



# NERA Electricity Insights

2017 Quarter 3 Comparative Analysis | Issue No. 3

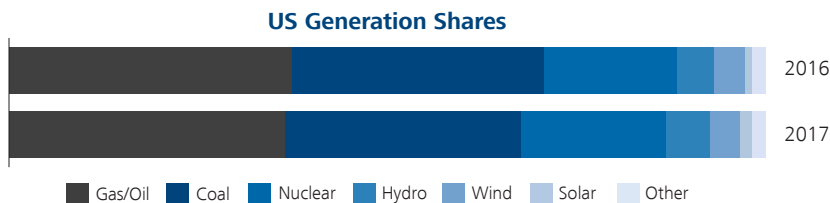
## About NERA Electricity Insights

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 2017.

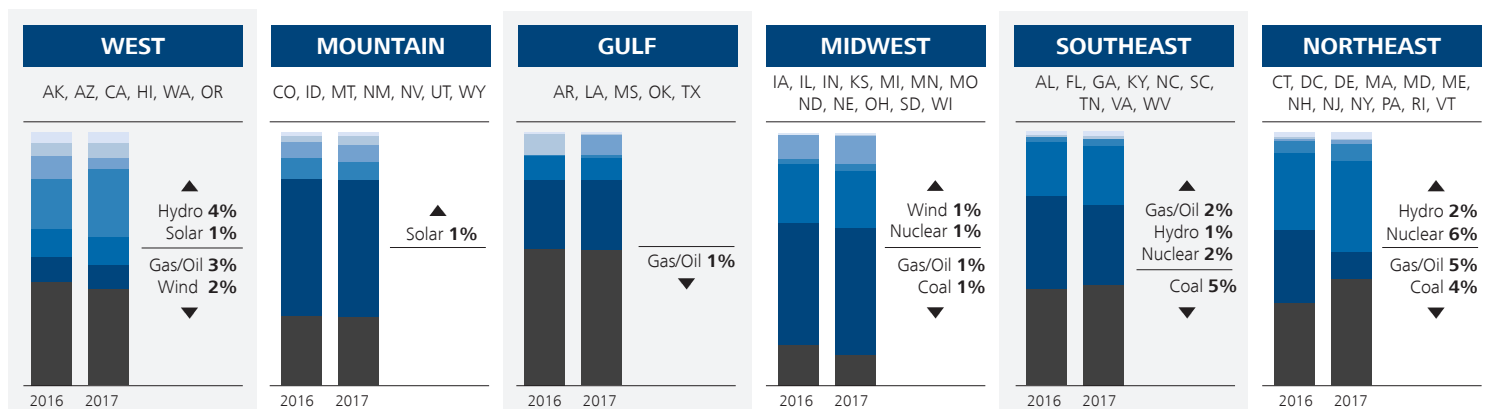
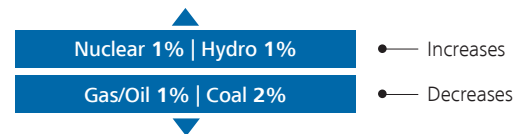
## The Big Picture: Q3 2017 vs. Q3 2016

	Q3 2016	Q3 2017	Change	Q3 2016	Q3 2017	Change		
			<i>US Generation (TWh)</i>			<i>US Capacity (GW)</i>		
Combined Cycle	349	327	(22)	239	245	6		
Peaking Gas/Oil	90	81	(9)	246	241	(4)		
Coal	390	348	(41)	273	264	(9)		
Nuclear	207	212	4	100	100	0		
Hydro	57	66	9	80	80	0		
Wind	48	46	(1)	75	84	9		
Solar	12	16	4	17	24	7		
Other	22	22	0	41	42	0		
			<i>CO<sub>2</sub> Emissions (MM Metric Tons)</i>					
US Power Sector CO <sub>2</sub>	588	535	(53)					
			<i>Avg. Delivered Fuel Prices to Power Sector (\$/MMBtu)</i>					
Natural Gas	\$3.00	\$3.19	\$0.19					
Coal	\$2.11	\$2.09	(\$0.02)					

## Regional Generation Mix: Q3 2017 vs. Q3 2016



### US Changes Relative to Q3 2017 and Q3 2016

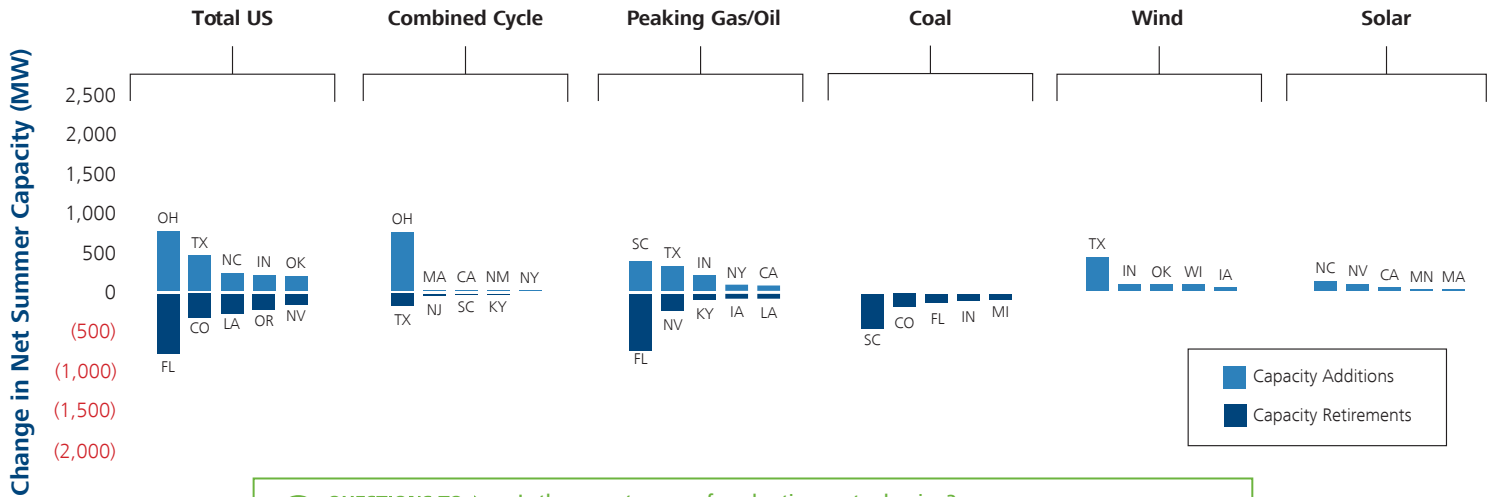


**QUESTIONS TO THINK ABOUT**

How long until wind and solar make meaningful increases in their generation shares?  
Are increased shares from nuclear and hydro sustainable?

## Capacity Additions and Retirements (Top 5 States by Technology): Q3 2017 vs. Q2 2017

Nationally, there were additions of 0.8 GW of wind, 0.8 GW of combined cycle, and 0.6 GW of solar during Q3; there were also retirements of 0.7 GW of coal and 0.3 GW of peaking units.



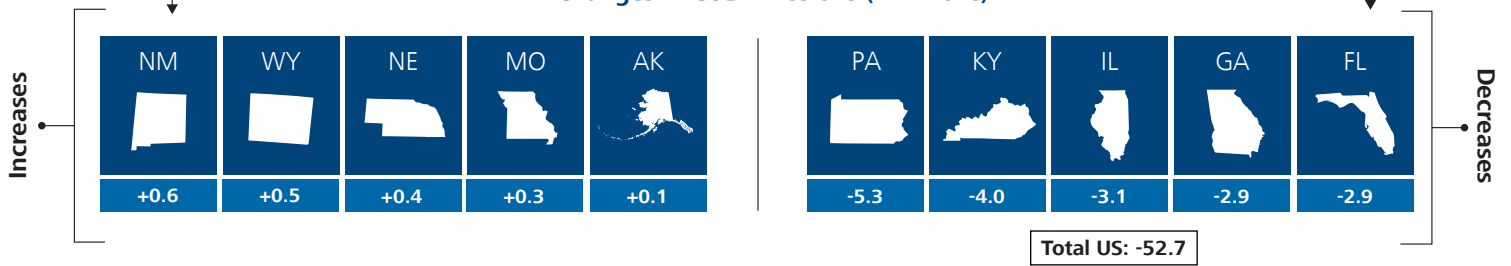
**QUESTIONS TO THINK ABOUT**

Is the recent wave of coal retirements slowing?  
Are infrastructure needs slowing combined cycle and renewables additions?

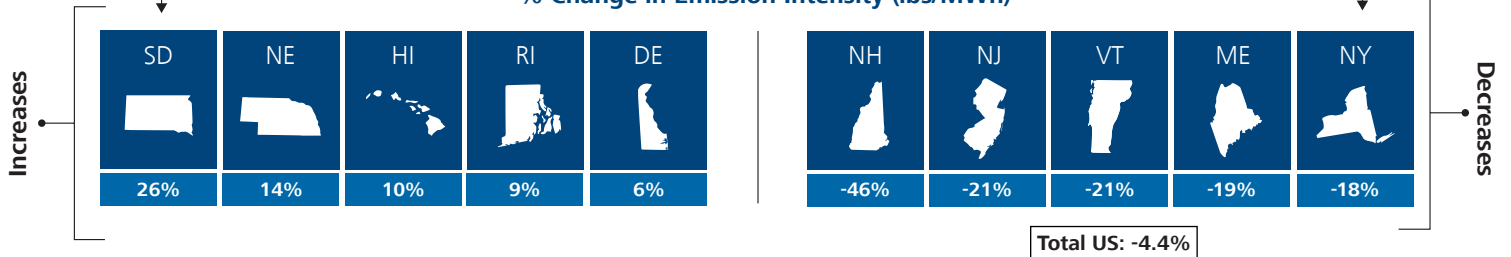
## US and State Changes in CO<sub>2</sub> Emissions and CO<sub>2</sub> Emission Intensity: Q3 2017 vs. Q3 2016

Nationally, power sector CO<sub>2</sub> emissions in Q3 2017 were 53 MM metric tons less than in Q3 2016 (9.0% decline), and generation was also down 4.8% over the same period, leading to a decrease in national CO<sub>2</sub> emissions intensity of 4.4%.

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



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



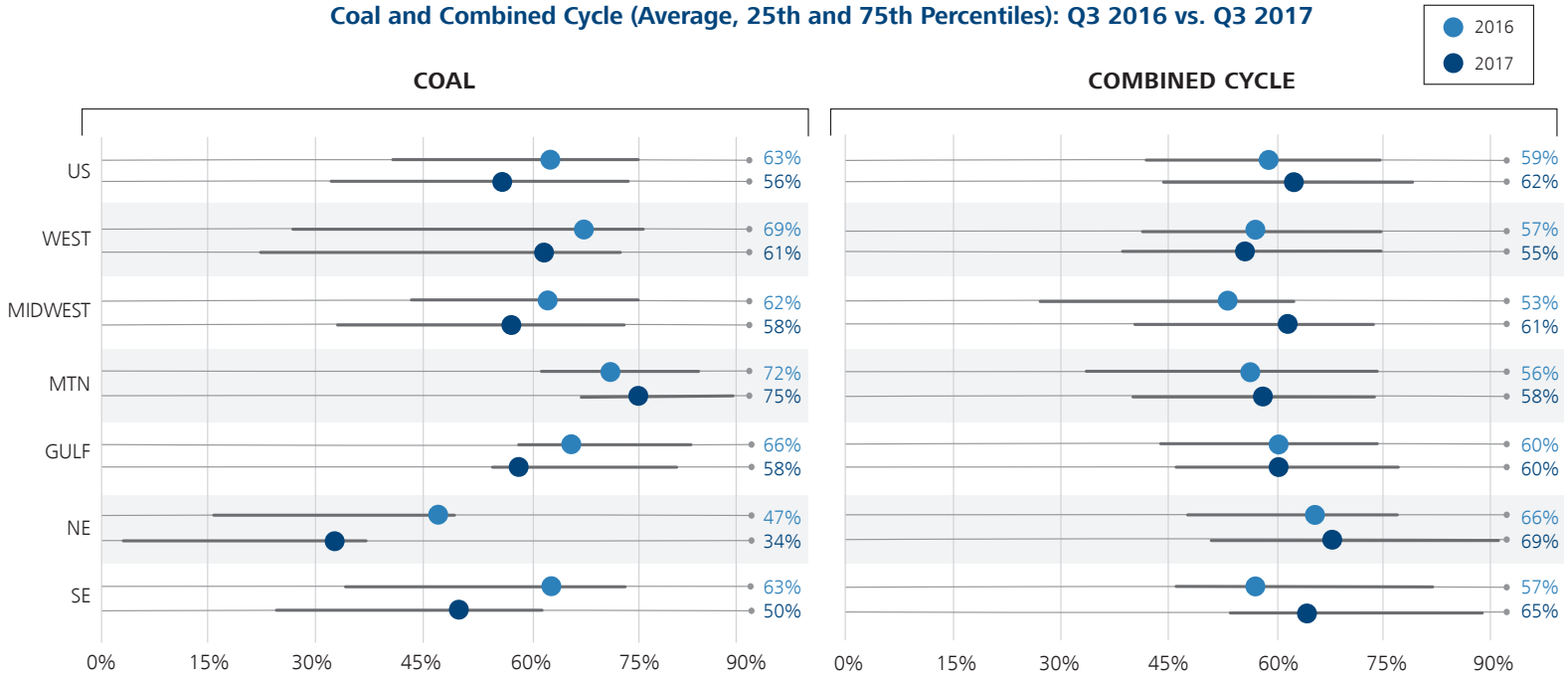
**QUESTIONS TO THINK ABOUT**

Are the national CO<sub>2</sub> emissions reductions (tons and intensity) sustainable absent new environmental regulations/policies?

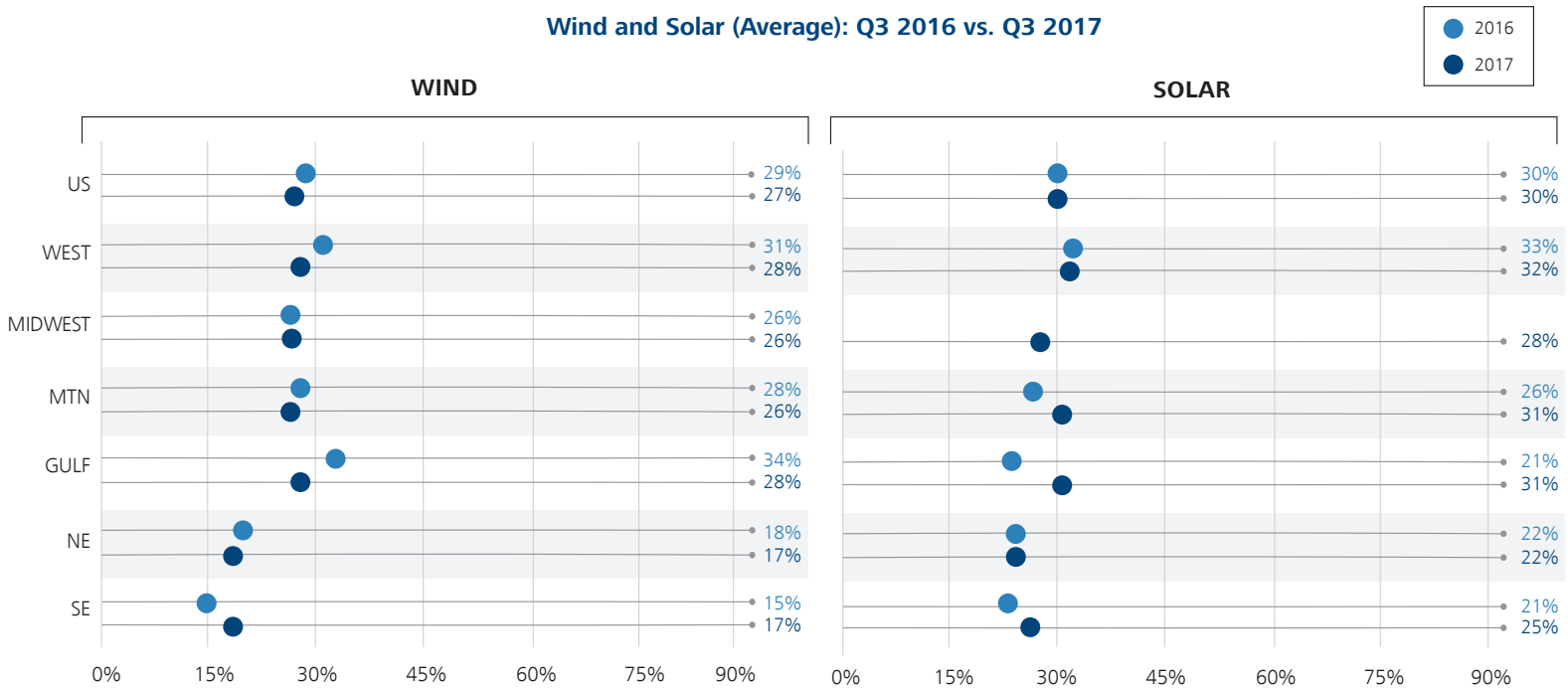
## Unit-Level Capacity Factors: Q3 2017 and Q3 2016

The lower capacity factors for US coal-fired generators in Q3 2017 (relative to Q3 2016) reflect both decreased generation and capacity.

**Coal and Combined Cycle (Average, 25th and 75th Percentiles): Q3 2016 vs. Q3 2017**



**Wind and Solar (Average): Q3 2016 vs. Q3 2017**



Note: Insufficient data to calculate factor for 2016 Midwest solar.



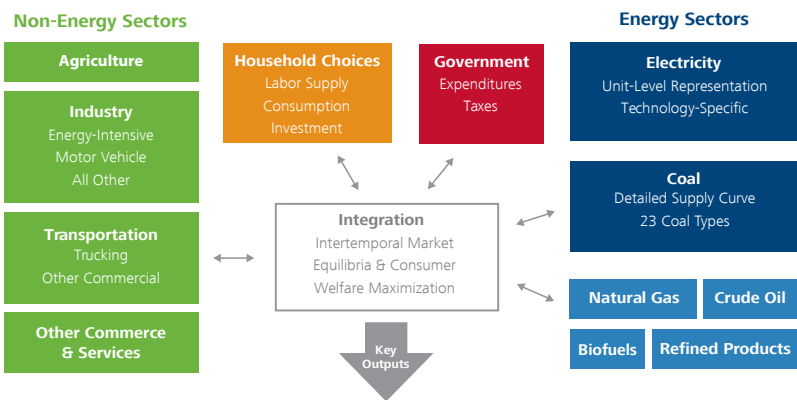
Are higher combined cycle capacity factors translating into higher profits?  
As solar expands, what will happen to its average capacity factors?

## 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>ew</sub>ERA 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>ew</sub>ERA 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.

### The NewERA Model



Macroeconomic (National/Regional)	Primary Energy (National/Regional)	Electricity (National/Regional/Generating Unit)
Welfare GDP, consumption, investment Output by sector	Demand Prices Production	Prices Builds, retrofits, retirements Load and dispatch

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