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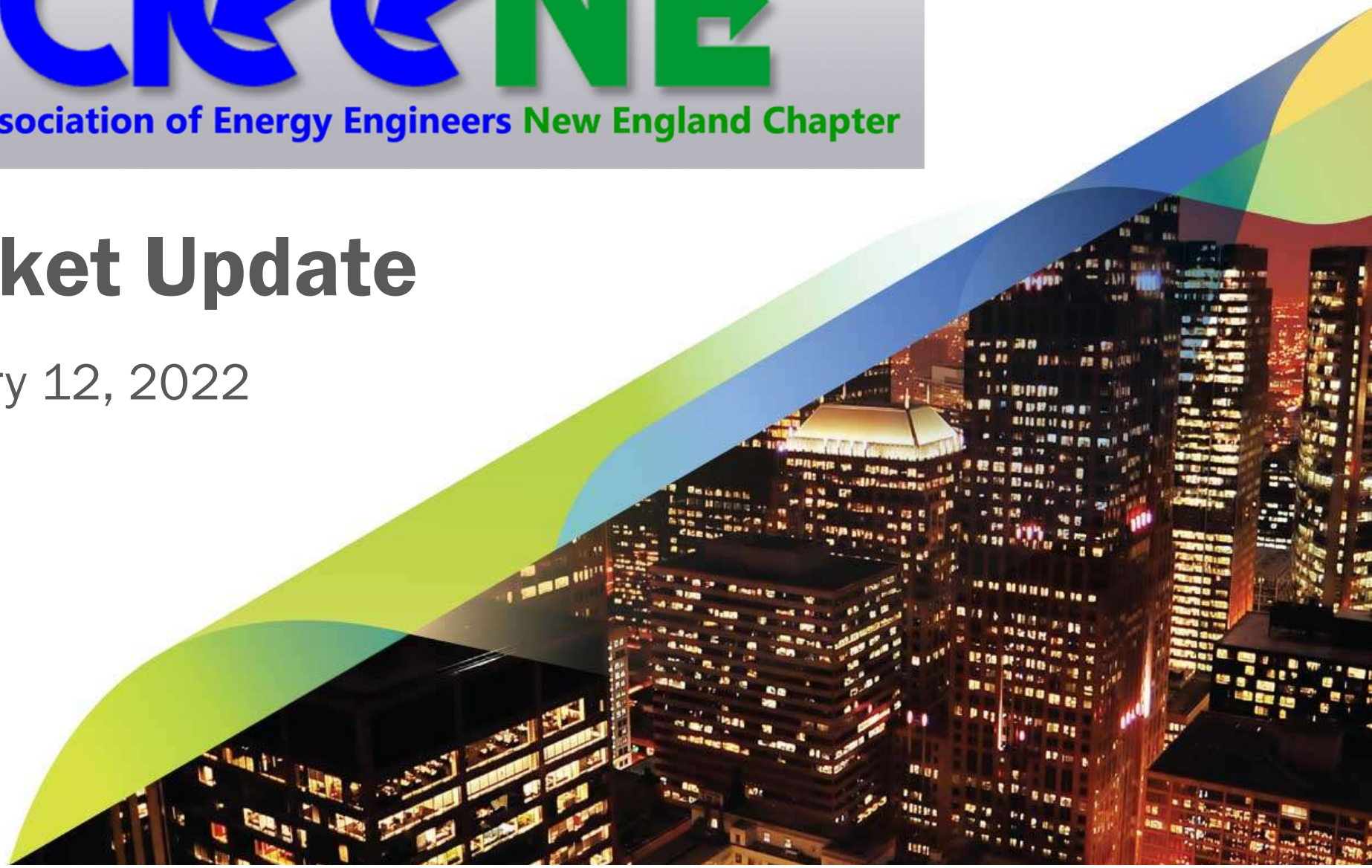
AEENE
The Association of Energy Engineers New England Chapter

Market Update

January 12, 2022



Prompt Natural Gas Gaps Up Well Past $4/MMBtu

Customer Takeaway: The range had been between $3.54 and $4.09 since December 5th when the first batch of mild forecasts hit the market in earnest; but a recent jump in pricing is likely due to variable, yet significant cold forecasts hitting the market.

Source: CME Group

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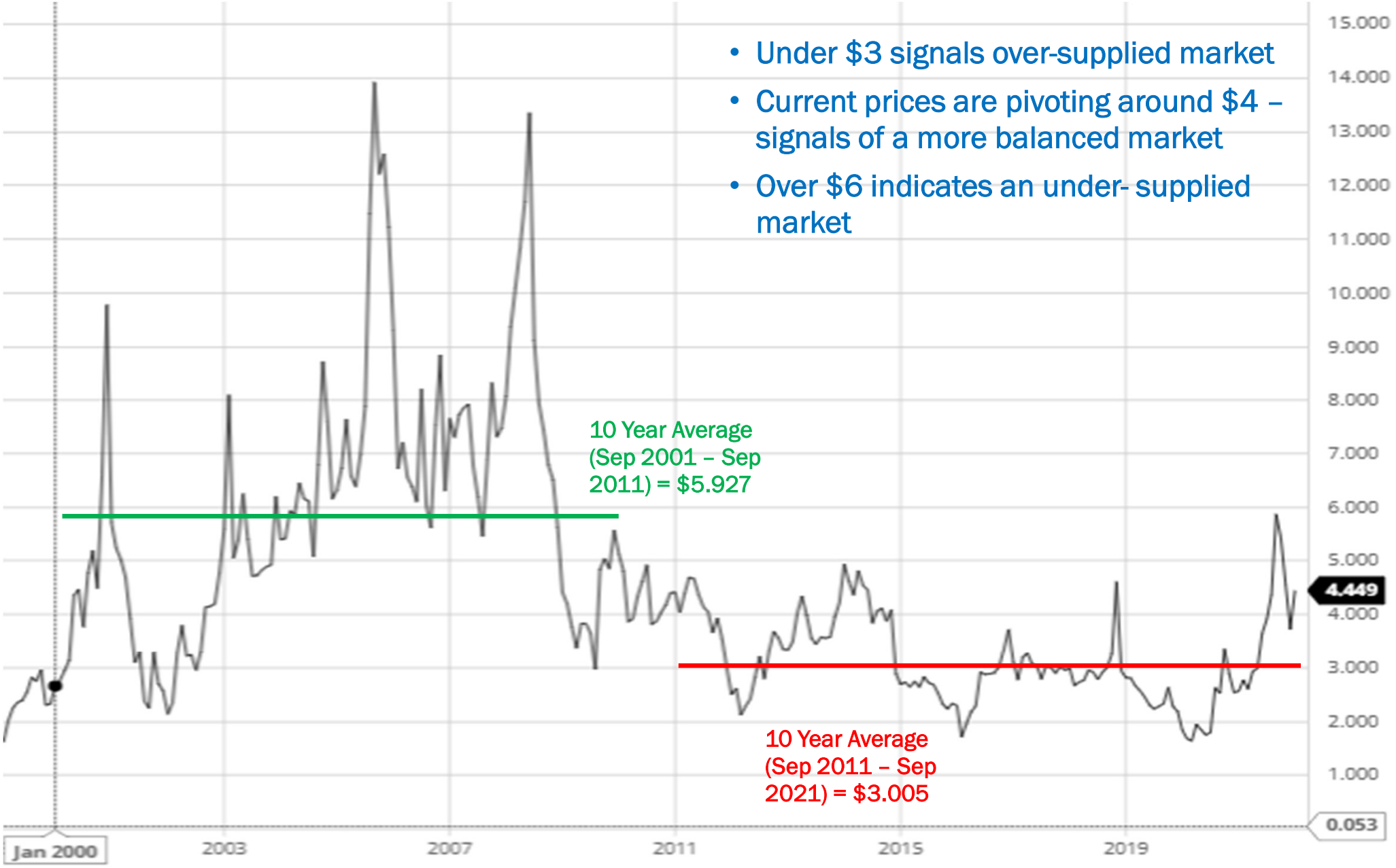
NYMEX Gas Prices in Perspective



Source: barchart.com

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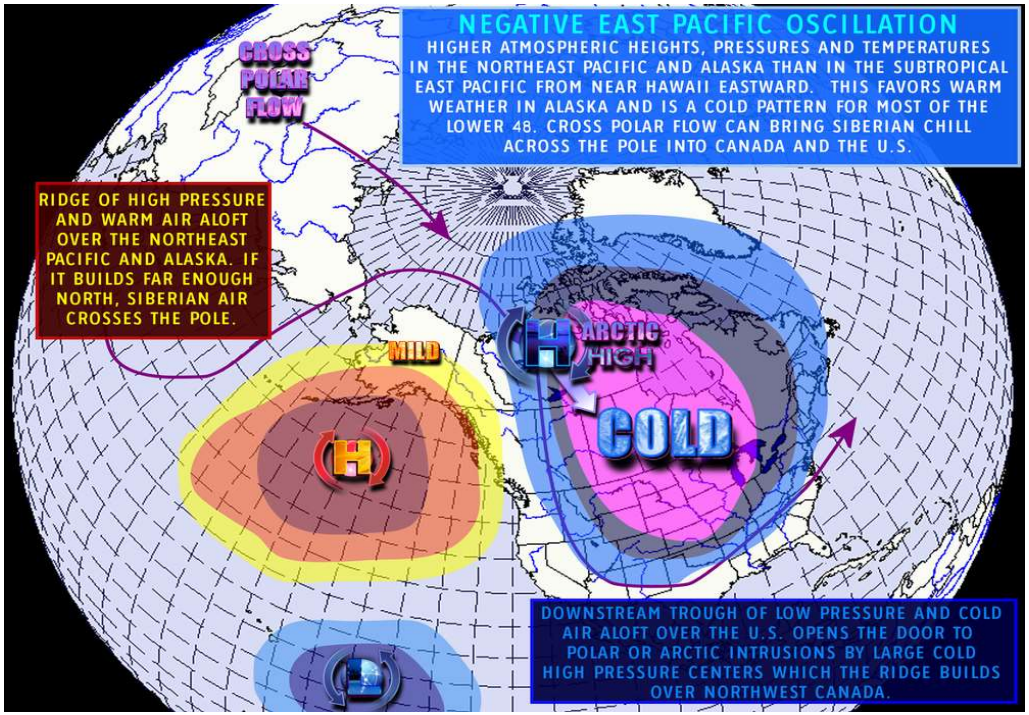
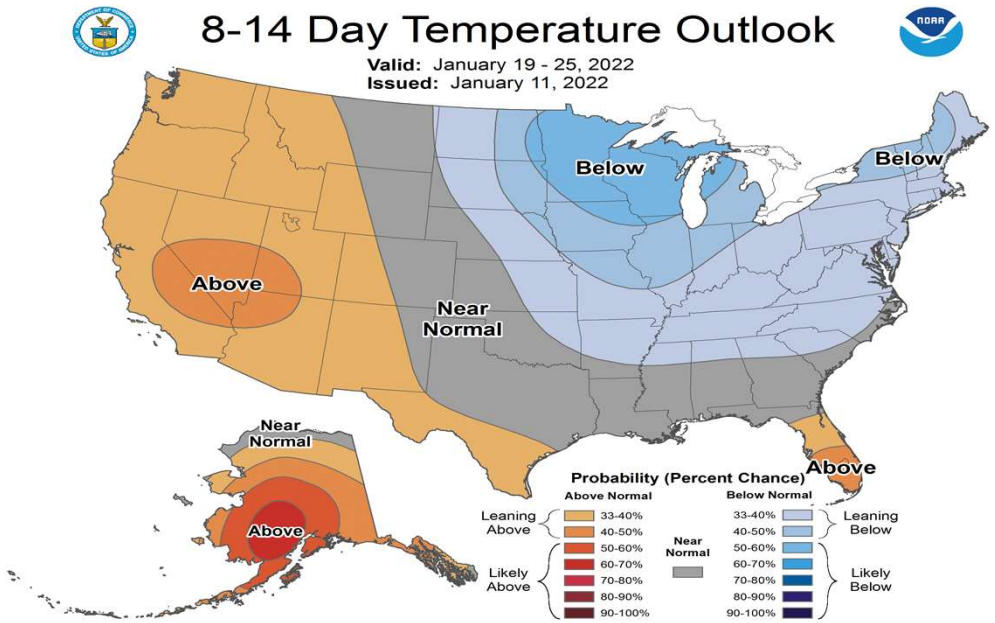
Variable Yet Cold Midwest and East Expected





- A variable pattern leans colder-than-normal from the Midwest and East, with demand higher than normal nationally over the next two weeks. A few very cold days are expected on occasional as Arctic air surges south out of Canada due to blocking over Alaska.
- The current negative EPO is the main culprit for some dashes of strong cold in the eastern 2/3rds of the country.
    - Though spots of extreme cold, we have yet to see it sustained keeping some upward price resistance.

Day 1-14 GWDD Outlook Covering Jan 13 - Jan 26: 5-Year Historical Comparison

	Rank	NGWDDs	Year
Most Bullish	1.	557 GWDDs (Forecast)	2022
	2.	514 GWDDs	2019
Neutral	3.	478 GWDDs	2018
	4.	447 GWDDs	2020
Most Bearish	5.	443 GWDDs	2021
	6.	359 GWDDs	2017

Source: NOAA, Constellation, Celsius Energy, Dacula Weather

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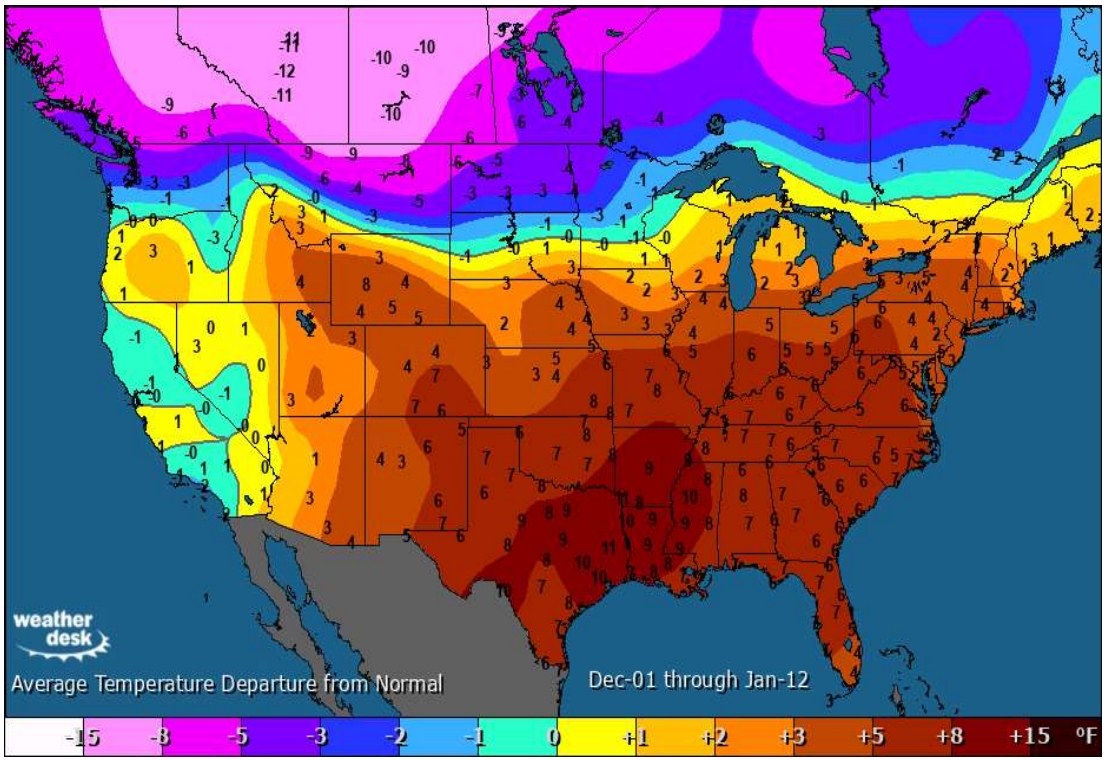
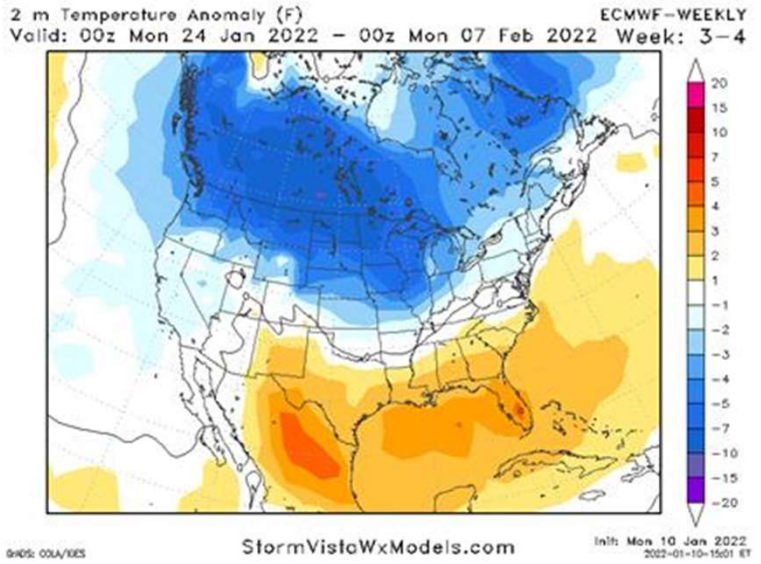
Mild Start/Mild Finish to Winter – Survive the Next 4 Weeks

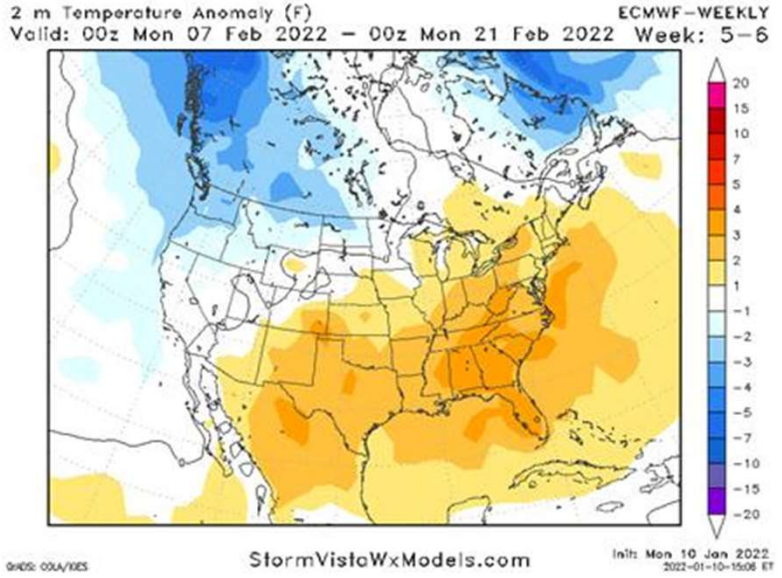
Dec 1 – Present Temperature Departure (4th warmest)



Late Jan/Early Feb



Mid February



- Current forecasts show variable but colder temps expected through early February.
- If sustained stretches of sharp coldness can be avoided that will limit price spikes.
- A return to the La Nina pattern (cold northern tier, moderate Northeast, warm South) in mid-February could be a benign finish to an “average” winter.

Source: Maxar, Storm Vista, Constellation

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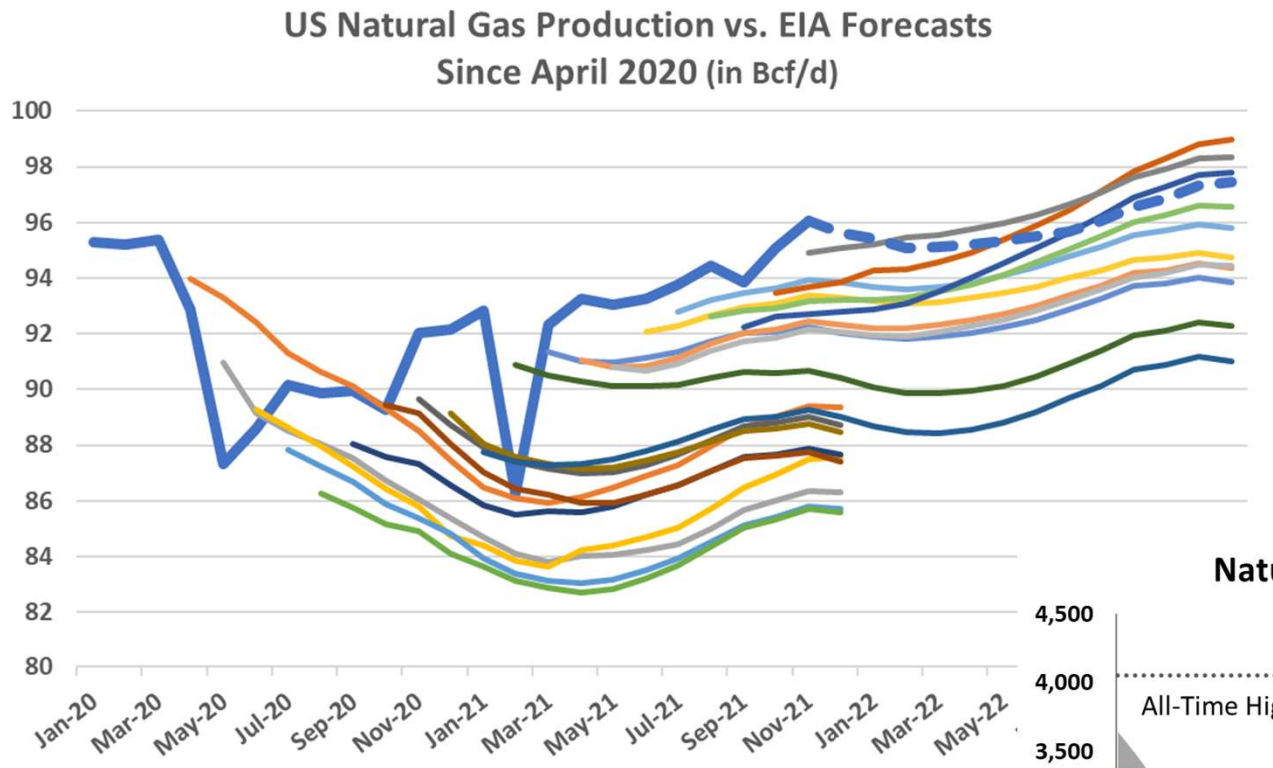
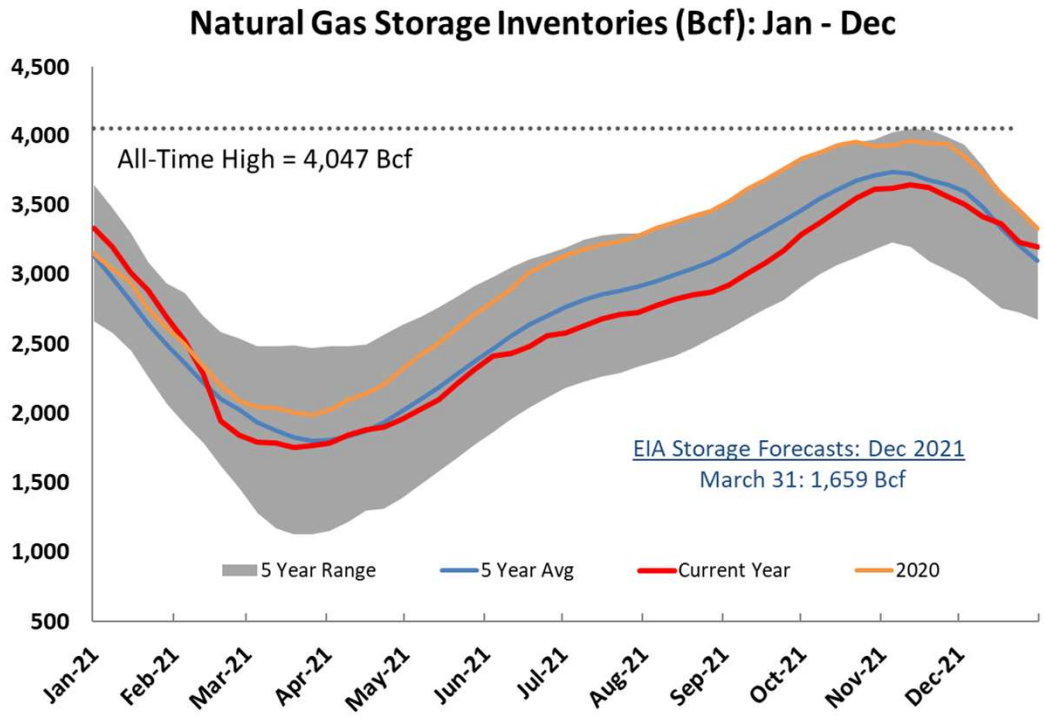
Production Gains Expected to Continue into 2022/Storage Steady



Customer Takeaway: Fundamentals have rightfully settled down thanks to a very mild December. Winter risks still exist but at least we've taken one month off the table (Dec). Production gains and a realized warm winter will be biggest driver on how far lower we can push prices.



- The top graph shows realized dry gas production through Dec 2022 dark blue line vs. historic monthly EIA forecasts since the pandemic began.
  - Dotted dark blue is 2022 forecast from Dec 2022 EIA STEO.
- Variable yet above-average temps have kept storage levels steady to historicals and is currently at 4.6% below last year and 3.1% above the 5-year average.

Sources: EIA

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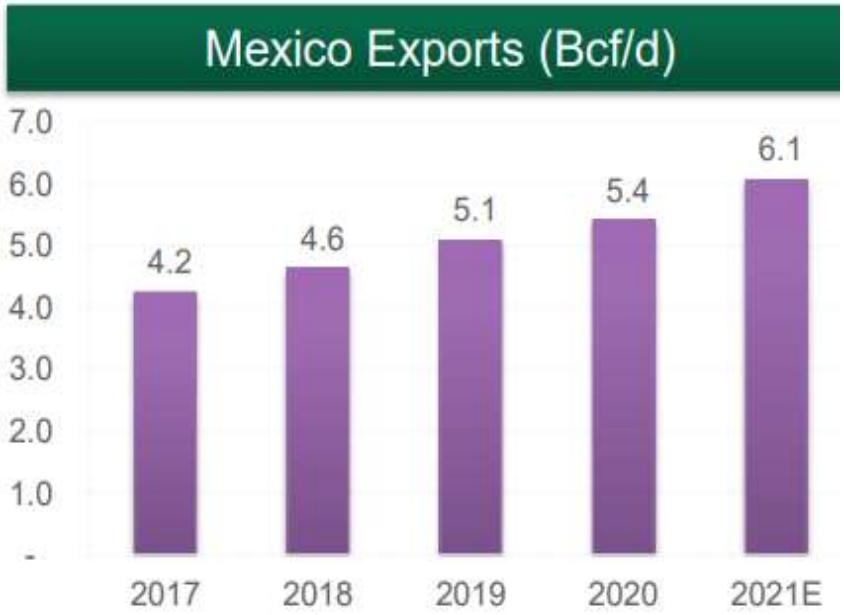
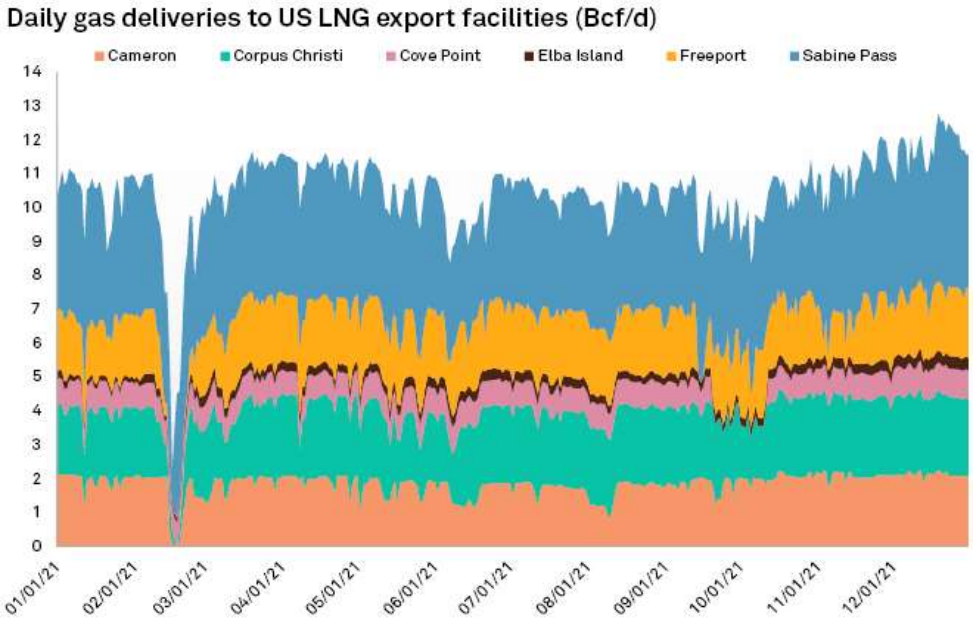
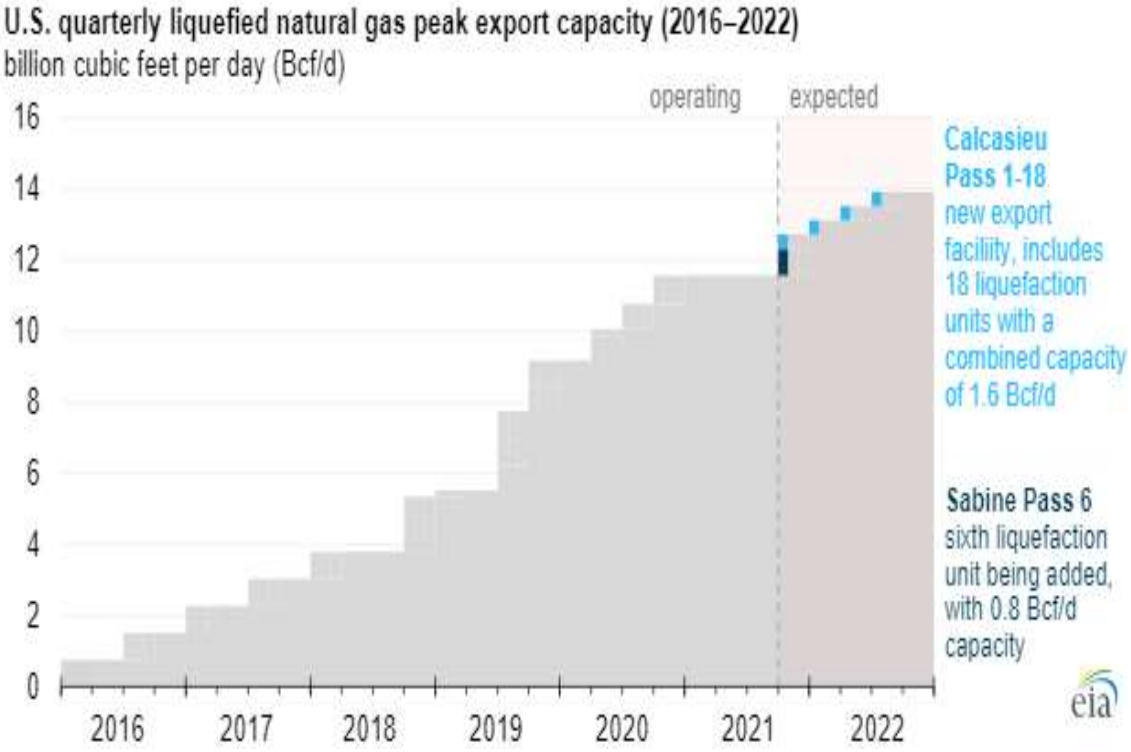
Exports Expected to Max Out in Tight Global Markets





Data compiled Jan. 4, 2022.
Source: S&P Global Market Intelligence



Customer Takeaway: Incremental growth in both Mexican and LNG exports are expected due to infrastructure projects but on the whole, expect this demand driver to remain at capacity as tight global markets make cheap US natural gas quite attractive. Going forward in to 2022, expect only downside risks to exports on the natural gas balance sheet due to unplanned outages, weather disruptions, etc.

Sources: EIA. Antero Resources, S&P Global

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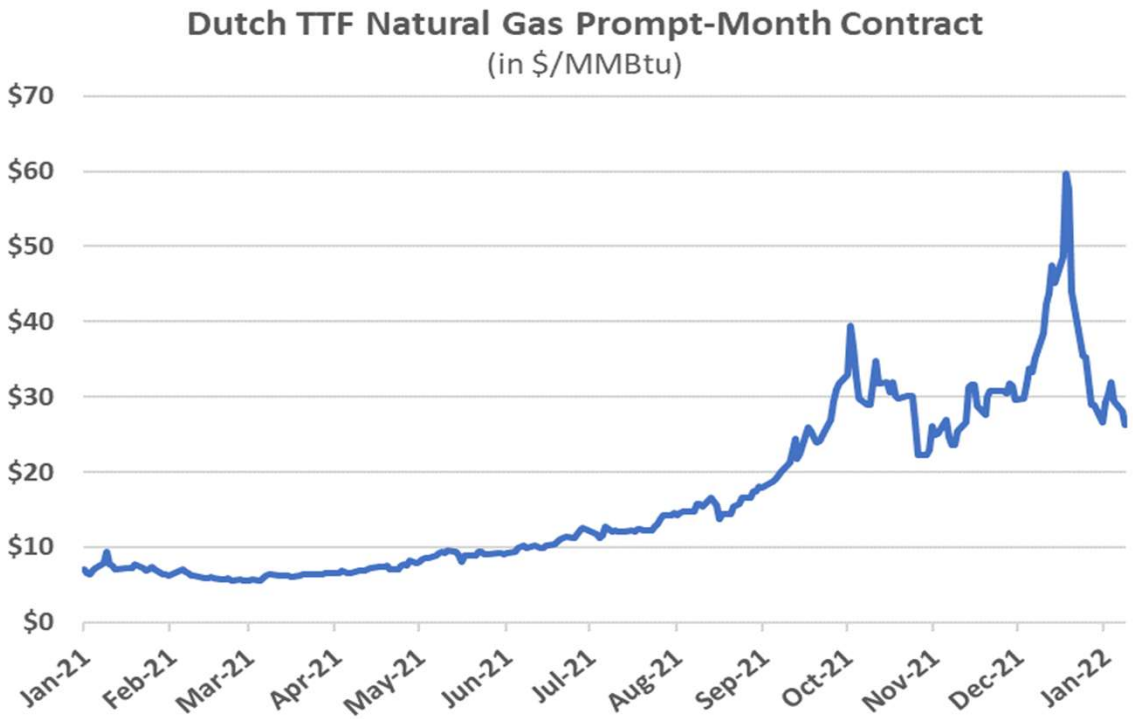
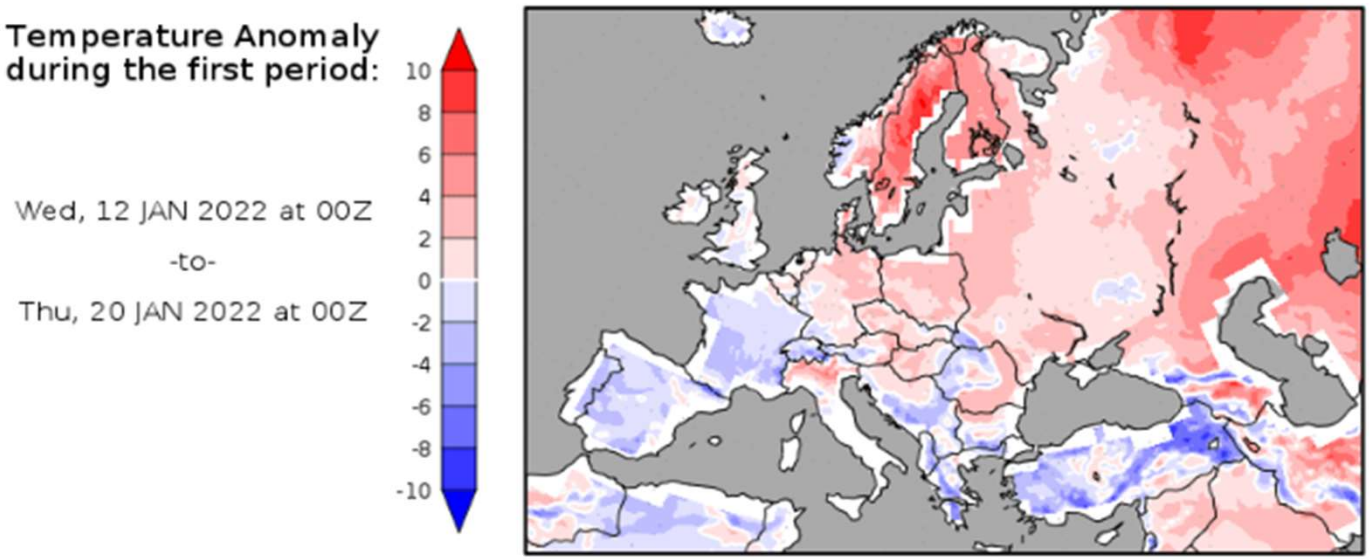
Tight and Expensive Global Markets Ripple to New England

- The Dutch TTF (European natural gas benchmark) rallied to almost to $60/MMBtu on December 21 off news that France's EDF were seeing extended maintenance outages for 4 of its nukes.
- The period only proved to be brief spike as free markets took hold and those high prices incentivized additional cargoes (namely US originated) to make port and provide much needed supply.
    - Realized mild temps and end-of-year positional close outs brought prices back to the 3 month "norm" towards $30/MMBtu.





Customer Takeaway: Winter fuel constraints remain the #1 risk in New England – LNG imports mitigate those risks with supplemental supply. To incentivize cargoes to Boston, New England gas prices must match global markets. New England gas prices correlate tightly to European prices.

Source: COLA-George Mason University, Constellation

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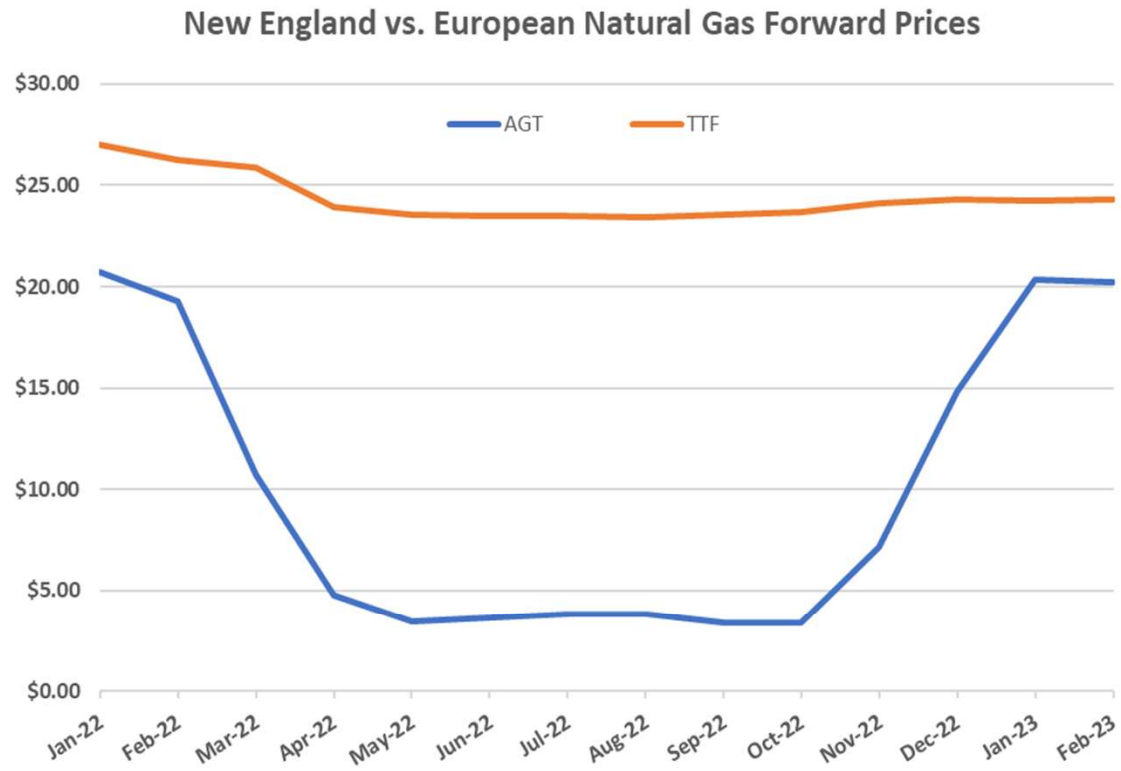
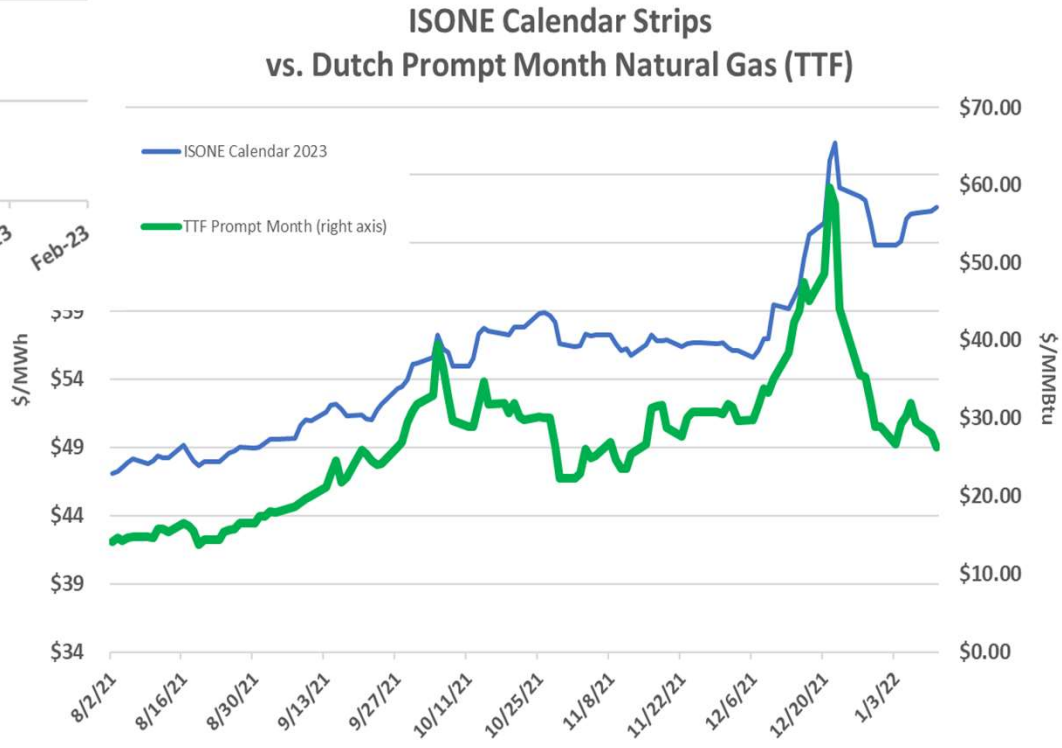
New England Winter Gas and Power Elevated Due to Global Markets





Source: Constellation

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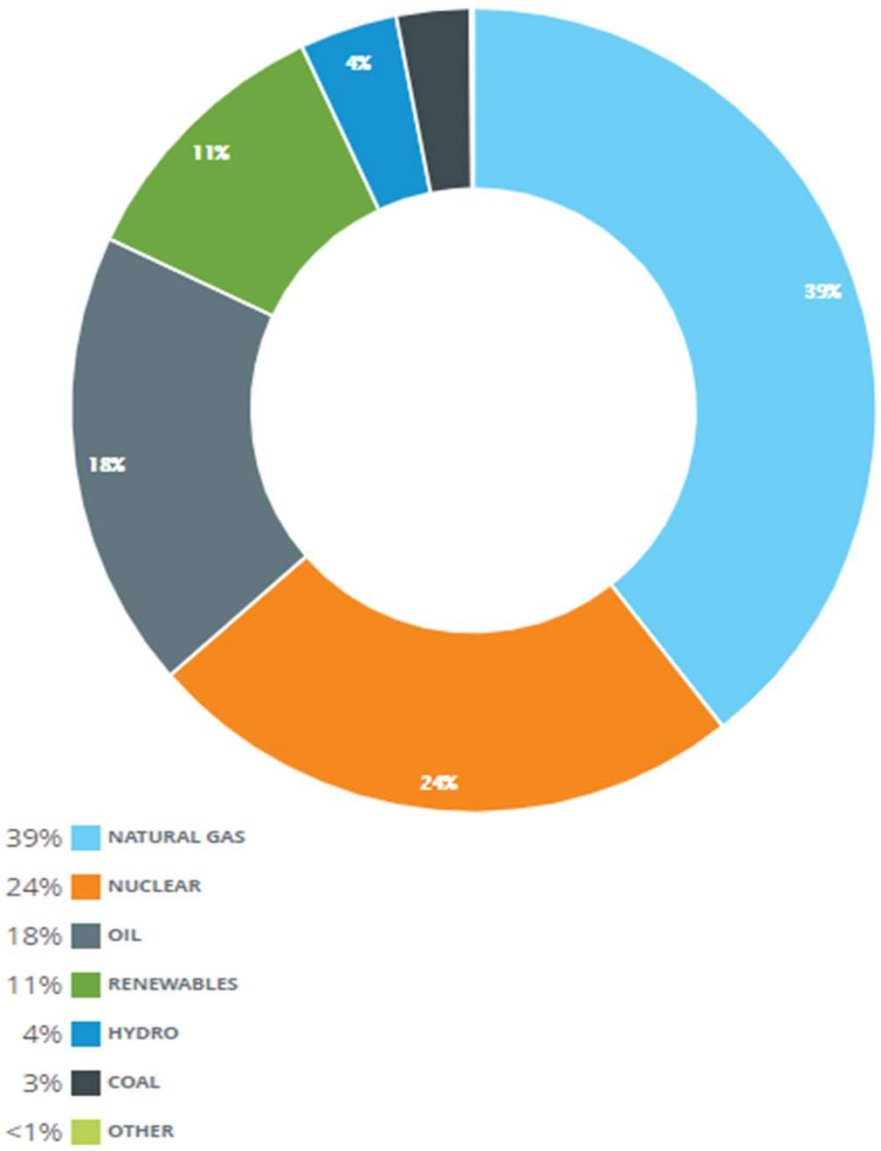
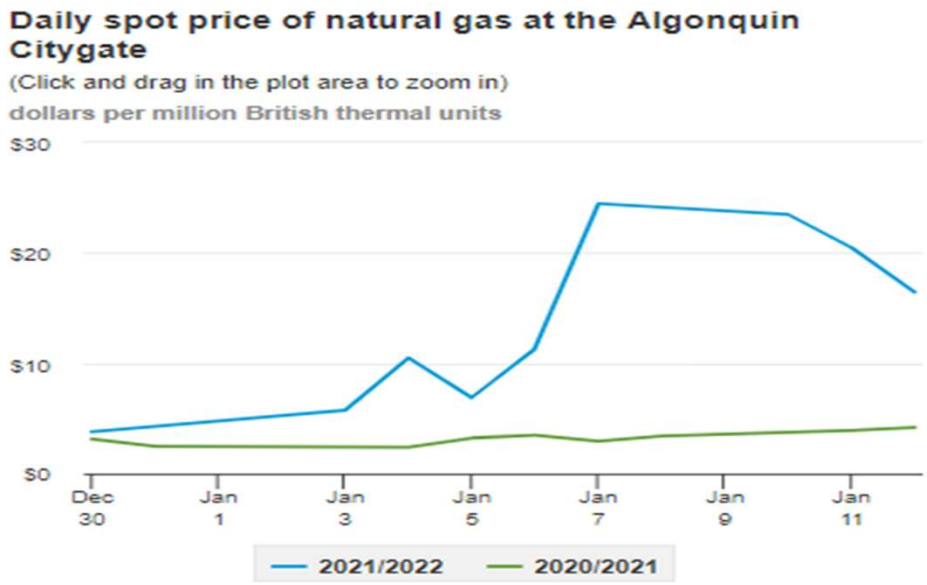
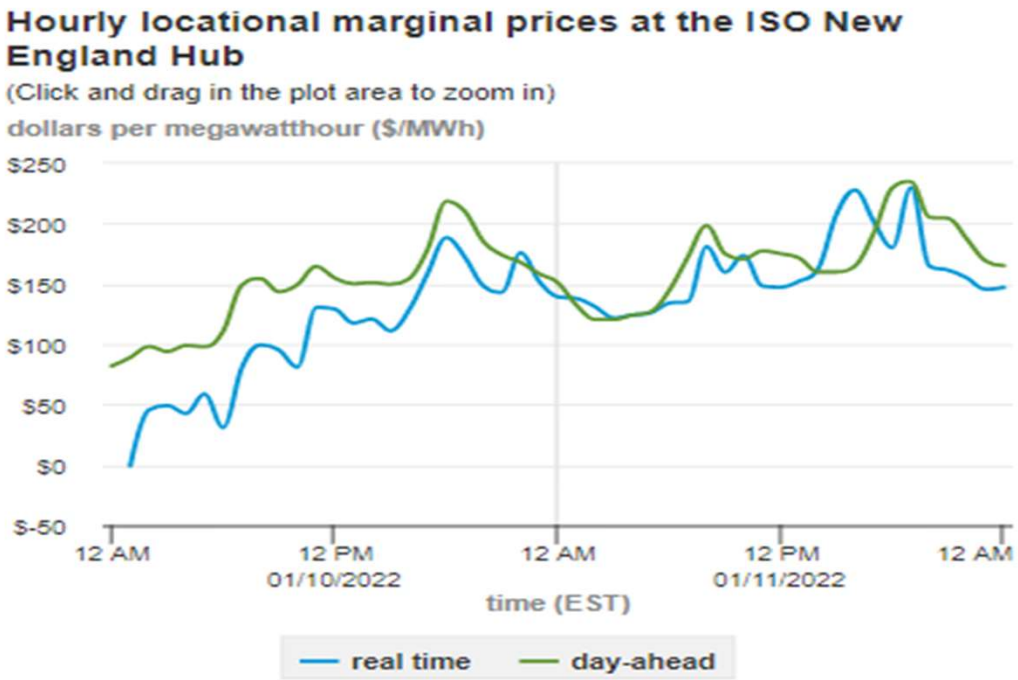
January 11 Cold Shot Dispatches Oil and Elevates Index Prices

ISONE Fuel Mix – 1/11/22 11:45 AM



MARGINAL FUEL: OIL





Source: ISONE, EIA

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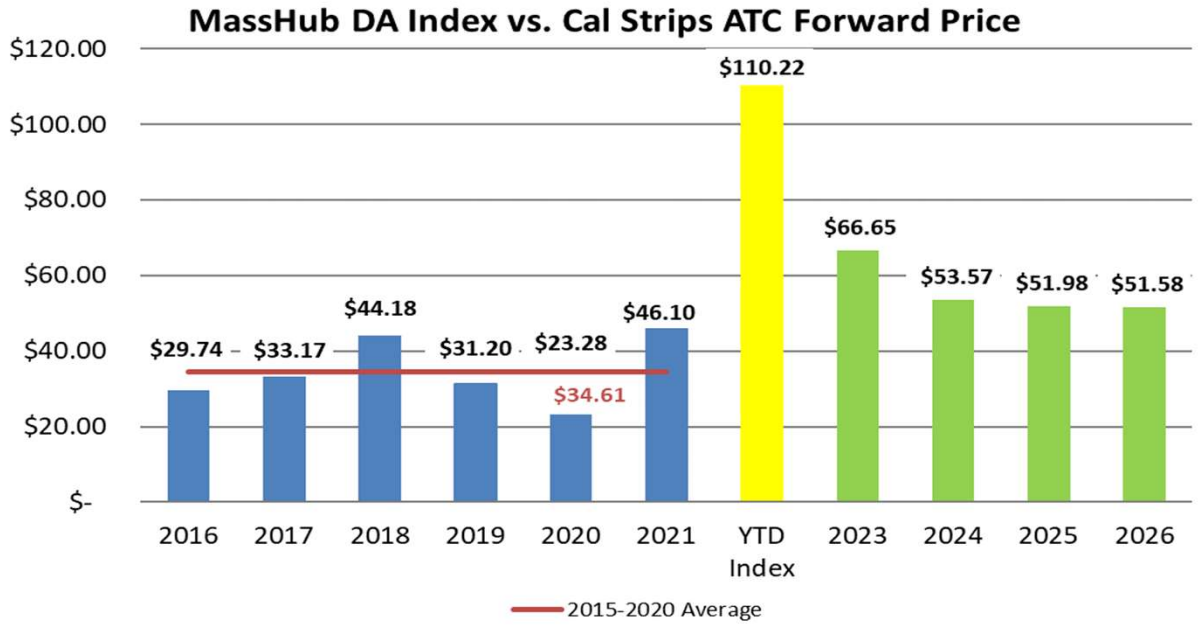
Early January Cold Pushes Index Prices to $110/MWh

										5-Yr Avg
Jan-18	$ 109.58	Jan-19	$ 56.17	Jan-20	$ 26.46	Jan-21	$ 42.29	Jan-22	$ 110.22	$ 68.95
Feb-18	$ 40.18	Feb-19	$ 36.05	Feb-20	$ 23.06	Feb-21	$ 73.57	Feb-22		$ 43.21
Mar-18	$ 35.38	Mar-19	$ 38.25	Mar-20	$ 17.19	Mar-21	$ 34.97	Mar-22		$ 31.45
Apr-18	$ 44.97	Apr-19	$ 27.00	Apr-20	$ 18.38	Apr-21	$ 26.11	Apr-22		$ 29.12
May-18	$ 24.06	May-19	$ 24.24	May-20	$ 16.44	May-21	$ 24.99	May-22		$ 22.43
Jun-18	$ 26.75	Jun-19	$ 22.10	Jun-20	$ 19.87	Jun-21	$ 36.68	Jun-22		$ 26.35
Jul-18	$ 32.93	Jul-19	$ 29.71	Jul-20	$ 23.74	Jul-21	$ 37.53	Jul-22		$ 30.98
Aug-18	$ 39.17	Aug-19	$ 25.77	Aug-20	$ 23.85	Aug-21	$ 49.38	Aug-22		$ 34.54
Sep-18	$ 33.87	Sep-19	$ 21.10	Sep-20	$ 20.47	Sep-21	$ 47.99	Sep-22		$ 30.86
Oct-18	$ 38.45	Oct-19	$ 20.76	Oct-20	$ 24.54	Oct-21	$ 57.68	Oct-22		$ 35.36
Nov-18	$ 57.24	Nov-19	$ 32.22	Nov-20	$ 25.36	Nov-21	$ 56.51	Nov-22		$ 42.84
Dec-18	$ 47.55	Dec-19	$ 41.05	Dec-20	$ 40.05	Dec-21	$ 65.45	Dec-22		$ 48.52
2018	**$ 44.18**	2019	**$ 31.20**	2020	**$ 23.28**	2021	**$ 46.10**	2022	**$ 110.22**	**$ 37.05**



Source: ISONE, Constellation

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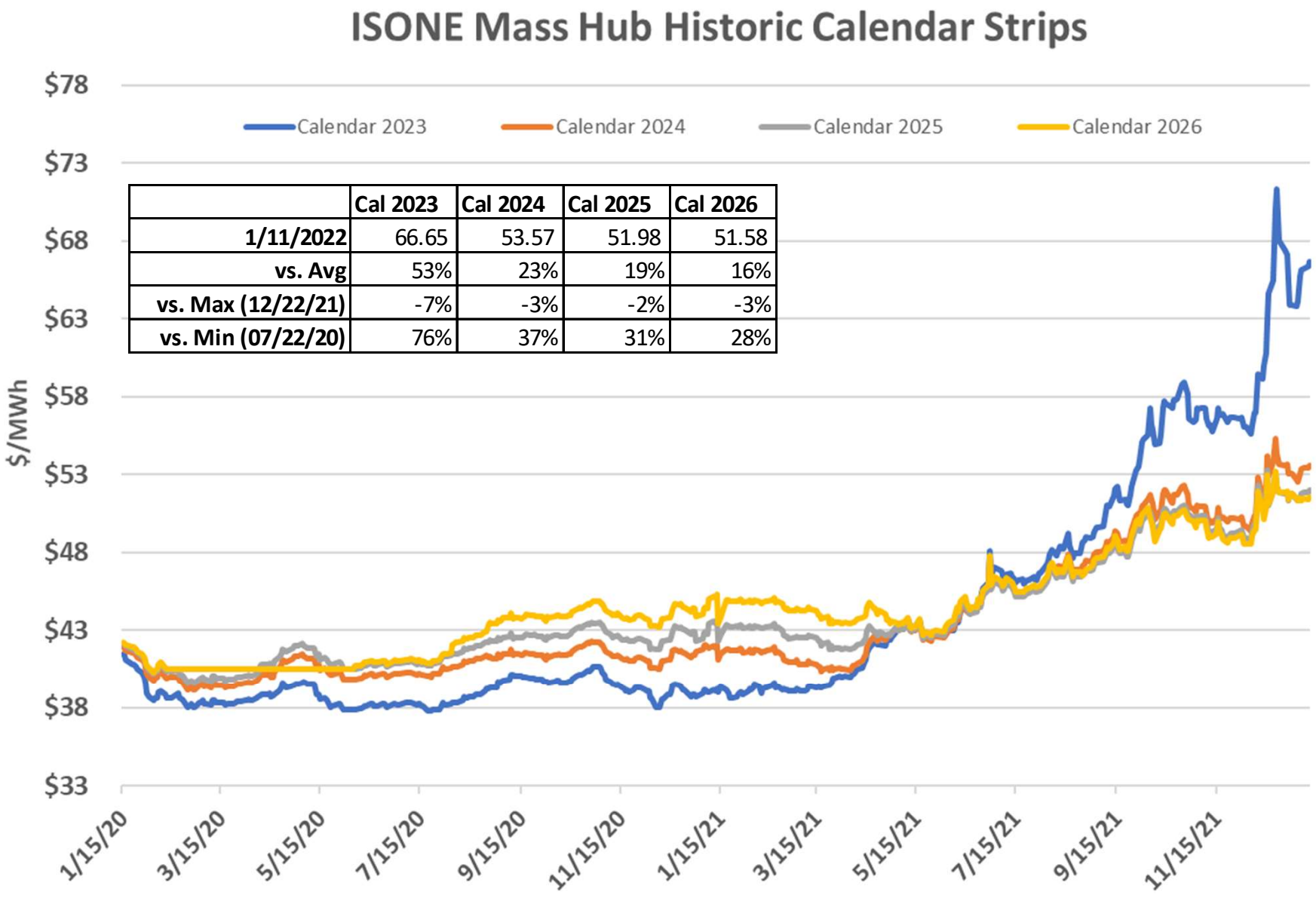
New England Historical Power Pricing – 2 Year Lookback



	Cal 2023	Cal 2024	Cal 2025	Cal 2026
1/11/2022	66.65	53.57	51.98	51.58
vs. Avg	53%	23%	19%	16%
vs. Max (12/22/21)	-7%	-3%	-2%	-3%
vs. Min (07/22/20)	76%	37%	31%	28%

Source: Constellation

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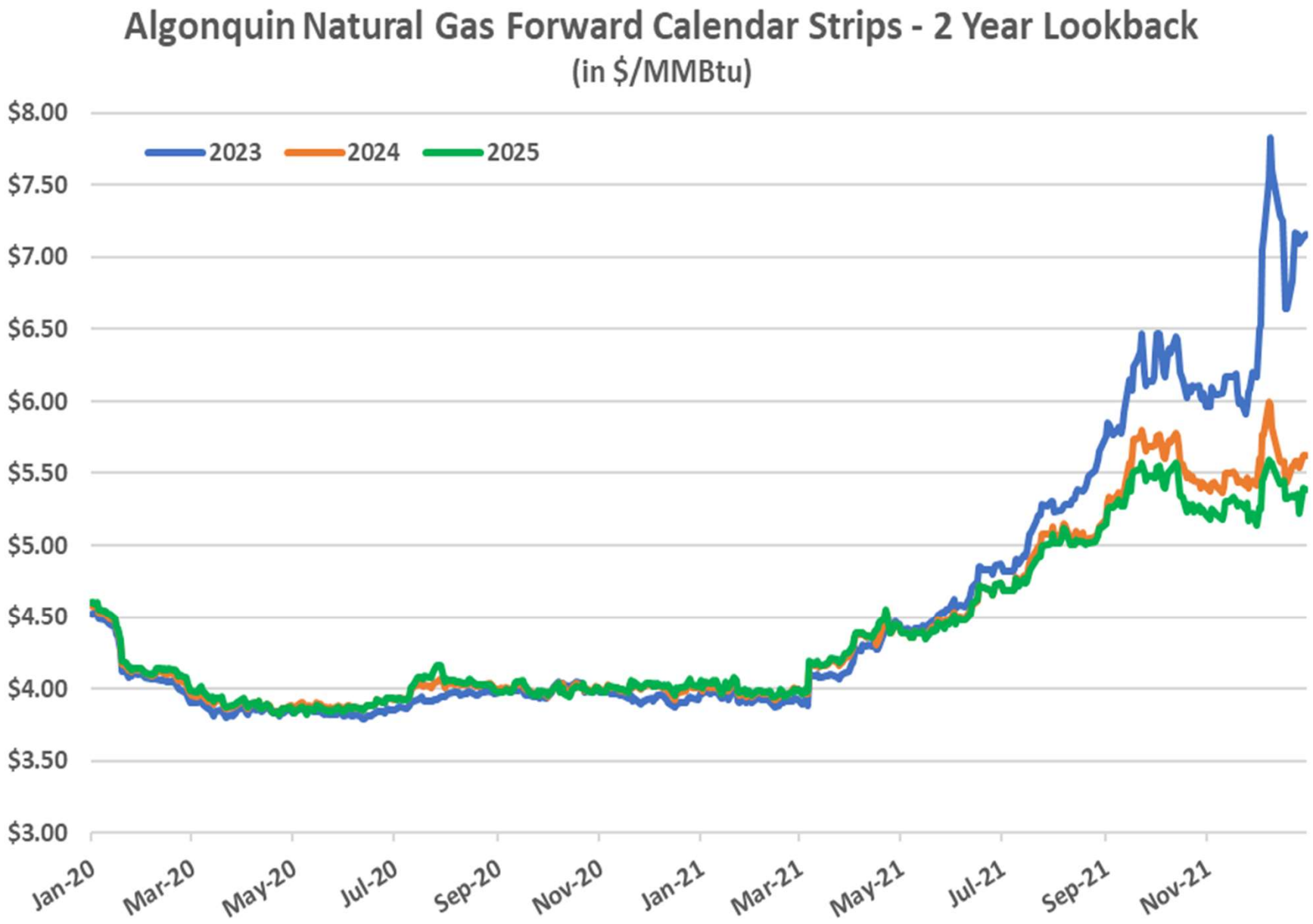
New England Historical Gas Pricing – 2 Year Lookback



Source: Constellation

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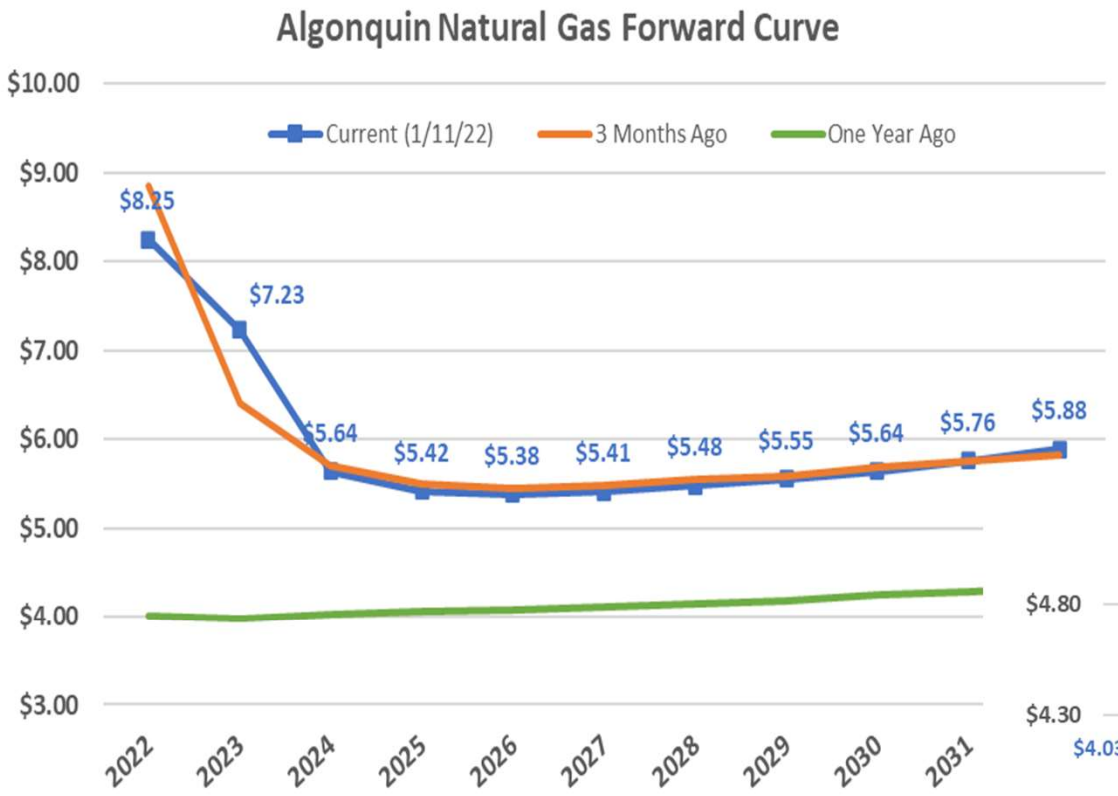
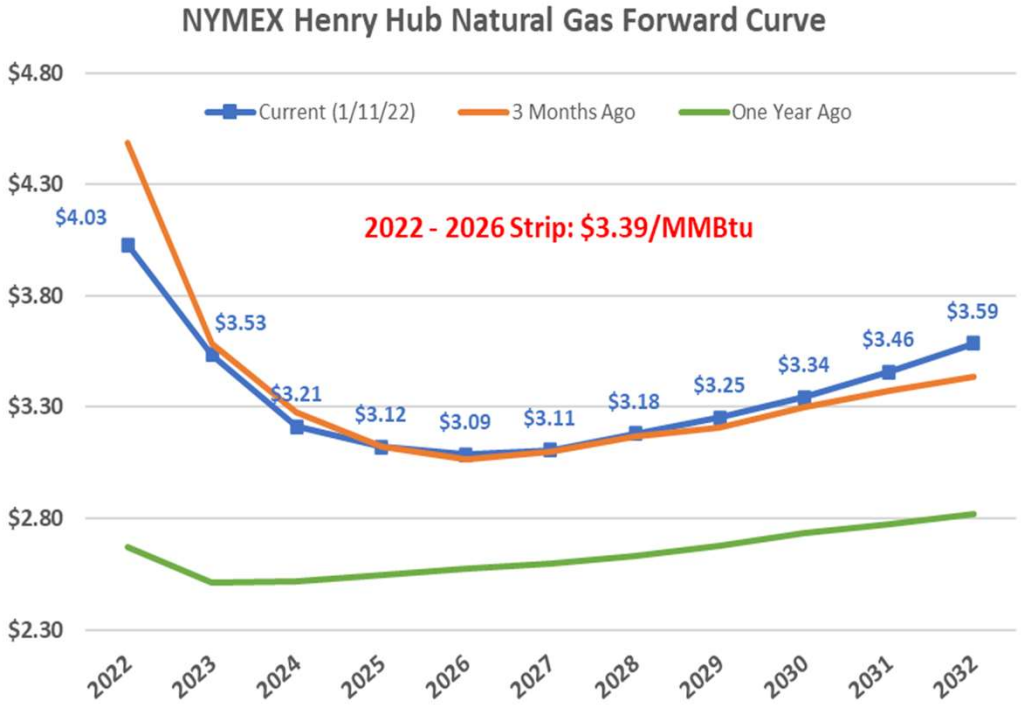
Price Value in the Belly of the Annual Forward Curve





Source: Constellation

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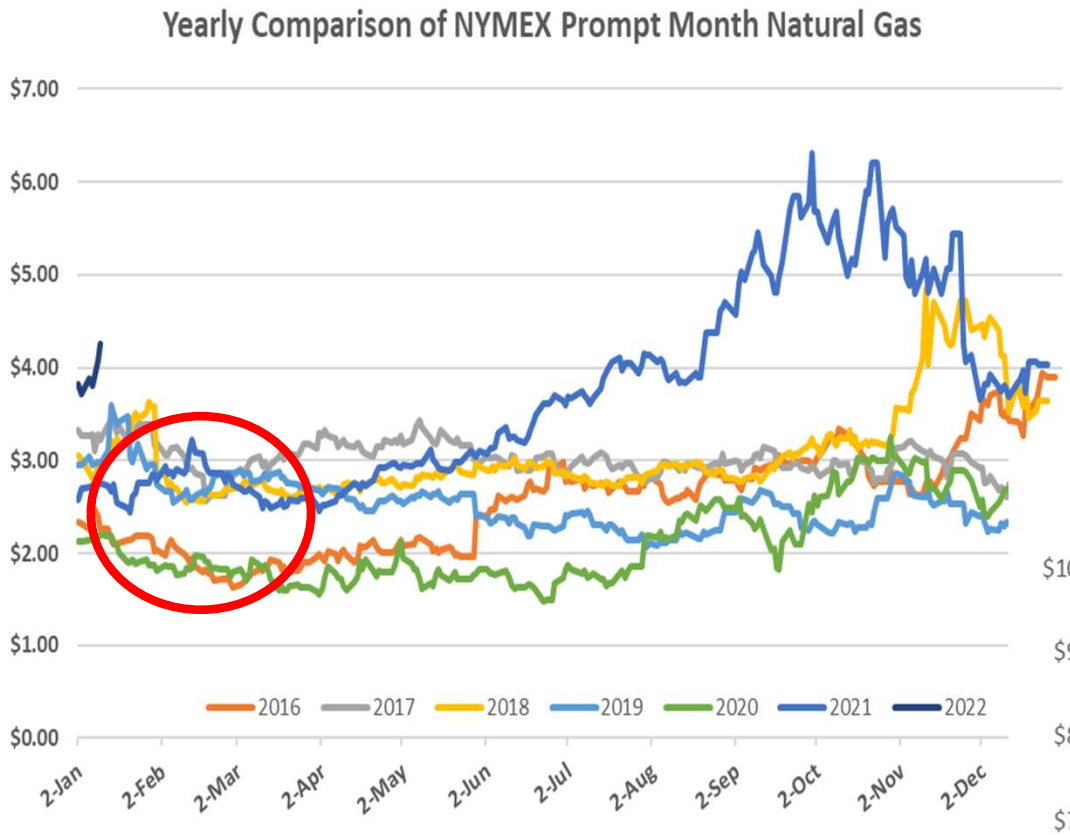
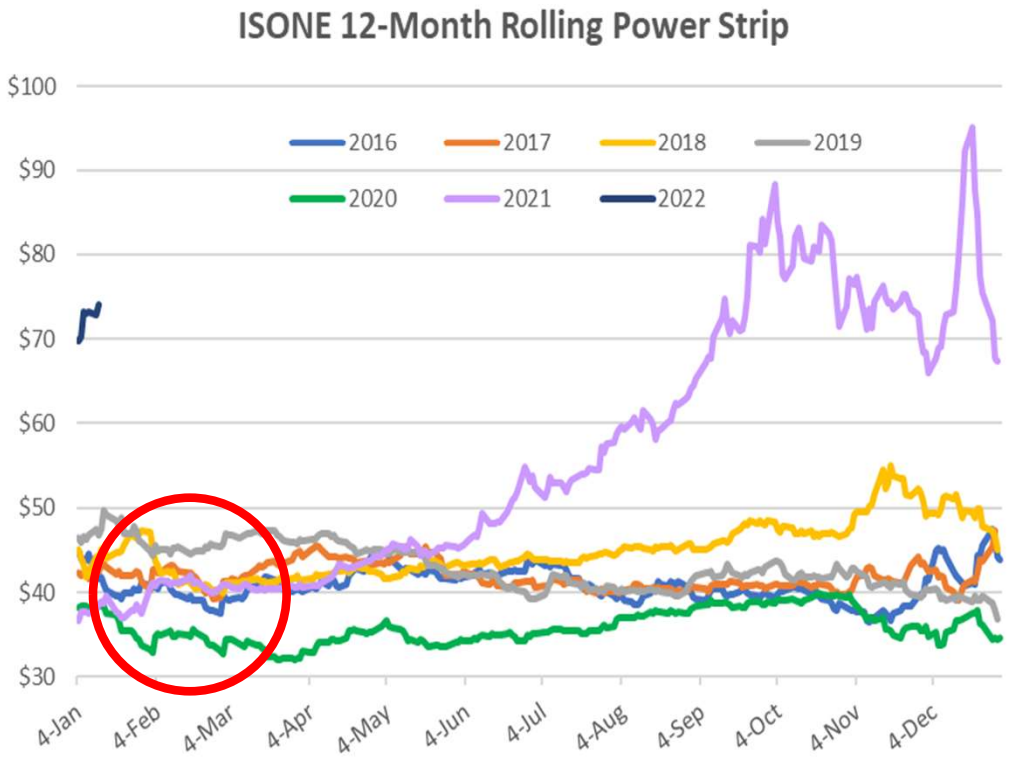
Potential Q1 Buying Opportunity Following Benign Winter





Source: Constellation

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Thank You

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Appendix

Preliminary ISO New England Peak Demand Day/Hour Set

ISONE	Hourly Peak Value	H.E.	Actual 5 min Peak	Forecast 5 min peak
6/7/2021	22,573	6pm	22,767	22,860
6/8/2021	22,439	4pm	22,511	23,100
6/21/2021	20,603	6pm	20,756	23,050
6/28/2021	24,492	7pm	24,618	24,500
6/29/2021	25,269	6pm	25,277	25,250
6/30/2021	24,759	6pm	24,903	25,240
8/12/2021	24,779	6pm	24,879	24,950
8/13/2021	24,355	6pm	24,456	24,400

- The grid operator officially (and preliminarily) set New England's calendar 2021's peak hour/day at June 29 hour ending 6pm with a demand value of 25,268.712

Annual System Peak Day, Hour, and Load

Capability Year & Capacity Commitment Period (CCP)	Begin Date	End Date	Peak Date	Peak Hour		System Peak Load
Date Range	Date	Date	Date	Hour Begin	Hour End	MW
6/1/2009 - 5/31/2010	1/1/2008	12/31/2008	6/10/2008	14:00	15:00	-25,691.470
6/1/2010 - 5/31/2011	1/1/2009	12/31/2009	8/18/2009	14:00	15:00	-24,707.827
6/1/2011 - 5/31/2012	1/1/2010	12/31/2010	7/06/2010	14:00	15:00	-26,701.350
6/1/2012 - 5/31/2013	1/1/2011	12/31/2011	7/22/2011	14:00	15:00	-27,312.342
6/1/2013 - 5/31/2014	1/1/2012	12/31/2012	7/17/2012	16:00	17:00	-25,543.347
6/1/2014 - 5/31/2015	1/1/2013	12/31/2013	7/19/2013	16:00	17:00	-26,910.954
6/1/2015 - 5/31/2016	1/1/2014	12/31/2014	7/02/2014	14:00	15:00	-24,067.772
6/1/2016 - 5/31/2017	1/1/2015	12/31/2015	7/29/2015	16:00	17:00	-24,052.353
6/1/2017 - 5/31/2018	1/1/2016	12/31/2016	8/12/2016	14:00	15:00	-25,111.431
6/1/2018 - 5/31/2019	1/1/2017	12/31/2017	6/13/2017	16:00	17:00	-23,507.885
6/1/2019 - 5/31/2020	1/1/2018	12/31/2018	8/29/2018	16:00	17:00	-25,559.141
6/1/2020 - 5/31/2021	1/1/2019	12/31/2019	7/30/2019	17:00	18:00	-23,929.184
6/1/2021 - 5/31/2022	1/1/2020	12/31/2020	7/27/2020	17:00	18:00	-24,726.738
6/1/2022 - 5/31/2023	**1/1/2021**	**9/30/2021**	**6/29/2021**	**17:00**	**18:00**	**-25,268.712**

Customer Takeaway: ISO New England preliminarily set the grid's 2021 peak day, hour and demand value on October 20. All information is subject to change and the final value is typically set in the April.

Source: ISONE

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