



UTILITIES & POWER

Regulateds – Market Underweight

Integrateds – Market Overweight

IPPs – Market Overweight

Gas/Power Infrastructure – Market Overweight

November 18, 2019

THE WEEKLY MARK

Who says the IPPs can't grow?

NRG and VST lay out illustrative growth examples

In our view, both NRG and VST made compelling cases on Q3 calls when discussing future EBITDA and Free Cash Flow growth based on real capital allocation flexibility.

NRG's framework split FCF 50/50 between growth and capital return. The growth hurdle rate is 12-15% unlevered IRRs and 5-year payback. Return of capital would go towards a 3% yield dividend with 7-9%/year growth, and the remainder likely available for buybacks. In its illustrative example, FCF would grow by 50% and share count would fall by 30% over 2020-2024 (assumes 50% of non-dividend cash towards repurchases). NRG didn't address potential lost EBITDA from aging plants.

VST's framework was slightly less tilted towards growth – assuming \$2B/year in Free Cash Flow and 25% towards growth over 10 years. This would replace lost EBITDA from at-risk assets and still leave \$3.5-4B available for growth investment. This would generate EBITDA growth of \$90-100M/year assuming IRRs of 500-600bps above VST's cost of equity. The remaining 75% of FCF (\$1.5B/year) would go towards dividend growth, share buybacks, and maintaining leverage targets. In VST's illustrative example, EBITDA would still grow by almost 20% over 2021-2030.

We ran our own numbers – EBITDA/FCF per share growth is best in sector

We took the time to run our own numbers here. We think the best way to show this is on a per share basis, given how meaningfully the potential buybacks could lower share count. In this exercise, we are assuming 50% of capital allocated towards growth for both companies – invested at 6x EBITDA with 60% converted to FCF. Over time, the amount of cash deployed towards buybacks grows exponentially, as incremental EBITDA creates debt capacity (2.5x target) and a lower share count limits total dividend outflows despite continued growth. **For VST and NRG, we see EBITDA/FCF per share CAGRs of 11% and 15% respectively. This analysis uses many assumptions, but at the very least, it shows how effective FCF use can more than offset core business pressures. With stable base businesses, the IPPs could have the best per share growth of any company in the sector.**

VST	2020E	2021E	2022E	2023E	2024E	2025E	NRG	2020E	2021E	2022E	2023E	2024E	2025E
EBITDA	3,464	3,312	3,458	3,673	3,882	4,161	EBITDA	2,040	1,940	2,037	2,179	2,317	2,502
Growth (6x / 60%)	146	215	209	280	291		Growth (6x / 60%)	96	142	138	185	193	
FCF	2,185	2,127	2,214	2,343	2,468	2,636	FCF	1,405	1,407	1,464	1,550	1,632	1,743
Debt Capacity	(378)	364	159	896	858		Debt Capacity	(249)	241	107	586	569	
Buyback	-	609	1,021	983	1,412	1,489	Buyback	414	291	558	533	825	901
Dividend	254	266	269	269	266	258	Dividend	288	288	295	296	284	255
Avg. Shares	475	464	439	410	379	344	Avg. Shares	240	222	211	196	174	145
YE Shares	475	454	423	396	361	327	YE Shares	225	218	203	188	161	129
EBITDA/Sh	\$7.30	\$7.13	\$7.88	\$8.96	\$10.25	\$12.10	EBITDA/Sh	\$8.50	\$8.74	\$9.66	\$11.14	\$13.30	\$17.29
FCF/Sh	\$4.60	\$4.58	\$5.05	\$5.72	\$6.52	\$7.66	FCF/Sh	\$5.85	\$6.34	\$6.94	\$7.93	\$9.37	\$12.05
Dividends/Sh	\$0.54	\$0.57	\$0.61	\$0.66	\$0.70	\$0.75	Dividends/Sh	\$1.20	\$1.30	\$1.40	\$1.51	\$1.63	\$1.76

*2020/2021E = Wolfe Estimates

**Buyback assumes \$30/\$45 VST/NRG share price in 2021 growing 10%

***Assumes 2.5x Debt/EBITDA in 2020

Sentiment meter

We keep our power sentiment meter at "3" this week. EXC was initially weak at the start of EEI on Illinois political concerns, but we came away feeling hopeful nuclear support legislation will still be successful in 2020. We also downgraded PEG to Peer Perform, as the utility EPS upsides feel well-reflected, while power continues to face headwinds with no easy fix. Feedback to the ratings change was very quiet.

Wolfe/MTM/Cons Estimates

Ticker	2019	2020	2021	2022
IPPs				
NRG				
Wolfe	\$1,925	\$2,040	\$1,940	\$1,920
MTM	\$1,926	\$2,041	\$1,998	\$1,911
Cons	\$1,942	\$1,978	\$1,913	\$1,757
VST				
Wolfe	\$3,358	\$3,464	\$3,312	\$3,209
MTM	\$3,367	\$3,521	\$3,465	\$3,107
Cons	\$3,370	\$3,397	\$3,238	\$3,141

Integrated Utilities

EXC				
Wolfe	\$3.13	\$3.09	\$3.00	\$3.13
MTM	\$3.13	\$3.09	\$3.02	\$3.10
Cons	\$3.14	\$3.09	\$3.04	\$3.08
PEG				
Wolfe	\$3.25	\$3.46	\$3.49	\$3.48
MTM	\$3.25	\$3.46	\$3.46	\$3.47
Cons	\$3.24	\$3.40	\$3.48	\$3.69

Source: Wolfe Research

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Market Commodity Prices versus Wolfe Research assumptions

In the following exhibits we highlight our current published commodity and power assumptions and compare them to weekly market prices. Please note the market prices are as of 11/14/2019.

Exhibit 1: Wolfe 7x24 power price estimates

	2019	2020	2021	2022
PJM West	\$27.81	\$30.00	\$28.55	\$27.83
PJM East	\$28.86	\$30.95	\$29.58	\$28.84
NEPOOL	\$35.45	\$39.12	\$39.36	\$39.59
NY Zone A	\$25.87	\$28.20	\$27.92	\$27.85
NY Zone G	\$27.22	\$31.88	\$32.12	\$33.82
NY Zone J	\$29.99	\$35.34	\$35.91	\$37.47
A/D Hub	\$27.16	\$28.80	\$27.16	\$26.42
NI Hub	\$23.75	\$24.33	\$23.33	\$23.28
Indiana Hub	\$28.72	\$27.93	\$27.62	\$27.39
ERCOT (Houston)	\$34.81	\$34.09	\$30.66	\$30.16
ERCOT (South)	\$34.11	\$31.36	\$28.26	\$27.81
ERCOT (North)	\$33.96	\$32.38	\$28.70	\$28.16
ERCOT (West)	\$32.29	\$30.47	\$26.49	\$25.05
NP-15	\$38.18	\$34.38	\$35.97	\$37.15
SP-15	\$36.79	\$34.56	\$35.16	\$36.16
Mid-C	\$25.18	\$27.79	\$30.49	\$30.99
Entergy	\$32.96	\$33.22	\$32.74	\$31.98
Palo Verde	\$28.43	\$29.09	\$28.29	\$29.41
Nymex Gas (\$/Mcf)	\$2.60	\$2.45	\$2.45	\$2.45
CAPP Coal (\$/ton)	\$65.00	\$65.00	\$65.00	\$65.00
PRB Coal (\$/ton)	\$12.00	\$12.00	\$12.00	\$12.00

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 2: Market 7x24 power price estimates

	2019	2020	2021	2022
PJM West	\$27.12	\$29.92	\$28.69	\$28.02
PJM East	\$28.12	\$30.92	\$29.69	\$29.02
NEPOOL	\$33.22	\$38.75	\$38.84	\$39.25
NY Zone A	\$25.39	\$28.11	\$28.15	\$28.00
NY Zone G	\$26.94	\$31.49	\$31.82	\$33.11
NY Zone J	\$29.57	\$34.75	\$35.60	\$36.63
A/D Hub	\$26.97	\$29.14	\$27.85	\$26.99
NI Hub	\$23.42	\$24.42	\$23.38	\$22.84
Indiana Hub	\$28.85	\$28.49	\$27.81	\$27.79
ERCOT (Houston)	\$35.03	\$37.22	\$32.91	\$30.17
ERCOT (South)	\$33.89	\$34.43	\$30.88	\$27.88
ERCOT (North)	\$34.20	\$35.46	\$30.90	\$28.06
ERCOT (West)	\$32.47	\$33.51	\$27.83	\$25.27
NP-15	\$38.08	\$35.57	\$35.20	\$35.06
SP-15	\$36.71	\$35.65	\$35.46	\$35.45
Mid-C	\$24.28	\$29.68	\$31.78	\$33.06
Entergy	\$32.39	\$32.39	\$32.39	\$32.39
Palo Verde	\$29.42	\$33.01	\$32.27	\$31.98
Nymex Gas (\$/Mcf)	\$2.59	\$2.50	\$2.47	\$2.48
CAPP Coal (\$/ton)	\$65.00	\$65.00	\$65.00	\$65.00
PRB Coal (\$/ton)	\$12.00	\$12.00	\$12.00	\$12.00

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 3: Market 7x24 vs. Wolfe 7x24

	2019	2020	2021	2022
PJM West	(2.5%)	(0.2%)	0.5%	0.7%
PJM East	(2.6%)	(0.1%)	0.4%	0.6%
NEPOOL	(6.7%)	(0.9%)	(1.3%)	(0.8%)
NY Zone A	(1.9%)	(0.3%)	0.8%	0.5%
NY Zone G	(1.0%)	(1.2%)	(0.9%)	(2.1%)
NY Zone J	(1.4%)	(1.7%)	(0.9%)	(2.3%)
A/D Hub	(0.7%)	1.2%	2.5%	2.1%
NI Hub	(1.4%)	0.4%	0.2%	(1.9%)
Indiana Hub	0.5%	2.0%	0.7%	1.4%
ERCOT (Houston)	0.6%	8.4%	6.8%	0.0%
ERCOT (South)	(0.6%)	8.9%	8.5%	0.3%
ERCOT (North)	0.7%	8.7%	7.1%	(0.4%)
ERCOT (West)	0.6%	9.1%	4.8%	0.9%
NP-15	(0.3%)	3.3%	(2.2%)	(5.9%)
SP-15	(0.2%)	3.1%	0.8%	(2.0%)
Mid-C	(3.7%)	6.4%	4.0%	6.3%
Entergy	(1.8%)	(2.5%)	(1.1%)	1.3%
Palo Verde	3.4%	11.9%	12.3%	8.0%
Nymex Gas (\$/Mcf)	(0.5%)	2.0%	0.9%	1.0%
CAPP Coal (\$/ton)	0.0%	0.0%	0.0%	0.0%
PRB Coal (\$/ton)	0.0%	0.0%	0.0%	0.0%

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 4: Key markets for companies

Company	Ticker	Key Markets
Exelon	EXC	NI Hub, PJM East
PSEG	PEG	PJM East, PJM West, NEPOOL
NRG Energy	NRG	ERCOT, PJM West, NY, NEPOOL
Vistra Energy	VST	ERCOT, PJM, NEPOOL, NY A, NP-15

Source: Wolfe Research Utilities & Power Research

Integrated Comparables

Exhibit 5: Integrated Comparables, Wolfe Research earnings estimates

Company Name	Ticker	Current Price*	Mkt Cap (\$M)	Wolfe Research EPS				Wolfe Research P/E				Dividend Yield
				2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E	
Exelon	EXC	\$45.02	41,734	3.13	3.09	3.00	3.13	14.4x	14.6x	15.0x	14.4x	3.2%
PSEG	PEG	\$60.89	30,932	3.25	3.46	3.49	3.48	18.7x	17.6x	17.5x	17.5x	3.1%
Integrated Average								16.6x	16.1x	16.2x	16.0x	3.1%
Regulated Average								22.5x	21.2x	20.0x	18.9x	3.0%

Source: Wolfe Research Utilities & Power Research

Exhibit 6: Integrated Comparables, Mark to Market earnings estimates

Company Name	Ticker	Current Price*	Mkt Cap (\$M)	Mark to Market EPS				Mark to Market P/E				Dividend Yield
				2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E	
Exelon	EXC	\$45.02	41,734	3.13	3.09	3.02	3.10	14.4x	14.6x	14.9x	14.5x	3.2%
PSEG	PEG	\$60.89	30,932	3.25	3.46	3.46	3.47	18.8x	17.6x	17.6x	17.5x	3.1%
Integrated Average								16.6x	16.1x	16.3x	16.0x	3.1%
Regulated Average								22.5x	21.2x	20.0x	18.9x	3.0%

Source: Wolfe Research Utilities & Power Research

Exhibit 7: Integrated Comparables, Open earnings estimates

Company Name	Ticker	Current Price*	Mkt Cap (\$M)	Open EPS				Open P/E				Dividend Yield
				2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E	
Exelon	EXC	\$45.02	41,734	2.78	3.23	3.07	3.13	16.2x	13.9x	14.6x	14.4x	3.2%
PSEG	PEG	\$60.89	30,932	3.23	3.44	3.44	3.45	18.9x	17.7x	17.7x	17.6x	3.1%
Integrated Average								17.5x	15.8x	16.2x	16.0x	3.1%
Regulated Average								22.5x	21.2x	20.0x	18.9x	3.0%

Source: Wolfe Research Utilities & Power Research

*Priced as of Friday's close

IPP Comparables

Exhibit 8: IPP Comparables, Wolfe Research Free Cash Flow estimates

Company Name	Ticker	Current Price*	Mkt Cap (\$M)	Free Cash Flow				Free Cash Flow Yield			
				2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E
NRG Energy	NRG	39.80	12,577	1,217	1,405	1,407	1,396	11.7%	15.3%	17.5%	18.6%
Vistra Energy	VST	26.20	11,203	2,137	2,185	2,127	2,085	16.0%	17.2%	17.5%	18.6%
Average								13.9%	16.2%	17.5%	18.6%

Source: Wolfe Research Utilities & Power Research

Exhibit 9: IPP Comparables, Wolfe Research Mark to Market Free Cash Flow estimates

Company Name	Ticker	Current Price*	Mkt Cap (\$M)	MTM Free Cash Flow				MTM Free Cash Flow Yield			
				2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E
NRG Energy	NRG	39.80	12,577	1,218	1,406	1,465	1,387	11.7%	15.3%	18.2%	18.5%
Vistra Energy	VST	26.20	11,203	2,144	2,227	2,238	2,011	16.1%	17.5%	18.4%	17.9%
Average								13.9%	16.4%	18.3%	18.2%

Source: Wolfe Research Utilities & Power Research

Exhibit 10: IPP Comparables, Wolfe Research EBITDA estimates

Company Name	Ticker	Current Price*	Mkt Cap (\$M)	Wolfe Research EBITDA				Wolfe Research EV/EBITDA			
				2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E
NRG Energy	NRG	39.80	12,577	1,925	2,040	1,940	1,920	8.4x	7.4x	7.2x	7.0x
Vistra Energy	VST	26.20	11,203	3,358	3,464	3,312	3,209	7.0x	6.5x	6.4x	6.1x
Average								7.7x	7.0x	6.8x	6.5x

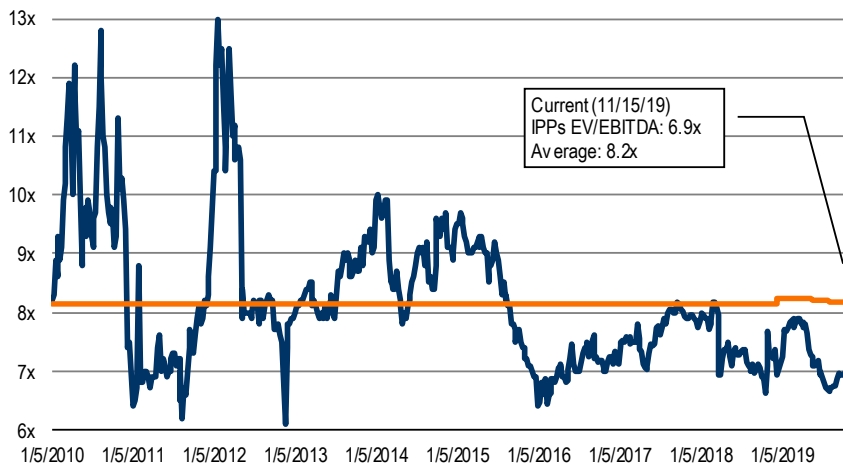
Source: Wolfe Research Utilities & Power Research

Exhibit 11: IPP Comparables, Wolfe Research Mark to Market EBITDA estimates

Company Name	Ticker	Current Price*	Mkt Cap (\$M)	Mark to Market EBITDA				Mark to Market EV/EBITDA			
				2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E
NRG Energy	NRG	39.80	12,577	1,926	2,041	1,998	1,911	8.4x	7.4x	7.0x	7.0x
Vistra Energy	VST	26.20	11,203	3,367	3,521	3,465	3,107	7.0x	6.4x	6.1x	6.3x
Average								7.7x	6.9x	6.6x	6.6x

Source: Wolfe Research Utilities & Power Research
*Priced as of Friday's close

Exhibit 12: IPP Average 2-Year Forward MTM EV/EBITDA



Source: Wolfe Research Utilities & Power Research

Integrated utility estimates and valuation

In the exhibits on the next page we highlight our current published earnings estimates as well as our estimates adjusted for current market prices (Mark to Market EPS) and without the presence of hedges (Open Earnings to Market) for the integrated utilities within the broader competitive power sector.

In addition, we calculate our earnings sensitivities for a \$1/MMBtu change in natural gas and \$5/MWh change in power prices.

Exhibit 13: Exelon (EXC)

<u>Financial Summary</u>	2019E	2020E	2021E	2022E
EPS	\$3.13	\$3.09	\$3.00	\$3.13
Mark to Market EPS	\$3.13	\$3.09	\$3.02	\$3.10
Open Earnings Mark to Market	\$2.78	\$3.23	\$3.07	\$3.13
Consensus	\$3.14	\$3.09	\$3.04	\$3.08
Generation EBITDA				
Generation EBITDA	\$3,102	\$2,794	\$2,505	\$2,452
Mark to Market EBITDA	\$3,096	\$2,799	\$2,529	\$2,417
Open EBITDA Mark to Market	\$2,667	\$2,974	\$2,595	\$2,453
Sensitivities				
EPS Sensitivity: \$5 Power Change	\$0.00	\$0.08	\$0.29	\$0.52
% Change	0%	3%	10%	17%
EPS Sensitivity: \$1 Nat Gas Change	\$0.03	\$0.09	\$0.31	\$0.54
% Change	1%	3%	10%	17%
Hedges				
% Overall Power Hedged	98%	84%	55%	25%
Capacity Payments (\$MM)	\$1,572	\$1,349	\$1,193	\$1,084
Valuation Metrics				
P/E Current	14.4x	14.6x	15.0x	14.4x
P/E MTM	14.4x	14.6x	14.9x	14.5x
P/E Open MTM	16.2x	13.9x	14.6x	14.4x

Source: Wolfe Research Utilities & Power Research

Exhibit 14: PSEG (PEG)

<u>Financial Summary</u>	2019E	2020E	2021E	2022E
EPS	\$3.25	\$3.46	\$3.49	\$3.48
Mark to Market EPS	\$3.25	\$3.46	\$3.46	\$3.47
Open Earnings Mark to Market	\$3.23	\$3.44	\$3.44	\$3.45
Consensus	\$3.24	\$3.40	\$3.48	\$3.69
EBITDA				
Generation EBITDA	\$1,058	\$1,079	\$975	\$837
Mark to Market EBITDA	\$1,056	\$1,078	\$952	\$832
Open EBITDA Mark to Market	\$1,006	\$1,028	\$902	\$782
Sensitivities				
EPS Sensitivity: \$5 Power Change	\$0.04	\$0.02	\$0.19	\$0.30
% Change	1%	1%	6%	9%
EPS Sensitivity: \$1 Nat Gas Change	\$0.04	(\$0.05)	(\$0.03)	\$0.04
% Change	1%	(1%)	(1%)	1%
Hedges				
% Overall Power Hedged	98%	98%	73%	30%
Capacity Payments (\$MM)	\$11	\$11	\$11	\$11
Valuation Metrics				
P/E Current	18.7x	17.6x	17.5x	17.5x
P/E MTM	18.8x	17.6x	17.6x	17.5x
P/E Open MTM	18.9x	17.7x	17.7x	17.6x

Source: Wolfe Research Utilities & Power Research

IPP estimates and valuation

In the following exhibits we highlight our current published earnings estimates as well as our estimates adjusted for current market prices (Mark to Market EBITDA) and without the presence of hedges (Open EBITDA) for the independent power producers within the broader competitive power sector.

In addition, we calculate our earnings sensitivities for a \$1/MMBtu change in natural gas and \$5/MWh change in power prices.

Exhibit 15: NRG Energy (NRG)

<u>Financial Summary</u>	2019E	2020E	2021E	2022E
EBITDA	\$1,925	\$2,040	\$1,940	\$1,920
Mark to Market EBITDA	\$1,926	\$2,041	\$1,998	\$1,911
Open EBITDA Mark to Market	\$2,083	\$2,228	\$2,008	\$1,911
Consensus	\$1,942	\$1,978	\$1,913	\$1,757
Free Cash Flow	\$1,217	\$1,405	\$1,407	\$1,396
Mark to Market Free Cash Flow	\$1,218	\$1,406	\$1,465	\$1,387
<u>Sensitivities</u>				
EBITDA Sensitivity (\$5/MWh)	(\$43)	\$94	\$304	\$381
% Change	(2%)	5%	16%	20%
EBITDA Sensitivity (\$1/MMBtu)	(\$56)	\$90	\$429	\$548
% Change	(3%)	4%	22%	29%
<u>Hedges</u>				
% Overall Power Hedged	89%	89%	26%	0%
Capacity Payments (\$MM)	\$557	\$684	\$599	\$590
<u>Valuation Metrics</u>				
EV/EBITDA	8.4x	7.4x	7.2x	7.0x
EV/EBITDA MTM	8.4x	7.4x	7.0x	7.0x
Net Debt / EBITDA	2.9x	2.7x	2.8x	2.6x

Source: Wolfe Research Utilities & Power Research

Exhibit 16: Vistra Energy (VST)

<u>Financial Summary</u>	2019E	2020E	2021E	2022E
EBITDA	\$3,358	\$3,464	\$3,312	\$3,209
Mark to Market EBITDA	\$3,367	\$3,521	\$3,465	\$3,107
Open EBITDA Mark to Market	\$3,791	\$3,887	\$3,561	\$3,137
Consensus	\$3,370	\$3,397	\$3,238	\$3,141
Free Cash Flow	\$2,137	\$2,185	\$2,127	\$2,085
Mark to Market Free Cash Flow	\$2,144	\$2,227	\$2,238	\$2,011
<u>Sensitivities</u>				
EBITDA Sensitivity (\$5/MWh)	\$27	\$143	\$590	\$685
% Change	1%	4%	18%	21%
EBITDA Sensitivity (\$1/MMBtu)	(\$252)	(\$51)	\$471	\$594
% Change	(7%)	(1%)	14%	19%
<u>Hedges</u>				
% Overall Power Hedged	96%	79%	26%	15%
Capacity Payments (\$MM)	\$996	\$819	\$839	\$792
<u>Valuation Metrics</u>				
EV/EBITDA	7.0x	6.5x	6.4x	6.1x
EV/EBITDA MTM	7.0x	6.4x	6.1x	6.3x
Net Debt / EBITDA	3.1x	2.9x	2.8x	2.7x

Source: Wolfe Research Utilities & Power Research

Sensitivity Analyses

Our sensitivity analyses for our integrated and IPP coverage universe is shown in the following exhibits. We look at \$1 gas sensitivity and \$5 power price sensitivity to 2020 earnings as those are years when most hedges have rolled off and companies are closer to Open earnings.

Exhibit 17: \$1/MMBtu Change in Natural Gas Sensitivity 2020 Earnings

<u>Ticker</u>	<u>2020 EPS</u>	<u>\$1 Change</u>	<u>% Change</u>
EXC	\$3.09	\$0.09	3%
PEG	\$3.46	(\$0.05)	(1%)

Source: Wolfe Research Utilities & Power Research

Exhibit 18: \$5/MWh Change in Power Price Sensitivity 2020 Earnings

<u>Ticker</u>	<u>2020 EPS</u>	<u>\$5 Change</u>	<u>% Change</u>
EXC	\$3.09	\$0.08	3%
PEG	\$3.46	\$0.02	1%

Source: Wolfe Research Utilities & Power Research

Our sensitivity analyses for our IPP coverage universe are shown in the following exhibits.

Exhibit 19: \$1/MMBtu Change in Natural Gas Sensitivity 2020 EBITDA

<u>Ticker</u>	<u>2020 EBITDA</u>	<u>\$1 Change</u>	<u>% Change</u>
VST	\$3,464	(\$51)	(1%)
NRG	\$2,040	\$90	4%

Source: Wolfe Research Utilities & Power Research

Exhibit 20: \$5/MWh Change in Power Price Sensitivity 2020 EBITDA

<u>Ticker</u>	<u>2020 EBITDA</u>	<u>\$5 Change</u>	<u>% Change</u>
VST	\$3,464	\$143	4%
NRG	\$2,040	\$94	5%

Source: Wolfe Research Utilities & Power Research

Detailed Hedge Data

Exhibit 21: Consolidated Hedged Power and Fuel Profile

Company name	Ticker	Type	2019E	2020E	2021E	2022E
Exelon	EXC	Power	98%	84%	55%	25%
NRG Energy	NRG	Power	89%	89%	26%	0%
		Coal	N/A	N/A	N/A	N/A
PSEG	PEG	Power	98%	98%	73%	30%
Vistra Energy	VST	Power	96%	79%	26%	15%

Source: Wolfe Research Utilities & Power Research

Regulated Earnings Breakdown

Exhibit 22: Regulated Earnings Breakdown

Company	Ticker	% Earnings Regulated			
		2019E	2020E	2021E	2022E
PSEG	PEG	75%	74%	79%	84%
Exelon	EXC	59%	64%	71%	73%

Source: Wolfe Research Utilities & Power Research

Earnings by Segment

In the following exhibit we show our integrated earnings by segment for 2019-2022.

Exhibit 23: Estimated Earnings by Segment

Company	Ticker	Segment	2019	2020	2021	2022
Exelon	EXC	Regulated	\$2.05	\$2.19	\$2.34	\$2.49
		Merchant	1.28	1.11	0.88	0.84
		Parent & Other	(0.20)	(0.21)	(0.21)	(0.20)
		Total	\$3.13	\$3.09	\$3.00	\$3.13
		<i>Regulated + Parent</i>	<i>\$1.85</i>	<i>\$1.98</i>	<i>\$2.12</i>	<i>\$2.29</i>
		<i>P/E on Regulated + Parent</i>	<i>24.3x</i>	<i>22.7x</i>	<i>21.2x</i>	<i>19.7x</i>
PSEG	PEG	Regulated	2.43	2.56	2.75	2.92
		Merchant	0.81	0.88	0.73	0.54
		Parent & Other	0.01	0.01	0.01	0.01
		Total	\$3.25	\$3.46	\$3.49	\$3.48
		<i>Regulated + Parent</i>	<i>\$2.44</i>	<i>\$2.57</i>	<i>\$2.76</i>	<i>\$2.93</i>
		<i>P/E on Regulated + Parent</i>	<i>24.9x</i>	<i>23.7x</i>	<i>22.0x</i>	<i>20.8x</i>

Source: Wolfe Research Utilities & Power Research

Power Markets – 7x24, Sparks and Darks

In the following exhibits we show 7x24 power prices, spark spreads and dark spreads in the region, as well as natural gas and coal prices. The change column calculates the percentage change versus the latest price (current).

We assume a 7,500 heat rate for spark spreads, a 10,250 heat rate for dark spreads. CAPP coal transport cost ranges between \$8/ton to \$24/ton by region. PRB coal transport cost is about \$26/ton.

Exhibit 24: PJM West

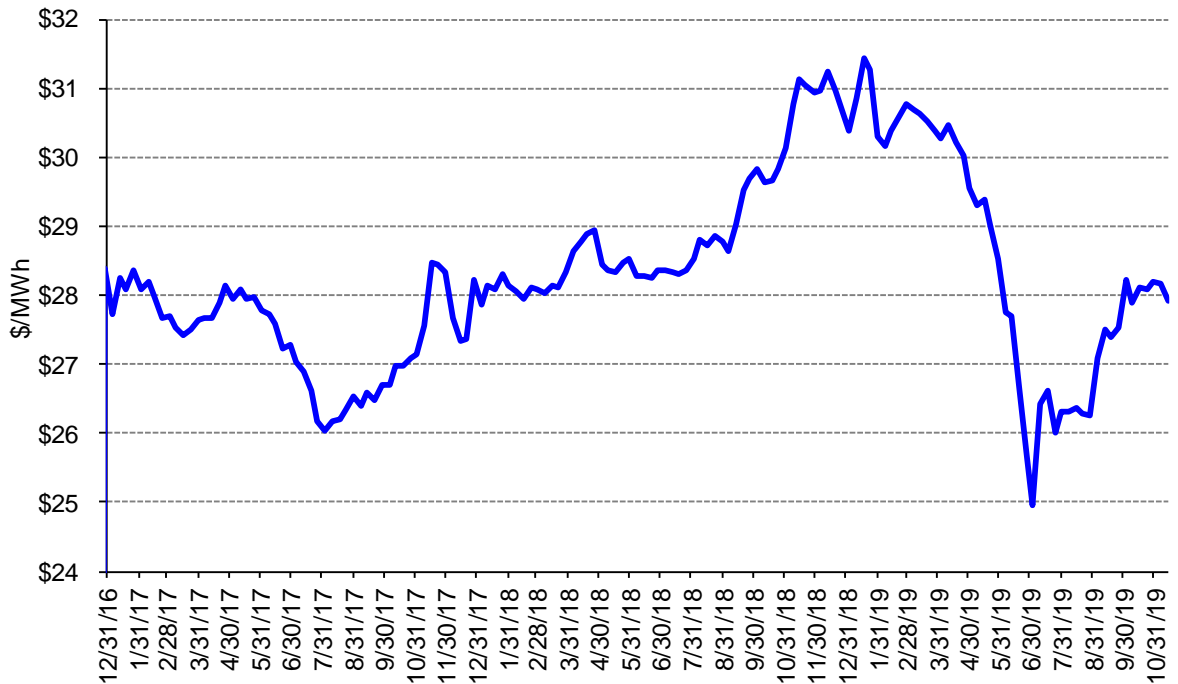
		PJM West 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$32.71	(17.1%)	\$32.51	(8.0%)	\$30.91	(7.2%)	\$29.77	(5.9%)
Last Week	11/7/19	\$27.18	(0.2%)	\$30.18	(0.8%)	\$28.87	(0.7%)	\$28.13	(0.4%)
Current	11/14/19	\$27.12		\$29.92		\$28.69		\$28.02	

		PJM West Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$17.32	(30.1%)	\$18.07	(13.2%)	\$16.59	(14.0%)	\$15.19	(12.2%)
Last Week	11/7/19	\$11.98	1.1%	\$15.59	0.6%	\$14.56	(2.0%)	\$13.33	(0.0%)
Current	11/14/19	\$12.11		\$15.68		\$14.27		\$13.33	

		PJM West Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	(\$2.31)	149.8%	(\$2.52)	17.9%	(\$4.11)	2.1%	(\$5.25)	(7.3%)
Last Week	11/7/19	(\$5.71)	(1.0%)	(\$2.71)	(9.4%)	(\$4.01)	(4.7%)	(\$4.75)	(2.4%)
Current	11/14/19	(\$5.77)		(\$2.96)		(\$4.20)		(\$4.87)	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 25: PJM West 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 26: PJM East

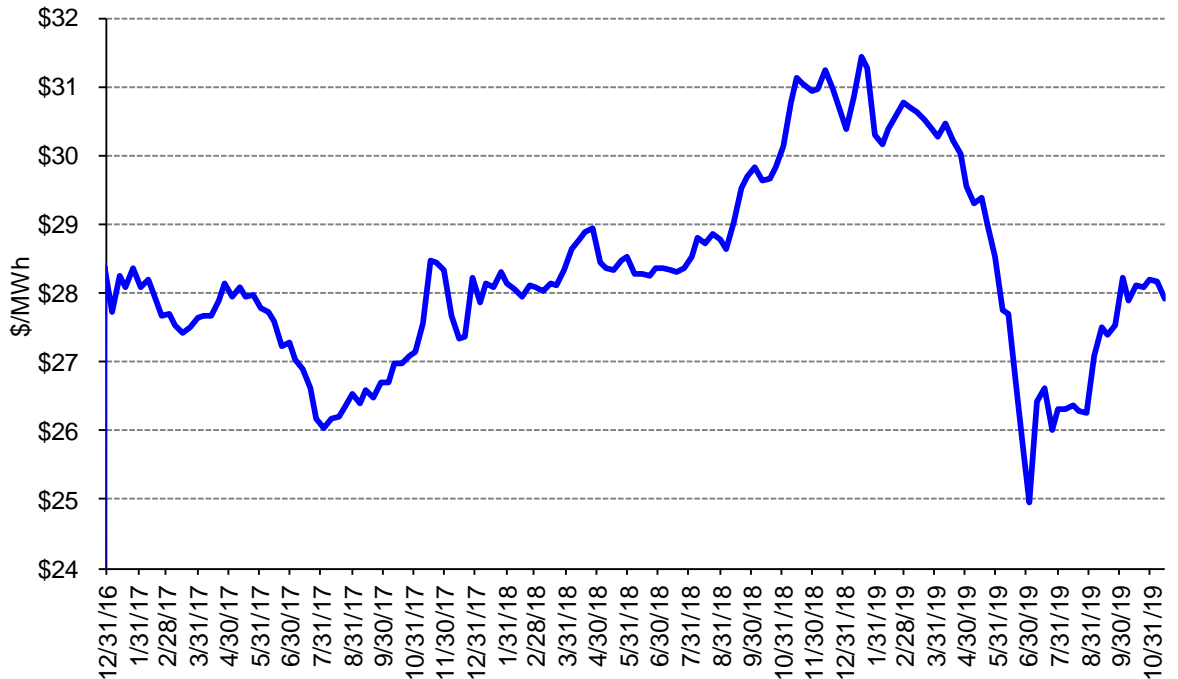
		PJM East 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$30.71	(8.4%)	\$30.51	1.4%	\$28.91	2.7%	\$27.77	4.5%
Last Week	11/7/19	\$28.18	(0.2%)	\$31.18	(0.8%)	\$29.87	(0.6%)	\$29.13	(0.4%)
Current	11/14/19	\$28.12		\$30.92		\$29.69		\$29.02	

		PJM East Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$15.32	(14.4%)	\$16.07	3.8%	\$14.59	4.6%	\$13.19	8.6%
Last Week	11/7/19	\$12.98	1.0%	\$16.59	0.5%	\$15.56	(1.9%)	\$14.33	(0.0%)
Current	11/14/19	\$13.11		\$16.68		\$15.27		\$14.33	

		PJM East Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	(\$4.31)	(10.7%)	(\$4.52)	56.5%	(\$6.11)	47.6%	(\$7.25)	46.7%
Last Week	11/7/19	(\$4.71)	(1.2%)	(\$1.71)	(15.0%)	(\$3.01)	(6.2%)	(\$3.75)	(3.0%)
Current	11/14/19	(\$4.77)		(\$1.96)		(\$3.20)		(\$3.87)	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 27: PJM East 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 28: NY Zone G

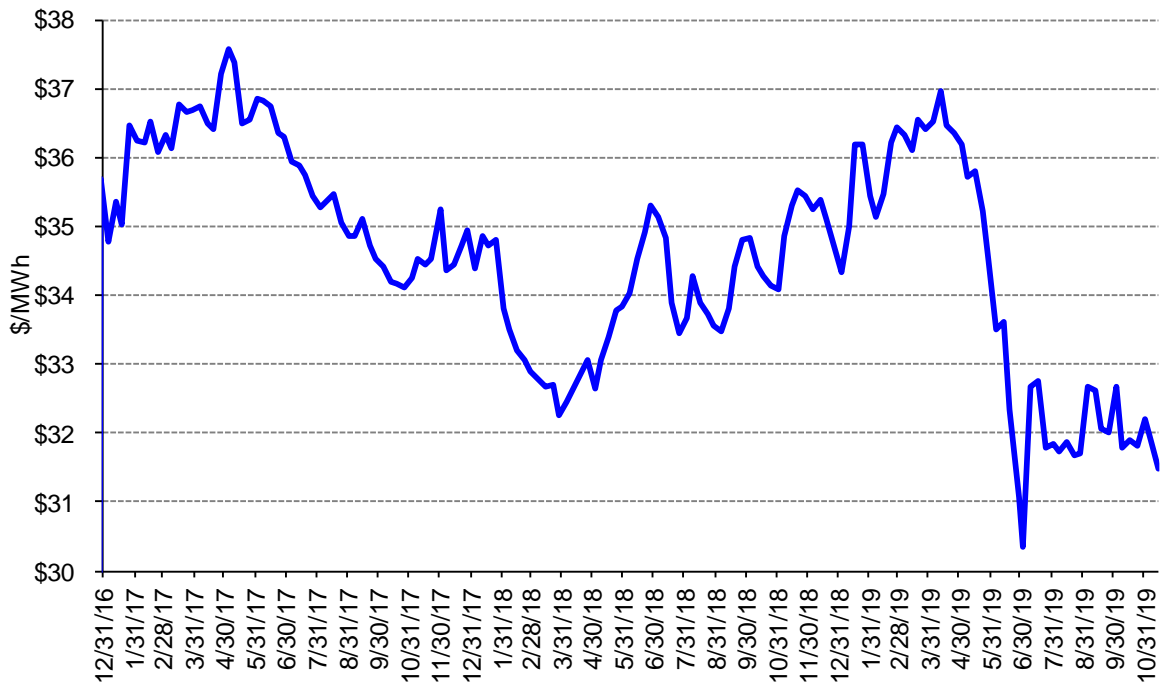
		NY Zone G 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$34.02	(20.8%)	\$34.18	(7.9%)	\$37.35	(14.8%)	\$40.93	(19.1%)
Last Week	11/7/19	\$27.20	(0.9%)	\$31.90	(1.3%)	\$32.05	(0.7%)	\$33.29	(0.6%)
Current	11/14/19	\$26.94		\$31.49		\$31.82		\$33.11	

		NY Zone G Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$14.90	(41.8%)	\$16.54	(20.0%)	\$19.87	(31.8%)	\$24.11	(38.4%)
Last Week	11/7/19	\$8.68	(0.1%)	\$13.24	(0.1%)	\$13.86	(2.2%)	\$15.03	(1.2%)
Current	11/14/19	\$8.68		\$13.22		\$13.56		\$14.85	

		NY Zone G Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	(\$1.00)	496.6%	(\$0.84)	65.5%	\$2.33	(145.7%)	\$5.90	(96.2%)
Last Week	11/7/19	(\$5.69)	(4.4%)	(\$0.98)	(42.0%)	(\$0.84)	(26.7%)	\$0.41	(45.3%)
Current	11/14/19	(\$5.94)		(\$1.39)		(\$1.06)		\$0.22	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 29: NY Zone G 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 30: NEPOOL

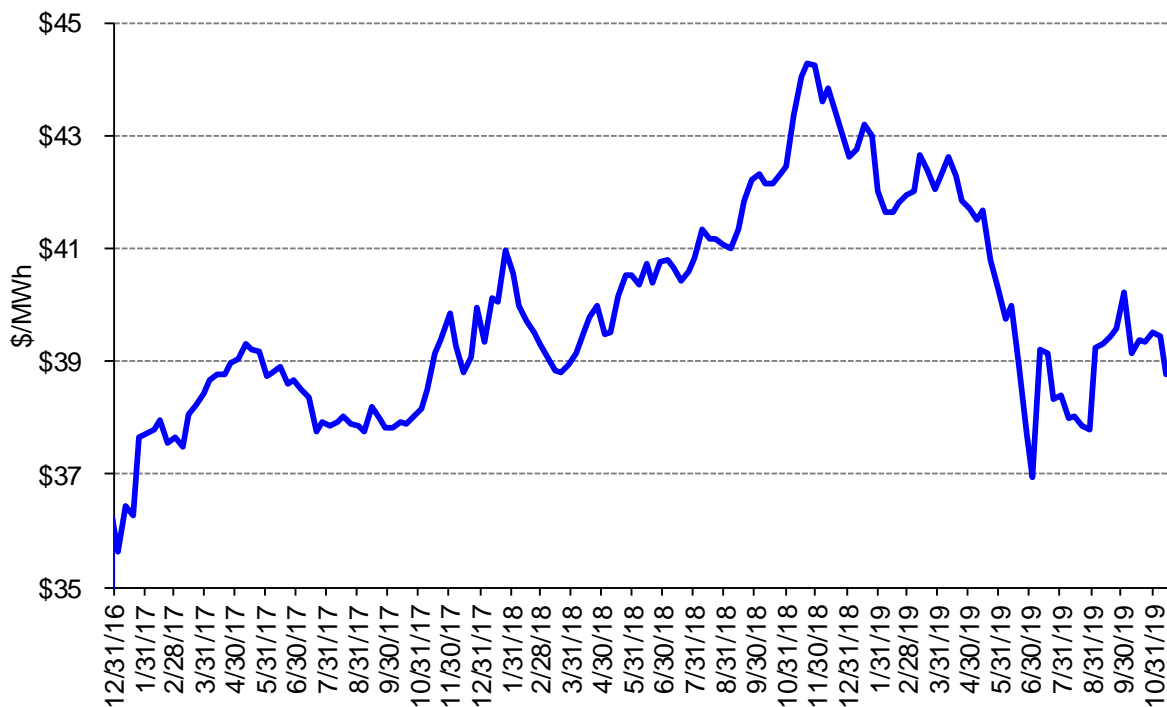
		NEPOOL 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$40.41	(17.8%)	\$42.46	(8.7%)	\$42.06	(7.7%)	\$42.16	(6.9%)
Last Week	11/7/19	\$33.61	(1.2%)	\$39.46	(1.8%)	\$39.10	(0.7%)	\$39.42	(0.4%)
Current	11/14/19	\$33.22		\$38.75		\$38.84		\$39.25	

		NEPOOL Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$15.37	(54.5%)	\$18.71	(21.9%)	\$18.13	(17.4%)	\$18.79	(17.2%)
Last Week	11/7/19	\$7.33	(4.5%)	\$14.83	(1.5%)	\$15.35	(2.4%)	\$15.63	(0.5%)
Current	11/14/19	\$6.99		\$14.61		\$14.98		\$15.56	

		NEPOOL Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$0.27	(1881.6%)	\$2.32	(67.9%)	\$1.91	(56.6%)	\$2.01	(38.2%)
Last Week	11/7/19	(\$4.40)	(8.9%)	\$1.45	(48.5%)	\$1.09	(23.7%)	\$1.41	(11.8%)
Current	11/14/19	(\$4.79)		\$0.74		\$0.83		\$1.24	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 31: NEPOOL 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 32: NI Hub

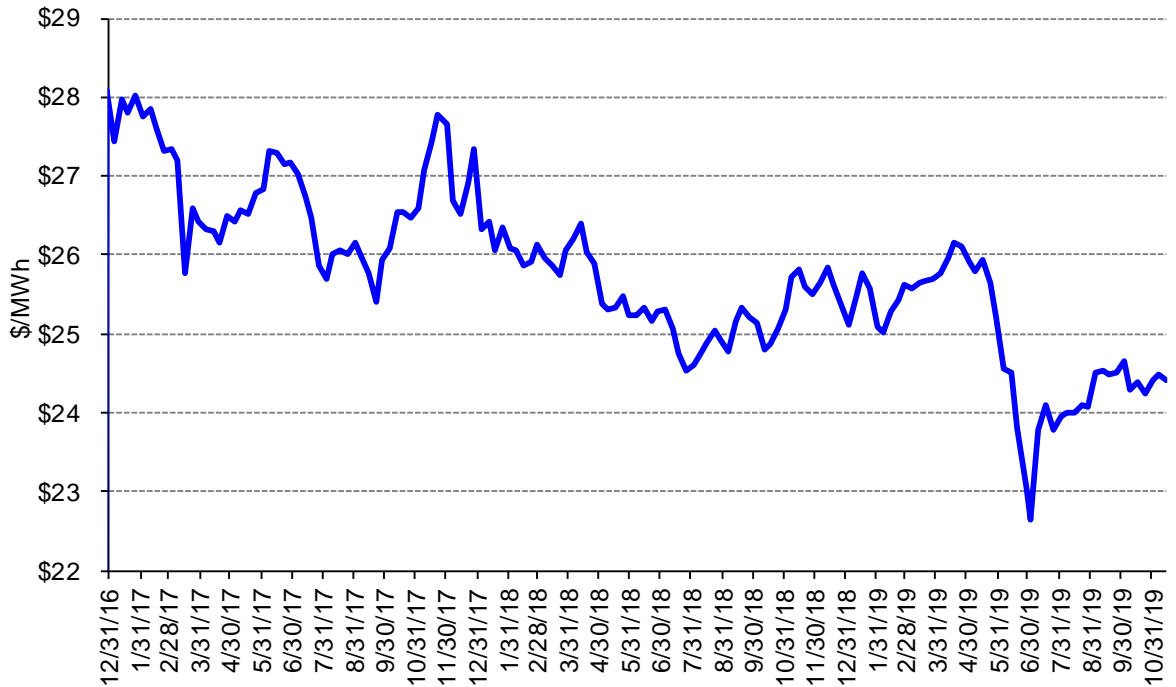
		NI Hub 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$26.24	(10.8%)	\$25.32	(3.6%)	\$24.44	(4.4%)	\$24.00	(4.8%)
Last Week	11/7/19	\$23.53	(0.4%)	\$24.49	(0.3%)	\$23.44	(0.3%)	\$22.86	(0.1%)
Current	11/14/19	\$23.42		\$24.42		\$23.38		\$22.84	

		NI Hub Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$11.18	(14.5%)	\$11.38	(5.4%)	\$10.39	(9.8%)	\$9.76	(14.6%)
Last Week	11/7/19	\$9.38	1.9%	\$10.49	2.6%	\$9.52	(1.5%)	\$8.33	0.2%
Current	11/14/19	\$9.56		\$10.76		\$9.38		\$8.34	

		NI Hub Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$4.11	(68.6%)	\$3.19	(28.2%)	\$2.31	(46.1%)	\$1.86	(62.2%)
Last Week	11/7/19	\$1.39	(7.5%)	\$2.36	(2.9%)	\$1.31	(5.1%)	\$0.73	(3.2%)
Current	11/14/19	\$1.29		\$2.29		\$1.25		\$0.71	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 33: NI Hub 2020 24x7 Power Price



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Exhibit 34: A/D Hub

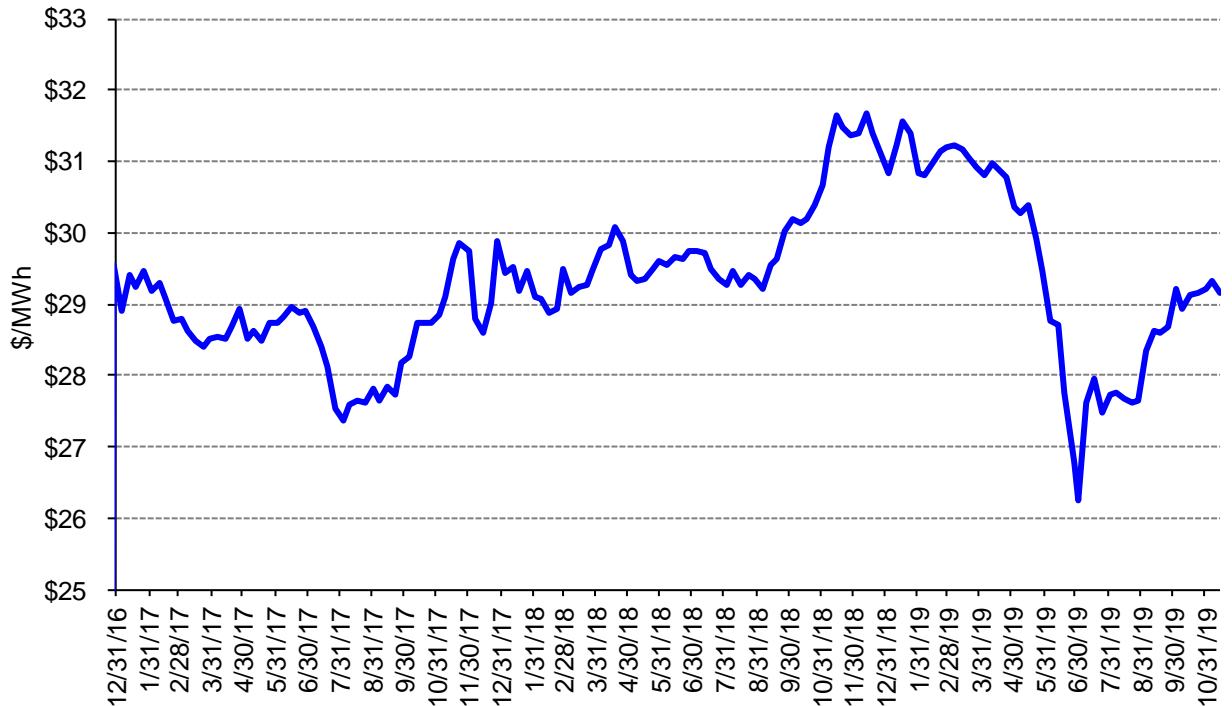
		A/D Hub 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$31.84	(15.3%)	\$30.96	(5.9%)	\$29.31	(5.0%)	\$28.09	(3.9%)
Last Week	11/7/19	\$26.90	0.3%	\$29.32	(0.6%)	\$27.92	(0.2%)	\$27.09	(0.4%)
Current	11/14/19	\$26.97		\$29.14		\$27.85		\$26.99	

		A/D Hub Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$16.35	(25.5%)	\$16.54	(9.0%)	\$14.94	(10.3%)	\$13.50	(8.9%)
Last Week	11/7/19	\$11.89	2.4%	\$14.83	1.4%	\$13.62	(1.6%)	\$12.28	0.2%
Current	11/14/19	\$12.18		\$15.05		\$13.40		\$12.30	

		A/D Hub Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$0.66	(414.1%)	(\$0.21)	146.4%	(\$4.00)	16.9%	(\$5.22)	(19.8%)
Last Week	11/7/19	(\$2.14)	3.6%	\$0.28	(64.6%)	(\$3.26)	(2.0%)	(\$4.08)	(2.4%)
Current	11/14/19	(\$2.07)		\$0.10		(\$3.33)		(\$4.18)	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 35: A/D Hub 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 36: NP-15

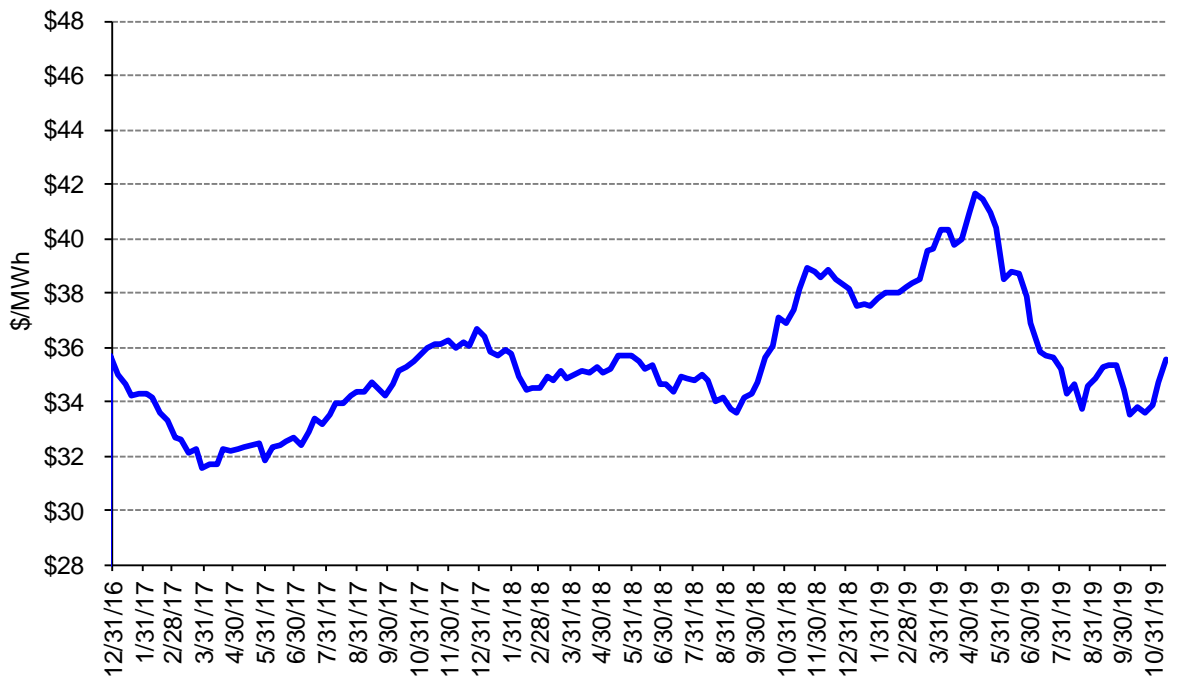
		NP-15 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$41.40	(8.0%)	\$38.09	(6.6%)	\$39.65	(11.2%)	\$40.52	(13.5%)
Last Week	11/7/19	\$37.92	0.4%	\$34.72	2.4%	\$34.42	2.3%	\$34.06	2.9%
Current	11/14/19	\$38.08		\$35.57		\$35.20		\$35.06	

		NP-15 Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$21.78	(17.4%)	\$18.45	(9.3%)	\$20.08	(18.7%)	\$20.47	(26.7%)
Last Week	11/7/19	\$17.68	1.8%	\$15.31	9.4%	\$15.19	7.5%	\$13.87	8.2%
Current	11/14/19	\$18.00		\$16.74		\$16.33		\$15.01	

		NP-15 Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$19.27	(17.3%)	\$15.96	(15.8%)	\$17.52	(25.4%)	\$18.39	(29.7%)
Last Week	11/7/19	\$15.79	1.0%	\$12.59	6.7%	\$12.29	6.4%	\$11.93	8.4%
Current	11/14/19	\$15.95		\$13.44		\$13.07		\$12.93	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 37: NP-15 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 38: SP-15

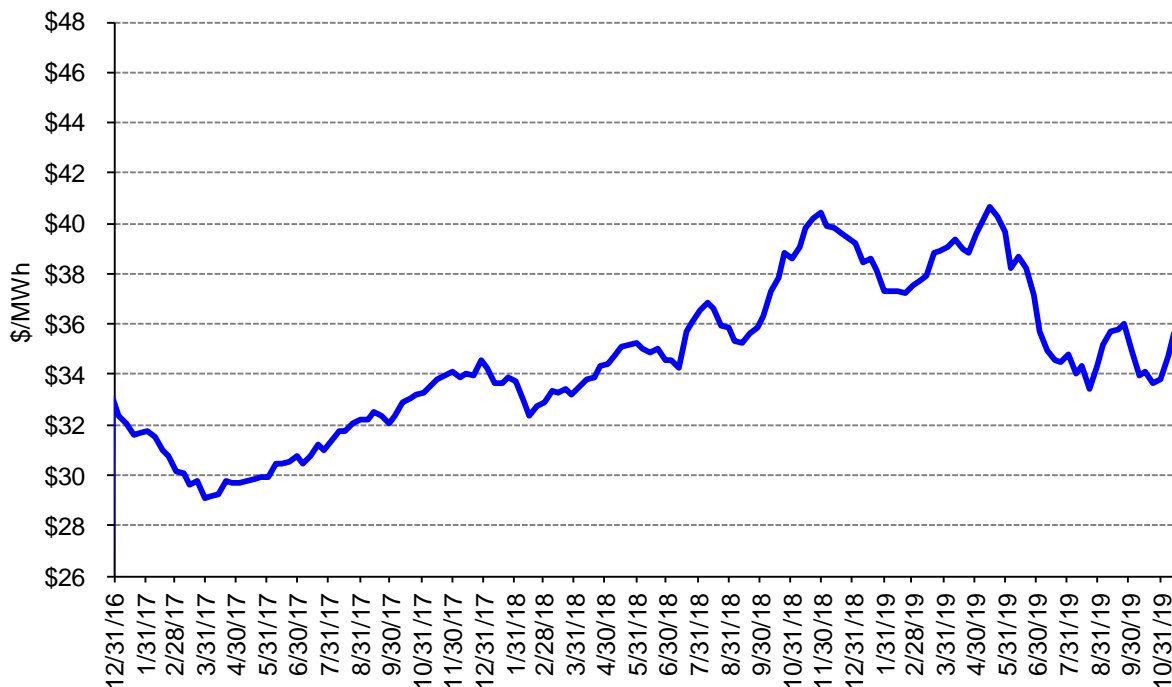
		SP-15 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$42.28	(13.2%)	\$39.14	(8.9%)	\$39.34	(9.9%)	\$39.80	(10.9%)
Last Week	11/7/19	\$36.72	(0.0%)	\$34.73	2.7%	\$34.52	2.7%	\$34.44	2.9%
Current	11/14/19	\$36.71		\$35.65		\$35.46		\$35.45	

		SP-15 Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$25.87	(28.2%)	\$14.54	35.9%	\$17.21	12.6%	\$17.67	4.1%
Last Week	11/7/19	\$18.17	2.3%	\$18.40	7.4%	\$18.41	5.3%	\$17.26	6.6%
Current	11/14/19	\$18.59		\$19.76		\$19.39		\$18.40	

		SP-15 Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$20.15	(27.6%)	\$17.01	(20.5%)	\$17.21	(22.6%)	\$17.67	(24.6%)
Last Week	11/7/19	\$14.59	(0.1%)	\$12.60	7.3%	\$12.39	7.5%	\$12.31	8.2%
Current	11/14/19	\$14.58		\$13.52		\$13.33		\$13.32	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 39: SP-15 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 40: ERCOT Houston

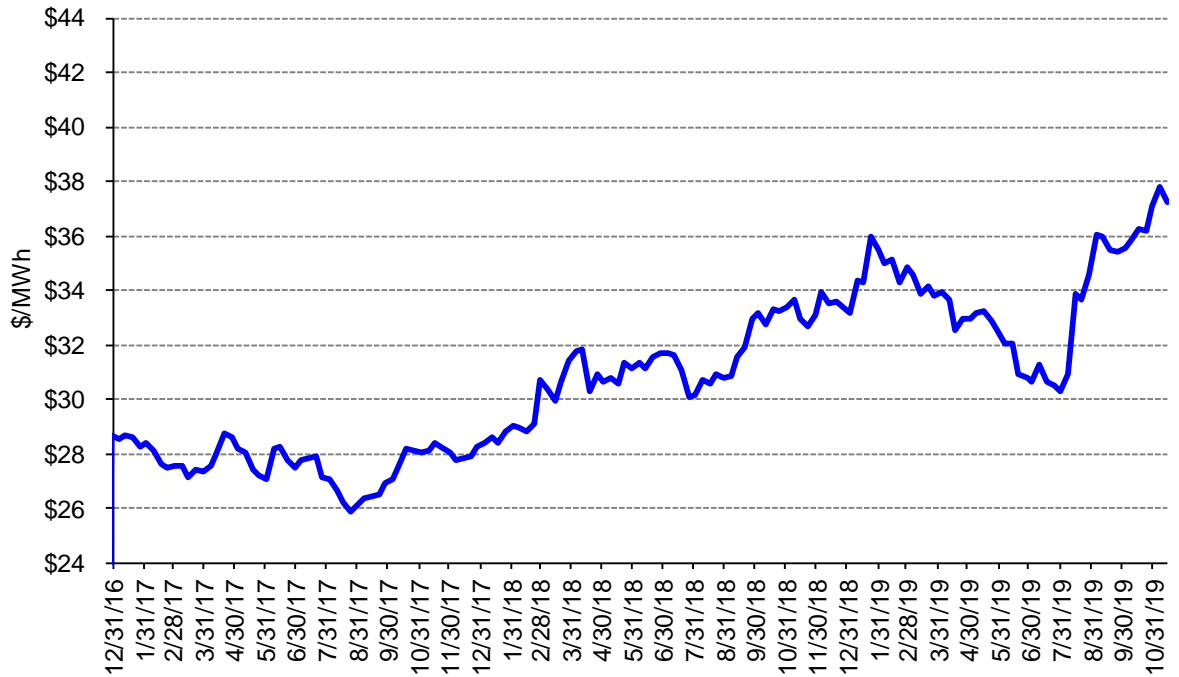
		ERCOT Houston 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$38.40	(8.8%)	\$33.33	11.7%	\$30.64	7.4%	\$30.10	0.2%
Last Week	11/7/19	\$35.03	0.0%	\$37.79	(1.5%)	\$33.21	(0.9%)	\$30.51	(1.1%)
Current	11/14/19	\$35.03		\$37.22		\$32.91		\$30.17	

		ERCOT Houston Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$31.88	6.1%	\$25.16	30.7%	\$21.54	17.5%	\$19.85	3.5%
Last Week	11/7/19	\$33.47	1.0%	\$33.60	(2.2%)	\$26.01	(2.7%)	\$21.30	(3.6%)
Current	11/14/19	\$33.81		\$32.87		\$25.32		\$20.54	

		ERCOT Houston Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$16.27	(20.7%)	\$11.20	34.8%	\$8.51	26.6%	\$7.97	0.9%
Last Week	11/7/19	\$12.90	0.0%	\$15.66	(3.6%)	\$11.08	(2.7%)	\$8.38	(4.0%)
Current	11/14/19	\$12.90		\$15.09		\$10.78		\$8.04	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 41: ERCOT Houston 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 42: ERCOT North

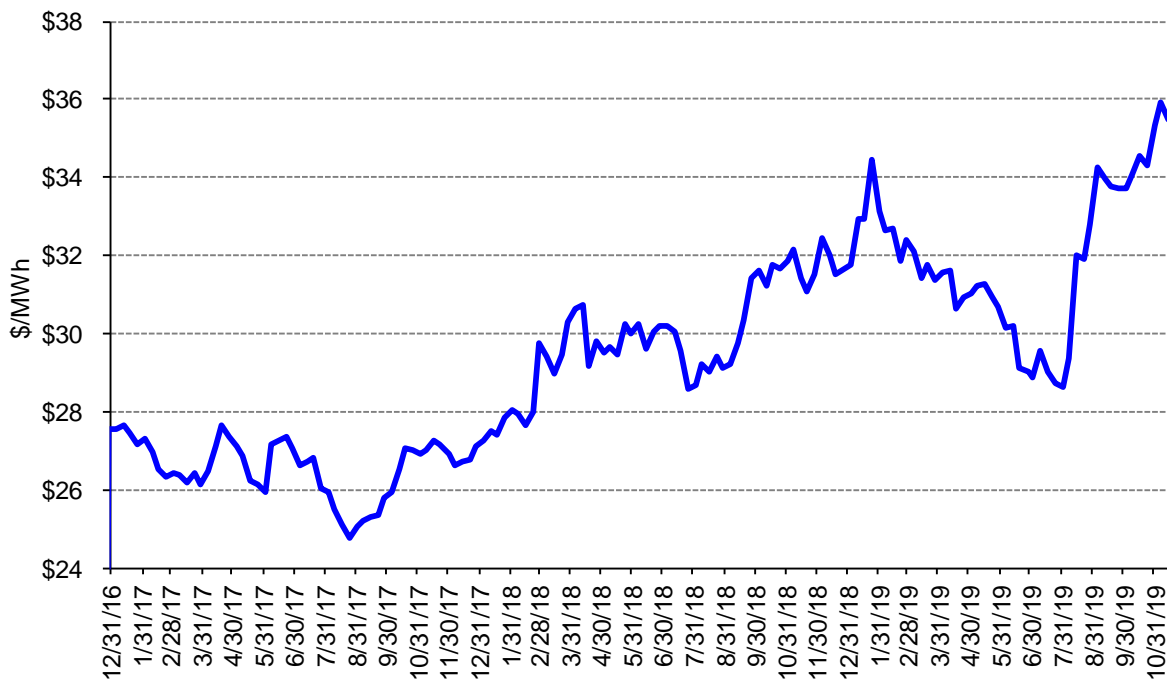
		ERCOT North 7x24							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$37.35	(8.5%)	\$31.93	11.1%	\$28.85	7.1%	\$27.67	1.4%
Last Week	11/7/19	\$34.15	0.1%	\$35.94	(1.3%)	\$31.18	(0.9%)	\$28.45	(1.4%)
Current	11/14/19	\$34.20		\$35.46		\$30.90		\$28.06	

		ERCOT North Spark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$30.70	6.3%	\$23.17	33.9%	\$19.08	20.6%	\$17.22	3.4%
Last Week	11/7/19	\$32.25	1.2%	\$31.31	(0.9%)	\$23.71	(2.9%)	\$18.56	(4.1%)
Current	11/14/19	\$32.65		\$31.03		\$23.01		\$17.80	

		ERCOT North Dark Spread							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$15.22	(20.7%)	\$9.80	36.1%	\$6.72	30.6%	\$5.54	6.9%
Last Week	11/7/19	\$12.02	0.4%	\$13.81	(3.4%)	\$9.05	(3.1%)	\$6.32	(6.3%)
Current	11/14/19	\$12.07		\$13.33		\$8.77		\$5.93	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 43: ERCOT North 2020 24x7 Power Price



Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 44: CAPP Coal

		CAPP Coal							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$70.00	(7.1%)	\$70.00	(7.1%)	\$70.00	(7.1%)	\$70.00	(7.1%)
Last Week	11/7/19	\$65.00	0.0%	\$65.00	0.0%	\$65.00	0.0%	\$65.00	0.0%
Current	11/14/19	\$65.00		\$65.00		\$65.00		\$65.00	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 45: PRB Coal

		PRB Coal							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$12.00	0.0%	\$12.00	0.0%	\$12.00	0.0%	\$12.00	0.0%
Last week	11/7/19	\$12.00	0.0%	\$12.00	0.0%	\$12.00	0.0%	\$12.00	0.0%
Current	11/14/19	\$12.00		\$12.00		\$12.00		\$12.00	

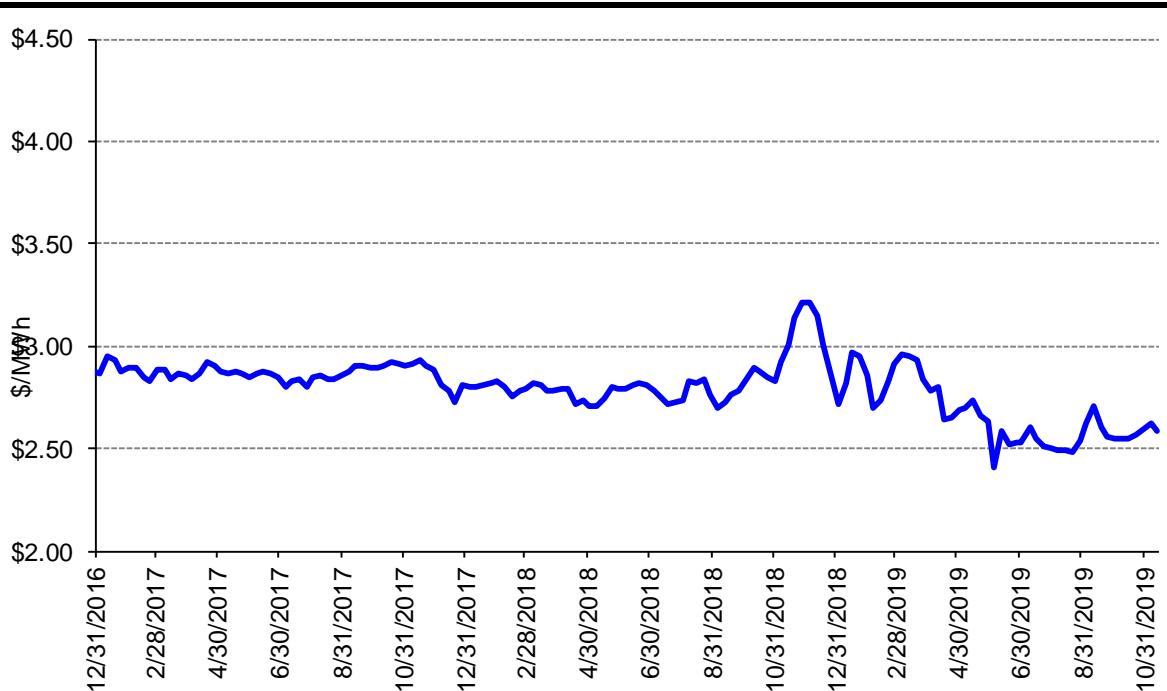
Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 46: Natural Gas

		Natural Gas							
		2019	Change	2020	Change	2021	Change	2022	Change
Year End	1/4/19	\$2.78	(6.9%)	\$2.64	(5.4%)	\$2.61	(5.3%)	\$2.65	(6.7%)
Last Week	11/7/19	\$2.62	(1.2%)	\$2.55	(1.8%)	\$2.47	0.1%	\$2.49	(0.7%)
Current	11/14/19	\$2.59		\$2.50		\$2.47		\$2.48	

Source: Platts, Wolfe Research Utilities & Power Research

Exhibit 47: 2020 Natural Gas



Source: Platts, Wolfe Research Utilities & Power Research

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