PointLogic

Presentation

Talladega Nights Act 3: Redemption of the North America Producer

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Samuel Andrus, Executive Director, sam.andrus@ihsmarkit.com +1 919 650 4690

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Ricky Bobby in the gas patch

- Unbridled arrogant success (Act 1) followed by abject failure (Act 2) with a wizened return (Act 3)
- Act 1 – spend 200% of cash flow borrowing copiously to drill with the view that you can cut costs faster than your competition. Pinnacle reached in December of 2019 by both gas and oil producers. Global oil production exceeds demand by at least 10% and domestic gas production exceeds domestic demand by over 5%.
- Act 2 – after a decade of negative returns, Wall Street enforces capital discipline with drilling capex at <70% of cash flow. COVID19 crushes global demand prevents use of normal production decline to bring balance and forces rapid production curtailment. Sustained sub $2.00 prices wreak financial havoc on already distressed producer balance sheets
- Act 3 – humbly get your financial house in order before turning to growth. 2020 hedges, placed to staunch low price bleeding and stabilize cash flow, now become a liability draining cash for margin calls. Robust economic recovery and winter cold drive rapid demand growth pushing up prices as supply remains relatively inelastic. Higher prices cover margin calls but when does growth begin?

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- IHS Markit combines information, analytics and expertise to provide solutions for business, finance and government. We help our customers see why things happen and focus on what really matters so they can make confident decisions to improve efficiency, outpace competitors and drive growth.
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- We're able to isolate cause and effect, risk and opportunity in new ways that empower our customers to make well-informed decisions with greater confidence.
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- S&P Global and IHS Markit have agreed to merge with closing expected in Q4 subject to regulatory approval.

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- Real-time flows and notices
- Daily market fundamentals
- Daily/weekly market insights
- Analytics & news

- 3-yr Canada and US Lower-48 outlook
- 3-yr outlooks for 6 regions and 13 sub-regions
- Monthly short-term market insights

Regional Integrated Service:
Strategy & Planning

- Integrated long-term market view
- Canada and US Lower-48 outlook, and regional outlooks through 2050
- Semi-annual long-term market insights

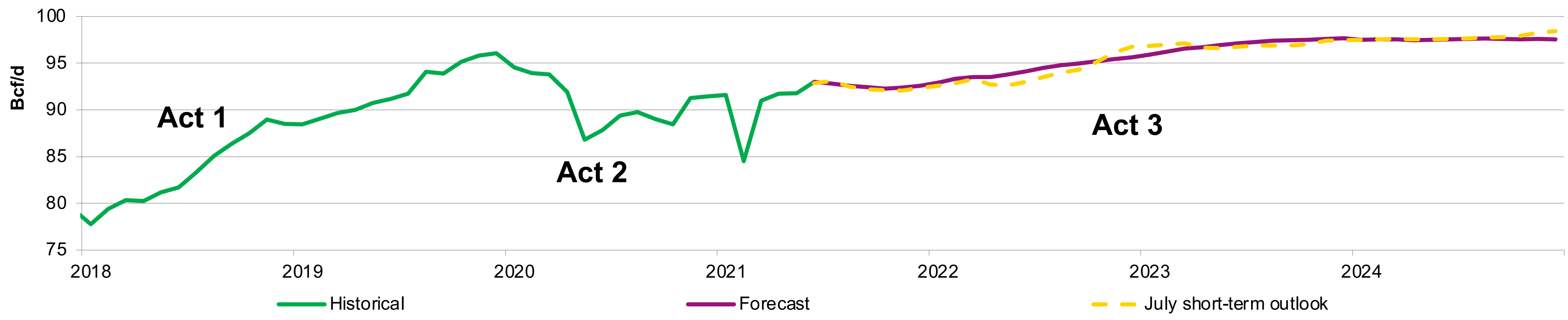
Real-time — Daily/Weekly

Short-term — Monthly

Long-term — Semi-annual

And now for the rest of the story

US lower-48 natural gas production

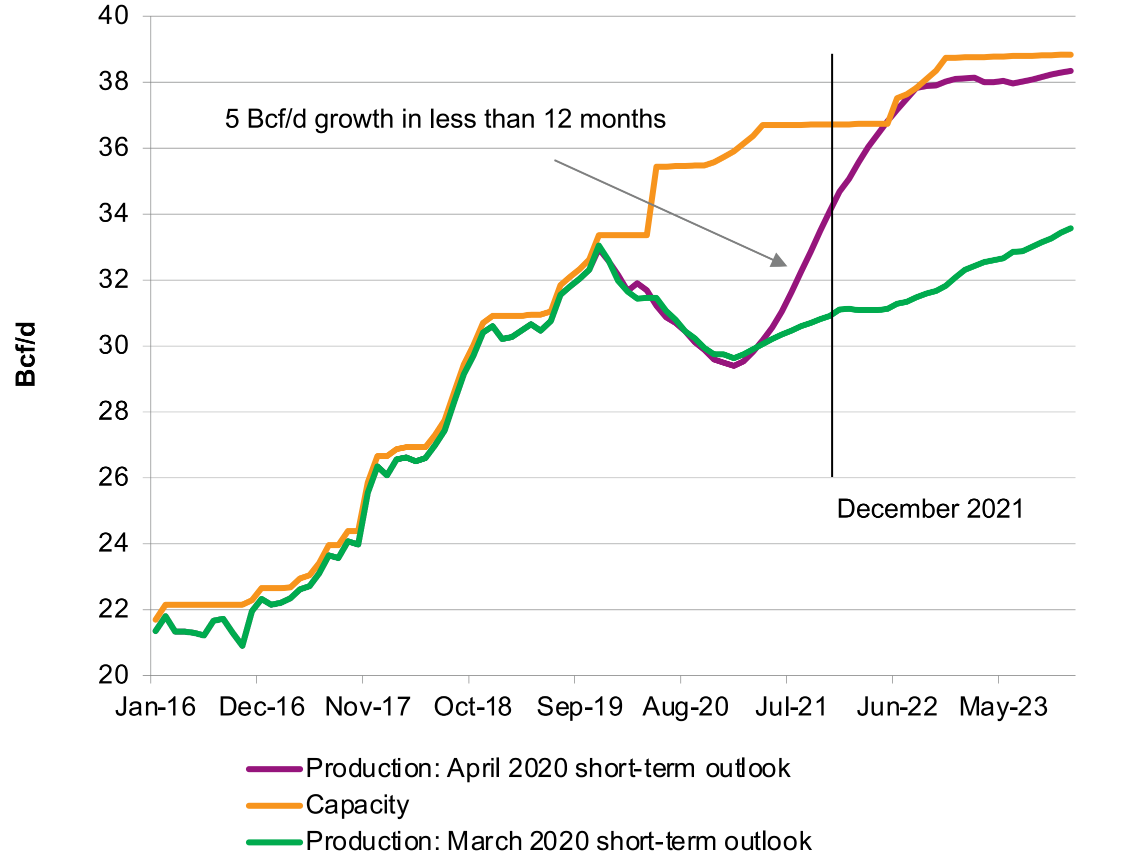


Source: IHS Markit

- **Exit 2019 production of 96 Bcf/d against 2020 pre Covid expected demand of 90 Bcf/d.**
- **Low prices stimulated power demand largely offsetting COVID demand destruction for the year, but lockdowns compressed the pace of rebalancing.**
- **Shut-in production returned quickly with slight boost, but lack of drilling gradually flattened the curve.**
- **February freeze-offs ding 2021 averages but allow for another short-term pop while Haynesville ramps up.**
- **Haynesville is a beast but insufficient to cover for constrained Marcellus and a Permian sitting on the bench.**
- **Significant associated gas growth doesn’t arrive until 2023 and 2024.**

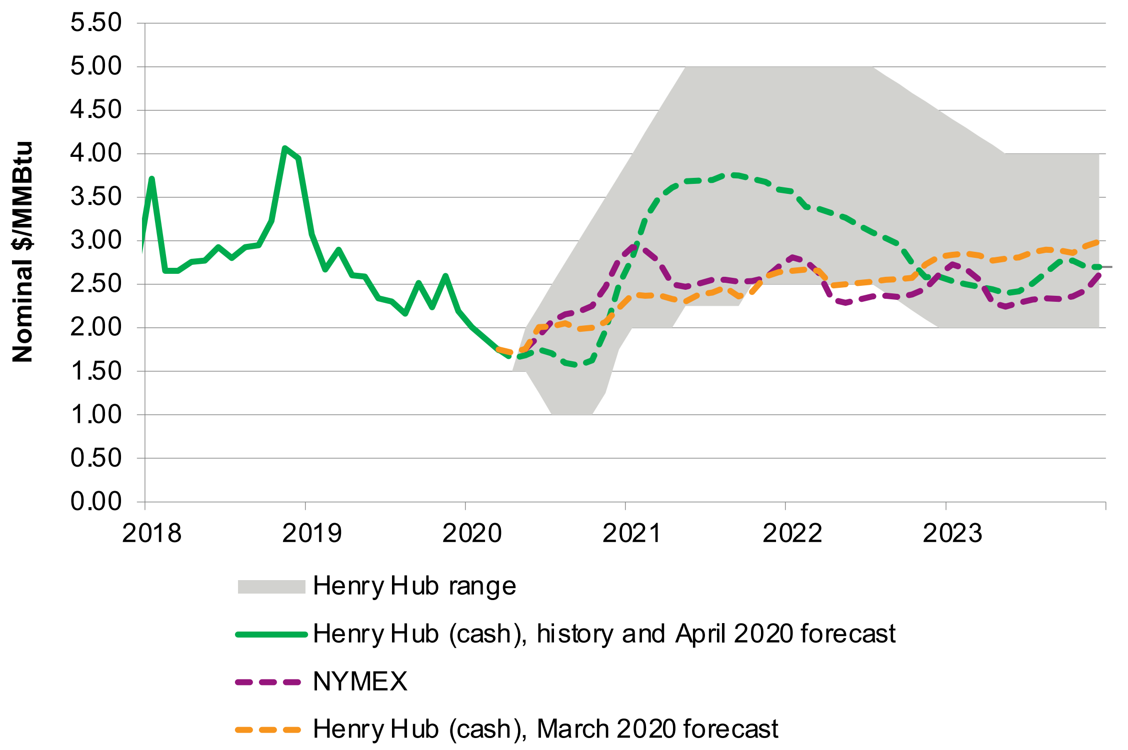
June 10, 2020: Higher prices required to drive Appalachian activity and increased use of coal

Appalachian production and pipeline capacity



Source: IHS Markit

Henry Hub cash prices and NYMEX natural gas futures

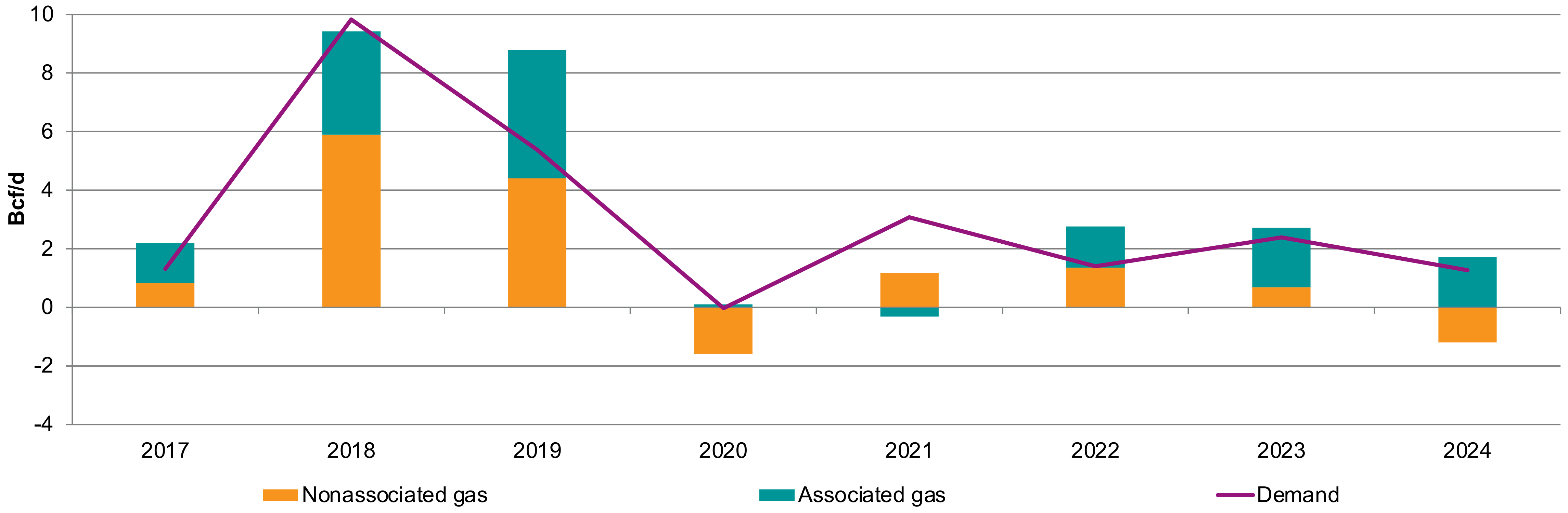


Note: NYMEX settlement prices as of 17 April 2020 are shown as dashed purple. Historical Henry Hub prices are shown as solid green, with the IHS Markit current forecast shown as dashed green.

Source: IHS Markit, Intelligence Press, CME Group

Annual year over year change highlight the pace of change challenge

US lower-48 gas demand and production year-over-year changes



Source: IHS Markit

The 2020 economic shutdown was relatively short, and the recovery has occurred more quickly and robustly than early 2020 forecasts

Real GDP growth

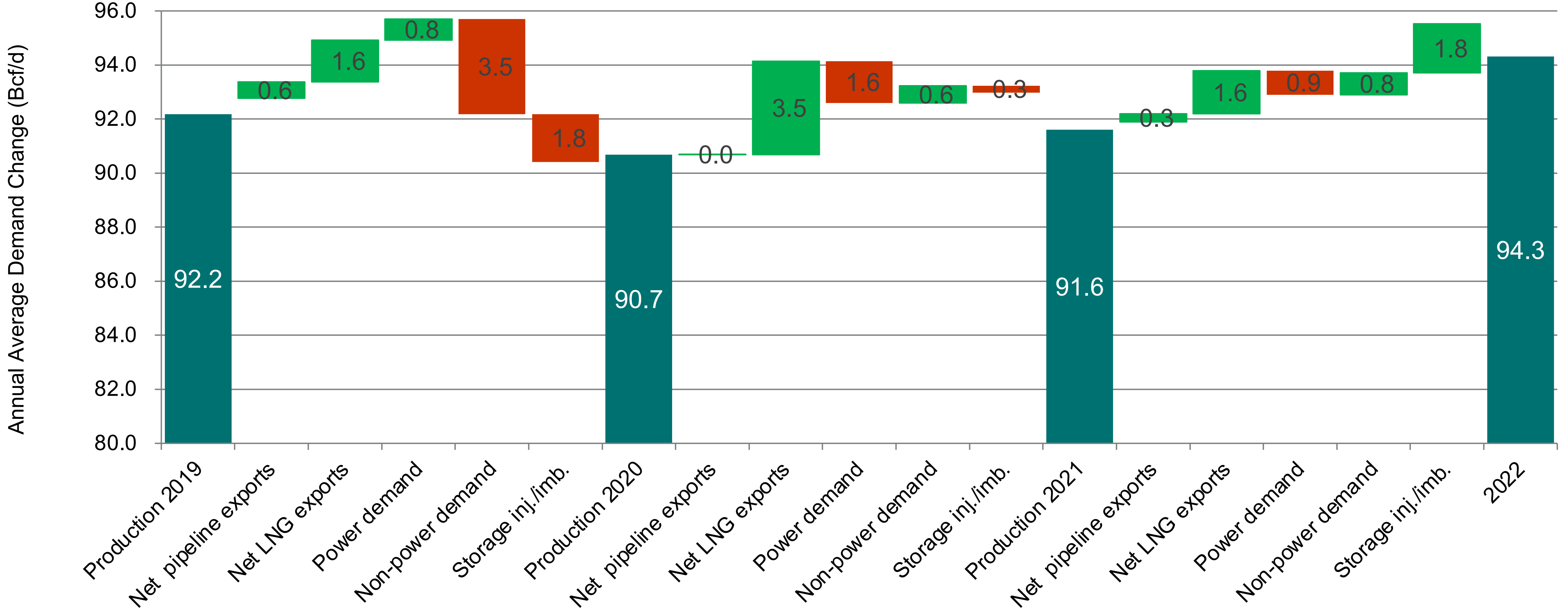
	2019	2020	2021	2022	2023	2024
World	2.9	(3.2)	**5.7**	4.7	3.8	3.6
US	2.3	(3.4)	**6.1**	4.4	2.2	2.4
Canada	1.9	(5.3)	**6.3**	4.3	2.1	2.1
UK	1.4	(9.8)	**6.7**	5.2	1.8	1.0
Russia	2.0	(2.9)	**4.2**	3.0	2.7	2.5
Eurozone	1.5	(6.7)	**5.0**	4.3	2.2	1.7
China	6.0	2.3	**8.5**	5.8	5.5	5.2
India*	4.1	(7.4)	**7.7**	6.5	5.5	6.1
Japan	0.0	(4.7)	**2.5**	2.7	1.2	0.9
Brazil	1.4	(4.4)	**5.2**	2.8	2.3	2.3

Source: IHS Markit, August 2021 economic outlook ©2021 IHS Markit

Note: India Fiscal year starts April 1

US Supply: feast to famine

US Lower-48 natural gas balance: Year-on-year changes



Source: IHS Markit

Inelastic supply and deficit storage inventories drive volatile prices this winter.

US lower-48 summer 2021 versus 2020 natural gas supply and demand (Bcf/d)

	Supply				Demand				Exports				
Season	Production	Imports	Other	Total	Res/ Com/ Ind	Power	Other	Domestic Total*	LNG Feed Gas	Mexico	Total Demand	Storage Injections	Henry Hub
Summer 2020	89.0	4.1	0.3	93.4	32.6	33.9	6.5	73.0	5.7	5.5	84.2	8.9	$ 1.87
Summer 2021	92.4	4.5	0.4	97.3	32.9	32.7	6.5	72.1	10.7	6.2	89.0	7.8	$ 2.87
Delta	3.4	0.4	0.1	3.9	0.3	(1.2)		(0.9)	5.0	0.7	4.8	(1.1)	$ 1.00

* Includes EIA Imbalance
Source: PointLogic August 2021 Short Term Outlook

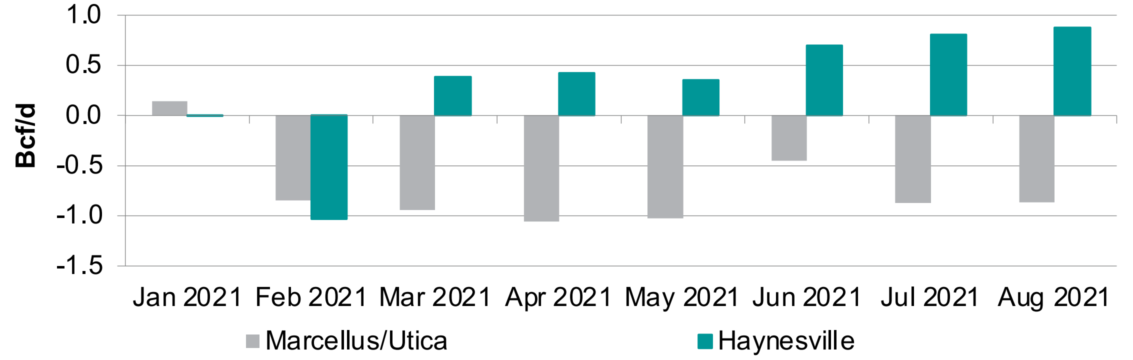
US lower-48 winter 2021 versus 2020 natural gas supply and demand (Bcf/d)

	Supply				Demand				Exports				
Season	Production	Imports	Other	Total	Res/ Com/ Ind	Power	Other	Domestic Total*	LNG Feed Gas	Mexico	Total Demand	Storage Withdrawals	Henry Hub
Winter 2020	90.0	5.5	0.3	95.9	61.3	26.7	7.3	95.3	10.3	5.4	111.0	(14.2)	$ 3.09
Winter 2021	92.9	4.6	0.6	98.1	62.2	26.3	6.9	95.4	11.6	5.3	112.3	((14.1)	$ 3.59
Delta	2.9	(0.9)	0.3	2.2	0.9	(0.4)	(0.4)	0.1	1.3	(0.1)	1.3	0.1	$ 0.50

* Includes EIA Imbalance
Source: PointLogic August 2021 Short Term Outlook

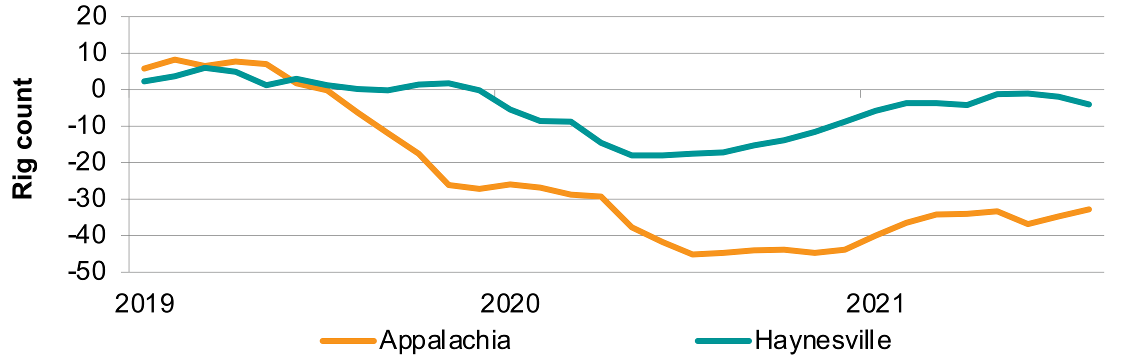
Haynesville production is winning the dry gas battle with Appalachia

Haynesville and Marcellus/Utica production change since December 2020



Source: IHS Markit, EIA, PointLogic

Haynesvile and Appalachia rig count change since December 2018

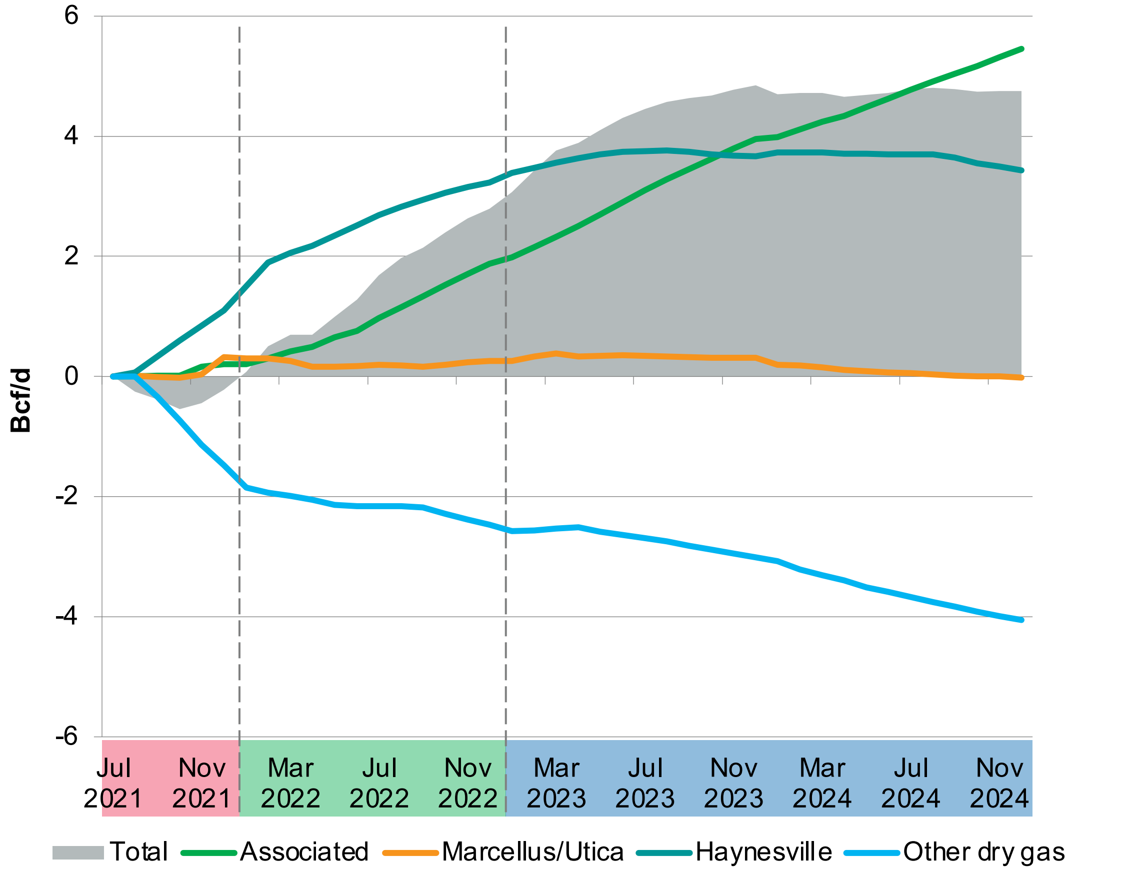


Source: Baker Hughes, IHS Markit

- **Production has been more resilient in Haynesville than Appalachia.** Production from Haynesville has climbed by 0.9 Bcf/d since December 2020, while Marcellus/Utica production has fallen by 0.9 Bcf/d.
- **Rig counts have also been steadier in Haynesville.** By comparison, Appalachian drilling activity dropped far more steeply during 2020 as natural gas prices fell. Appalachia has relied more on its DUC inventory: DUCs there have fallen by 21% since December 2019, in contrast to the 9% increase in Haynesville DUCs.
- **Several factors have favored Haynesville production versus Appalachia,** including a prevalence of more private operators, an extensive, integrated gas pipeline grid, and a geographic advantage of being closer to growing demand. For these reasons, we expect Haynesville to be more favorably situated to grow production compared with Appalachia in our short-term outlook.

Stagnant production through the rest of the summer is followed by strong growth, with Haynesville and associated gas production leading the way

Change in natural gas production since July 2021



Source: IHS Markit, EIA, PointLogic

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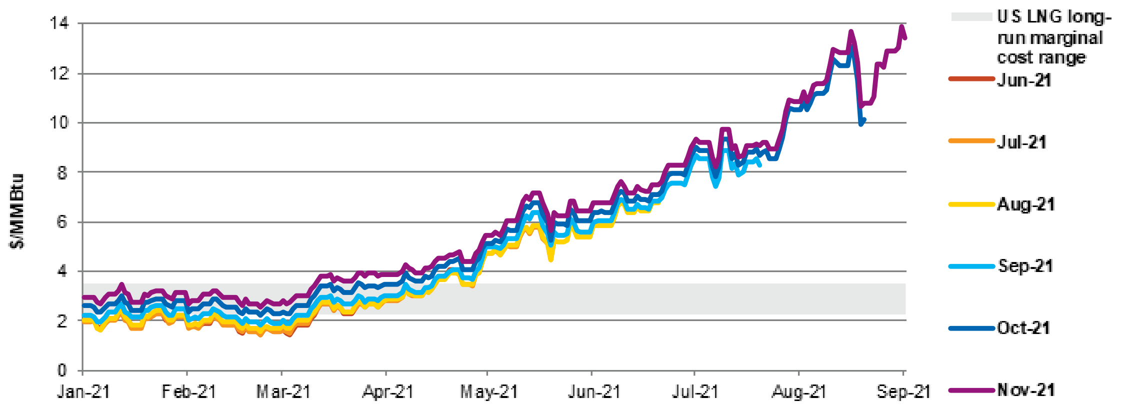
The current period of stagnant production will not last as the outlook unfolds in three stages:

- **Market reset**: July 2021 through November 2021
- **Strong growth, primarily from Haynesville**: November 2021 through December 2022
- **Return to associated gas–driven supply market**: December 2022 through December 2024

Double digit netbacks means LNG exports should stay at capacity
And be expensive to buy back if winter demand requires

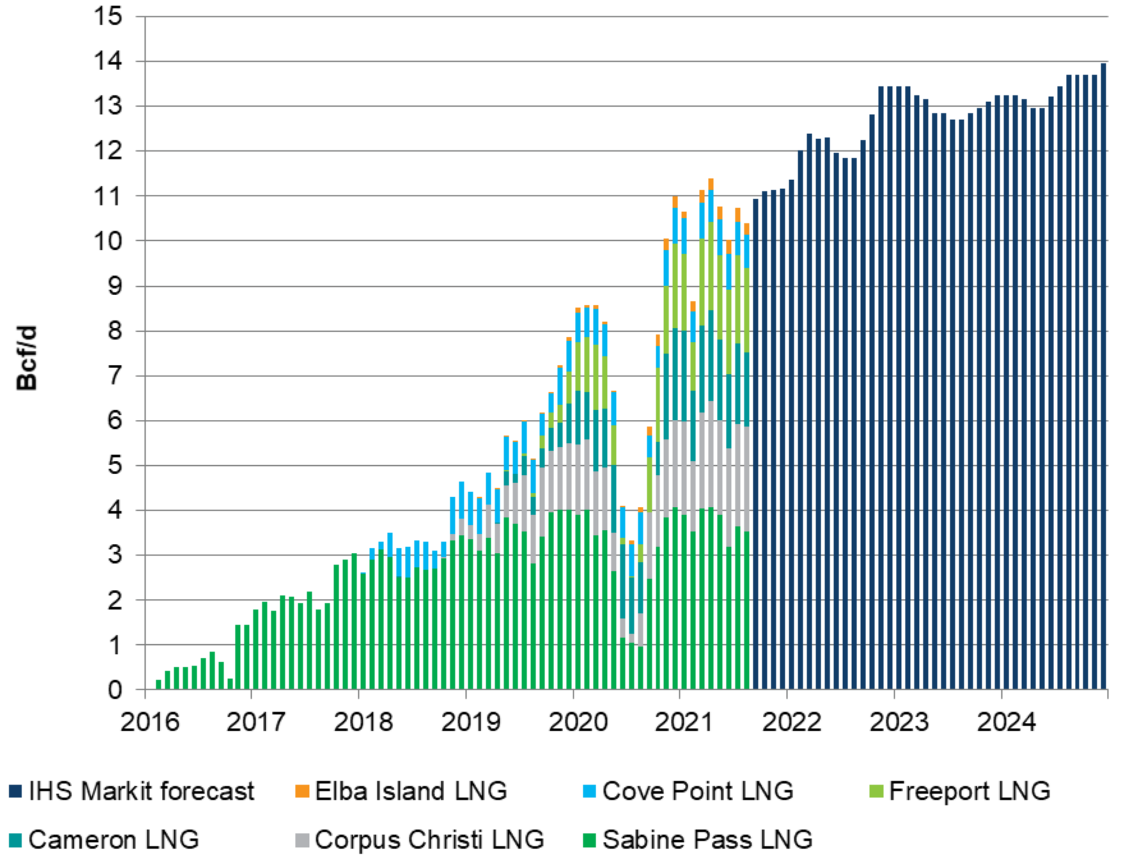
US Gulf Coast FOB LNG netback - US LNG short-run marginal cost differentials



Note:US Gulf Coast FOB LNG netback is calculated as the higher of the netbacks from JKM and TTF. TTF prices used are an average of zero and one months ahead of US LNG cargo loading. JKM prices used are one month ahead of US LNG cargo loading. We have assumed variable shipping costs of $1.30/MMBtu from the US Gulf coast to Northeast Asia and $0.70/MMBtu (including regasification and entry costs) to Northwest Europe. Netbacks and short-run marginal costs will vary by customer and depend on contract terms, shipping portfolio, and regasification access.

Source: CME Group, IHS Markit

US lower-48 LNG feed gas



Source: IHS Markit, PointLogic

Fiscal discipline and increased LNG exports lead to tight market

Flows to California are down and demand is up yielding $28/Dth prices

US Lower-48 Gas Fundamentals Daily

13 Sep 2021 - PointLogic | Data

Lower 48 Supply & Demand Balance

	9/9	9/10	9/11	9/12	9/13	Δ Daily	Month to Date	Δ MTD Last Year	Season To Date	Δ STD Last Year
Modeled Wellhead	103.58	103.51	104.26	104.32	102.98	-1.34	102.80	0.73	104.44	4.10
Production Losses	11.59	11.62	11.70	11.67	11.41	-0.26	11.40	-0.61	11.98	0.85
Modeled Dry	92.00	91.90	92.57	92.64	91.56	-1.08	91.39	1.34	92.46	3.24
Canada (Net Imports)	4.70	4.62	4.61	4.86	4.60	-0.26	4.57	0.76	4.67	0.58
LNG Sendout	0.08	0.06	0.06	0.06	0.06	0.00	0.07	0.00	0.07	-0.04
Total Supply	**96.78**	**96.58**	**97.25**	**97.57**	**96.23**	**-1.34**	**96.04**	**2.10**	**97.20**	**3.78**
Power	34.08	32.46	31.86	34.06	35.39	1.33	33.32	-3.81	32.98	-1.77
Industrial	21.34	21.26	20.97	20.80	20.95	0.15	20.94	-0.52	21.38	0.64
Res/Com	8.26	8.35	8.24	8.47	8.77	0.30	8.24	0.02	11.39	0.04
Total Consumption	63.67	62.07	61.07	63.33	65.11	1.78	62.49	-4.32	65.75	-1.09
LNG Feed Gas	10.65	11.00	10.81	11.21	11.26	0.05	10.82	5.71	10.67	5.42
Mexico Exports	5.65	5.68	4.70	5.30	5.22	-0.08	5.70	-0.29	6.24	0.88
Fuel & Pipe Loss	6.13	6.11	6.12	6.17	6.15	-0.02	6.08	-0.08	6.27	0.14
Total Demand	**86.10**	**84.85**	**82.70**	**86.02**	**87.75**	**1.73**	**85.10**	**1.03**	**88.93**	**5.35**
Implied Storage/Balancing	**10.68**	**11.73**	**14.54**	**11.55**	**8.48**	**-3.07**	**10.94**	**1.07**	**8.27**	**-1.57**

Fiscal discipline and increased LNG exports lead to tight market

Flows to California are down and demand is up yielding $28/Dth prices

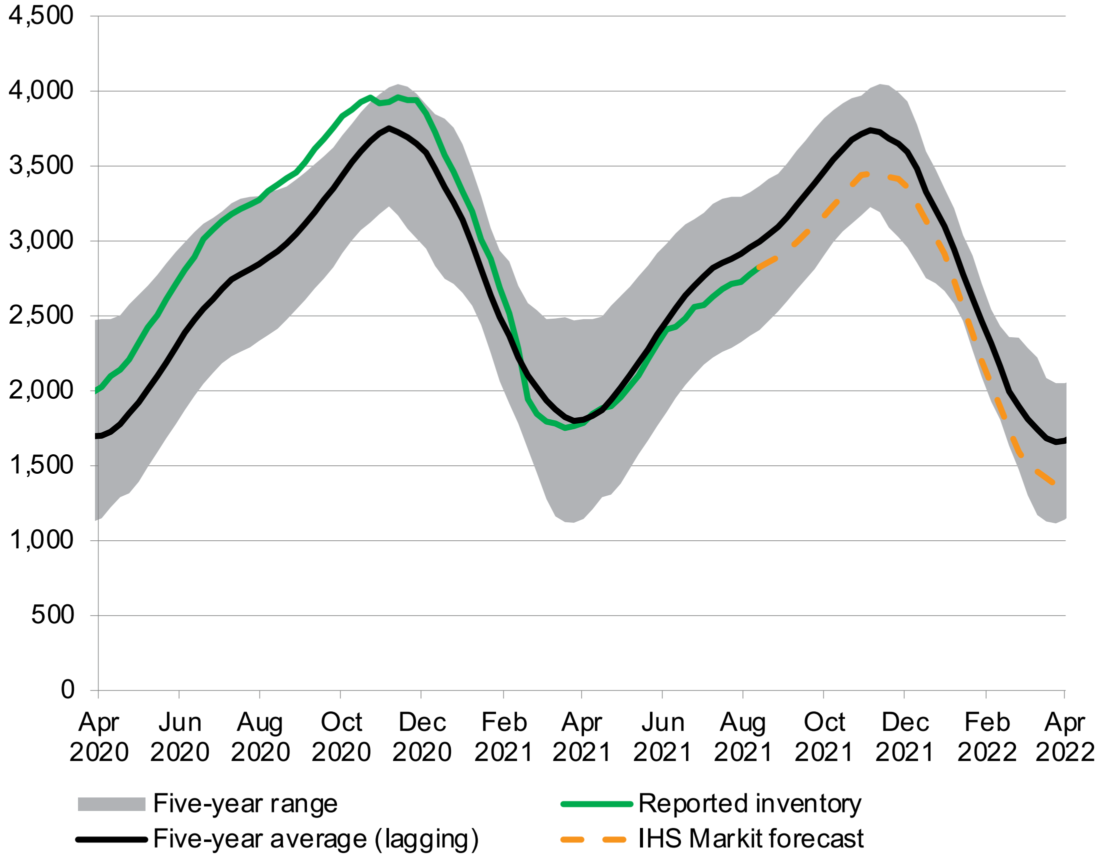
Texas Gas Fundamentals Daily

13 Sep 2021 - PointLogic | Data

Texas Supply & Demand	9/9	9/10	9/11	9/12	9/13	Δ Daily	Month to Date	Δ MTD Last Year	Season To Date	Δ STD Last Year
West Texas Production	8,627.00	8,718.00	8,623.00	8,536.00	8,095.00	-441.00	8,290.00	-693.00	9,000.00	235.00
South Texas Production	5,512.00	5,488.00	5,515.00	5,515.00	5,510.00	-5.00	5,484.00	-121.00	5,588.00	5.00
North Texas Production	7,387.00	7,263.00	7,343.00	7,343.00	7,302.00	-41.00	7,207.00	293.00	7,390.00	499.00
Total Supply	**21,525.00**	**21,469.00**	**21,481.00**	**21,394.00**	**20,908.00**	**-486.00**	**20,981.00**	**-522.00**	**21,978.00**	**740.00**
Power	5,628.00	5,340.00	4,909.00	5,124.00	4,893.00	-231.00	5,731.00	-162.00	5,229.00	-324.00
Industrial	5,072.00	5,053.00	5,030.00	5,028.00	5,072.00	44.00	5,028.00	16.00	5,129.00	217.00
Res/Com	887.00	796.00	828.00	795.00	836.00	41.00	804.00	187.00	731.00	141.00
Total Consumption	**11,587.00**	**11,189.00**	**10,768.00**	**10,948.00**	**10,801.00**	**-147.00**	**11,563.00**	**40.00**	**11,089.00**	**34.00**
Net Flows to Western	-1,151.00	-1,256.00	-1,315.00	-1,271.00	-1,044.00	227.00	-1,309.00	-1,598.00	-376.00	-558.00
Net Flows to Mexico	4,973.00	5,024.00	3,995.00	4,591.00	4,538.00	-53.00	4,946.00	-238.00	5,404.00	730.00
Net Flows to Southeast	3,346.00	3,304.00	3,898.00	3,651.00	3,617.00	-34.00	3,206.00	72.00	3,116.00	-969.00
Net Flows to Midcon	-2,297.00	-2,228.00	-2,225.00	-2,316.00	-2,322.00	-6.00	-2,367.00	-585.00	-1,540.00	-725.00
Net Outflows	**4,871.00**	**4,844.00**	**4,353.00**	**4,656.00**	**4,789.00**	**133.00**	**4,477.00**	**-2,350.00**	**6,604.00**	**-1,523.00**
LNG Feed Gas	3,958.00	4,347.00	3,854.00	4,290.00	4,290.00	0.00	4,176.00	1,374.00	4,161.00	2,790.00
Fuel and Pipeloss	1,550.00	1,535.00	1,523.00	1,524.00	1,492.00	-32.00	1,519.00	-28.00	1,560.00	42.00
Total Demand	**21,967.00**	**21,915.00**	**20,497.00**	**21,418.00**	**21,373.00**	**-45.00**	**21,735.00**	**-963.00**	**23,415.00**	**1,343.00**

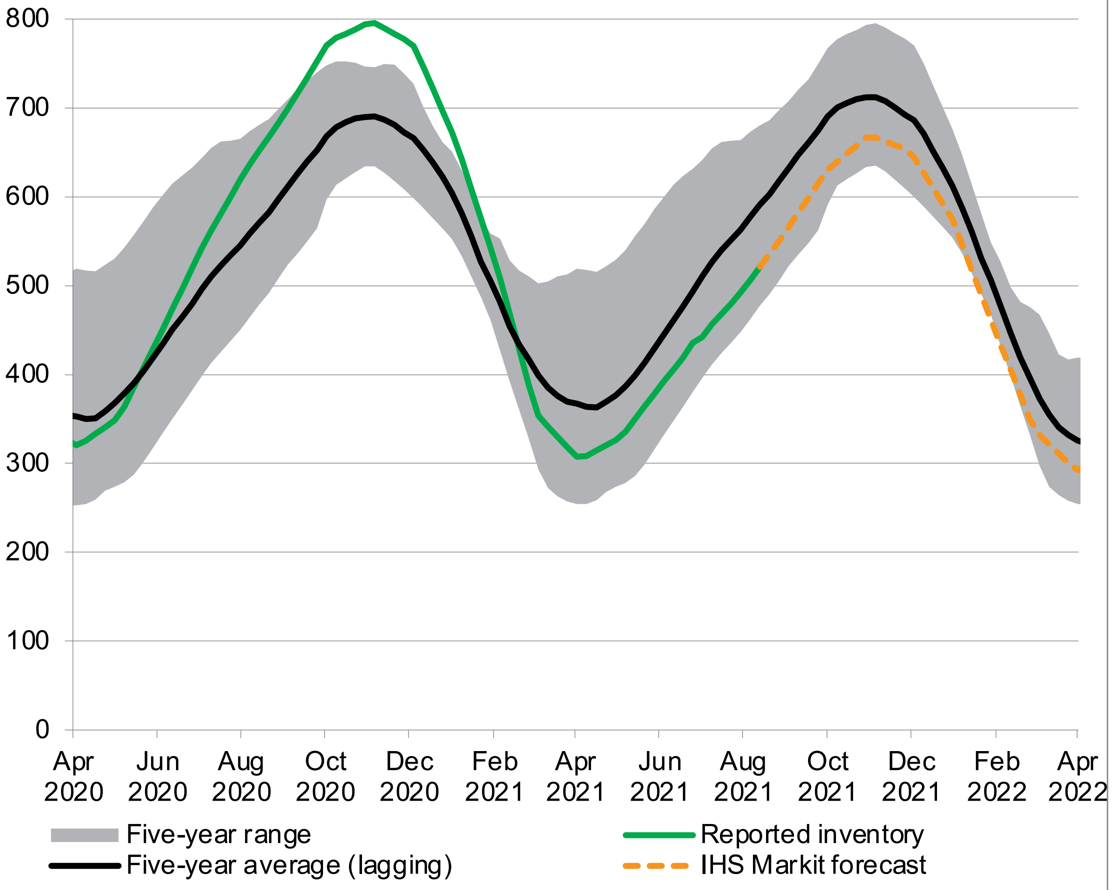
US and Canada enter winter with storage deficit

US lower-48 storage inventory (Bcf)



Source: IHS Markit, EIA

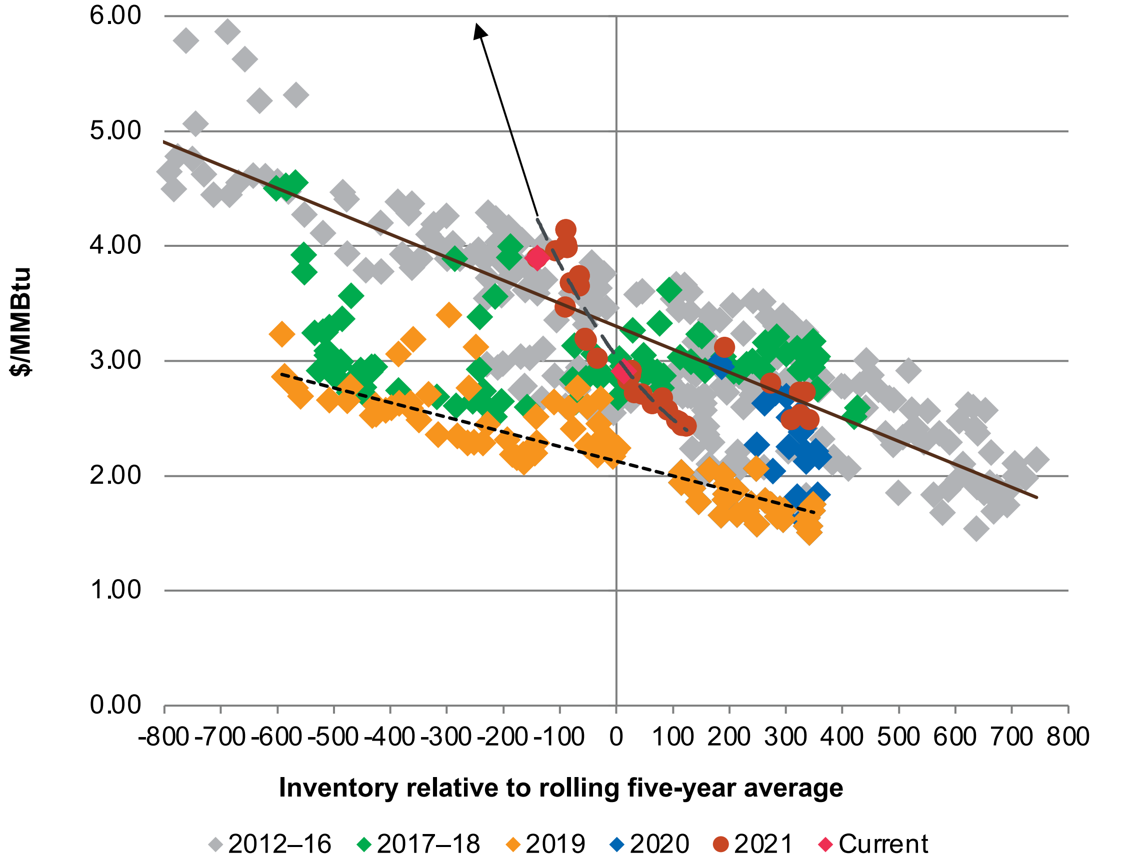
Canadian storage inventory (Bcf)



Source: IHS Markit, Enerdata

A steeper gas inventory–to-price relationship is emerging

Henry Hub/storage relationship (yield curve)



Source: IHS Markit, EIA, Intelligence Press

- **A steeper yield curve is emerging owing to several factors:**
  - **Coal and nuclear unit retirements have reduced fuel diversity and switching.**
  - **Tight coal markets leave gas on the margin, largely inelastic to price, with gas prices likely to drag coal price along**
  - **Capital discipline and cash flow constraints is reducing supply elasticity to price injecting risk premium at lower storage deficits.**
  - **Tight global gas market means LNG exports are largely inelastic to Henry Hub price.**

Key Takeaways

- Henry Hub expected to average between $3.50 and $4.00 for next couple of years
- New financial paradigm, labor shortages and global logistics challenges makes supply response slower and more drawn out.
- If Mountain Valley Pipeline gets finished, it is likely the last (only) interstate pipe to get built through 2050 absent a power grid reliability crisis.
- Power sector inelastic to gas price this winter and unable to balance gas market through fuel switching.
- Power sector gas consumption in 2020 unlikely to be repeated as renewable capacity grows. Call on gas becomes peakier seasonally, monthly, daily, and hourly.
- With Marcellus capacity constrained and Permian unlikely to arrive before 2022, Haynesville is the marginal source growing around 2 Bcf/d in 2021 and 2022.

Thank You

IHS Markit Customer Care

CustomerCare@ihsmarkit.com

Asia and the Pacific Rim

Japan: +81 3 6262 1887

Asia Pacific: +604 291 3600

Europe, Middle East, and Africa: +44 1344 328 300

Americas: +1 800 447 2273

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