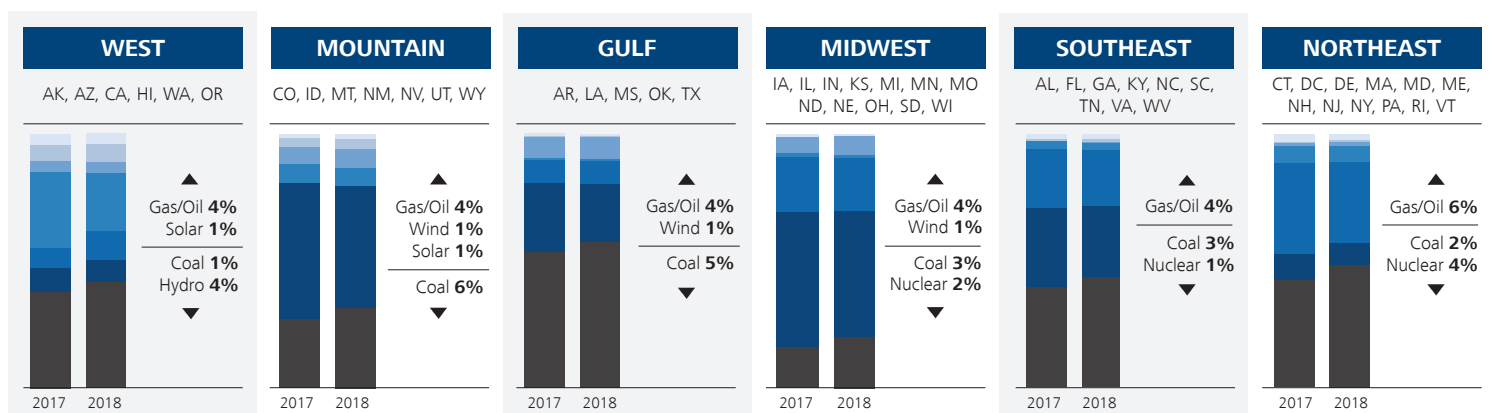
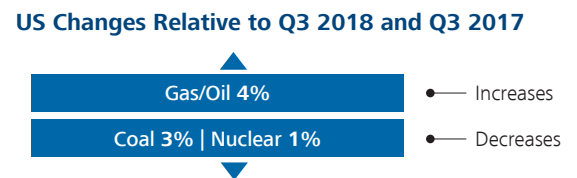
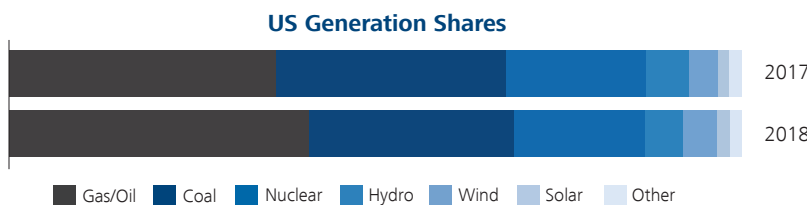
## About NERA Electricity Insights

NERA Electricity Insights provides timely quarterly analysis of the latest data on US power generators. Utilizing datasets released by the US Energy Information Administration (EIA) and the US Environmental Protection Agency (EPA), NERA stays at the forefront of an evolving electricity industry, tracks new developments, and presents broader energy trends that can also impact future outcomes. The following provides some insights for Q3 2018.

## The Big Picture: Q3 2018 vs. Q3 2017

|                                 | Q3 2017 | Q3 2018 | Change   | Q3 2017 | Q3 2018 | Change                  |  |  |
|---------------------------------|---------|---------|--|---------|---------|-------------------------|--|--|
|                                 |         |         | <i>US Generation (TWh)</i>                                   |         |         | <i>US Capacity (GW)</i> |  |  |
| Combined Cycle                  | 327     | 379     | 52   | 245     | 258     | 13                      |  |  |
| Peaking Gas/Oil                 | 81      | 102     | 22   | 241     | 242     | 1                       |  |  |
| Coal                            | 348     | 330     | (18)   | 264     | 247     | (17)                    |  |  |
| Nuclear                         | 212     | 209     | (2)  | 100     | 99      | (0)                     |  |  |
| Hydro                           | 66      | 64      | (2)  | 80      | 80      | (0)                     |  |  |
| Wind                            | 46      | 54      | 7  | 84      | 90      | 6                       |  |  |
| Solar                           | 16      | 20      | 4  | 24      | 30      | 5                       |  |  |
| Other                           | 22      | 21      | (1)  | 42      | 42      | 1                       |  |  |
|                                 |         |         | <i>CO<sub>2</sub> Emissions (MM Metric Tons)</i>             |         |         |                         |  |  |
| US Power Sector CO <sub>2</sub> | 531     | 540     | 8  |         |         |                         |  |  |
|                                 |         |         | <i>Avg. Delivered Fuel Prices to Power Sector (\$/MMBtu)</i> |         |         |                         |  |  |
| Natural Gas                     | \$3.17  | \$3.24  | \$0.07   |         |         |                         |  |  |
| Coal                            | \$2.04  | \$2.05  | \$0.01   |         |         |                         |  |  |

## Regional Generation Mix: Q3 2018 vs. Q3 2017

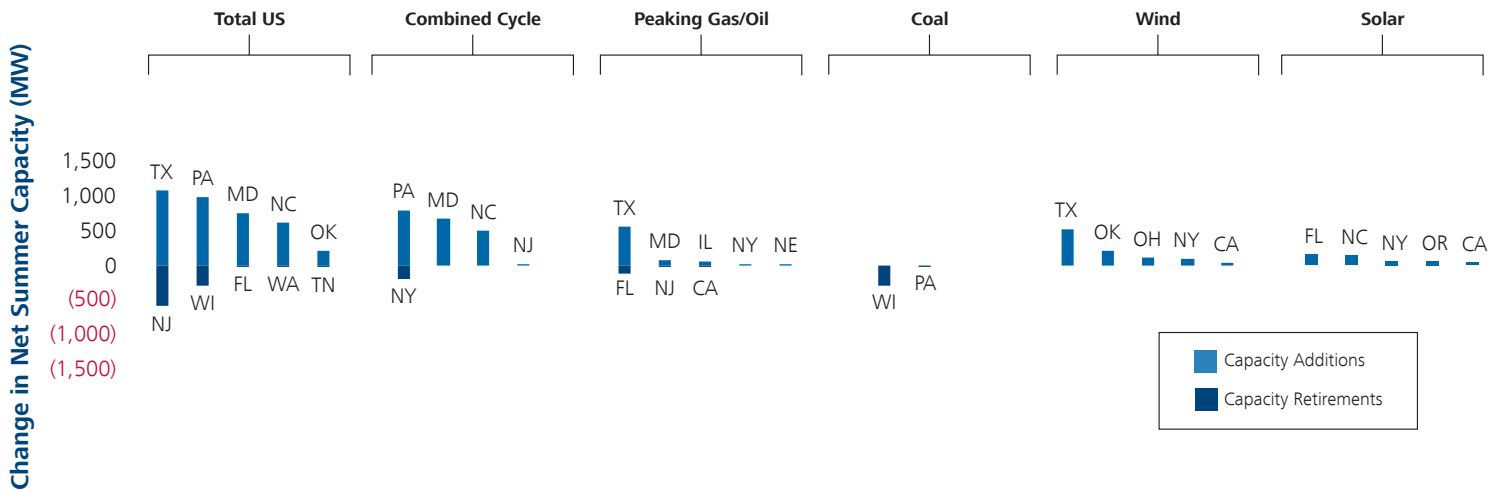


### QUESTIONS TO THINK ABOUT

What factors are contributing to a decrease in coal's generation share and an increase in the generation share of natural gas in each US region?  
Given the decline in the share of zero-carbon fuel sources, are current policy incentives that support such technologies still effective?

## Capacity Additions and Retirements (Top 5 States by Technology): Q3 2018 vs. Q2 2018

Nationally, there were additions of 1.8 GW of combined cycle units, 0.9 GW of wind units, and 0.6 GW of peaking gas/oil units; there were also retirements of 0.5 GW of nuclear and 0.3 GW of coal units. Storage additions were 0.01 GW.



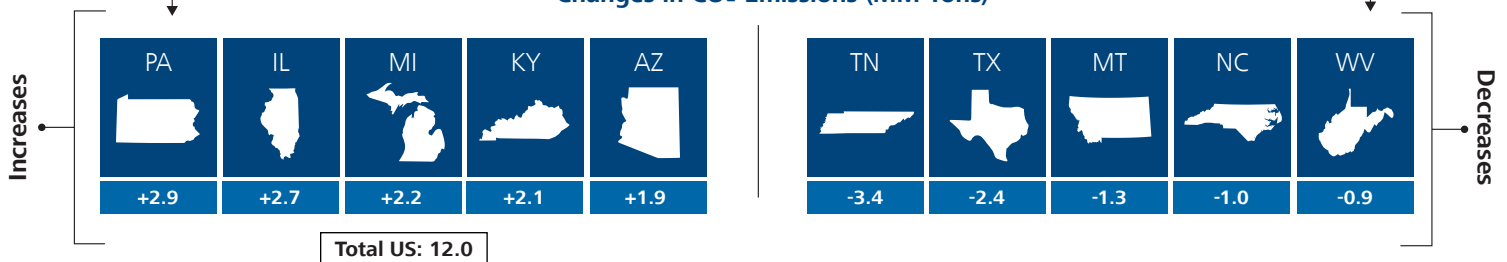
**QUESTIONS TO THINK ABOUT**

Is the slowing of coal retirements in this quarter (relative to the previous quarter) a blip or a trend? What role can we expect storage to play in states such as Texas that have consistently added intermittent renewables over the past few quarters?

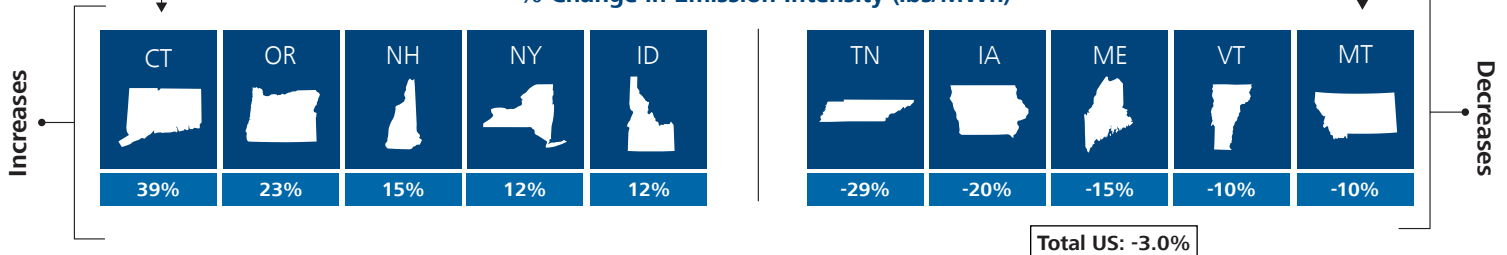
## US and State Changes in CO<sub>2</sub> Emissions and CO<sub>2</sub> Emission Intensity: Q3 2018 vs. Q3 2017

Nationally, power sector CO<sub>2</sub> emissions in Q3 2018 were 12 million metric tons lower than in Q3 2017 (2.3% decrease) and generation was up 5.5% over the same period, amounting to a 3.0% decrease in national CO<sub>2</sub> emissions intensity.

### Changes in CO<sub>2</sub> Emissions (MM Tons)



### % Change in Emission Intensity (lbs/MWh)



**QUESTIONS TO THINK ABOUT**

Is the sustained decrease in emissions intensity in each of the last five quarters a long-term trend? What are the primary drivers of this change? How much are higher electricity demand and higher CO<sub>2</sub> emissions attributable to higher economic growth?

## Unit-Level Capacity Factors: Q3 2018 and Q3 2017

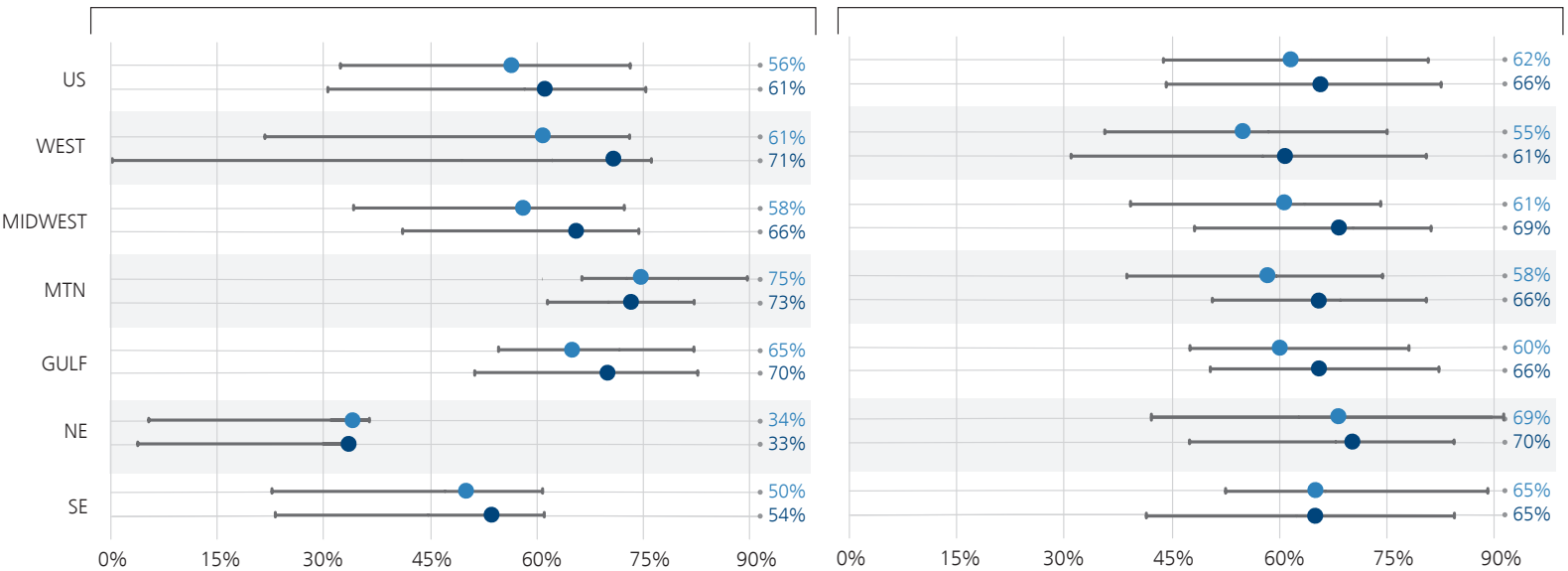
The higher capacity factors for combined cycle units reflect both increased generation and increased capacity while capacity factors for coal units have increased despite decreases in generation.

**Coal and Combined Cycle (Average, 25th, and 75th Percentiles): Q3 2017 vs. Q3 2018**



### COAL

### COMBINED CYCLE

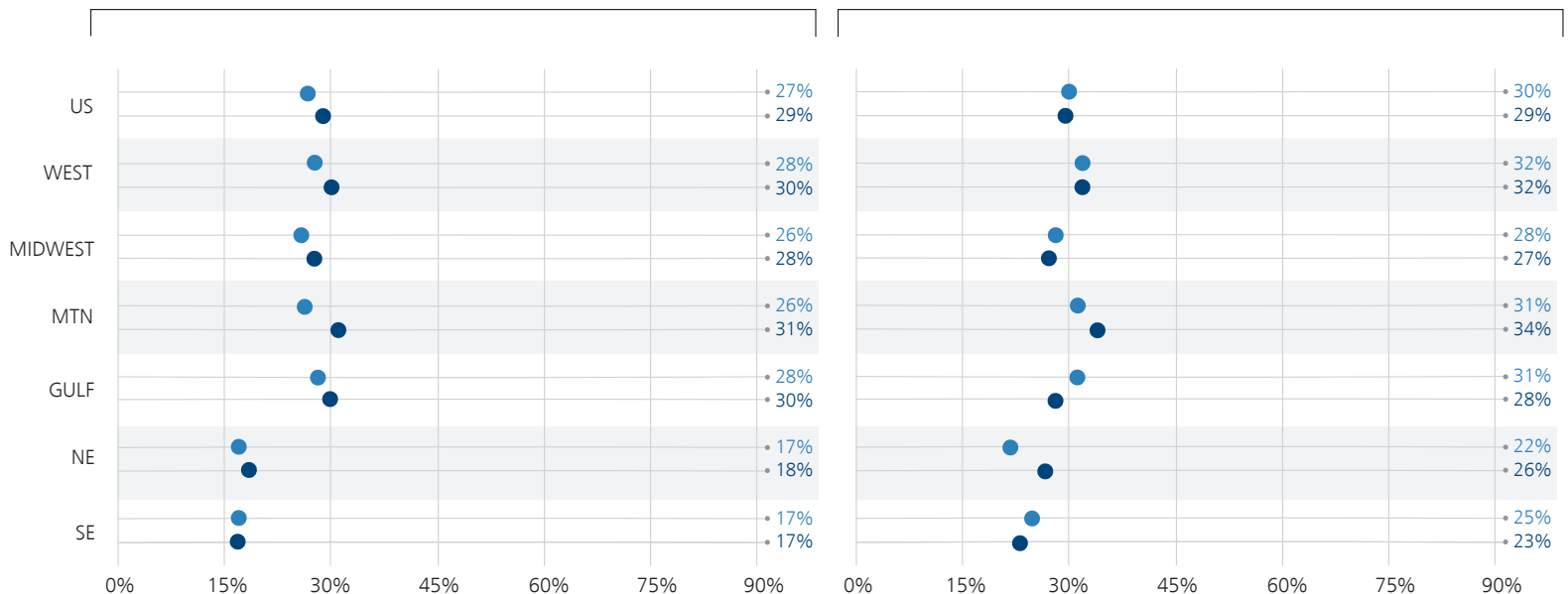


**Wind and Solar (Average): Q3 2017 vs. Q3 2018**



### WIND

### SOLAR



**QUESTIONS TO THINK ABOUT**

Given the increase in the capacity factors of coal units in the majority of US regions, are there large numbers of efficient coal units that can still thrive in a low-natural-gas-price world?  
Are technological developments in wind and solar contributing to improved capacity factors of wind and solar units?

## About NERA's Energy & Environment Group

NERA's Energy & Environment Group is at the forefront of the continuing transformation of the energy sector worldwide. We help companies develop strategies for exploring new opportunities and minimizing new risks, including issues related to climate change policy and other environmental rules. We work with our clients to develop new regulatory strategies and, when needed, support our clients with analysis and testimony before regulatory commissions, and domestic and international courts.

NERA has exceptional in-house market modeling capabilities to provide detailed analytical support for a wide variety of engagements. Our N<sub>e</sub>wERA model, the most state-of-the-art, fully-integrated electricity-macroeconomic model available in the consulting space, helps companies evaluate how new and potential future policy or market changes will interact with each other and influence business and economic outcomes. It captures policies' effects as they ripple through all sectors of the economy, supporting transaction evaluation, asset valuation, and policy analysis. The N<sub>e</sub>wERA model integrates a macroeconomic model with a highly-detailed electricity sector model, providing a unified understanding of the economic impacts of new policies on all sectors of the economy. Detailed electricity sector outputs include dispatch decisions for generating units, new builds, wholesale and retail electricity prices, and emissions prices.

## Coming Soon

### Year-End Comparison: 2018 vs. 2017

Keep your eyes out for a special edition of Electricity Insights that will be published during the first quarter of 2019. This issue will provide a full-year comparison of 2018 vs. 2017 and will look at trends that have developed over the past year.

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