

COAL – NATURAL GAS COMPETITION: THE CURRENT STATE OF PLAY – IMPACT ON SYSTEM DISPATCH

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Energy Information Administration

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ENERGY VENTURES ANALYSIS

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ABOUT ENERGY VENTURES ANALYSIS

Energy Ventures Analysis is an energy consulting firm located in Arlington, Virginia. Since 1981, EVA has been publishing supply, demand, and price forecasts as part of its FUELCAST subscription service for the electric power, coal, natural gas, petroleum, renewable, and environmental sectors.

EVA's cutting-edge expertise in energy market, economic, financial, and operation management matters has led our firm to international recognition. For over three decades, our innovative insights have helped our clients make confident, informed investment and operational decisions to maximize value and spur financial growth.

Our clients include:

- power & natural gas utilities
- fuel producers
- fuel transporters
- commodity traders
- regulators
- financial institutions



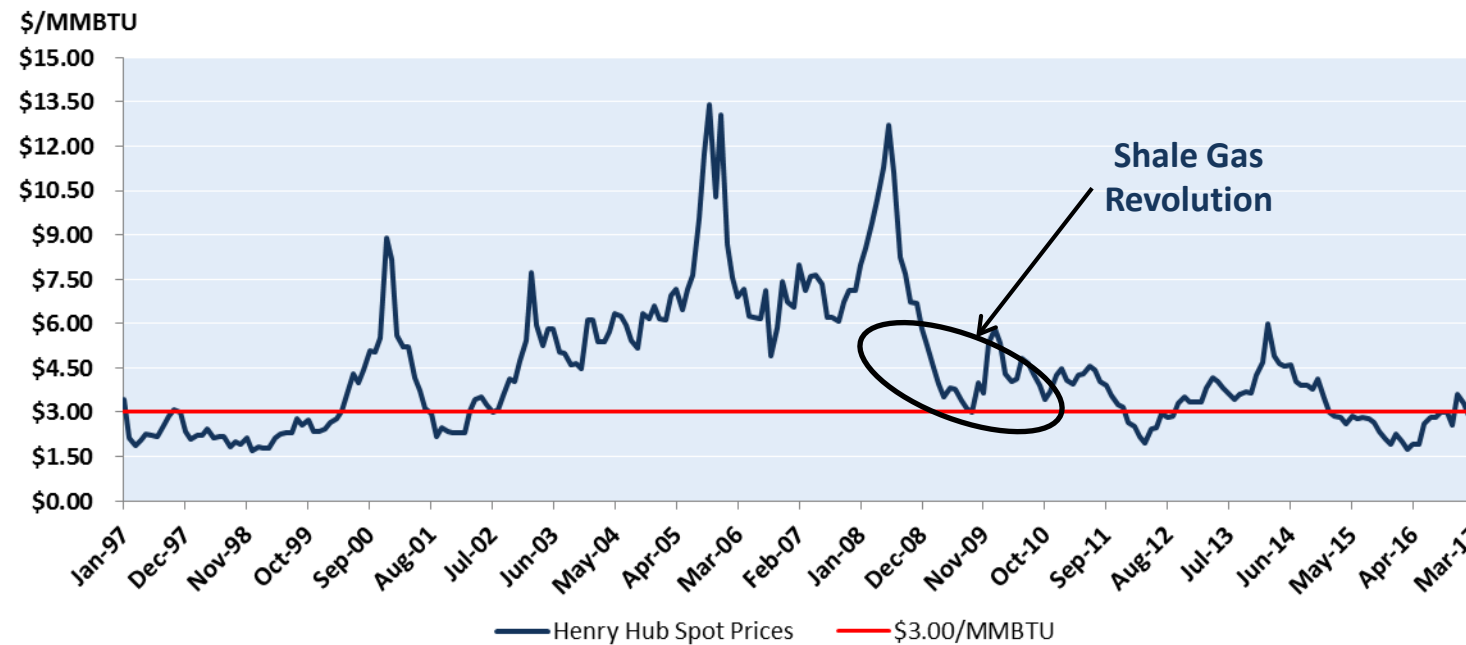
OUTLINE

1. A Brief History of Natural Gas Prices
2. Why is it Important to Analyze Coal & Gas Competition?
3. Factors Impacting Coal & Gas Competition
4. Impact on Dispatch
5. How the Market is Reacting
6. How We Analyze the Impact

A BRIEF HISTORY OF NATURAL GAS PRICES

- Natural gas prices have been volatile over the past two decades due to factors such as extreme weather, economy, technology advancements etc. impacting supply and demand.
- Since the shale gas revolution, natural gas prices have plummeted, changing the landscape of power generation in U.S.
- In 2015 and 2016, prices dropped significantly as a result of low demand and high supply.

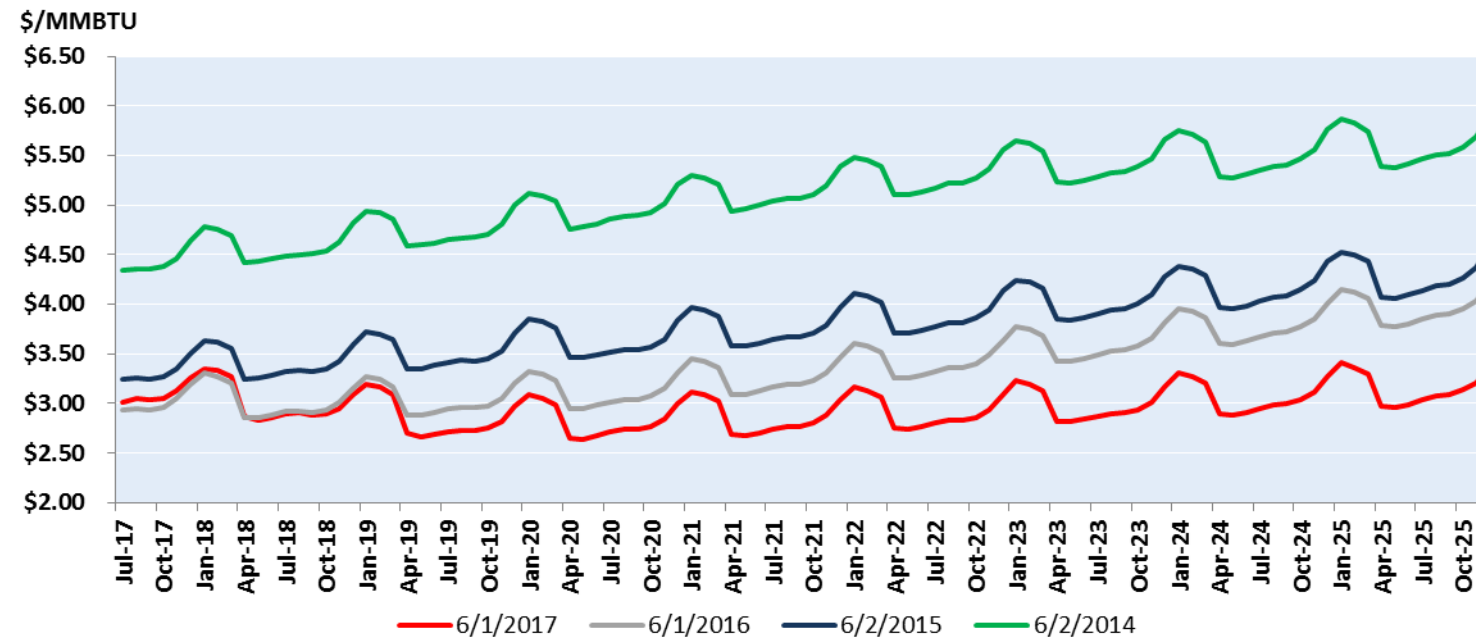
HISTORICAL MONTHLY HENRY HUB SPOT PRICES



A BRIEF HISTORY OF NATURAL GAS PRICES

- Over the past 4 years, the forward curve has continually shifted downwards.
- Higher supply expectations will keep prices nearly flat through 2025.
- Natural gas market has been a catch all for future projects (new infrastructure).

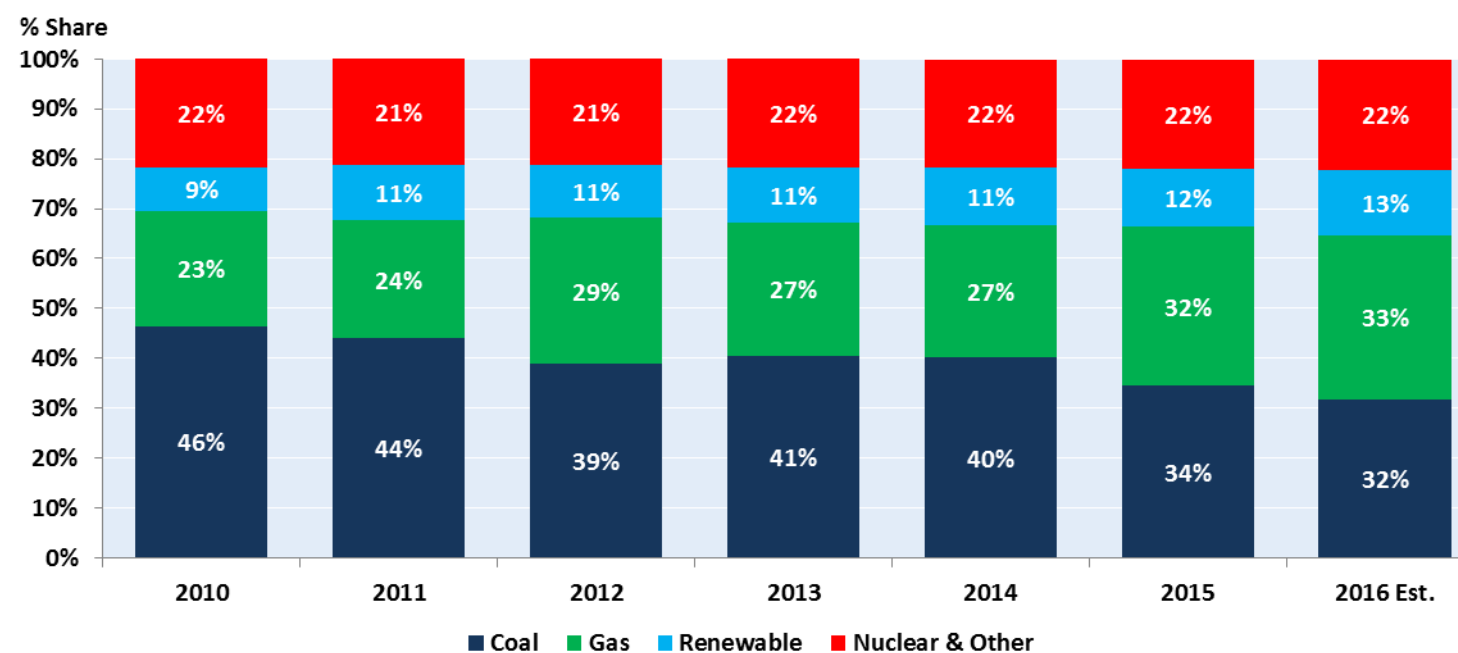
HENRY HUB FUTURES – CURRENT AND PAST 3 YEARS



WHY IS IT IMPORTANT TO ANALYZE COAL & GAS COMPETITION ?

- Coal's share of generation for the Lower-48 decreased from 46% in 2010 to 32% in 2016.
- At the same time, gas's share of generation increased from 23% in 2010 to 33% in 2016.
- In 2016, gas-fired generation outpaced coal-fired generation for the first time.
- Renewables have increased their generation share from 9% to 13%.
- Structural changes in the market led to fall of coal and rise of gas.

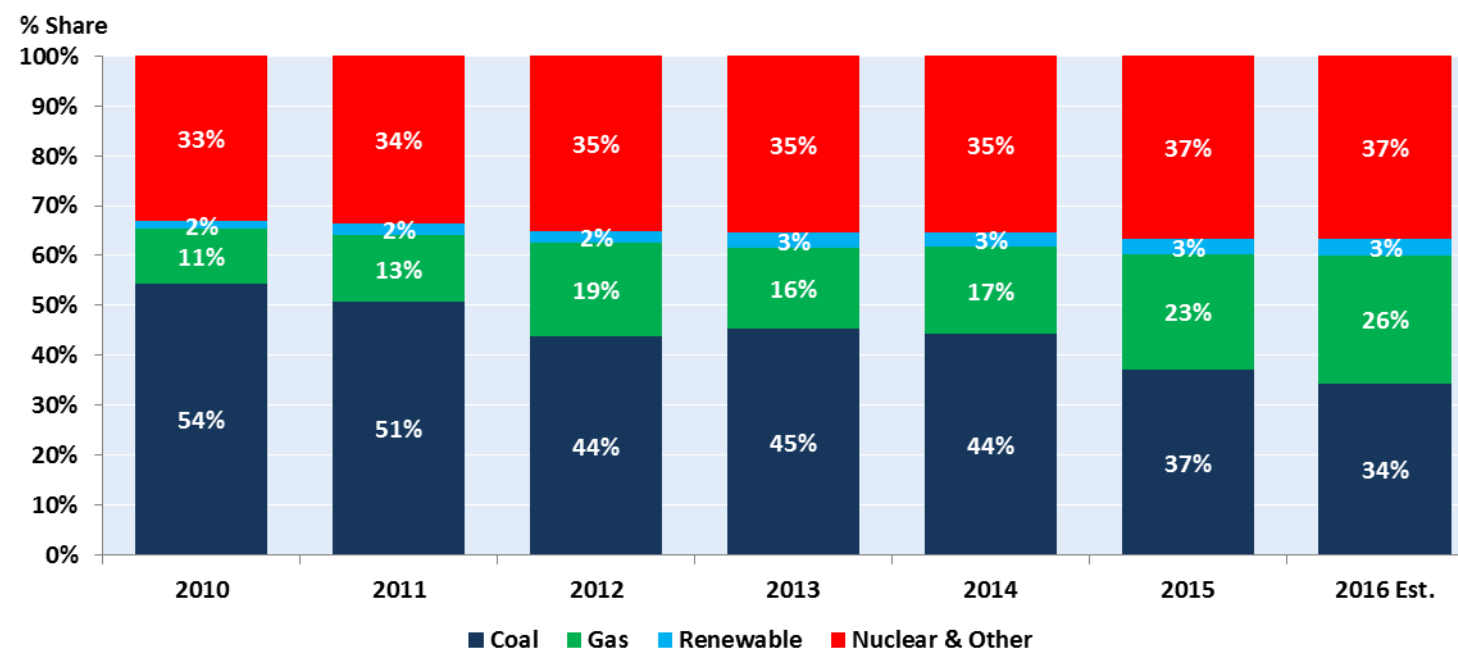
SHARE OF TOTAL GENERATION BY FUEL TYPE – LOWER-48



WHY IS IT IMPORTANT TO ANALYZE COAL & GAS COMPETITION ?

- PJM has seen a dramatic shift from coal to gas over the past 7 years. Coal's share of total generation dropped from 54% in 2010 to 34% in 2016 while gas's share increased from 11% in 2010 to 26% during the same period.
- This shift in the preferred choice of fuel for power generation has led to uncertainty and questions about grid reliability as fuel diversity is on the decline.

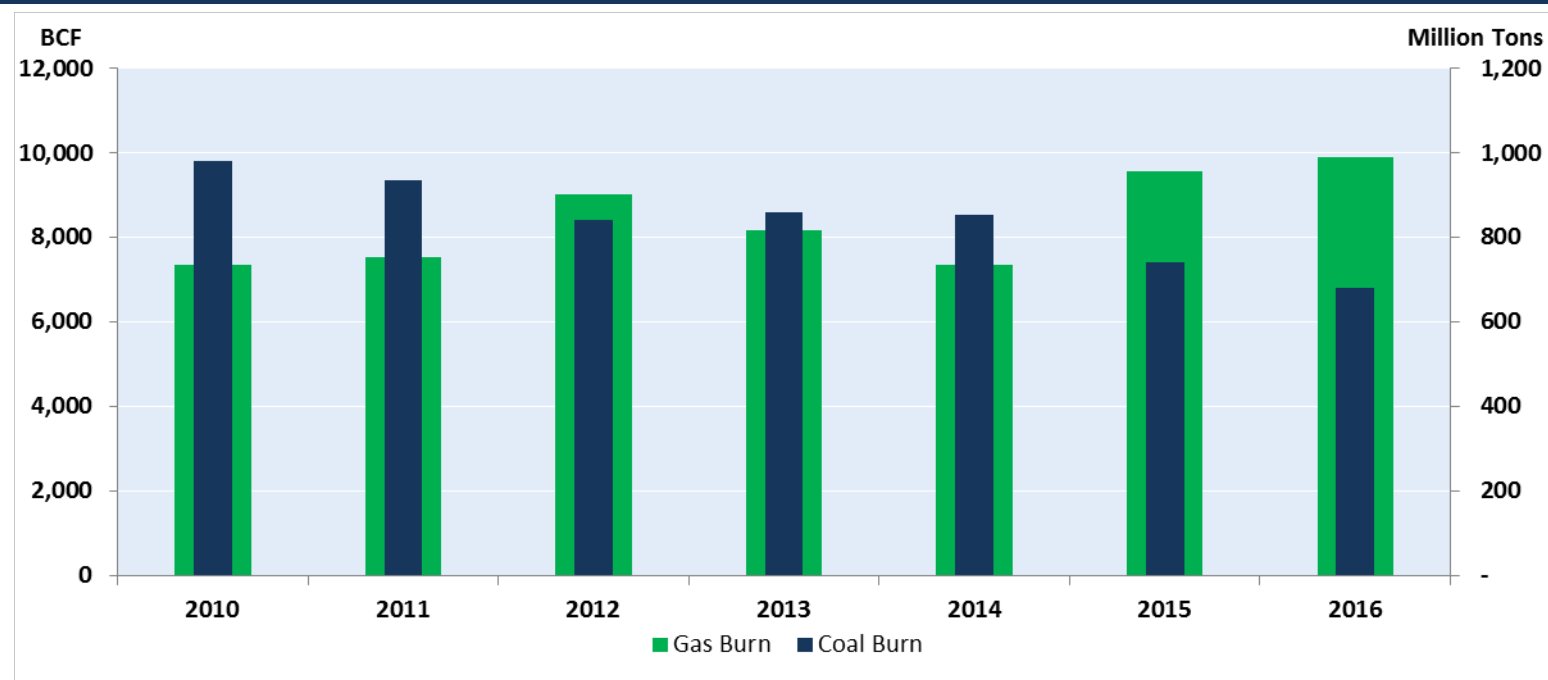
SHARE OF TOTAL GENERATION BY FUEL TYPE – PJM



WHY IS IT IMPORTANT TO ANALYZE COAL & GAS COMPETITION ?

- An analysis of historical power sector coal and gas burn indicates a continuous downward trend in coal burn, dropping from a high of almost 1 billion short tons in 2010 to just over 675 million short tons in 2016, marking a 30% decline.
- Gas burn increased from 7.35 TCF to nearly 9.9 TCF during the same period, a 35% increase.

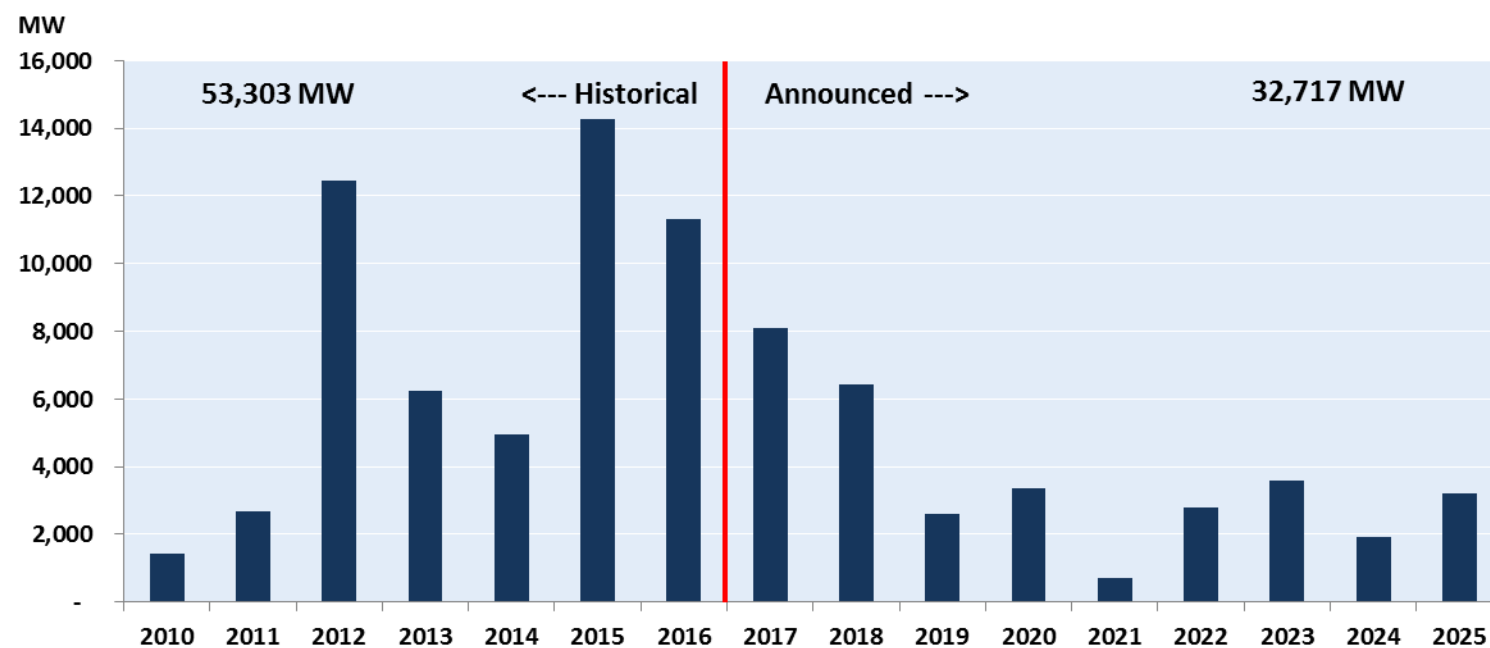
HISTORICAL COAL AND GAS BURN – LOWER-48



FACTORS IMPACTING COAL & GAS COMPETITION

- As a result of environmental regulations requiring coal units to install expensive environmental controls, many decided to retire prematurely.
- More than 50 GW of coal capacity has been retired in the past 7 years, and another 33 GW is slated to shutter by 2025.
- Fuel diversity is becoming a key issue. Over-reliance on gas-fired generation has the potential to create reliability issues during supply disruption events (Polar Vortex 2014).

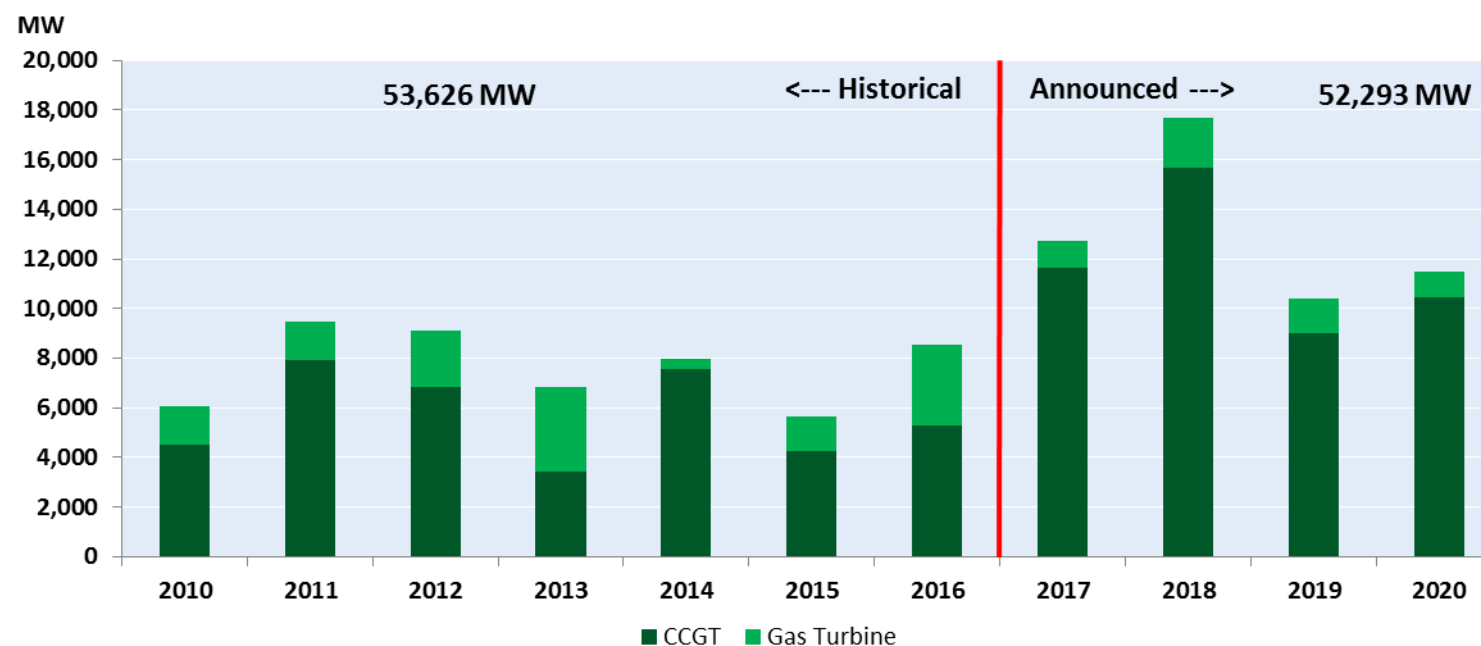
HISTORICAL AND ANNOUNCED COAL RETIREMENTS



FACTORS IMPACTING COAL & GAS COMPETITION

- The void created by the retiring coal units helped by favorable natural gas prices spurred a growth in gas-fired capacity. Almost all of the coal capacity retired through 2016 was replaced by gas capacity, with roughly the same amount expected to come online in the next four years.
- 2018 will see the single largest growth in gas capacity this decade, dominated by CCGTs.

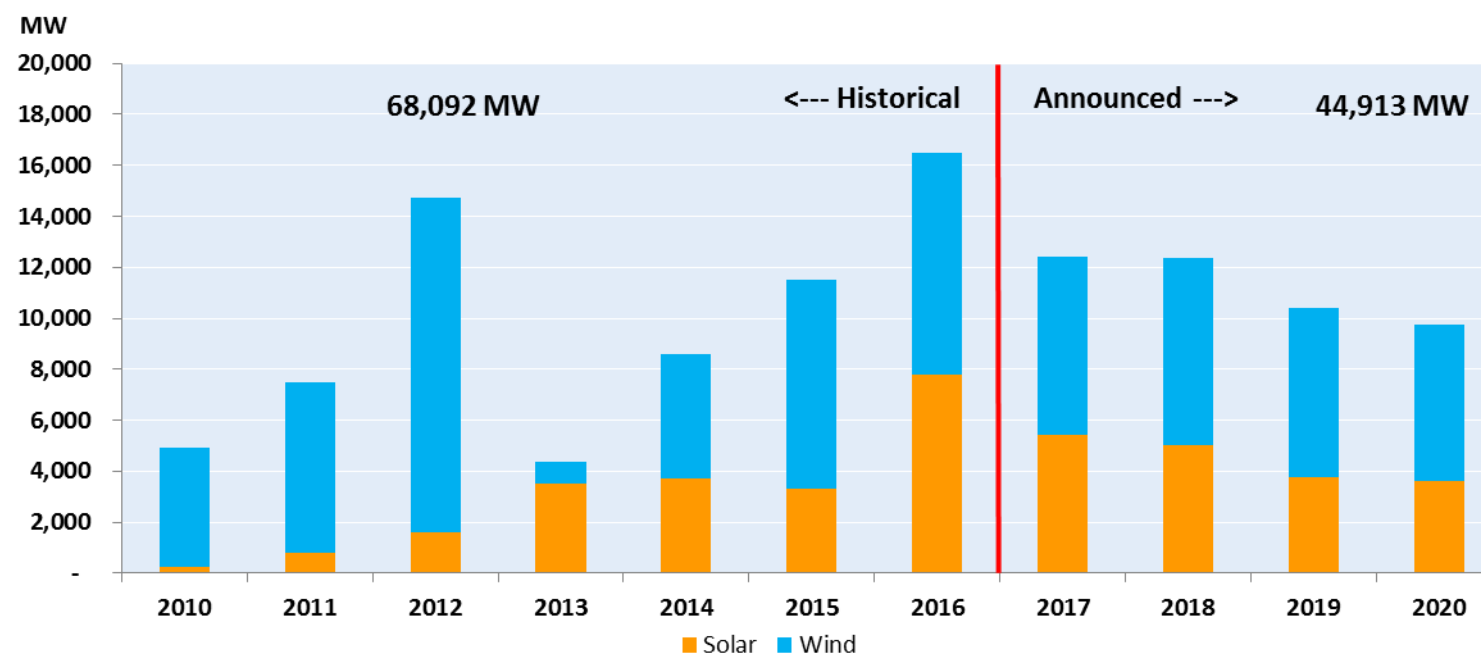
HISTORICAL AND ANNOUNCED NEW GAS CAPACITY ADDITIONS



FACTORS IMPACTING COAL & GAS COMPETITION

- Although the federal tax incentives like the Production Tax Credit for wind and Investment Tax Credit for solar have been around for quite some time, it was the advancement in technology that lowered the cost of renewable installation leading to a big increase in installed capacity. With the tax credits set to expire or phase out post-2020, we expect a reduction in renewable capacity expansion.
- Renewable growth is a major factor crowding the supply stack and intensifying the competition between coal and gas.

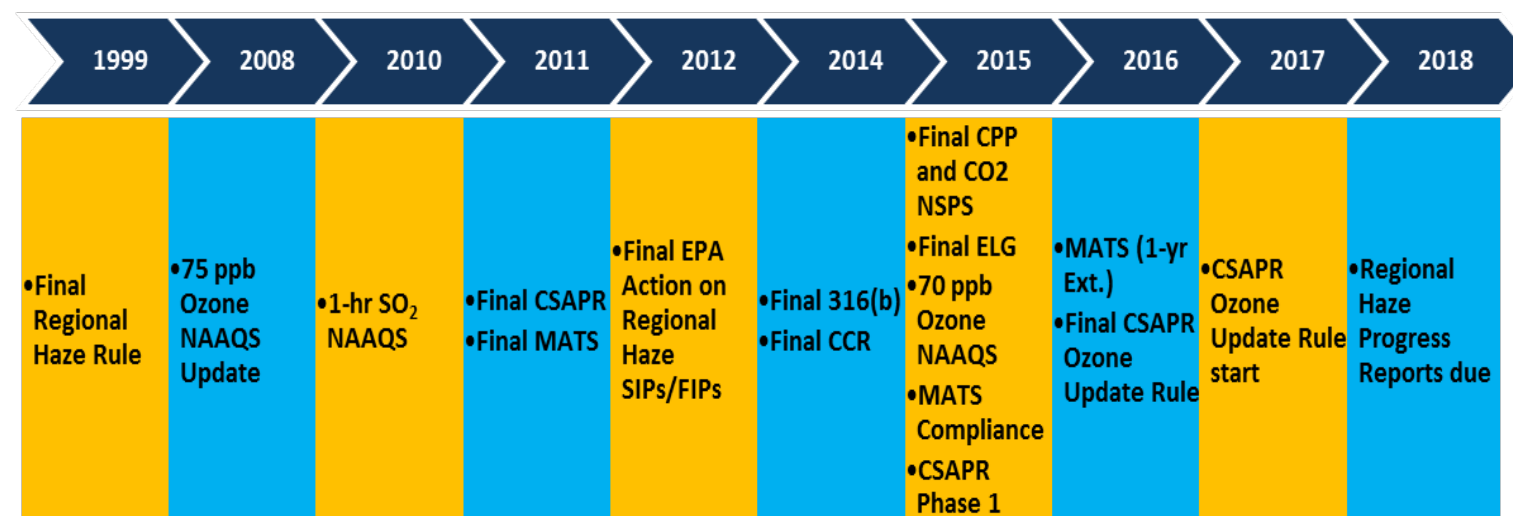
HISTORICAL AND ANNOUNCED NEW RENEWABLE CAPACITY ADDITIONS



FACTORS IMPACTING COAL & GAS COMPETITION

- A major driver of the current state of the market is the ever-growing list of environmental regulations that have disproportionately affected coal generators.
- One of the most impactful regulations that led to retirement of coal units was EPA's Mercury and Air Toxic Standards (MATS) rule, which required a significant investment during a time when low gas prices were pressuring energy revenues.

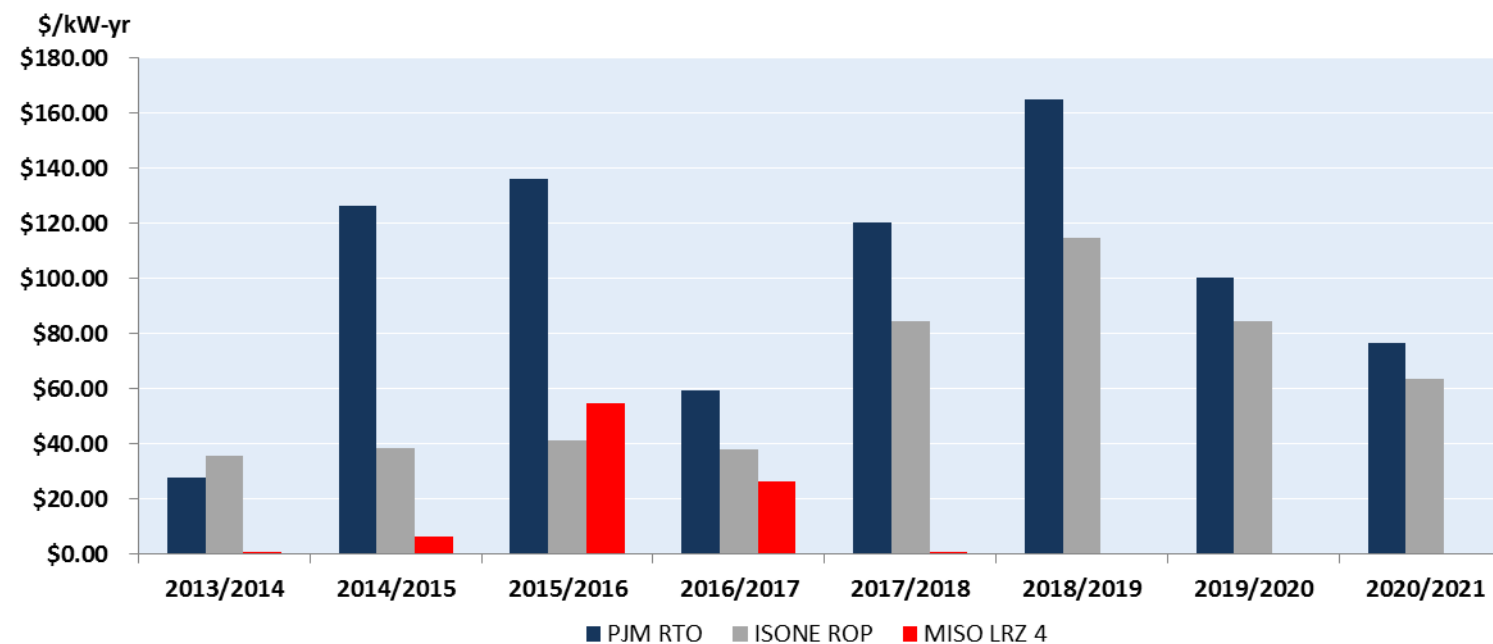
TIMELINE OF ENVIRONMENTAL PROTECTION AGENCY'S REGULATIONS AFFECTING COAL



FACTORS IMPACTING COAL & GAS COMPETITION

- Weaker capacity prices over the past several years have also hurt coal plant economics.
- Without sufficient energy and capacity revenue to cover fixed costs associated with necessary environmental controls, many coal plants have been forced to retire.

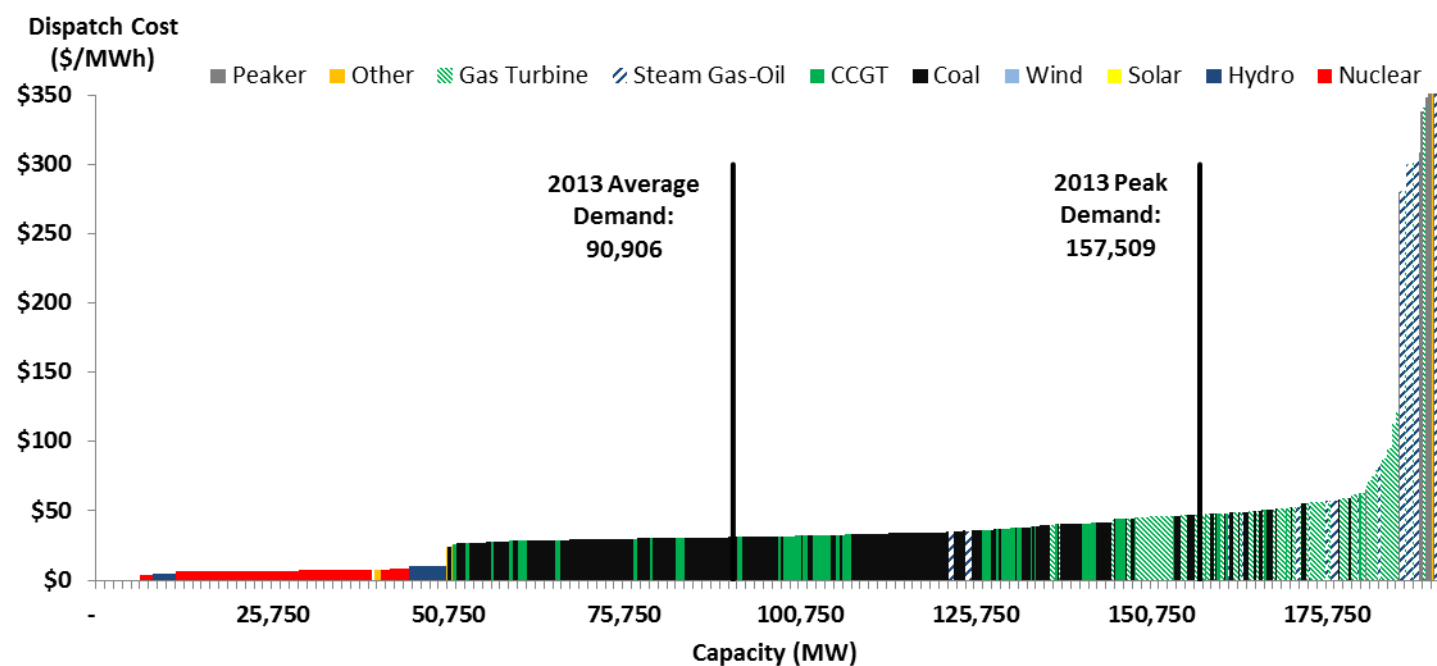
CAPACITY PRICES FOR MAJOR ISO



IMPACT ON DISPATCH

- A quick look at the 2013 supply stack for PJM shows that coal dominated as baseload capacity while gas remained on the margin. CCGTs had yet to make inroads into the PJM market.
- Average demand was 91 GW for the year while the summer peak clocked in at 157.5 GW allowing some price rise which helped fossil units.

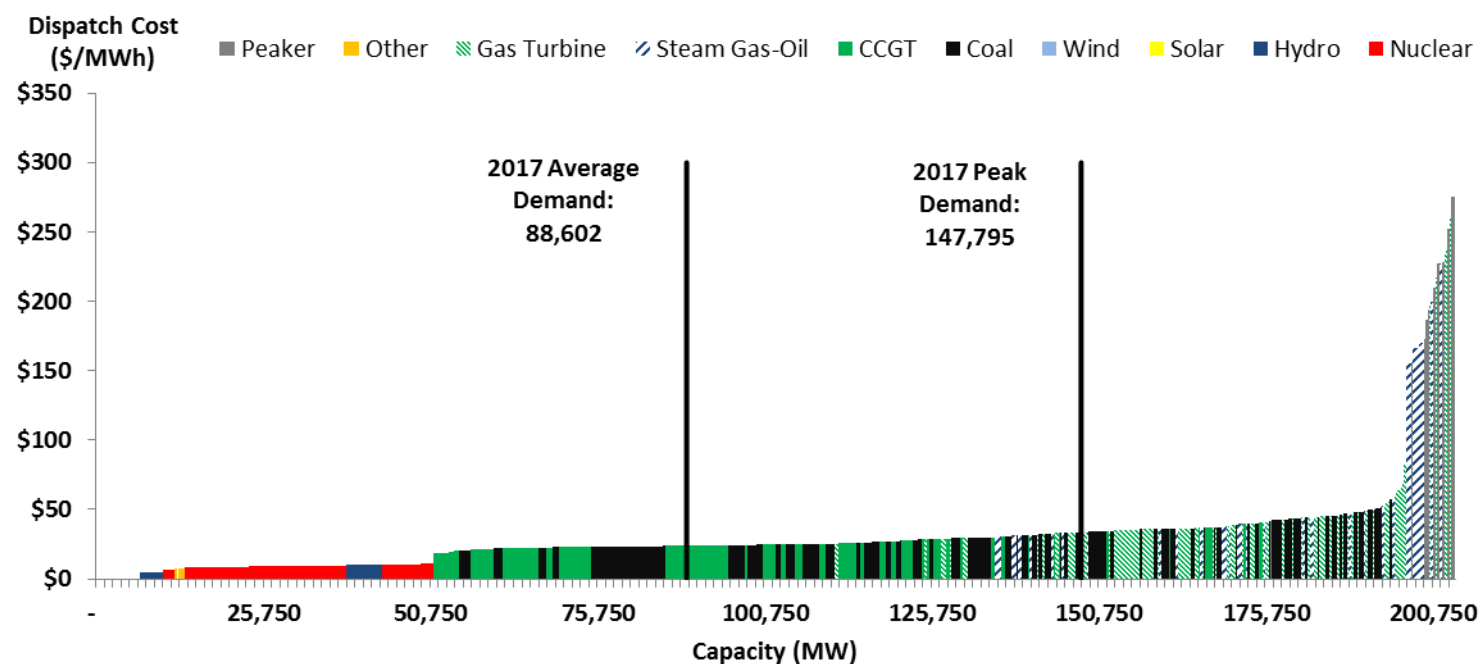
FULL LOAD SUPPLY STACK FOR PJM – 2013



IMPACT ON DISPATCH

- 2017 supply stack for PJM shows a contrasting picture with gas-fired generation, especially CCGTs crowding the bottom of the stack. Coal remains marginal at current projected gas prices.
- Compared to 2013, average demand in the region is expected to drop by 2.5 GW while peak demand is projected to be 10 GW lower than 2013. Energy efficiency measures and increasing participation from Demand Response have eroded demand growth prospects.

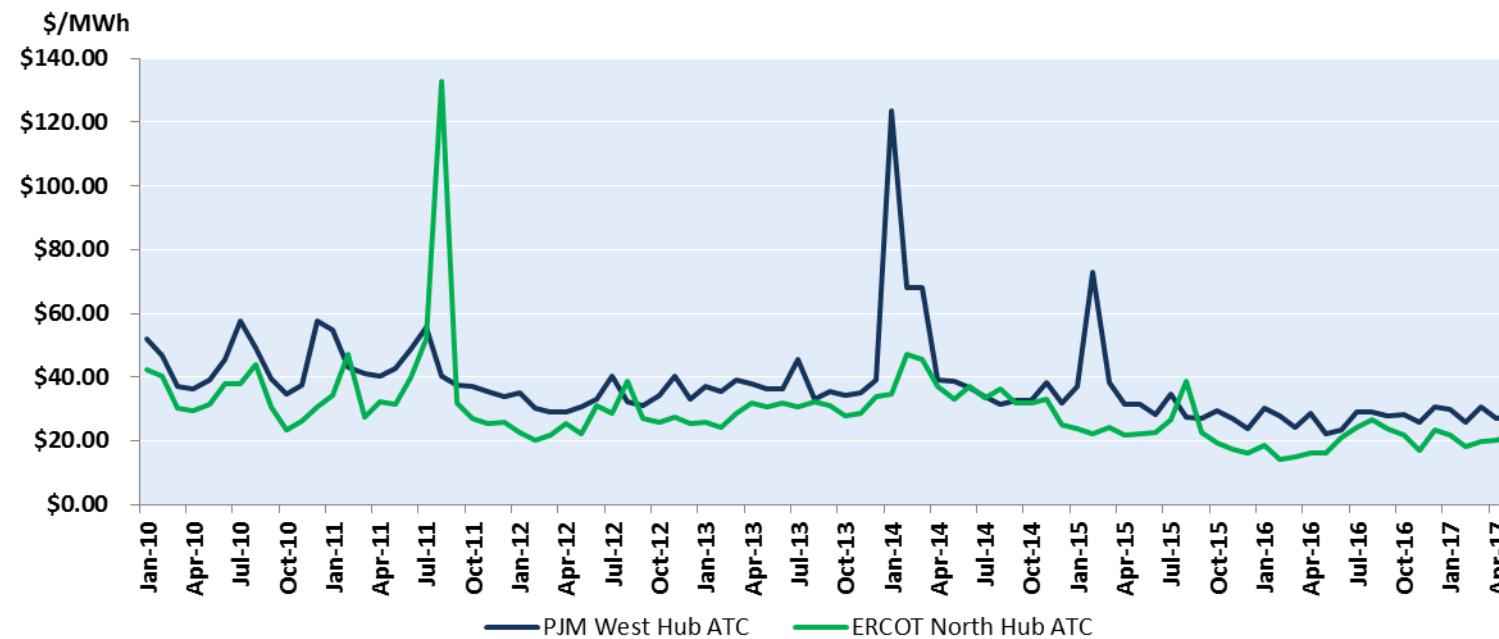
FULL LOAD SUPPLY STACK FOR PJM – 2017



IMPACT ON DISPATCH

- Historical averages of day-ahead prices for PJM and ERCOT exhibit a downward trend. Lower energy revenues, especially in the off-peak hours, are hurting coal-fired generators who must run overnight to capture the on-peak profitability. Wind generators are also distorting off-peak pricing by bidding in below cost.
- Barring a few weather-driven peak days, the seasonal variation has diminished over the past two years. This has hurt fossil units in ERCOT the most because, in the absence of a capacity market, they rely entirely on energy revenues to recover costs.

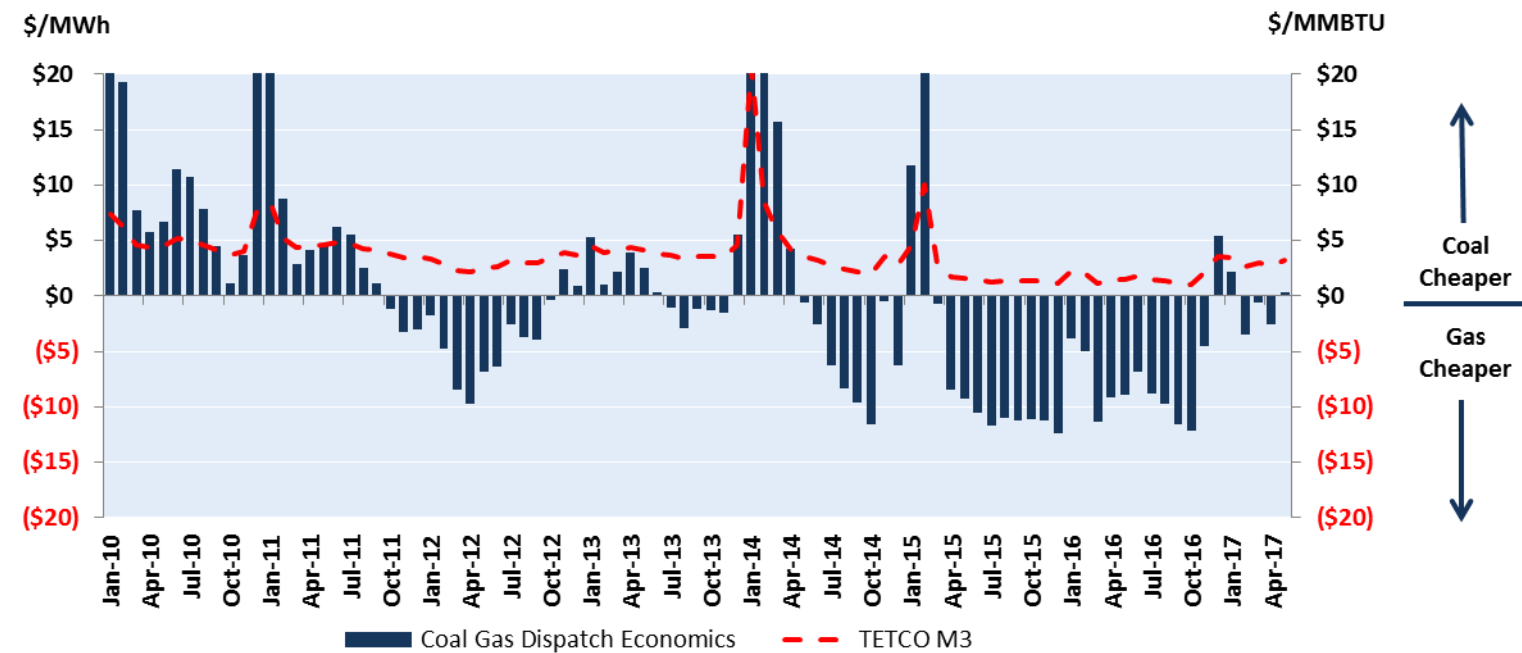
HISTORICAL ATC DAY AHEAD PRICES – PJM & ERCOT



IMPACT ON DISPATCH

- Comparing a hypothetical coal unit running at 10,000 BTU/kWh heat rate to a gas unit running at 7,000 BTU/kWh heat rate in PJM, we see that coal units are more economical to run when gas prices are above \$3.50/MMBTU whereas gas units are more economical to run when the gas prices are below \$3.50/MMBTU.
- With delivered gas prices in PJM staying below that threshold throughout 2016, coal units are burning expensive Appalachian coal at a disadvantage.

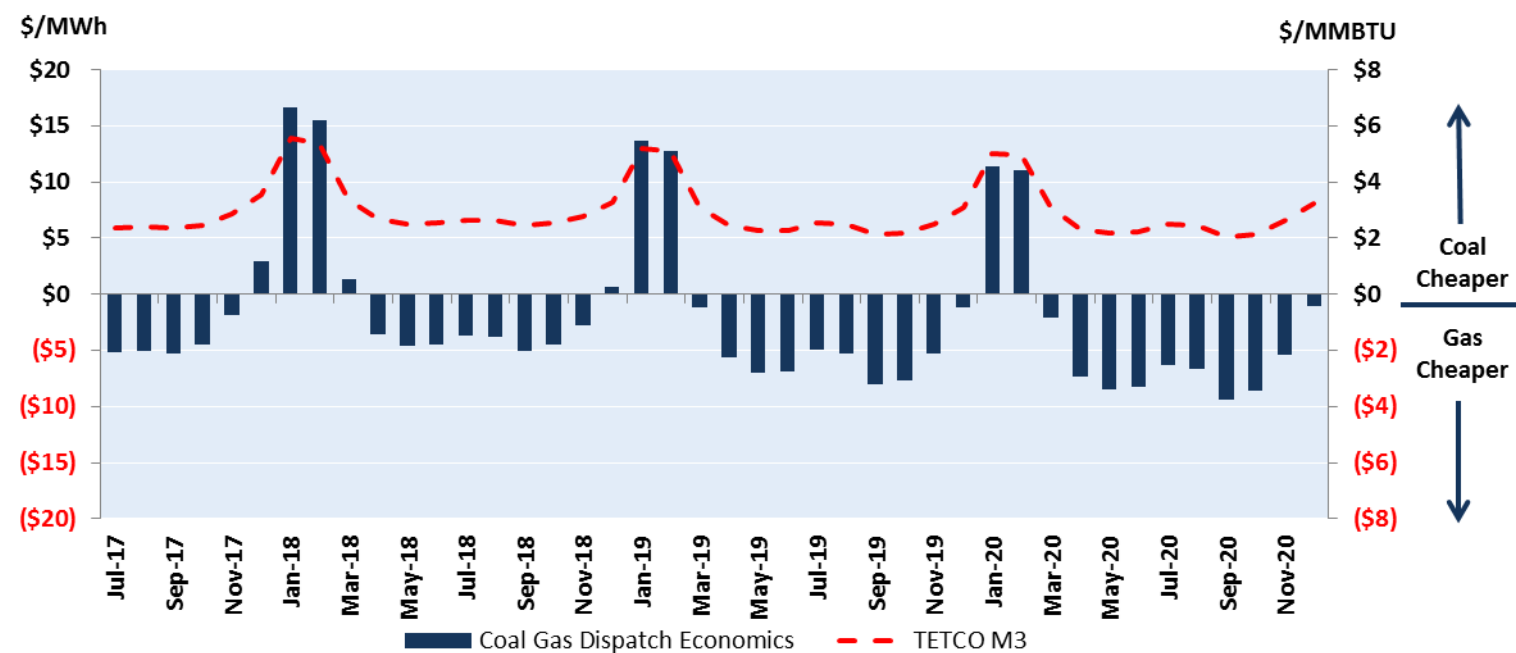
HISTORICAL COAL VS CCGT DISPATCH ECONOMICS - PJM



IMPACT ON DISPATCH

- Looking forward, barring the winter months when gas prices rise above \$4.00/MMBTU, gas units beat out coal units consistently through 2020 in PJM.
- Unless power prices improve, coal units will struggle to maintain profitability in a low gas price environment.

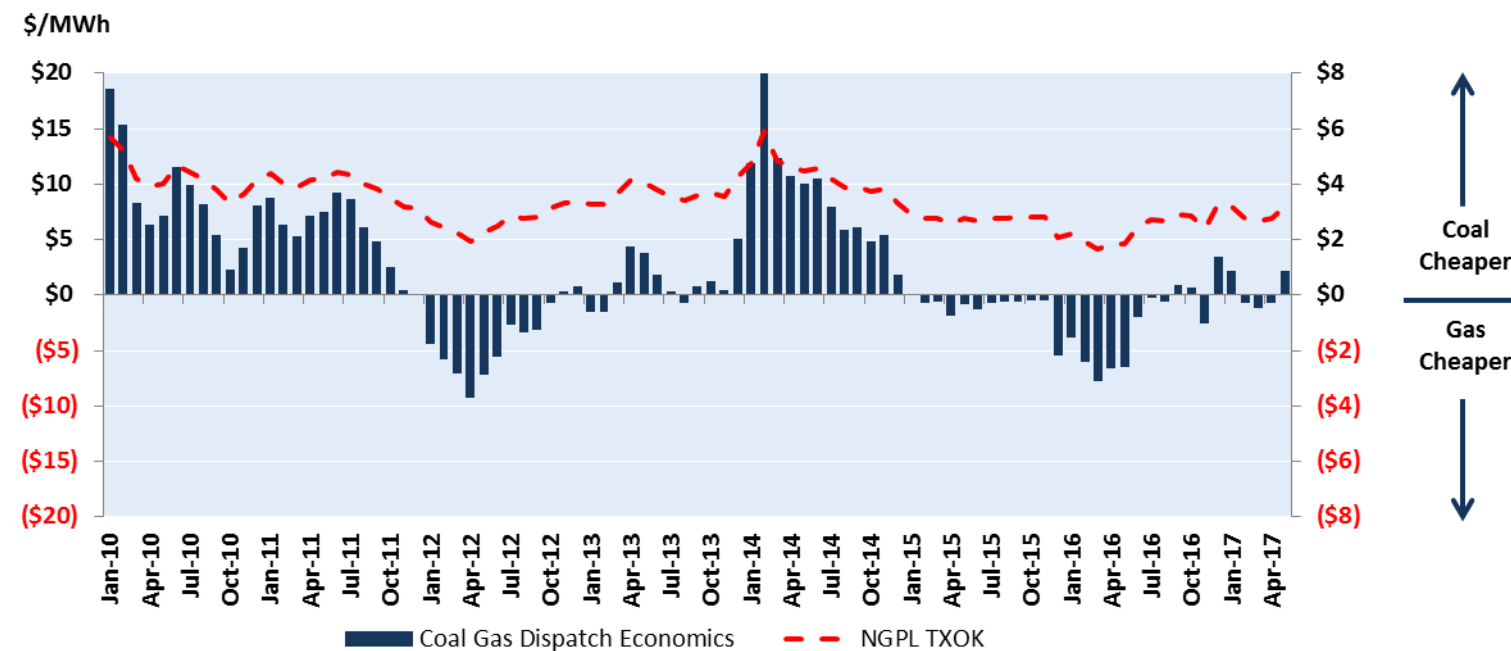
FORECASTED COAL VS CCGT DISPATCH ECONOMICS - PJM



IMPACT ON DISPATCH

- A similar historical analysis for ERCOT shows that coal units were profitable through 2011 and then again in 2014, but faced tough competition when delivered gas prices were below \$3/MMBTU, despite burning cheap PRB coal.
- This chart however does not quantify the impact that renewables are having on coal and gas competition in ERCOT.

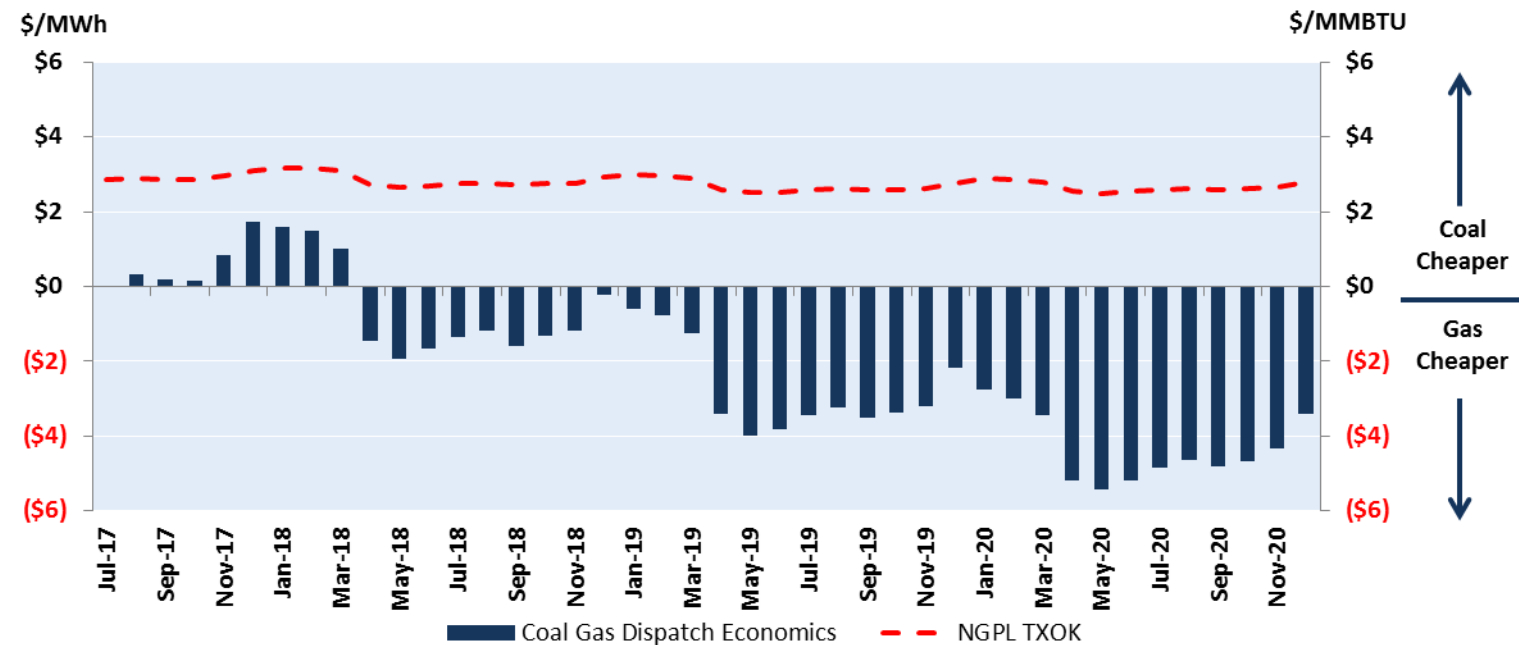
HISTORICAL COAL VS CCGT DISPATCH ECONOMICS - ERCOT



IMPACT ON DISPATCH

- Looking forward, the delivered gas prices to the region are staying flat without any seasonal variation, making it difficult for coal units to compete with gas on economics.
- However, higher summer loads in ERCOT give an opportunity to fossil-fired units to operate and make up a portion of the lost revenue during shoulder months.

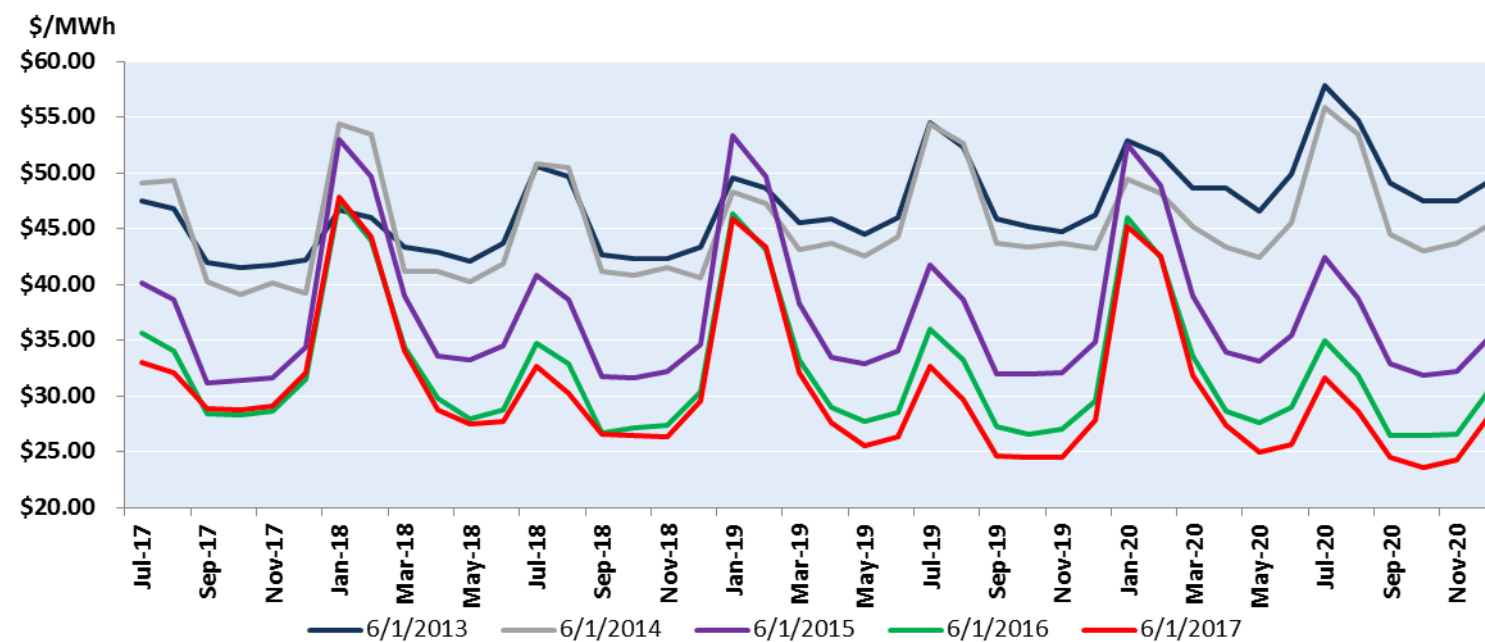
FORECASTED COAL VS CCGT DISPATCH ECONOMICS - ERCOT



HOW THE MARKET IS REACTING

- The market expectation for power prices has been bearish over the past 5 years. Comparing the 2013 PJM West hub market forwards with those of 2017, winter and summer peaks have declined by \$8/MWh and \$20/MWh, respectively.
- This decline highlights the impending difficulties that coal units face over the next 4 years.

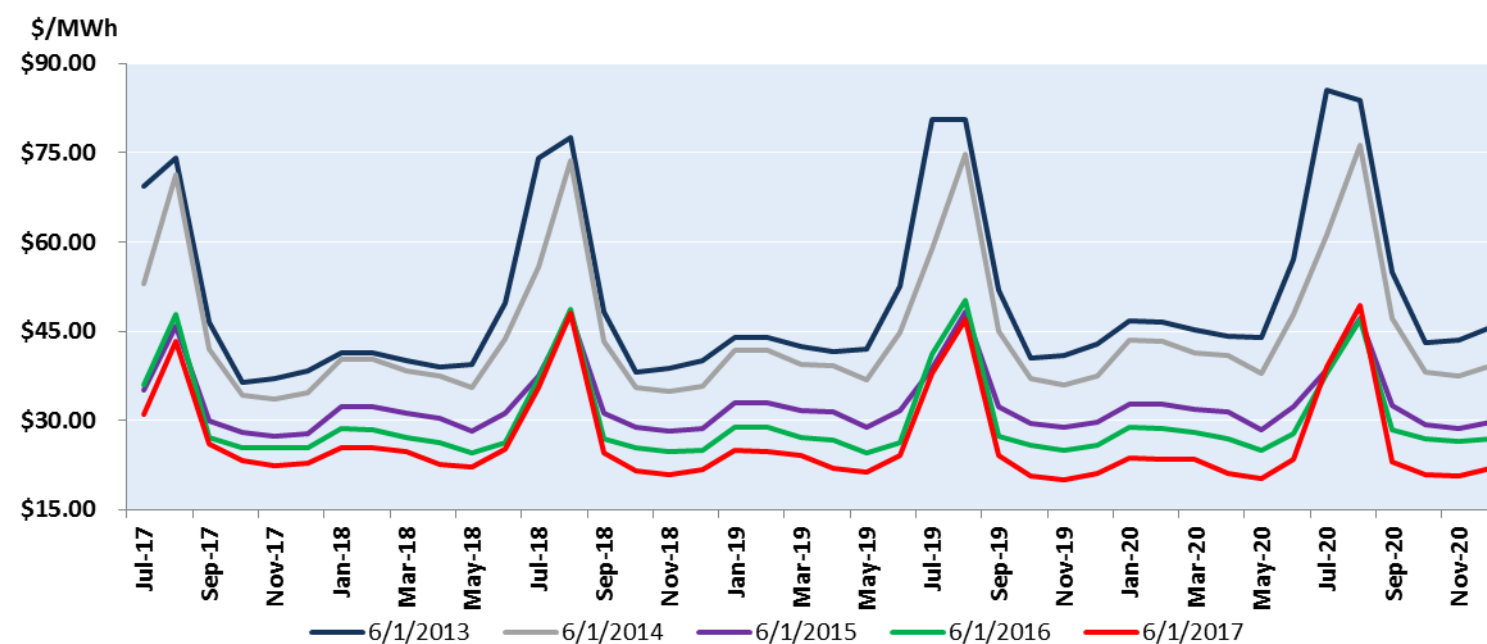
PJM-WEST HUB DAY AHEAD ATC FUTURES PRICES



HOW THE MARKET IS REACTING

- A similar story is evident in ERCOT, where on-peak market forwards during summer have fallen by almost \$30/MWh over the last 5 years.
- ERCOT fossil units rely heavily on scarcity pricing in summer, when the real-time prices tend to skyrocket.
- With bearish demand growth expectations, capacity oversupply and low natural gas prices, it will be difficult for coal units in ERCOT to earn high revenues over the next 4 years.

ERCOT NORTH HUB DAY AHEAD ATC FUTURES PRICES



HOW WE ANALYZE THE IMPACT

- EVA uses its proprietary Scenario Analysis (SCAN) methodology to quantify the impact of coal and gas competition.
- The main driver is natural gas prices. EVA runs a sensitivity analysis by changing gas prices to identify key inflection points where coal - gas switching occurs.
- EVA believes that a key support point for gas burn is between \$2.90 and \$3.00/MMBTU whereas a key resistance point is between \$3.40 and \$3.50/MMBTU gas price.

Power Markets	NYMEX - \$1.00	NYMEX - \$0.50	NYMEX - \$0.40	NYMEX - \$0.30	NYMEX - \$0.20	NYMEX - \$0.10	NYMEX	NYMEX + \$0.10	NYMEX + \$0.20	NYMEX + \$0.30	NYMEX + \$0.40	NYMEX + \$0.50	NYMEX + \$1.00
Jul-17	\$2.10	\$2.60	\$2.70	\$2.80	\$2.90	\$3.00	\$3.10	\$3.20	\$3.30	\$3.40	\$3.50	\$3.60	\$4.10
Total U.S. L-48	40.7	38.7	38.5	38.2	37.8	37.7	36.9	36.4	35.9	35.7	35.4	33.9	33.5
PJM	7.4	7.1	7.1	7.0	7.0	7.0	6.8	6.7	6.6	6.6	6.6	6.3	6.2
MISO	5.3	4.8	4.8	4.7	4.7	4.6	4.5	4.4	4.3	4.3	4.2	3.9	3.7
SPP	2.6	2.3	2.3	2.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.8	1.8
ERCOT	4.8	4.7	4.7	4.7	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.4	4.4
SERC	8.0	7.6	7.5	7.5	7.4	7.3	7.2	7.0	6.9	6.8	6.7	6.4	6.3
FRCC	4.0	3.9	3.9	3.9	3.9	3.9	3.8	3.8	3.8	3.8	3.8	3.7	3.7
WECC	4.7	4.4	4.4	4.3	4.3	4.3	4.2	4.1	4.1	4.1	4.1	4.0	3.9
NORTHEAST	3.9	3.8	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.5	3.4
Jul-Oct 2017	\$2.10	\$2.60	\$2.70	\$2.80	\$2.90	\$3.00	\$3.10	\$3.20	\$3.30	\$3.40	\$3.50	\$3.60	\$4.10
Total U.S. L-48	33.9	32.4	32.2	31.9	31.8	31.2	30.7	30.5	30.1	29.9	29.1	28.6	27.8
PJM	6.2	6.1	6.0	6.0	6.0	5.9	5.9	5.8	5.8	5.7	5.6	5.5	5.3
MISO	3.8	3.5	3.5	3.4	3.4	3.3	3.2	3.1	3.1	3.0	2.9	2.7	2.6
SPP	1.7	1.5	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.1	1.1
ERCOT	3.9	3.9	3.9	3.9	3.8	3.8	3.8	3.8	3.8	3.8	3.7	3.7	3.7
SERC	6.9	6.7	6.6	6.6	6.5	6.4	6.3	6.2	6.1	6.0	5.7	5.6	5.4
FRCC	3.7	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.4	3.4	3.4	3.3	3.3
WECC	4.5	4.2	4.1	4.1	4.1	4.0	4.0	3.9	3.9	3.9	3.8	3.8	3.8
NORTHEAST	3.2	3.1	3.0	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.8	2.8	2.7
Nov-Mar 2017/18	\$2.30	\$2.80	\$2.90	\$3.00	\$3.10	\$3.20	\$3.30	\$3.40	\$3.50	\$3.60	\$3.70	\$3.80	\$4.30
Total U.S. L-48	25.6	24.0	23.8	23.7	23.4	23.0	22.5	22.0	21.6	21.5	20.9	20.6	19.8
PJM	4.6	4.4	4.3	4.3	4.3	4.2	4.1	4.0	4.0	4.0	3.9	3.8	3.7
MISO	3.5	3.2	3.1	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.0
SPP	1.3	1.1	1.1	1.0	1.0	1.0	0.9	0.8	0.8	0.8	0.8	0.7	0.7
ERCOT	2.9	2.8	2.7	2.7	2.7	2.7	2.6	2.5	2.5	2.4	2.4	2.4	2.3
SERC	5.2	4.9	4.9	4.9	4.8	4.7	4.6	4.6	4.4	4.4	4.2	4.2	4.0
FRCC	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6
WECC	3.7	3.4	3.4	3.4	3.4	3.3	3.2	3.2	3.1	3.1	3.1	3.0	3.0
NORTHEAST	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Apr-Oct 2018	\$1.90	\$2.40	\$2.50	\$2.60	\$2.70	\$2.80	\$2.90	\$3.00	\$3.10	\$3.20	\$3.30	\$3.40	\$3.90
Total U.S. L-48	33.0	31.3	30.9	30.5	30.3	30.1	29.9	29.5	29.0	28.8	28.4	28.2	26.4
PJM	6.3	6.1	6.1	6.0	6.0	6.0	6.0	5.9	5.8	5.8	5.8	5.7	5.4
MISO	4.0	3.6	3.5	3.4	3.4	3.3	3.3	3.2	3.1	3.0	2.9	2.8	2.4
SPP	1.7	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.0
ERCOT	3.8	3.7	3.7	3.6	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.4
SERC	6.4	6.2	6.1	6.0	6.0	5.9	5.8	5.8	5.7	5.6	5.5	5.4	5.0
FRCC	3.7	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.4
WECC	4.4	4.1	4.0	3.9	3.9	3.9	3.9	3.8	3.8	3.7	3.7	3.7	3.6
NORTHEAST	2.7	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.2

HOW WE ANALYZE THE IMPACT

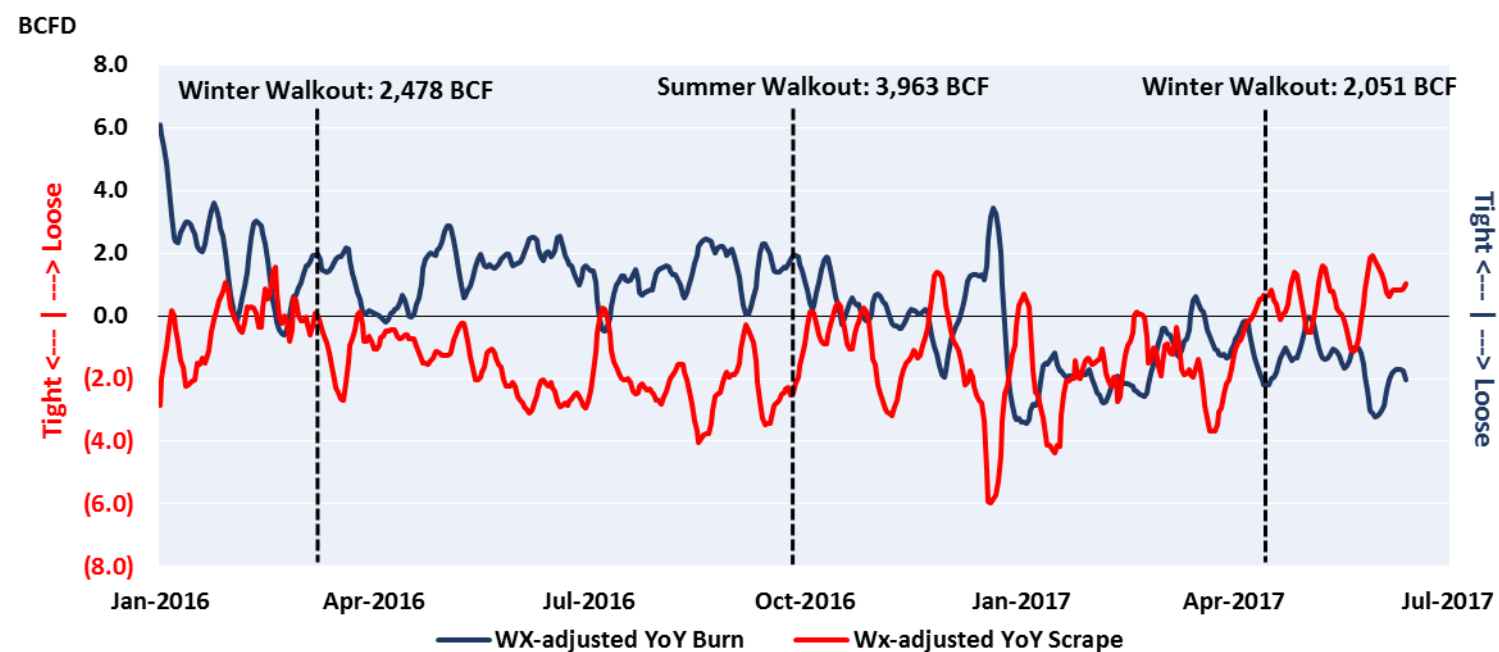
- The analysis also looks at coal burn at different gas prices to identify which coal basins are most susceptible to gas price fluctuations.
- This analysis is forward looking and it helps mitigate risk for parties involved in both coal and gas.
- The SCAN takes into account weather as well as the structural changes affecting coal and gas competition.

Coal Basins	NYMEX - \$1.00	NYMEX - \$0.50	NYMEX - \$0.40	NYMEX - \$0.30	NYMEX - \$0.20	NYMEX - \$0.10	NYMEX	NYMEX + \$0.10	NYMEX + \$0.20	NYMEX + \$0.30	NYMEX + \$0.40	NYMEX + \$0.50	NYMEX + \$1.00
Jul-17	\$2.10	\$2.60	\$2.70	\$2.80	\$2.90	\$3.00	\$3.10	\$3.20	\$3.30	\$3.40	\$3.50	\$3.60	\$4.10
Total U.S. L-48	65.4	66.8	66.9	67.0	67.3	67.3	68.8	69.4	70.0	70.2	70.4	72.0	73.4
NAPP	7.0	7.3	7.3	7.4	7.5	7.5	7.7	7.8	7.8	7.9	7.9	8.3	8.3
CAPP	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.8	2.0
ILLB	10.0	10.3	10.4	10.4	10.5	10.5	10.6	10.8	10.9	10.9	11.0	11.3	11.5
PRB	34.4	35.0	35.0	35.1	35.1	35.2	35.9	36.3	36.5	36.6	36.6	36.9	38.0
Rockies	3.1	3.1	3.1	3.1	3.1	3.1	3.3	3.3	3.3	3.3	3.3	3.6	3.6
Other	9.4	9.5	9.5	9.5	9.5	9.5	9.6	9.7	9.8	9.8	9.8	10.0	10.0
Jul-Oct 2017	\$2.10	\$2.60	\$2.70	\$2.80	\$2.90	\$3.00	\$3.10	\$3.20	\$3.30	\$3.40	\$3.50	\$3.60	\$4.10
Total U.S. L-48	255.1	257.4	257.9	258.4	258.7	262.1	264.7	265.4	268.2	269.3	274.6	278.1	280.0
NAPP	26.4	27.0	27.1	27.2	27.2	27.7	28.1	28.2	28.5	28.7	29.4	29.9	30.4
CAPP	4.6	4.8	4.9	4.9	4.9	5.2	5.3	5.4	5.5	5.7	6.1	6.4	6.8
ILLB	37.3	37.9	38.2	38.3	38.4	39.1	39.5	39.6	40.3	40.3	41.5	42.0	42.5
PRB	137.2	138.0	138.0	138.1	138.2	140.0	141.2	141.6	142.8	143.5	145.7	147.5	147.6
Rockies	12.7	12.7	12.7	12.7	12.8	12.9	13.2	13.2	13.3	13.4	13.7	13.9	14.1
Other	36.9	37.0	37.0	37.1	37.2	37.3	37.4	37.5	37.7	37.7	38.2	38.6	38.6
Nov-Mar 2017/18	\$2.30	\$2.80	\$2.90	\$3.00	\$3.10	\$3.20	\$3.30	\$3.40	\$3.50	\$3.60	\$3.70	\$3.80	\$4.30
Total U.S. L-48	262.4	272.6	273.5	274.4	276.5	279.8	284.9	288.8	293.9	294.6	300.6	303.2	310.9
NAPP	36.1	36.7	36.8	36.8	37.0	37.4	37.7	38.0	38.4	38.5	39.1	39.3	40.3
CAPP	8.2	8.8	8.8	8.8	9.0	9.1	9.3	9.3	9.7	9.7	10.0	10.2	10.8
ILLB	38.3	39.7	39.8	39.8	40.2	40.5	41.4	41.8	42.7	43.2	43.6	43.9	45.3
PRB	129.7	136.1	136.5	137.1	138.3	140.1	143.0	145.5	148.4	148.5	151.8	153.5	157.3
Rockies	12.4	12.6	12.8	12.8	12.9	13.2	13.6	13.8	13.9	13.9	14.3	14.4	14.8
Other	37.6	38.8	38.9	39.0	39.0	39.6	39.9	40.4	40.7	40.8	41.7	41.8	42.4
Apr-Oct 2018	\$1.90	\$2.40	\$2.50	\$2.60	\$2.70	\$2.80	\$2.90	\$3.00	\$3.10	\$3.20	\$3.30	\$3.40	\$3.90
Total U.S. L-48	404.2	414.3	416.4	419.9	420.9	421.9	422.5	425.7	431.9	433.9	437.0	439.5	460.9
NAPP	38.7	40.4	40.8	41.5	41.6	41.8	42.0	42.5	43.3	43.6	44.3	44.6	48.5
CAPP	9.0	9.5	9.6	9.8	9.9	9.9	10.0	10.2	10.5	10.7	10.9	11.2	12.7
ILLB	61.5	62.8	63.4	63.9	64.1	64.1	64.3	64.9	65.8	65.9	66.6	66.9	70.5
PRB	213.6	219.6	220.4	222.5	223.1	223.8	223.9	225.5	228.6	229.9	231.2	232.4	242.1
Rockies	20.2	20.5	20.5	20.5	20.5	20.5	20.5	20.6	21.0	21.0	21.1	21.2	22.2
Other	61.1	61.5	61.7	61.7	61.8	61.8	61.8	62.0	62.6	62.8	63.1	63.2	64.9

HOW WE ANALYZE THE IMPACT

- EVA's weather adjusted storage sample and power burn offer comparable observations on price behavior.
- As we entered the injection season with 2,051 BCF working gas in storage, we observe a stronger injection and weaker power burn compared to 2016; this has resulted in the recent price drop in Henry Hub NYMEX prices

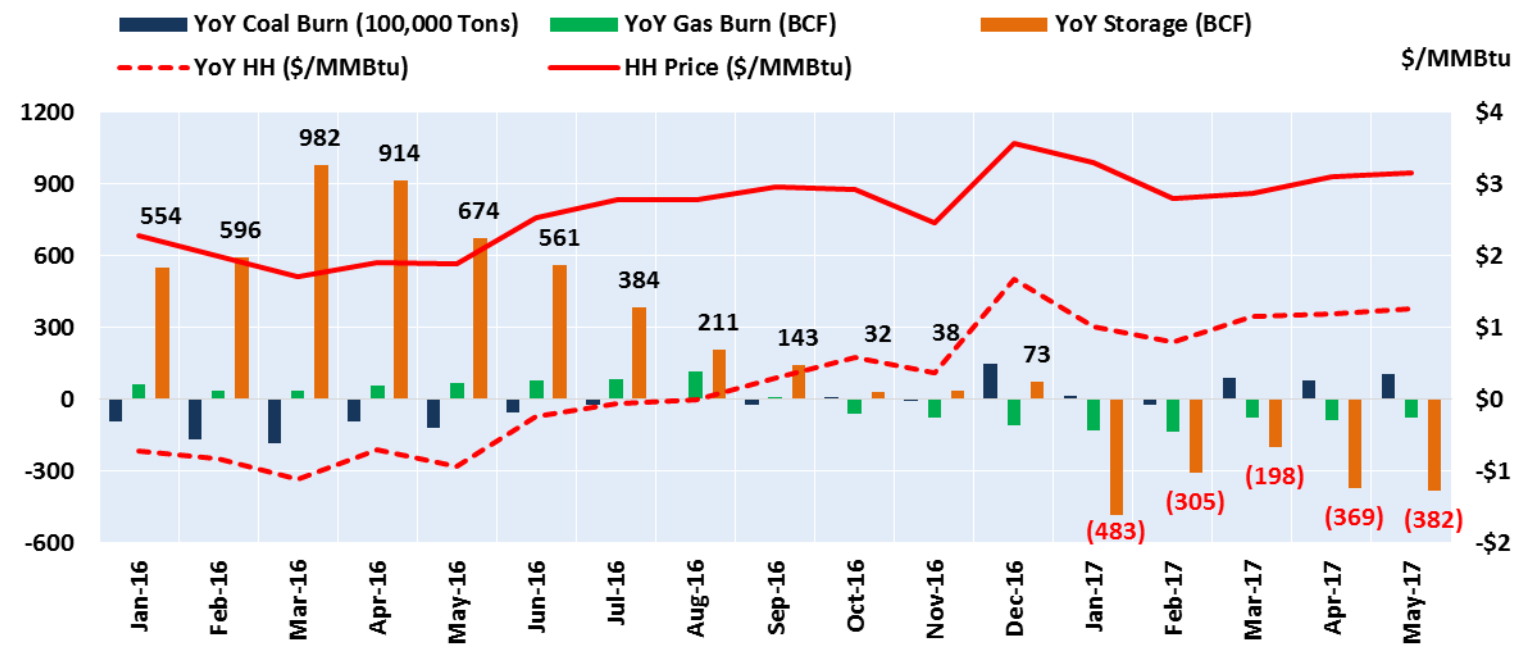
WEATHER ADJUSTED STORAGE SCRAPES



HOW WE ANALYZE THE IMPACT

- Another way of looking at the impact of storage on gas prices and gas and coal burn is by comparing the YoY changes. In the first half of 2016 we observed that as storage increased YoY, gas prices reduced thus increasing gas burn. However, YTD 2017 storage lags behind 2016 levels, resulting in higher gas prices and reduced gas burn.
- Coal burn has benefited from the low gas storage levels and higher gas prices.

YOY CHANGES IN STORAGE IMPACTING COAL AND GAS BURN

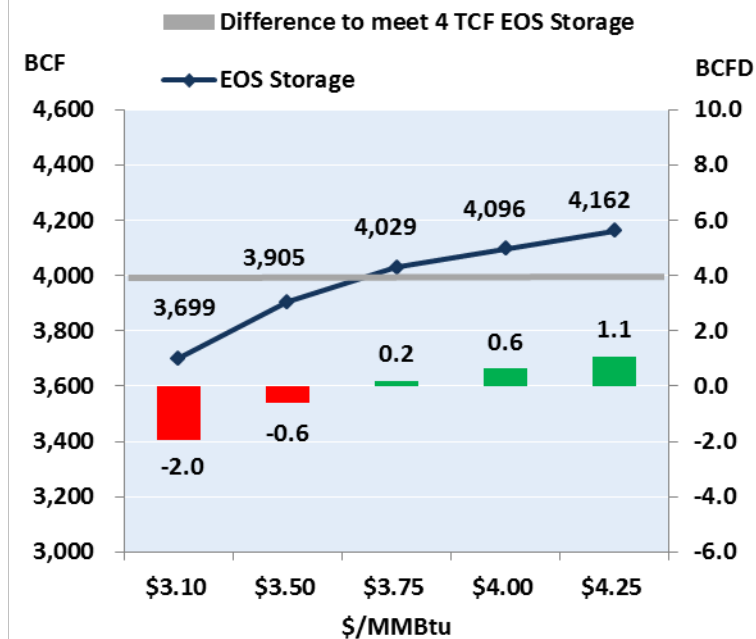


HOW WE ANALYZE THE IMPACT

- EVA's storage facilitator helps identify the market expectation of prices needed to achieve a 4.0 TCF in storage by EOS (10/31).
- At the current price levels, EVA projects a 3.7 TCF walk-out at EOS. Gas prices will need to rally in the range of \$3.50 - \$3.75/MMBTU for the balance of summer to significantly deter gas burn from the power sector and achieve a 4.0 TCF EOS storage. This implies that there is an upside risk for gas that coal can benefit from during summer if weather expectations actualize.

EVA'S STORAGE FACILITATOR

		N-V HH Prices (\$/MMBtu)				
		\$3.10	\$3.50	\$3.75	\$4.00	\$4.25
5/31 EOS (BCF)		2,590	2,590	2,590	2,590	2,590
M-V Supply/Demand	Production	72.4	72.5	72.6	72.7	72.8
	Net CAD Imports	6.6	6.6	6.6	6.6	6.7
	RES/COM	9.0	9.0	9.0	9.0	9.0
	IND	20.2	20.2	20.2	20.2	20.2
	Power Burn	30.8	29.6	28.8	28.6	28.3
	LNG	2.4	2.4	2.4	2.4	2.4
	Net MEX Exports	4.5	4.5	4.5	4.5	4.5
	OTHER	4.8	4.8	4.8	4.8	4.8
	Supply	79.0	79.1	79.2	79.3	79.5
	Demand	71.7	70.5	69.8	69.5	69.2
Build (BCF)	1,109	1,315	1,439	1,506	1,572	
Goal (BCF)	4,000					
10/31 EOS (BCF)	3,699	3,905	4,029	4,096	4,162	
BCF Diff	-301	-95	29	96	162	
BCFD Diff	-2.0	-0.6	0.2	0.6	1.1	



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