



A HARD BALANCE: The Persistent Oil Glut and the Coming US Gas Shortage

November 2020





Key Takeaways



Crude

- **Crude oil** prices recovered steadily over the summer as demand for transportation fuels (except for jet) rebounded from the lows of April-May. **Unfortunately, the demand recovery has since lost momentum, and WTI is currently struggling to tread water at \$40/Bbl.**
 - Refinery margins are still low, storage levels are still high, and we're heading in to the weak winter period.
 - Meanwhile, OPEC+ is struggling to maintain compliance, and Libyan supplies are coming back to the market after being absent since January.
- As a result....we have taken a more bearish stance on oil prices at the turning of the new year (\$35/Bbl in Q1 21).

Natural Gas

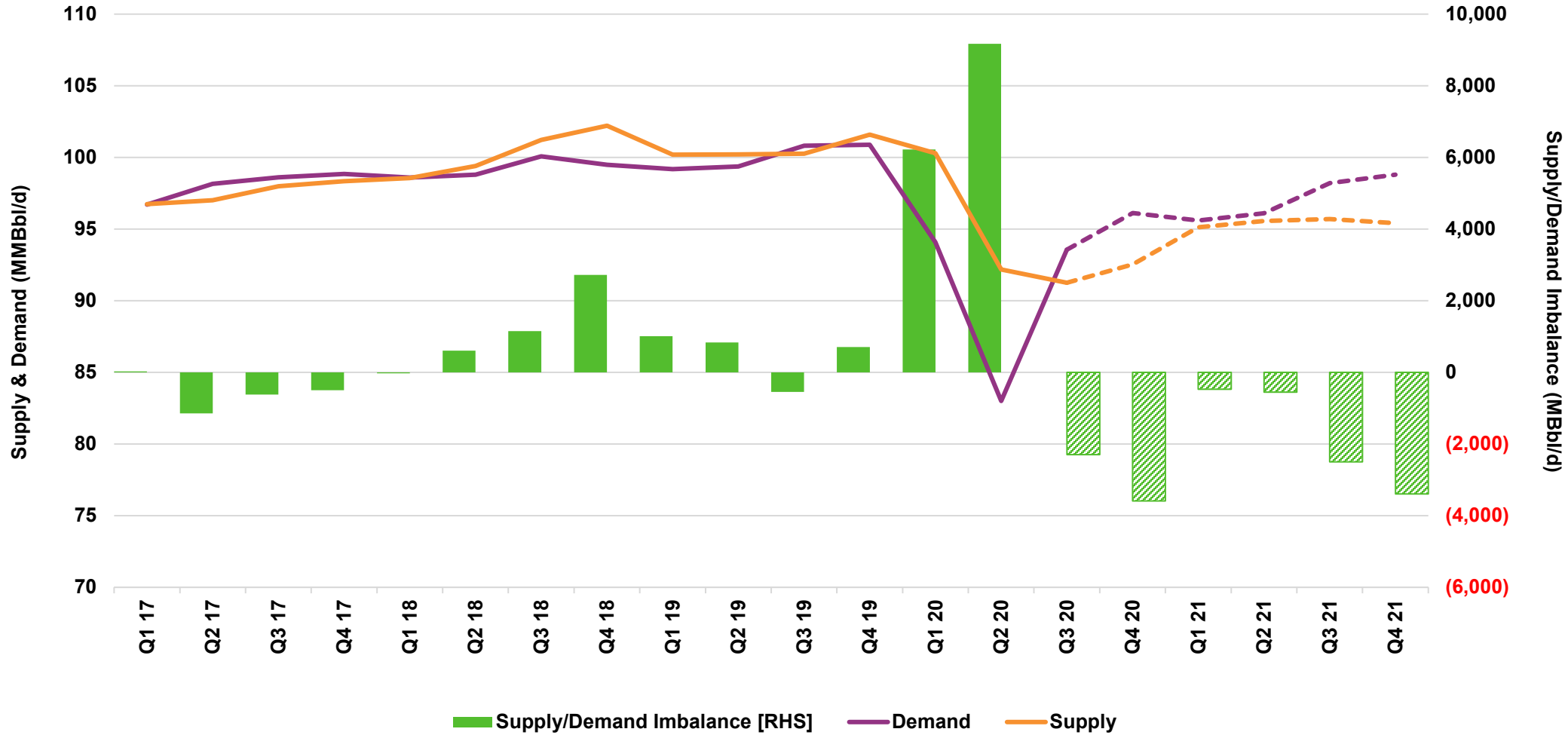
- With crude oil prices expected to remain depressed in 2021, associated natural gas is not expected to return next year. To offset the drop in associated gas, higher prices will be required to incentivize production gains from dry plays.
- Enverus expects natural gas prices to average \$3.49/MMBtu in 2021 and \$3.00/MMBtu starting in 2022 as oil prices recover to \$55-\$60/Bbl.

Earnings Season Preview

- The industry is watching E&Ps to determine sentiment and activity.
 - Well costs are at historical lows,
 - DUC counts are at historical highs
 - ...both will allow for a greater capital efficiency and lower capex next year.
 - Hedging activity is also limited, with operators reluctant to lock in the lows.

Global Supply and Demand Outlook: 2020-2021

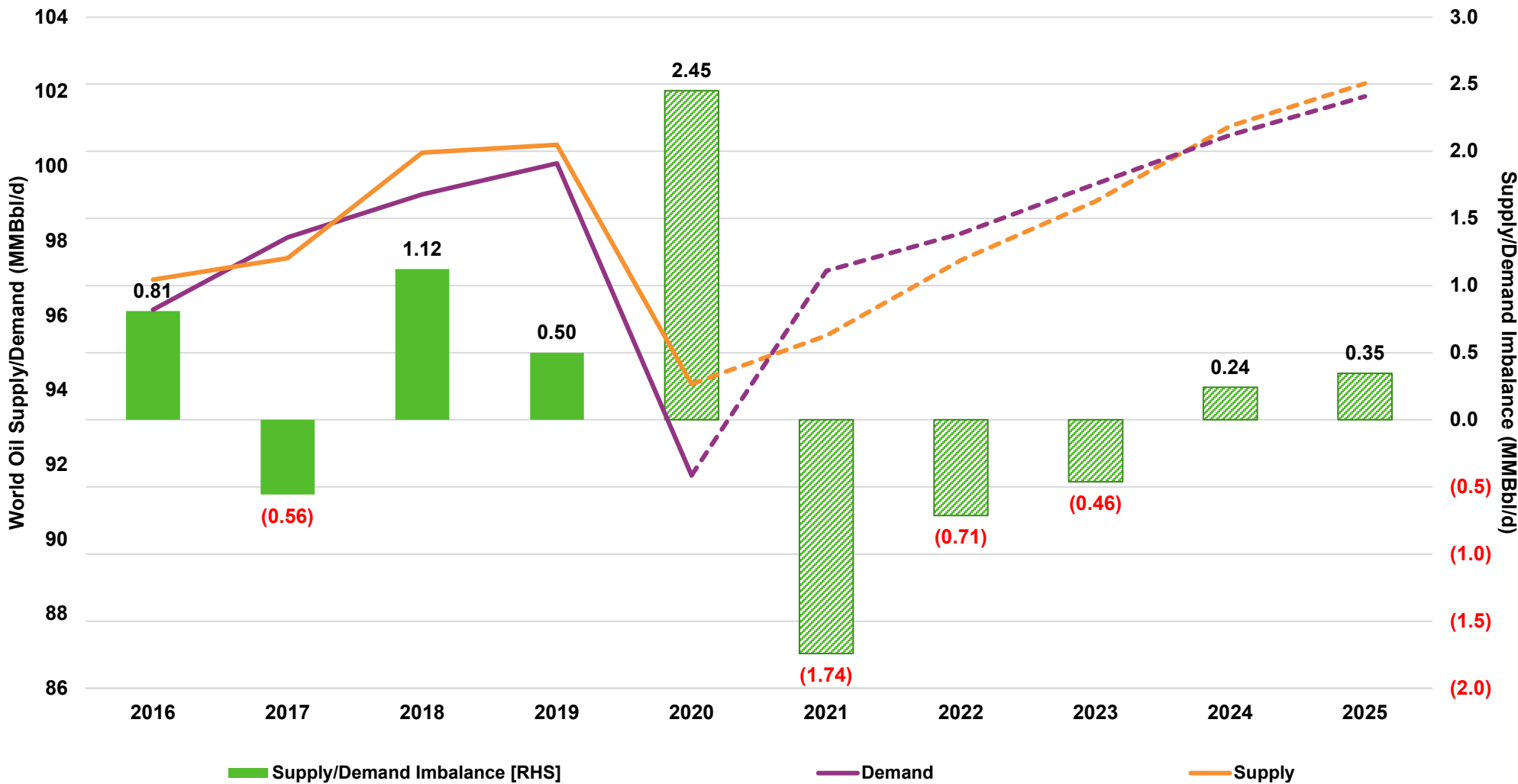
After the inventory builds in the first half of 2020 and the recent loss of momentum for demand growth, supply will need to remain suppressed for rebalancing to continue. This means outright WTI prices at or below \$40/Bbl in order keep incremental tight oil production below replacement (thereby allowing natural declines to carry total US production lower).



Notes: Volumes shown include crude oil, condensates, oil sands, natural gas liquids, biofuels, and volumetric gains from refining.

Medium Term Supply/Demand Outlook

Maintaining supply/demand balance is possible in the medium term if OPEC+ members can successfully 1) achieve high quota compliance with a WTI price stuck below \$60/bbl for a prolonged period, and 2) increase production in a controlled manner after the current OPEC+ supply agreement expires in 2022.

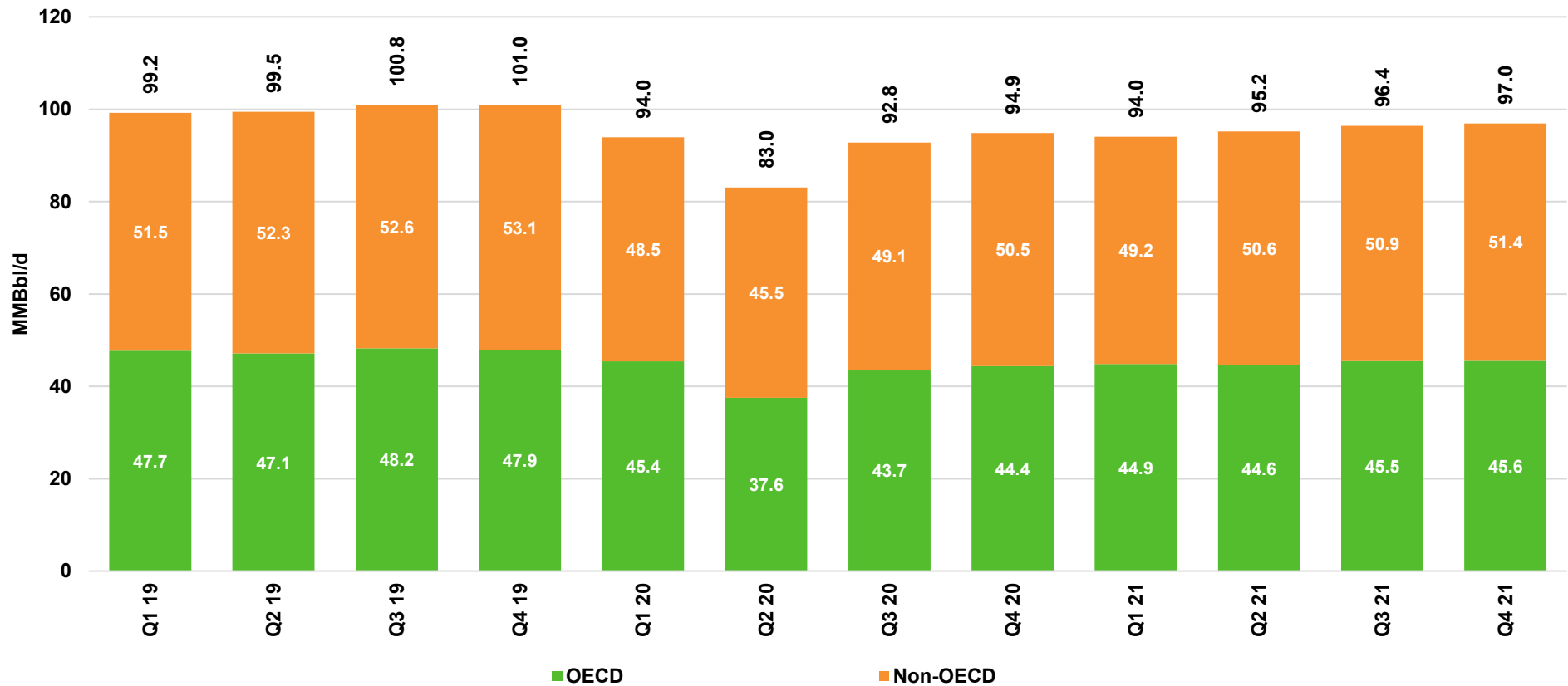




Demand Outlook: 2020-2021

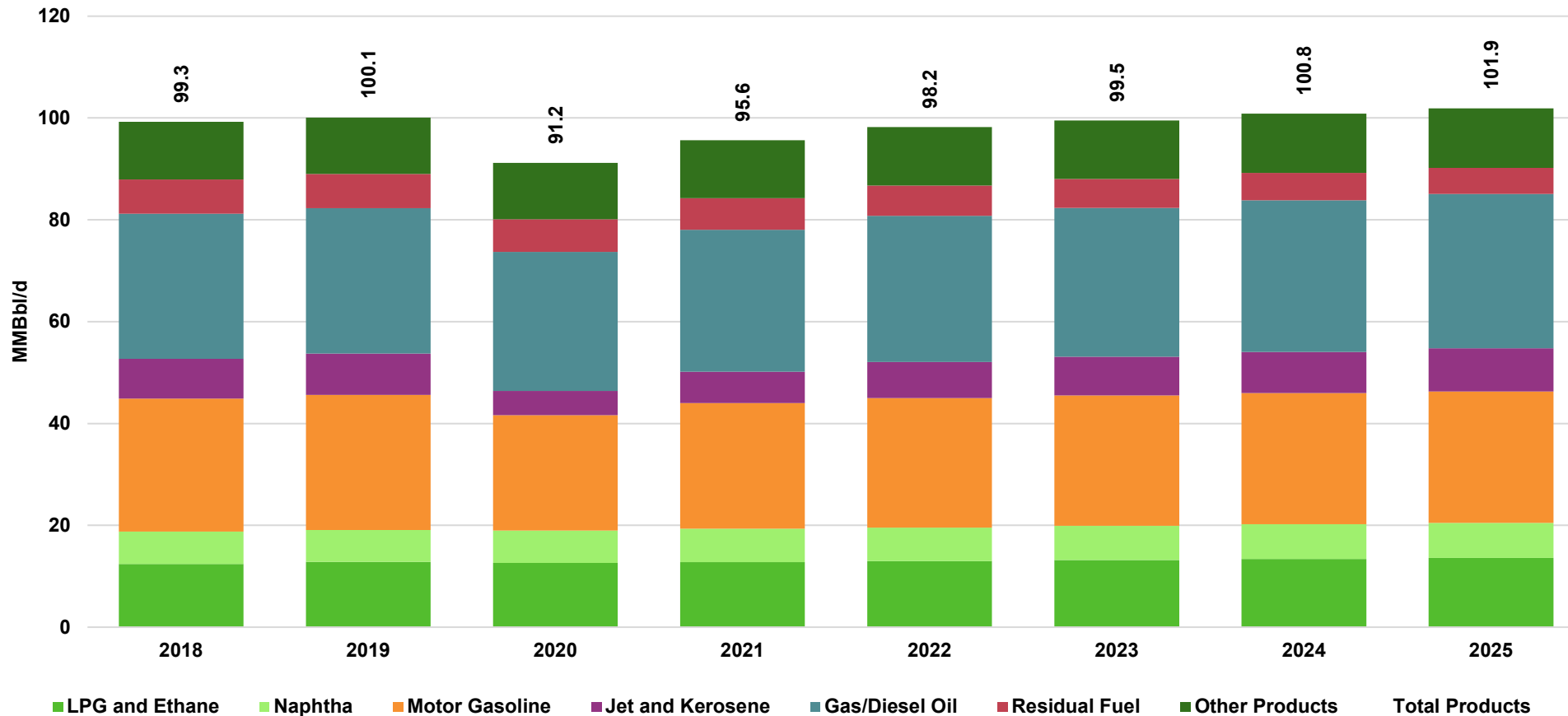
Global demand is forecast to decline by almost 9 MMBbl/d on average in 2020 versus 2019 but is expected to recoup less than half of that amount in 2021. Transportation fuels were heavily impacted by the lockdowns in Q2 20 and the subsequent easing of restrictions were key to their rebound in Q3 20. Gains to demand have since abated with the conclusion of the US driving season.

Global Liquids Demand: OECD vs. Non-OECD



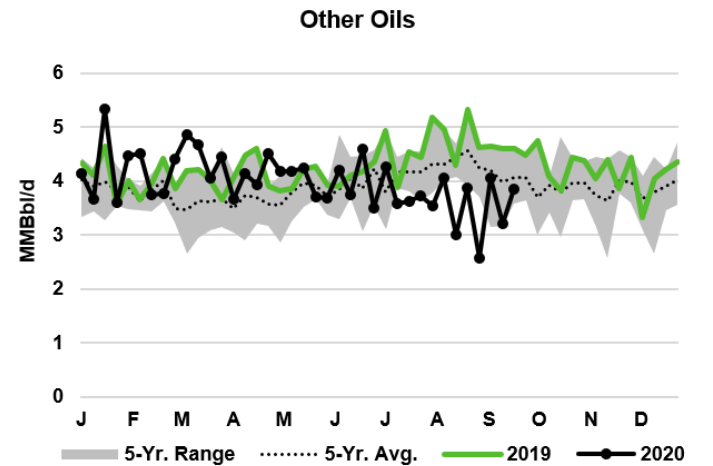
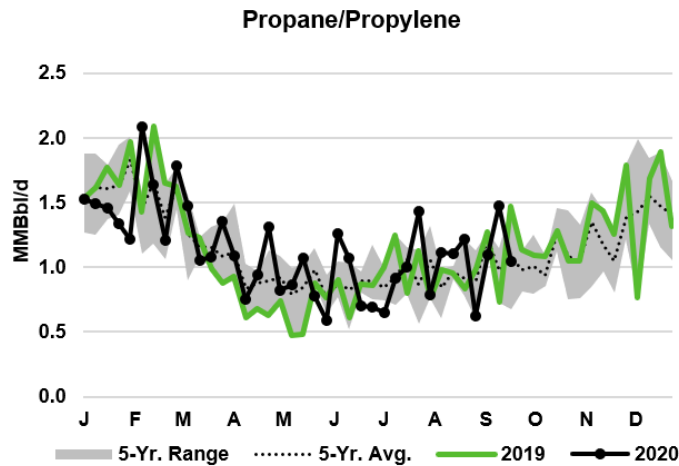
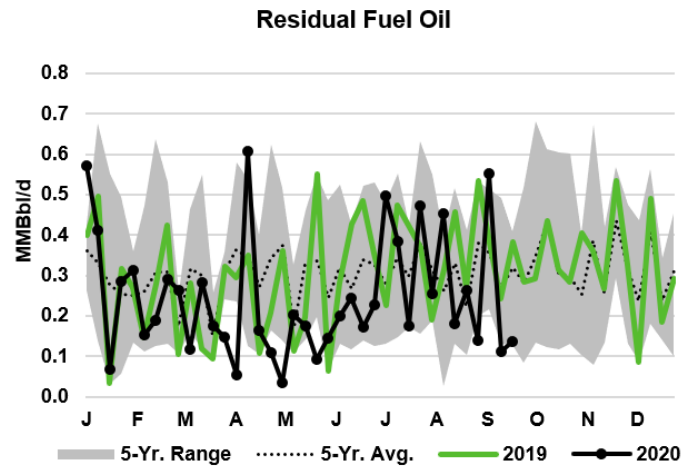
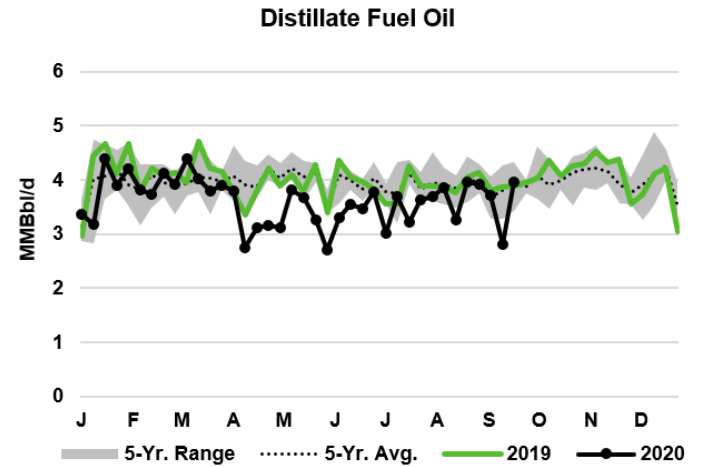
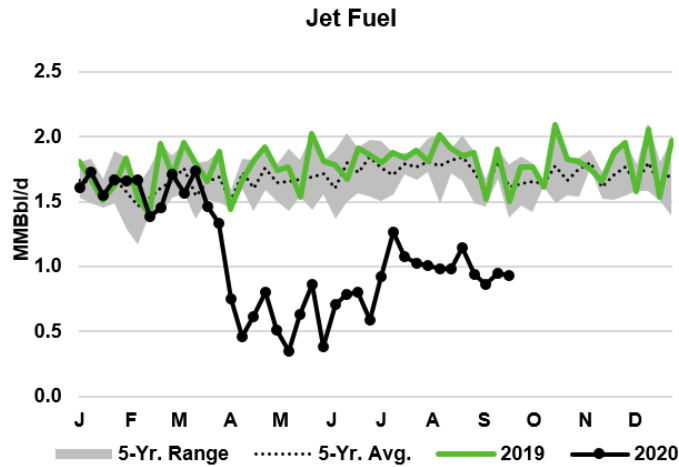
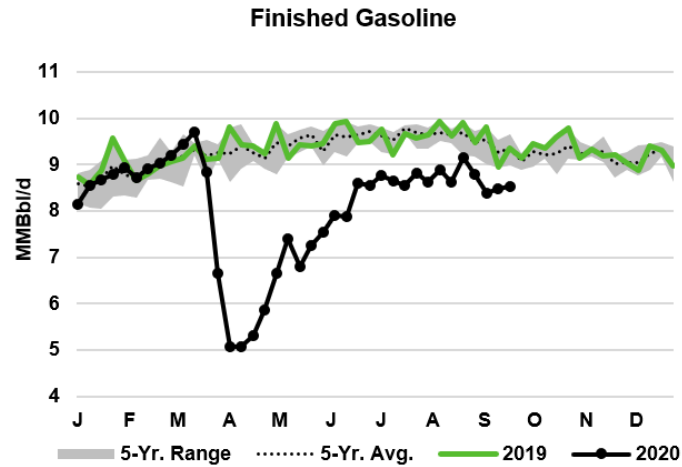
Medium-Term Global Demand Outlook

Post-pandemic changes to end-user behavior (such as increased working from home), efficiency gains, and demographic trends are expected to limit medium-term demand growth. A recovery to pre-pandemic demand levels is not anticipated until 2024.



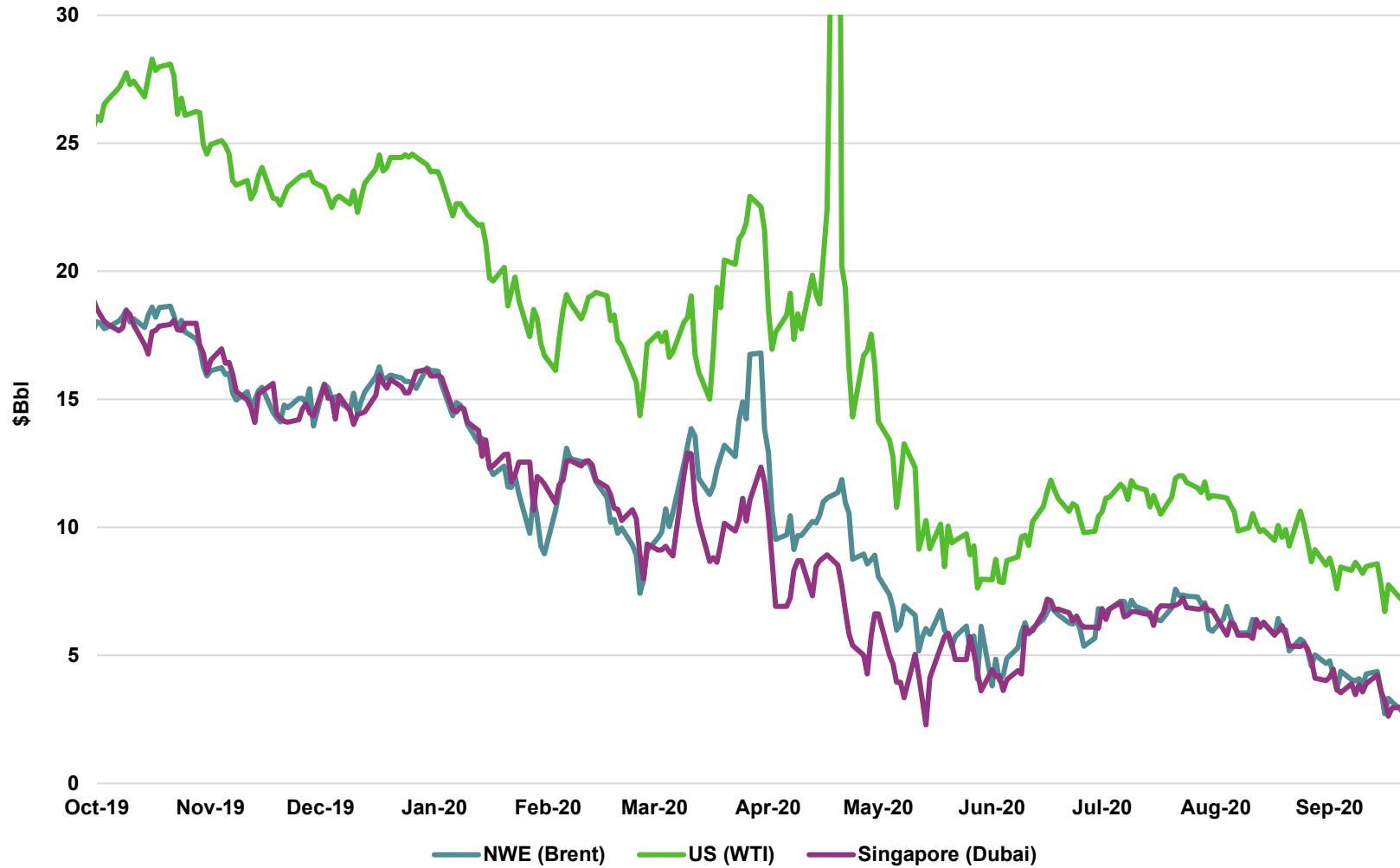
US Liquids Demand

With the summer driving season now in the rearview mirror, the crude complex will need to find support from products other than just gasoline. Unfortunately, middle distillate demand is still not healthy, and jet consumption remains well below normal levels.

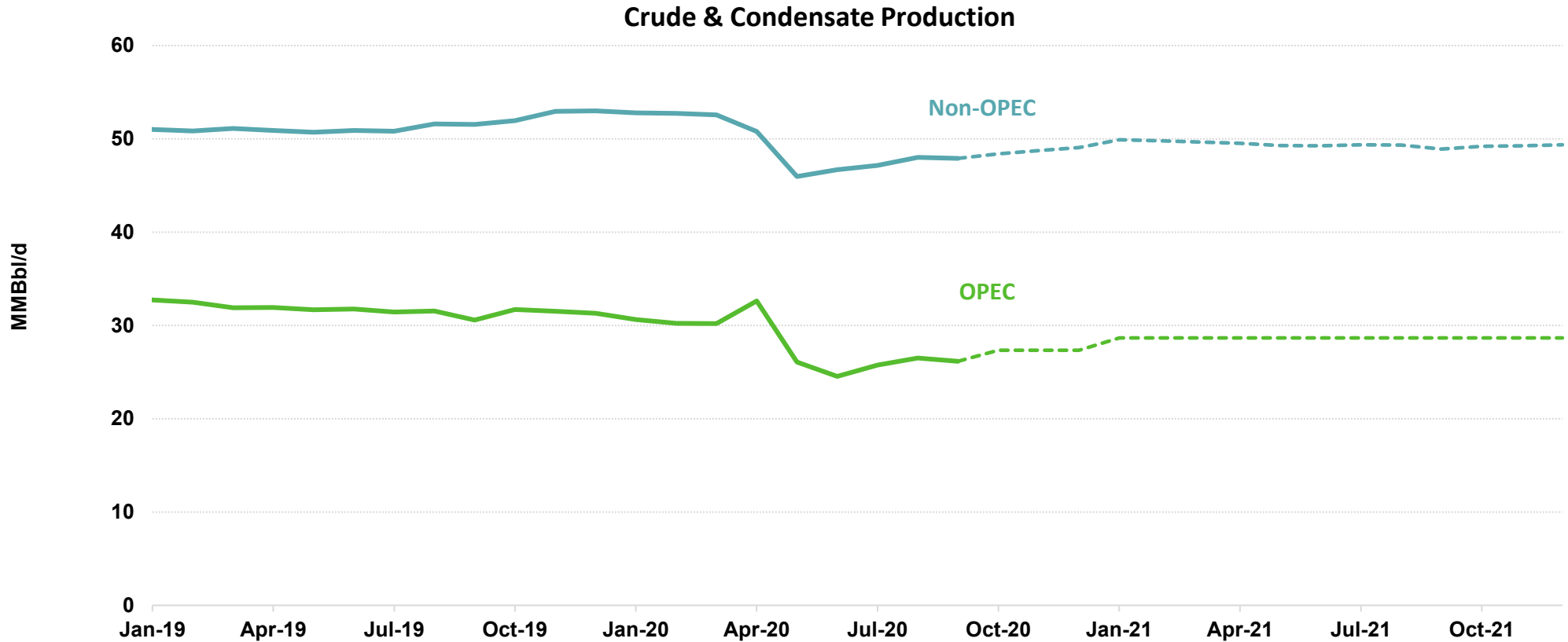


Global ULSD/Gasoil Cracks

Prompt ULSD/gasoil cracks have come under renewed pressure in most enclaves as middle distillate inventories swelled over the third quarter.



Global Crude and Condensate Production

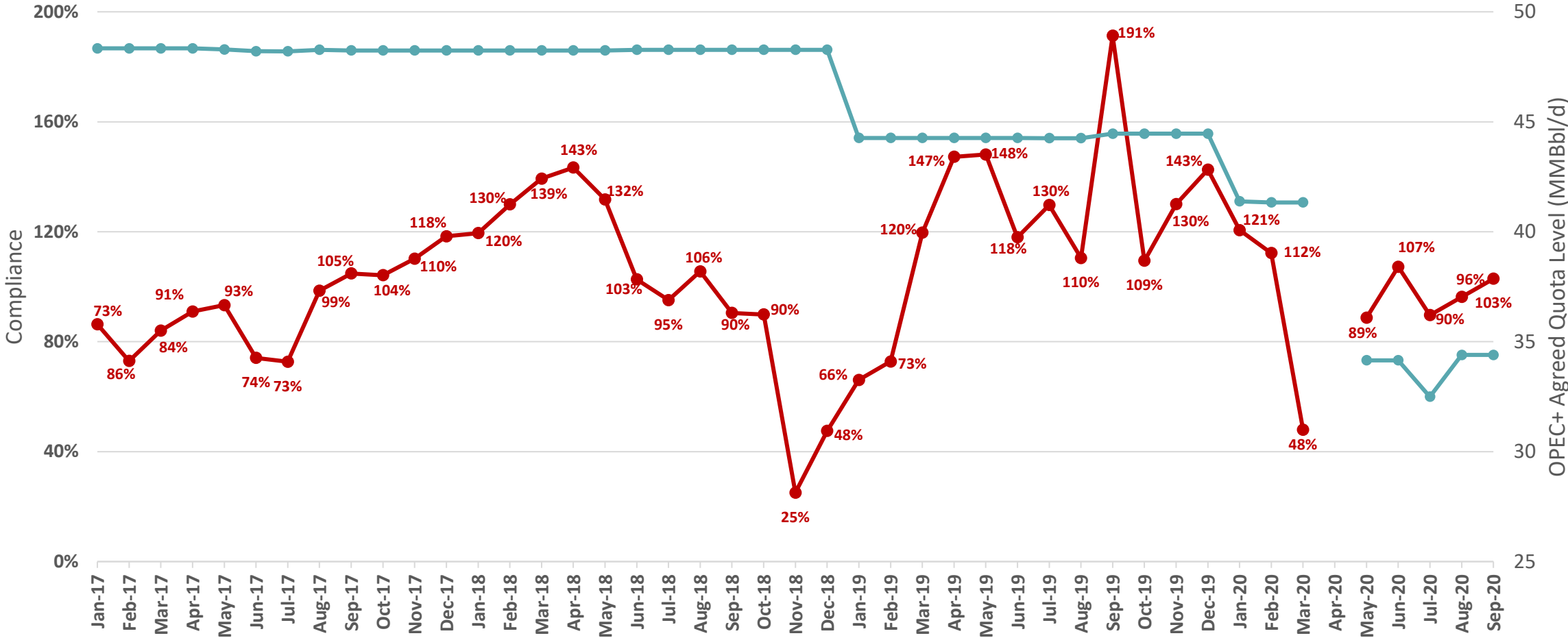


Notes: Assumes full OPEC compliance, compensatory production cuts in September through December, and a resumption in Libyan production (reaching 1 MMBbl/d by January 2021). Condensate is not quota constrained per the OPEC+ supply agreement but is included in the chart above to allow like-to-like comparison with non-OPEC production.

OPEC+ Compliance: Jan 2017 – Sep 2020



OPEC+ Compliance With Past and Current Supply Agreements

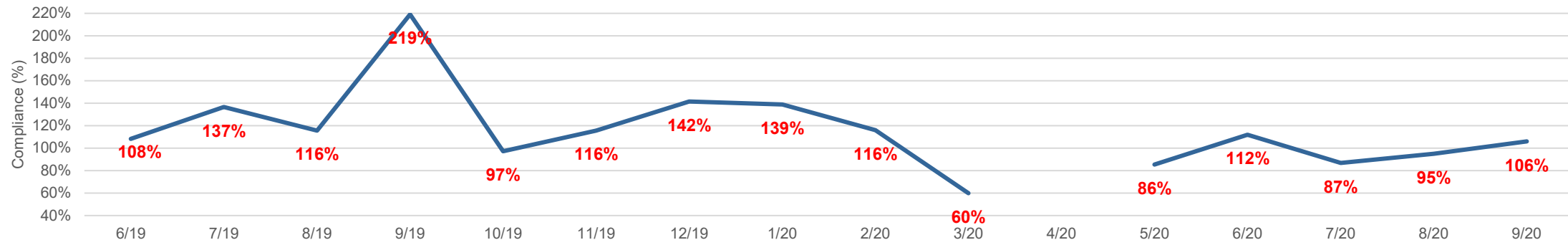


OPEC Quota Compliance

OPEC Crude Oil Production Quotas: Update for September 2020



Member	Quota (MBbl/d)	September 2020 (MBbl/d)	Compliance (MBbl/d)	Sustainable Cap (MBbl/d)	Spare Cap (MBbl/d)
Saudi Arabia	8,988	8,980	8	12,000	3,020
Iraq	3,802	3,650	152	4,900	1,250
UAE	2,589	2,580	9	3350	770
Kuwait	2,295	2,300	-5	2850	550
Nigeria	1,494	1,350	144	1,800	450
Angola	1,249	1,220	29	1,420	200
Algeria	864	860	4	1,030	170
Congo	266	300	-34	350	50
Gabon	153	190	-37	220	30
Eq. Guinea	104	100	4	130	30
TOTAL	20,599	22,070	273	28,050	5,980



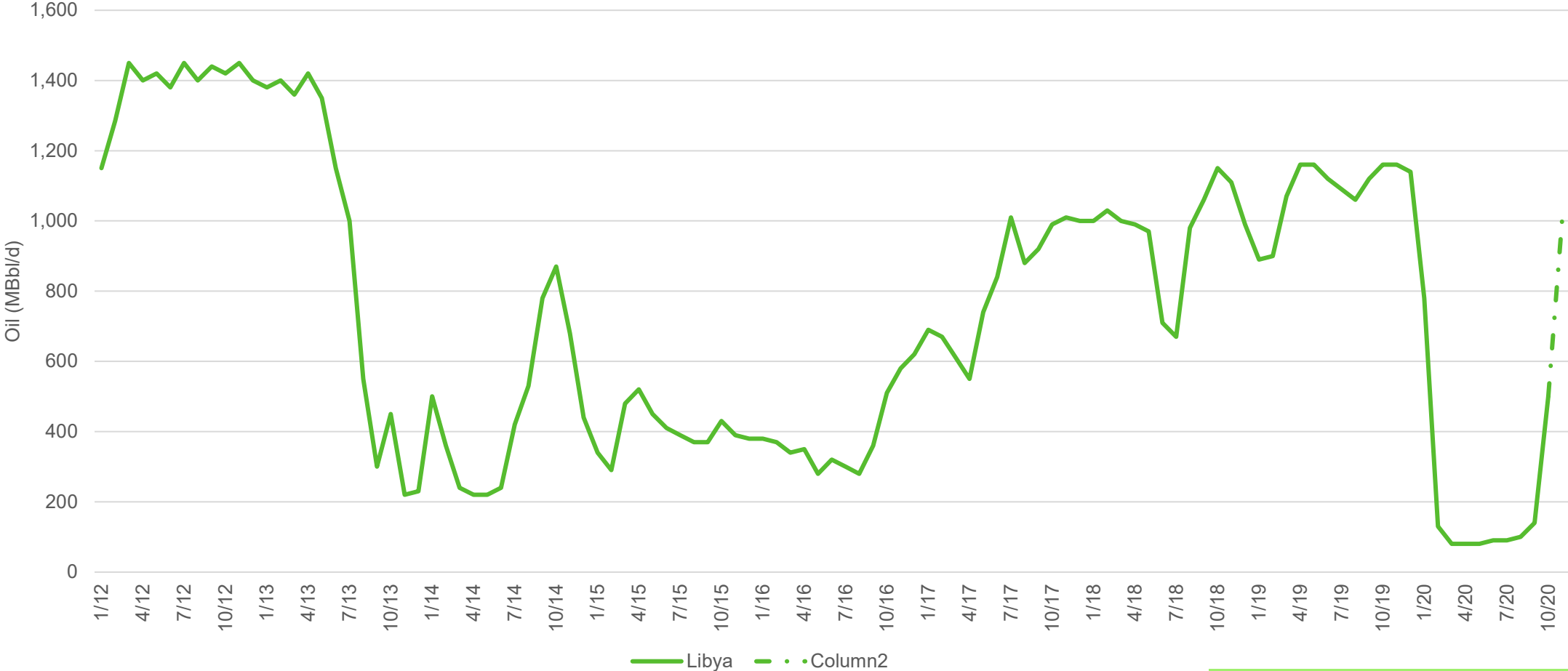
OPEC+ Production Cuts

Participant	Agreed Baseline	May-June Cut	July Cut	Aug-Dec Cut	Jan 21-Apr 22 Cut
Saudi Arabia	11,000	2,508	2,508	2,012	1,515
Iraq	4,653	1,061	1,061	851	641
UAE	3,168	722	722	579	436
Kuwait	2,809	641	641	514	387
Nigeria	1,829	417	417	335	252
Angola	1,528	348	348	279	211
Algeria	1,057	241	241	193	146
Congo	325	74	74	59	45
Gabon	187	43	43	34	26
Equatorial Guinea	127	29	29	23	17
Total OPEC	26,683	6,084	6,084	4,880	3,676
Russia	11,000	2,508	2,508	2,012	1,515
Kazakhstan	1,709	390	390	313	235
Mexico	1,753	100	0	-	0
Oman	883	201	201	161	122
Azerbaijan	718	164	164	131	99
Others	1,107	252	252	202	153
Total Non-OPEC	17,170	3,616	3,516	2,820	2,124
Total OPEC+	43,853	9,700	9,600	7,700	5,800

Notes: All baselines are based on agreed October 2018 production levels, except for Saudi Arabia and Russia (which agreed to set their baselines at 11 MMBbl/d). Iran, Libya, and Venezuela are exempt. Others include Bahrain, Brunei, Malaysia, Sudan, and South Sudan. Mexico ceased participation with the OPEC+ agreement in July 2020.

Libya Production

Libya Crude Oil Production



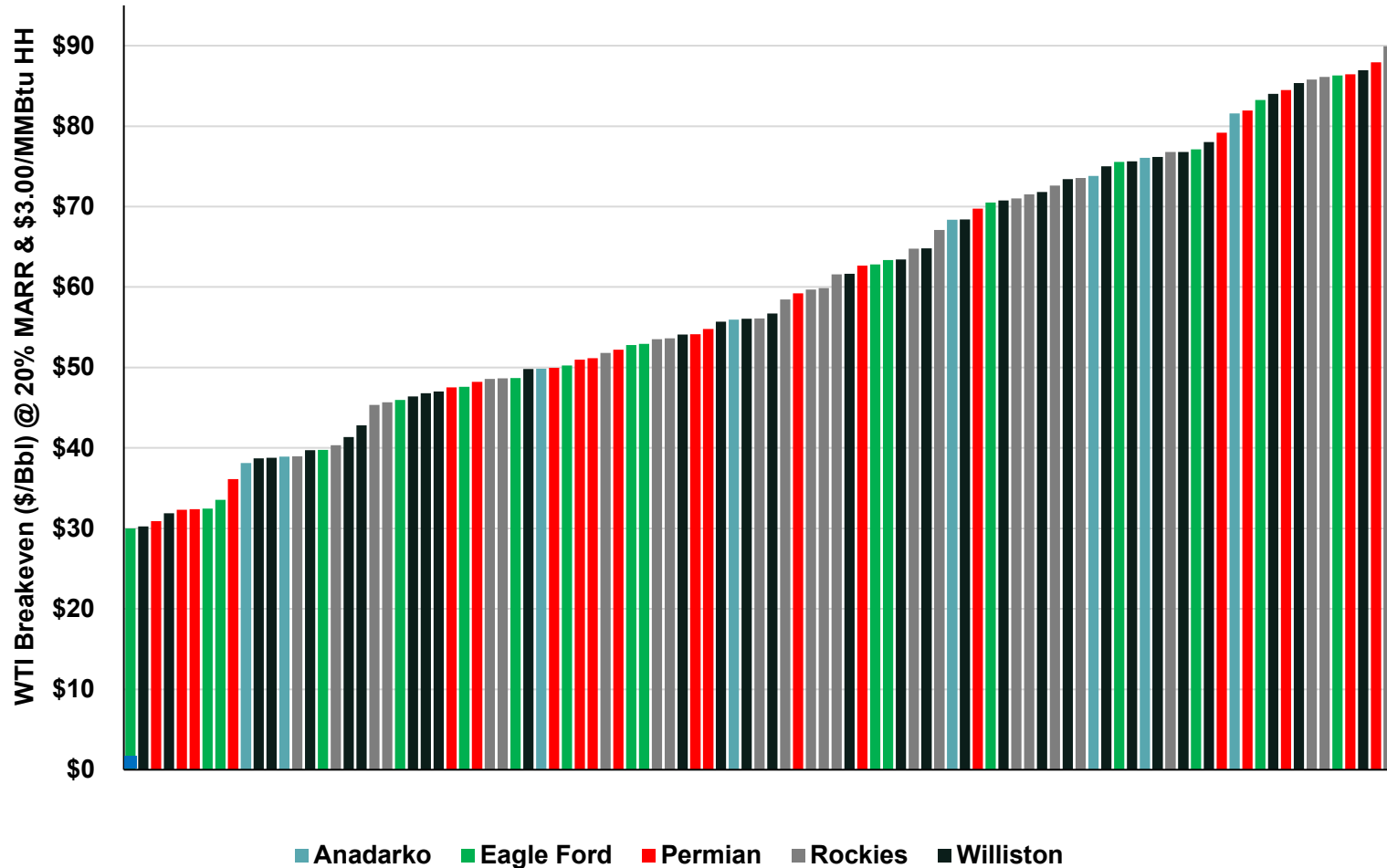
Iran Production

Iran Crude Oil Production

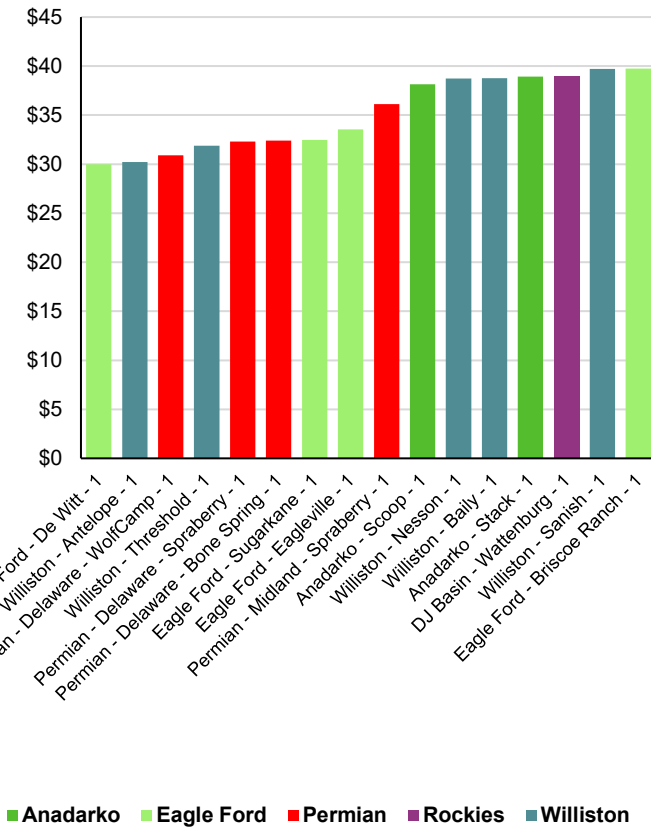


Crude Oil Breakevens

WTI Breakeven (\$/Bbl) @ 20% MARR & \$3.00/MMBtu

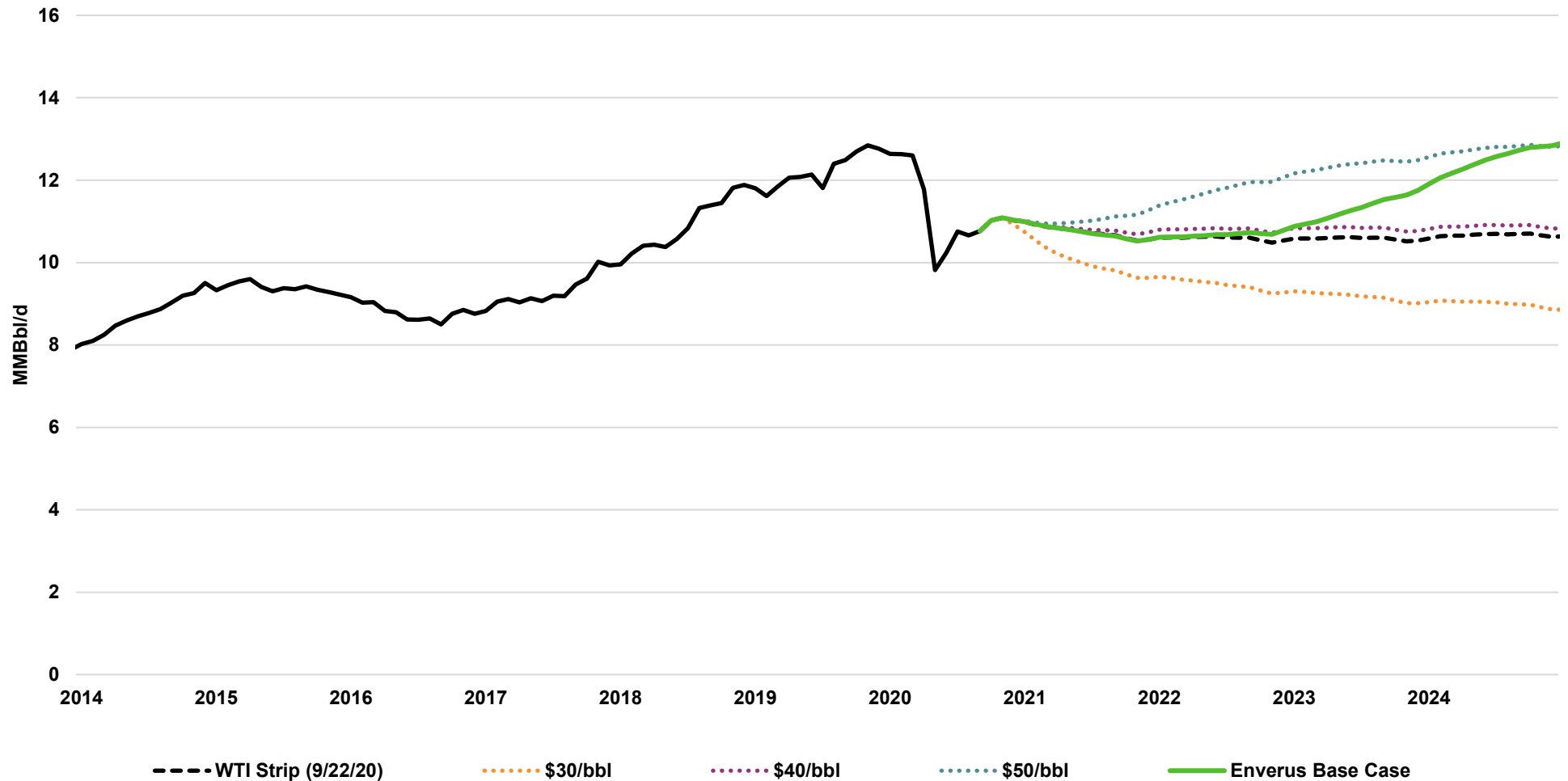


Breakevens below \$40/Bbl & \$3.00/MMBtu HH @20% MARR

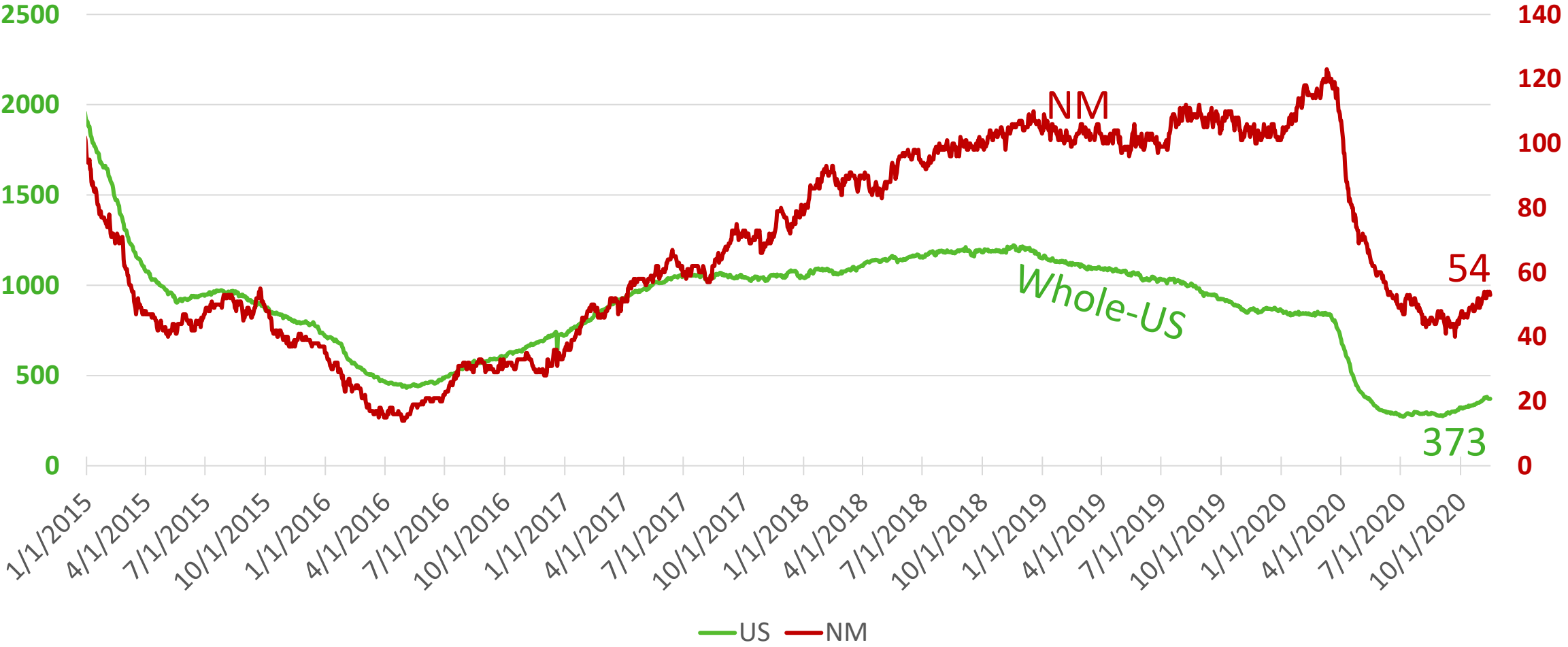


US Crude and Condensate Production

Production nosedived from March-May as wells were shut across the country. Restarts have since led to a modest recovery, but these increases have been partially offset by successive Gulf of Mexico disruptions between Aug-Sept. Continued gains are forecast through year's end before production drops just below 10.6 MMBbl/d in December 2021. Production growth in 2022+ will require \$45+ WTI.

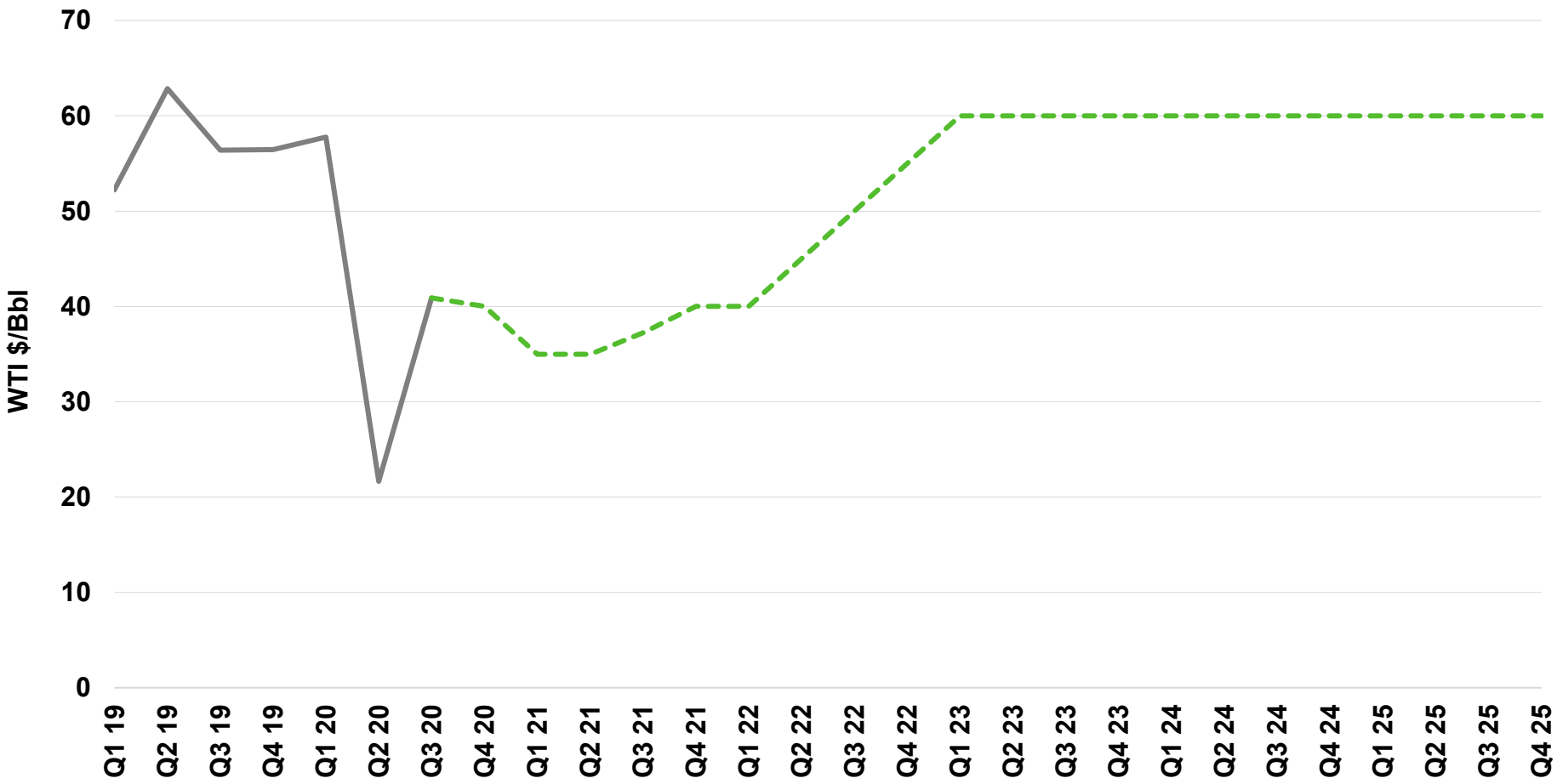


New Mexico Rigs Compared To Whole-US



WTI Price Forecast: Enverus Base Case

Refining economics are expected to act as a brake on prices above \$40/bbl in Q4 20, and seasonally lower demand risks, sending prices lower in early 2021. OPEC+ supply management through April 2022 remains critical to price stability.

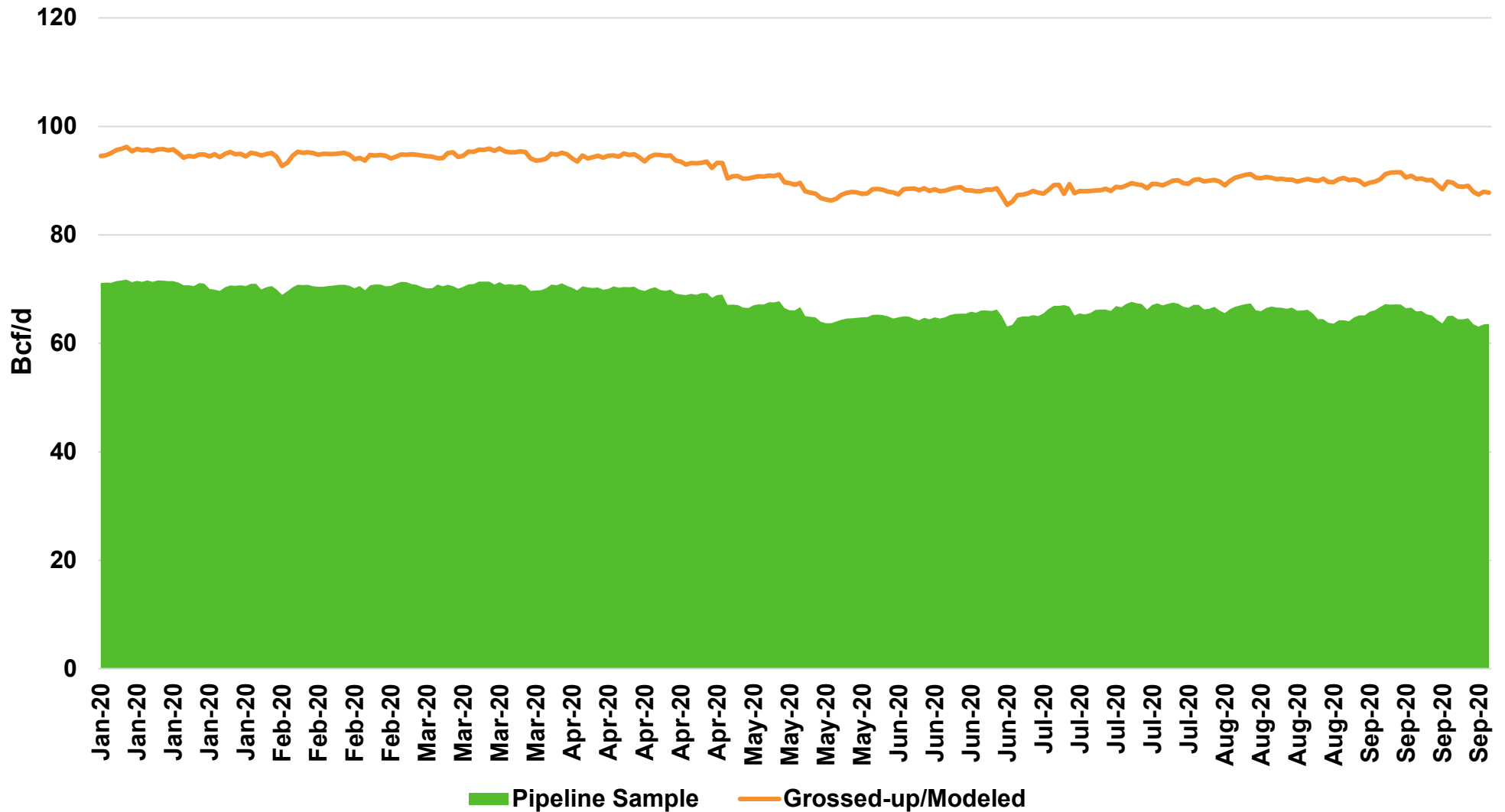




NATURAL GAS

Dry Gas Production Slowly Recovering

2020 Daily US Dry Gas Production: Sample vs. Modeled



Gas Production Remains Down 5.5 Bcf/d Compared to the Beginning of the Year

After bottoming in June, production began to recover through June and July as shut-ins were brought back online. However, the combined impacts of hurricane season as well as the onset of shoulder season demand has softened this recovery.

The Anadarko and Williston plays are the only areas with production higher in September than in July.

Moving forward, expect the FO Gulf to return to pre-hurricane levels and as winter months arrive, dry gas basin activity will increase.

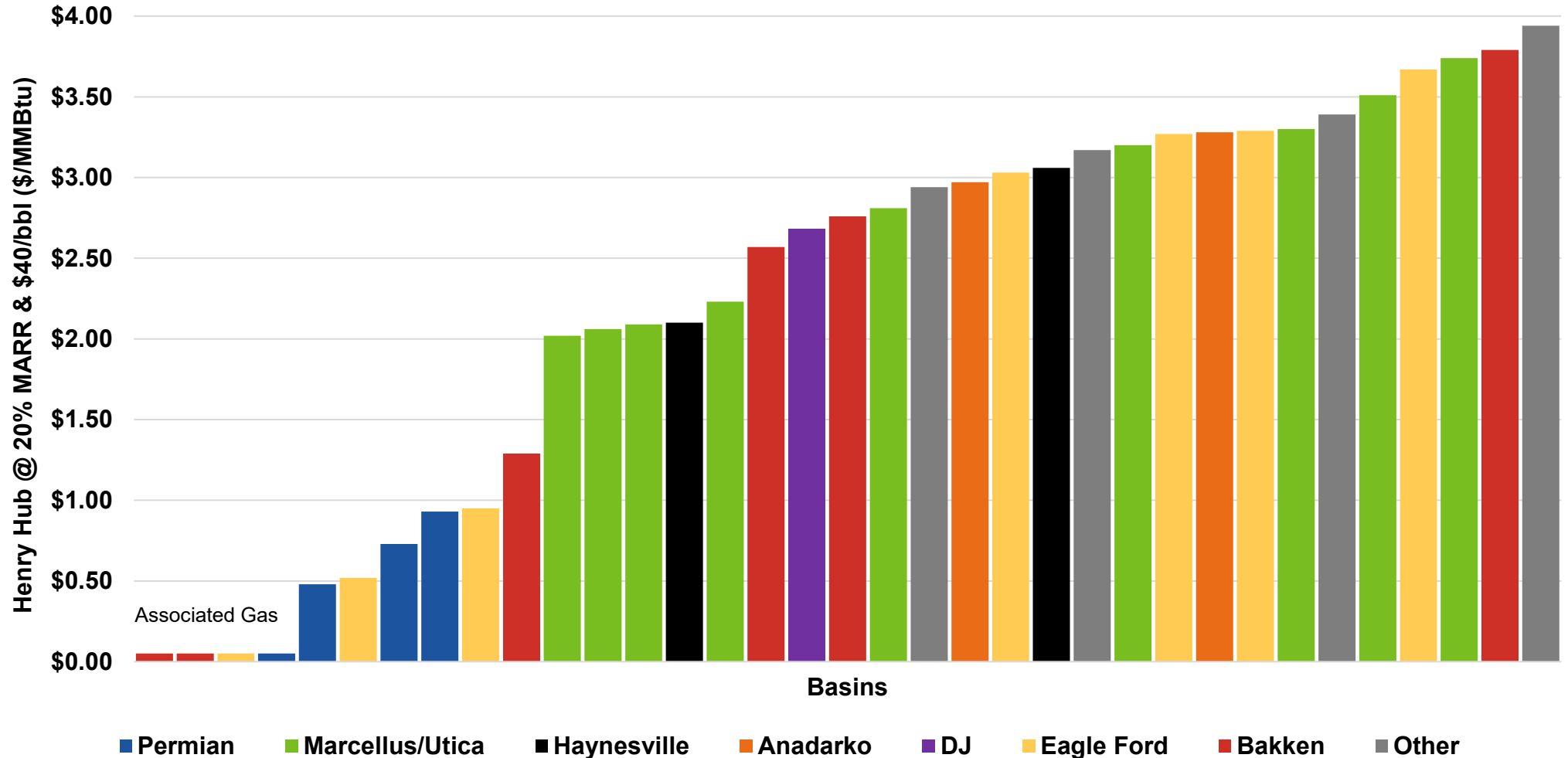
Basin/Play	Sample Size	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Sept vs June	Sept vs Jan
Appalachia (OH,PA, WV)	100%	33.1	32.9	32.8	32.6	31.4	31.5	32.5	33.2	32.1	0.6	(1.0)
Permian	45%	6.1	6.0	6.0	5.8	5.3	5.4	5.6	5.6	5.4	0.0	(0.7)
Haynesville	62%	6.9	6.9	7.1	7.1	7.4	7.1	6.7	6.4	6.4	(0.7)	(0.5)
Anadarko (OK)	49%	3.7	3.5	3.5	3.4	3.1	3.2	2.9	3.0	3.3	0.1	(0.4)
DJ	89%	2.8	2.8	2.8	2.8	2.5	2.5	2.6	2.7	2.6	0.1	(0.2)
PRB	73%	0.7	0.6	0.7	0.6	0.4	0.4	0.5	0.5	0.6	0.2	(0.1)
Other Rockies	100%	5.5	5.4	5.4	5.4	5.1	5.1	5.0	5.0	5.1	0.0	(0.4)
FO Gulf	63%	2.9	3.0	3.0	2.9	2.3	2.2	2.2	1.3	1.6	(0.6)	(1.3)
Williston (ND)	94%	1.9	2.0	2.0	1.9	1.3	1.4	1.6	1.8	2.0	0.6	0.1
Other	50%	7.4	7.4	7.4	7.3	6.9	6.2	7.0	6.3	6.2	0.0	(1.2)
Total US Sample	74%	71.0	70.5	70.7	69.8	65.7	65.0	66.6	65.8	65.3	0.3	(5.7)
Grossed up/Modeled	-	95.1	94.6	94.9	94.0	88.9	88.0	88.9	90.2	89.6	1.6	(5.5)

¹ Calculated based on February 2020. Other Rockies include the following basins from ProdCast: Big Horn, GR-O, Paradox, Raton, Uinta. Appalachian = Appalachian, PA North, South and West, Utica and West Virginia.

Gas Breakevens \leq \$4.00/MMBtu

With WTI prices expected to remain under \$40/MMBtu in 2021, Marcellus/Utica and Haynesville will bring significant amounts of production to help meet expected demand growth.

Henry Hub Breakevens @ 20% MARR & \$40.00/bbl

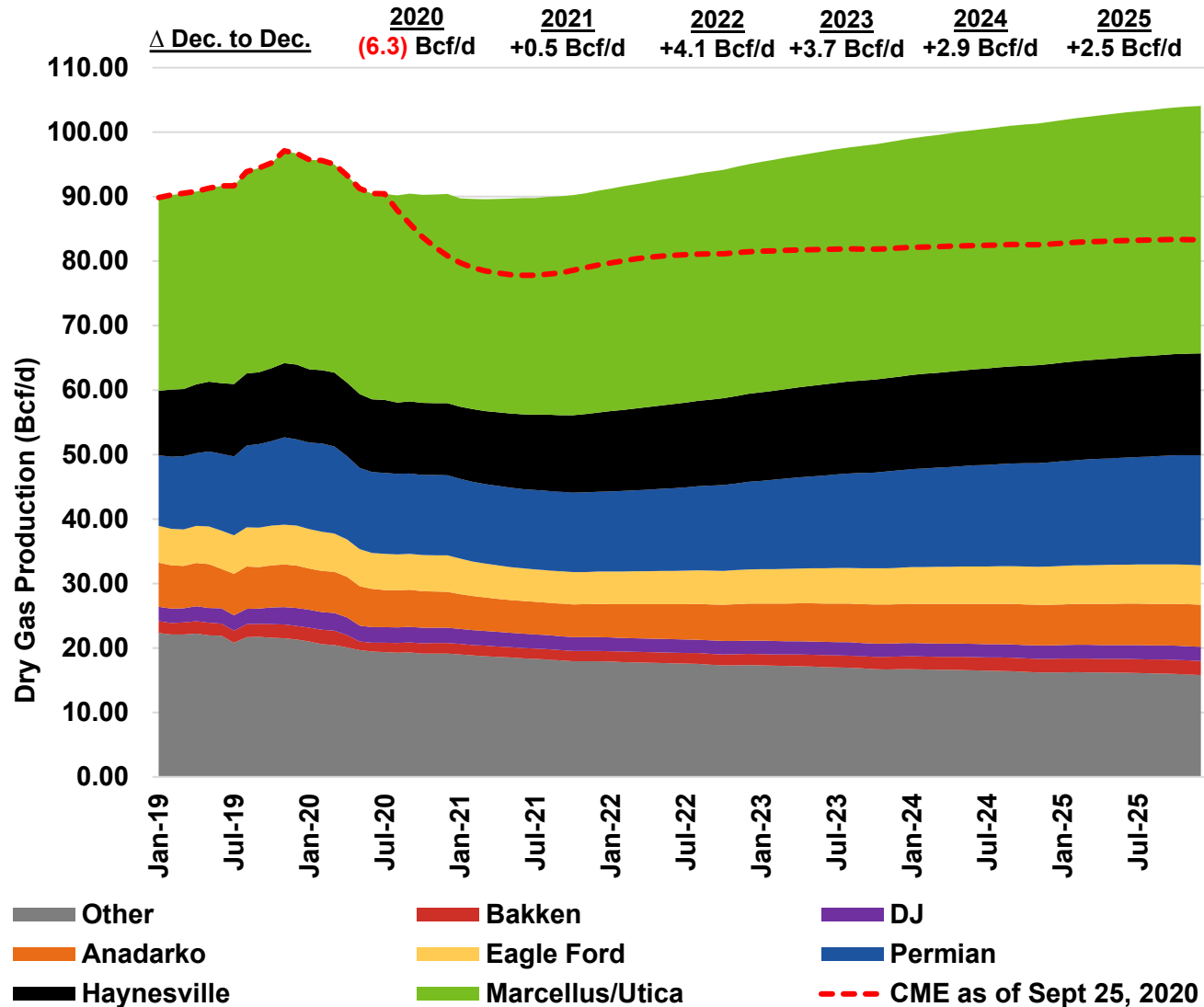


Gas Production: 5-Year Outlook



Year	HH (\$/MMBtu)	WTI (\$/Bbl)
2021	\$3.49	\$37
2022	\$3.00	\$55
2023	\$3.00	\$55
2024+	\$3.00	\$60

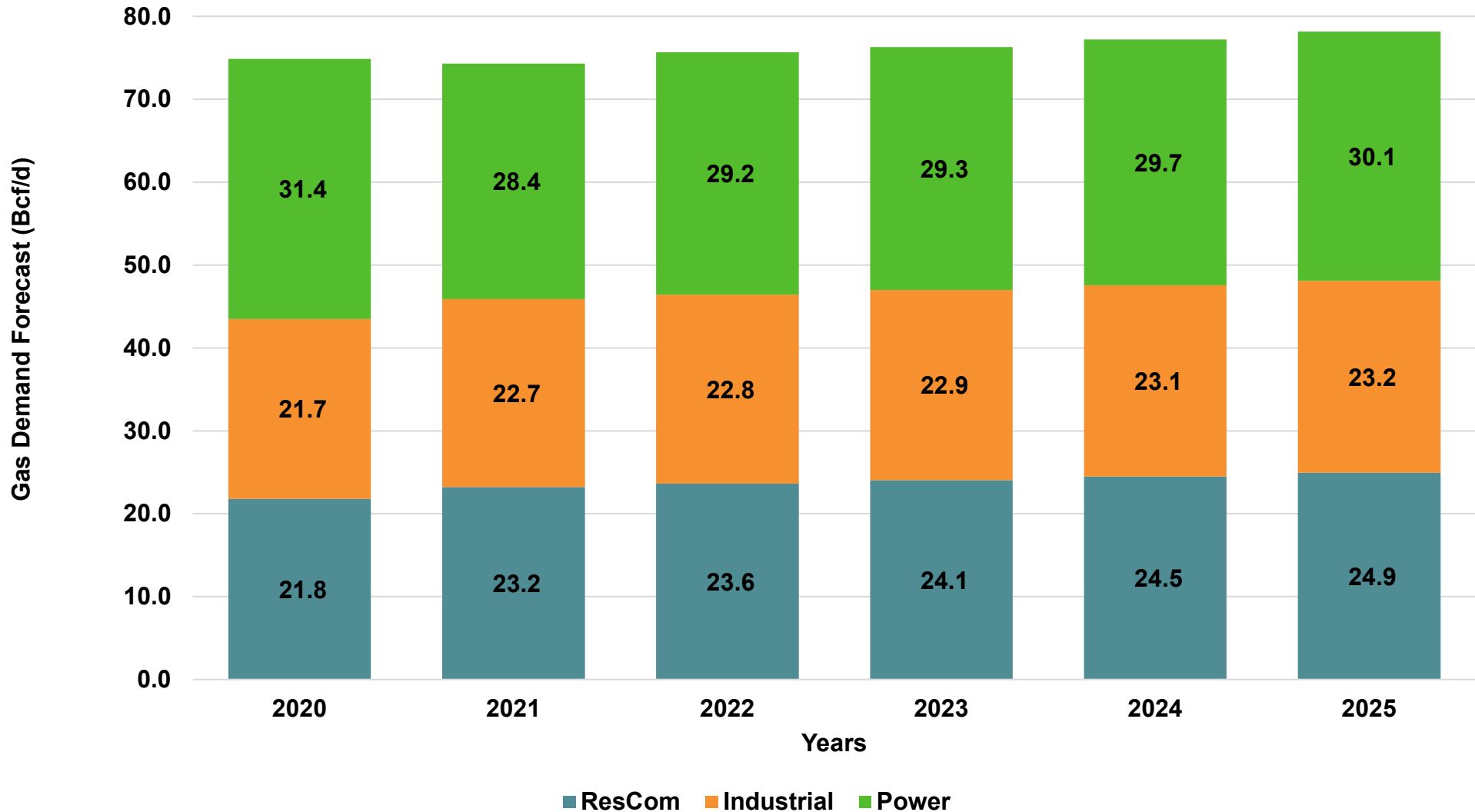
Dry Natural Gas Production





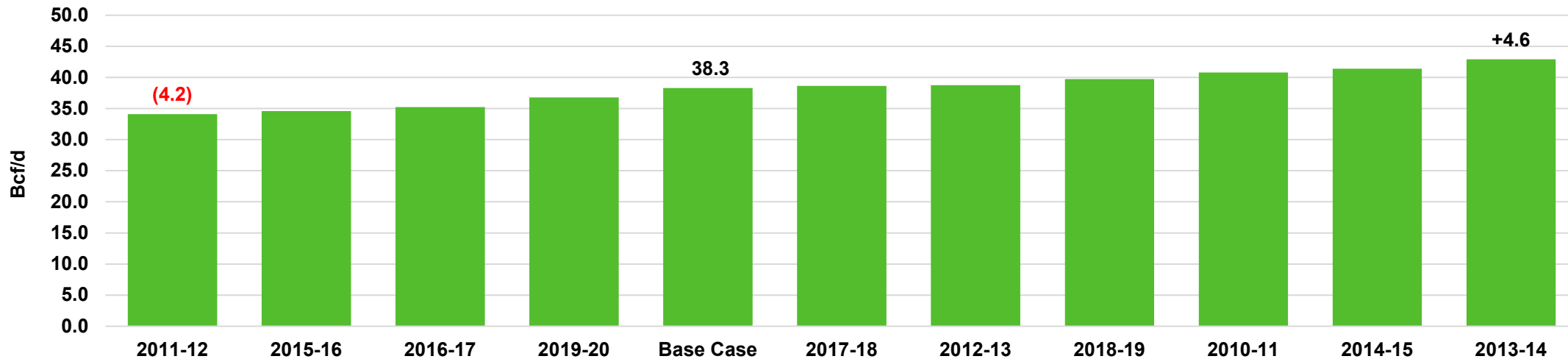
US Gas Demand – Base Case 5-Year Forecast

Domestic Natural Gas Demand

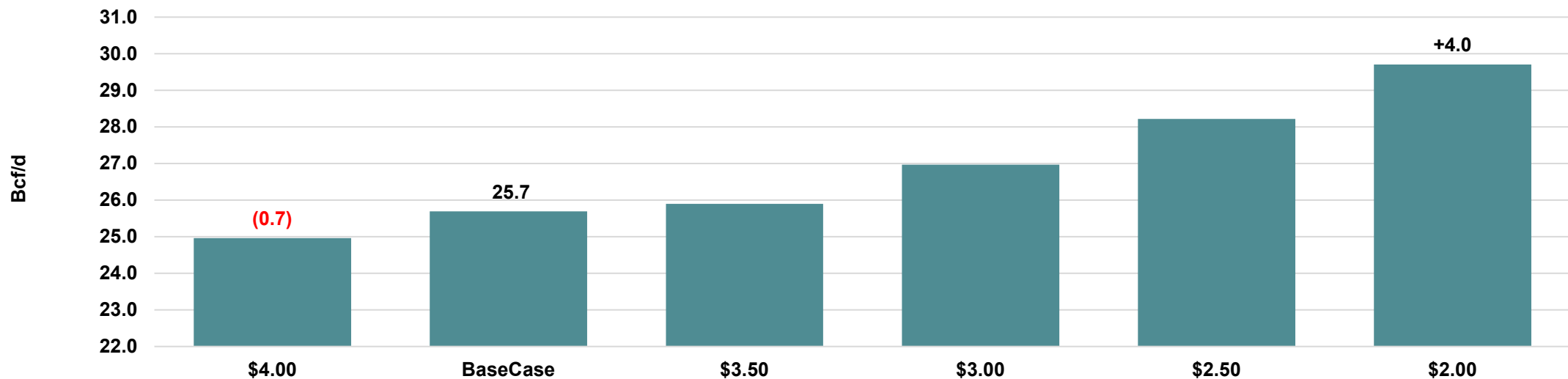


Gas Demand Winter 2020-21 Scenarios

2020-21 Winter (Nov-Mar) ResCom Demand With Historical Weather Scenarios



2020-21 Winter (Nov-Mar) Power Demand With Price Scenarios



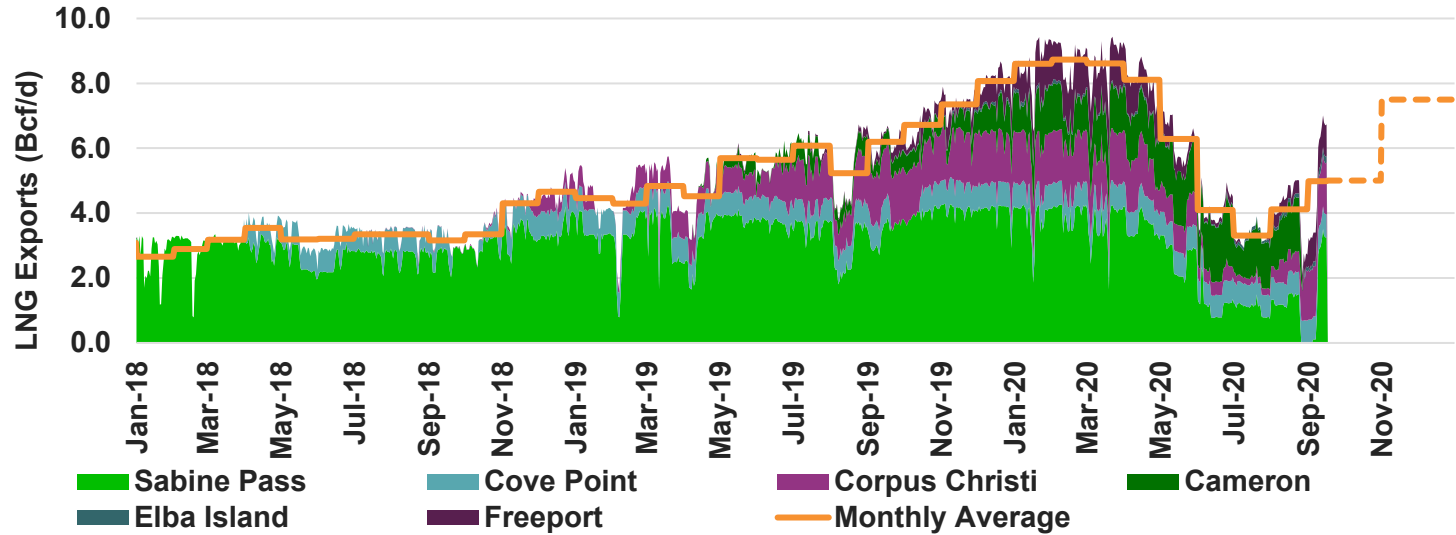
LNG Exports and Pricing Economics

LNG exports have seen a consistent recovery from the lows of July. LNG sendout observed in pipeline data is showing an average of 5.5 Bcf/d so far in September, up 1.6 Bcf/d from July levels.

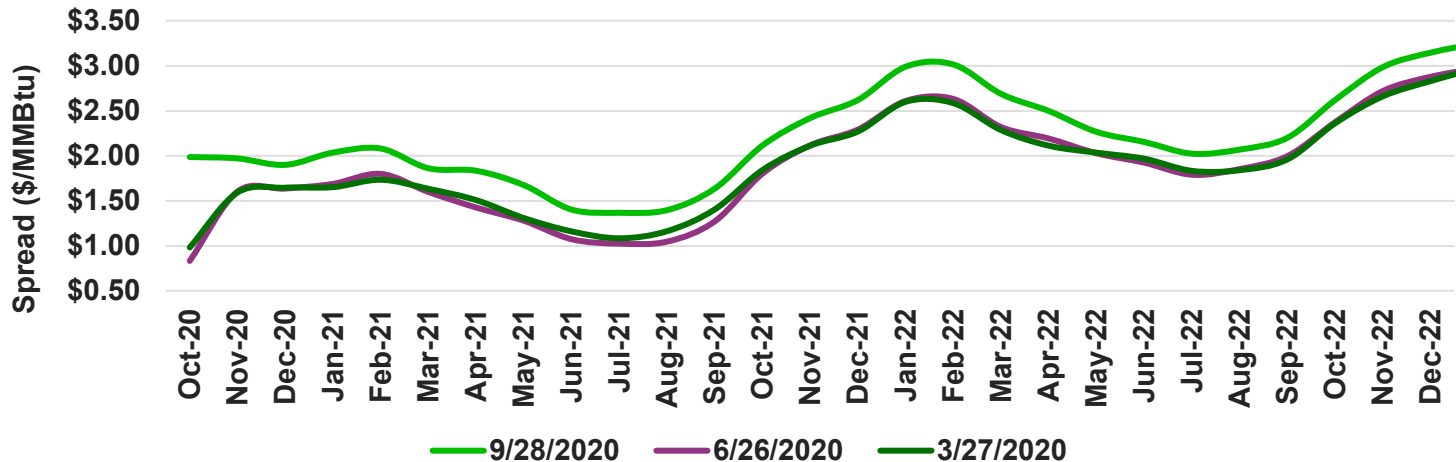
Enverus expects LNG exports to reach 7.5 Bcf/d in November and December.

Pricing economics also support an increase in exports as the spread between NBP (UK National Balancing Point) and HH (US Henry Hub) has widened about 20 cents between the peak of the pandemic from March-June and current trading levels.

LNG Exports



NBP-HH Spread

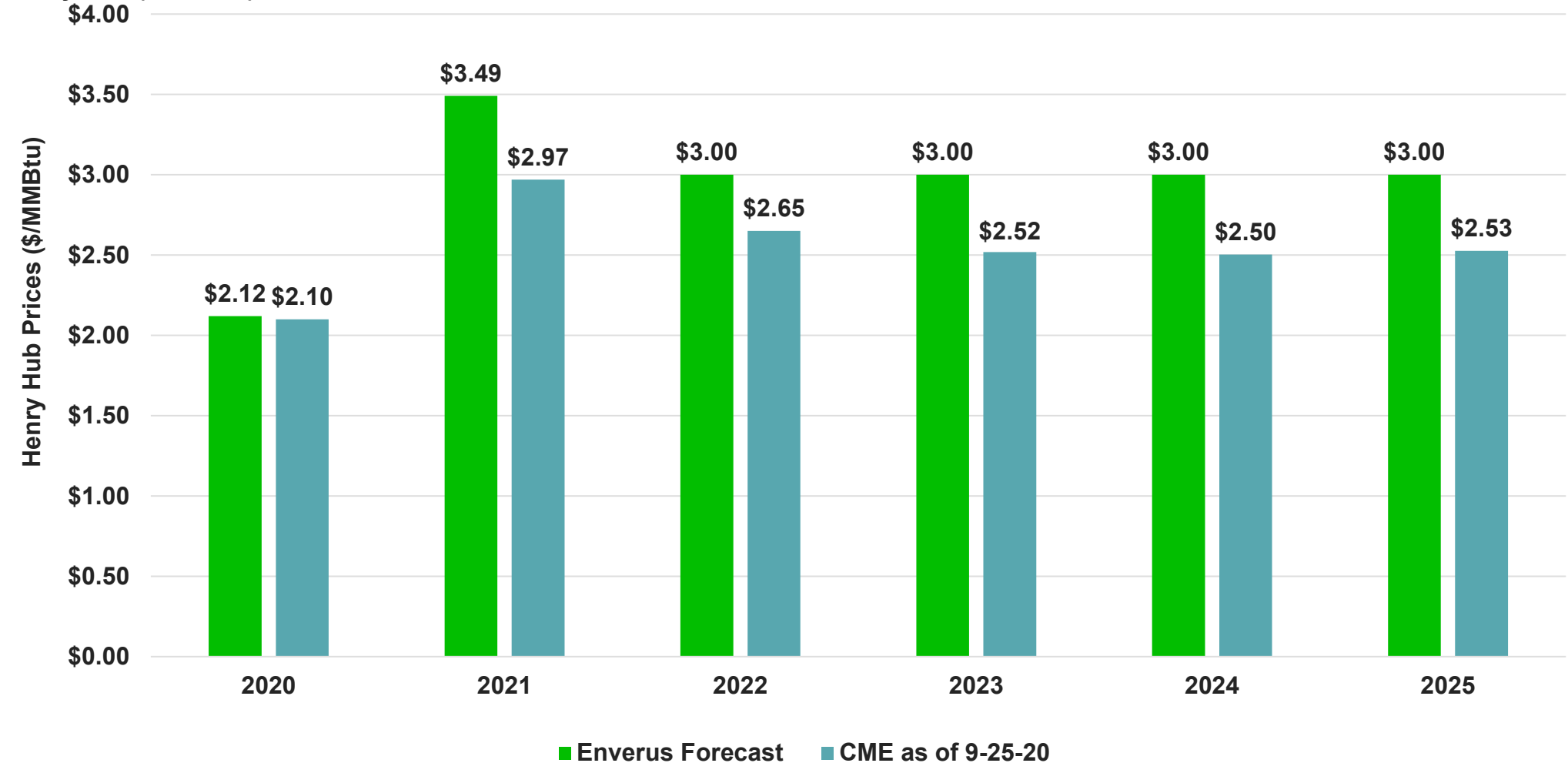




Enverus 5-Year Gas Price Forecast

Enverus expects a price increase in 2021 to \$3.49/MMBtu in order to incentivize production growth to meet expected demand. This is a higher price than the currently forward curve shows (\$2.97/MMBtu as of Sept. 25). Starting in 2022, prices are forecast to return to \$3.00/MMBtu levels. The lower gas price comes along with higher oil price expectations.

Henry Hub (\$/MMBtu)





E&P Activity Update



Q3 Earnings

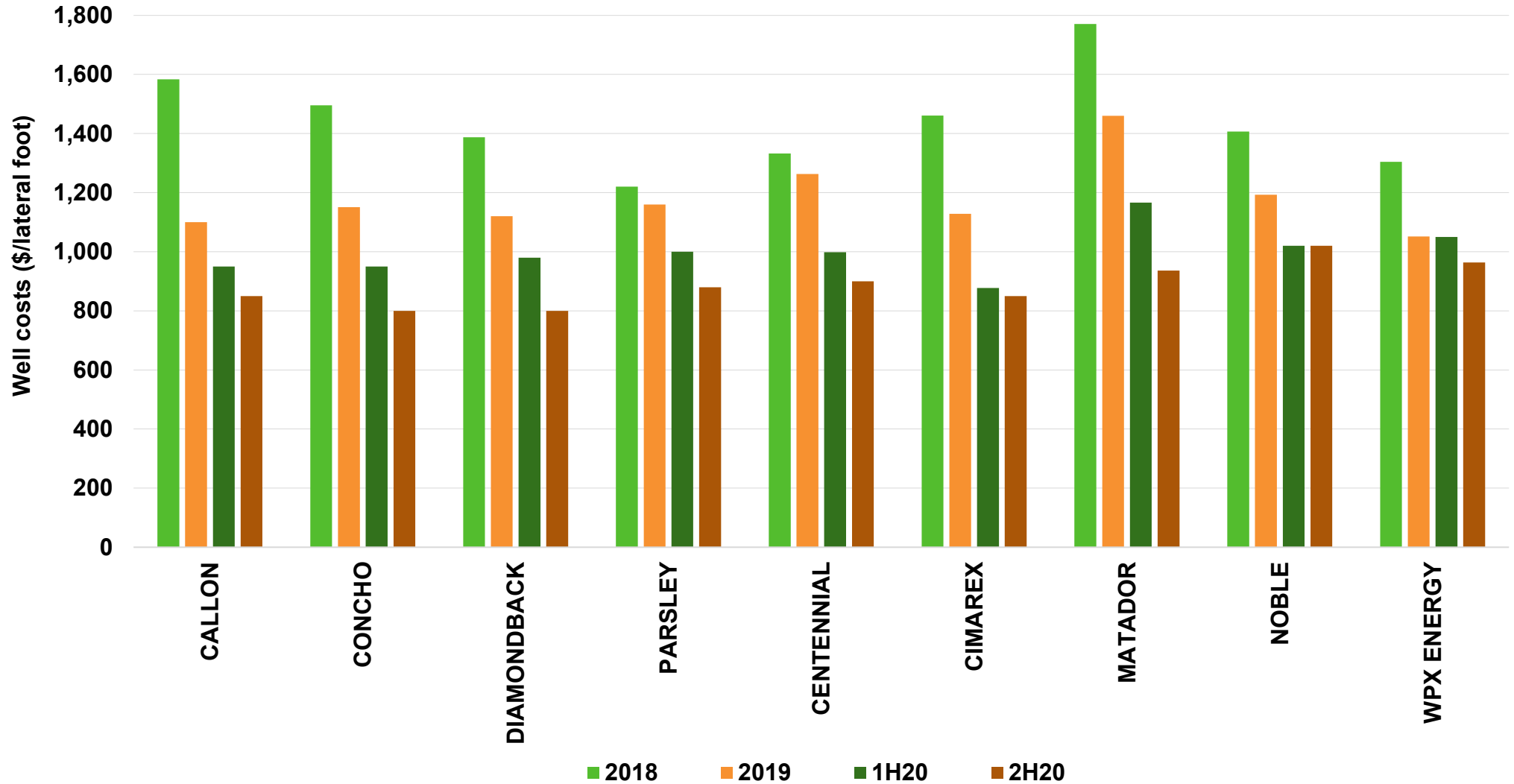
Key Themes

- **2021 Plans** – E&P 2021 guidance will start to trickle in during Q3 earnings. Most plans will likely be pushed until February in anticipation of more certainty. Investors will be interested in where companies are allocating capital in this environment.
- **Well Costs** – Oilfield services' margins are being chased to the bottom as limited activity continues. In turn, well costs for upstream are an-all time low. Operators are hitting strides on efficiency and therefore labeling the well cost savings as permanent or structural. The questions asked will revolve around the sustainability of the savings and which portions are here to stay if prices rebound.
- **DUCs** – The downturn had a disproportionate number of completion crews relative to rigs out of work. Therefore, many operators now sit on several years' worth of DUC inventory. Coupled with historically low well costs, operators will start to look more capital-efficient, as drill costs have already been spent. How many untapped DUCs does each operator have? Where are the breakevens after the sunk drilling cost?
- **Shut-ins** – Here and gone – we observed over 50 operators' filings and calculated a net production curtailment from each. Expect disclosure and curiosity on when those wells will return to production if they have not already.
- **Hedges** – The saying goes “buy low, sell high”, right? Operators are reluctant to lock in hedges at historically low prices.

Well Costs

Cost savings keep activity somewhat afloat

Calculated and Disclosed Delaware Basin D&C Costs (\$/ft)

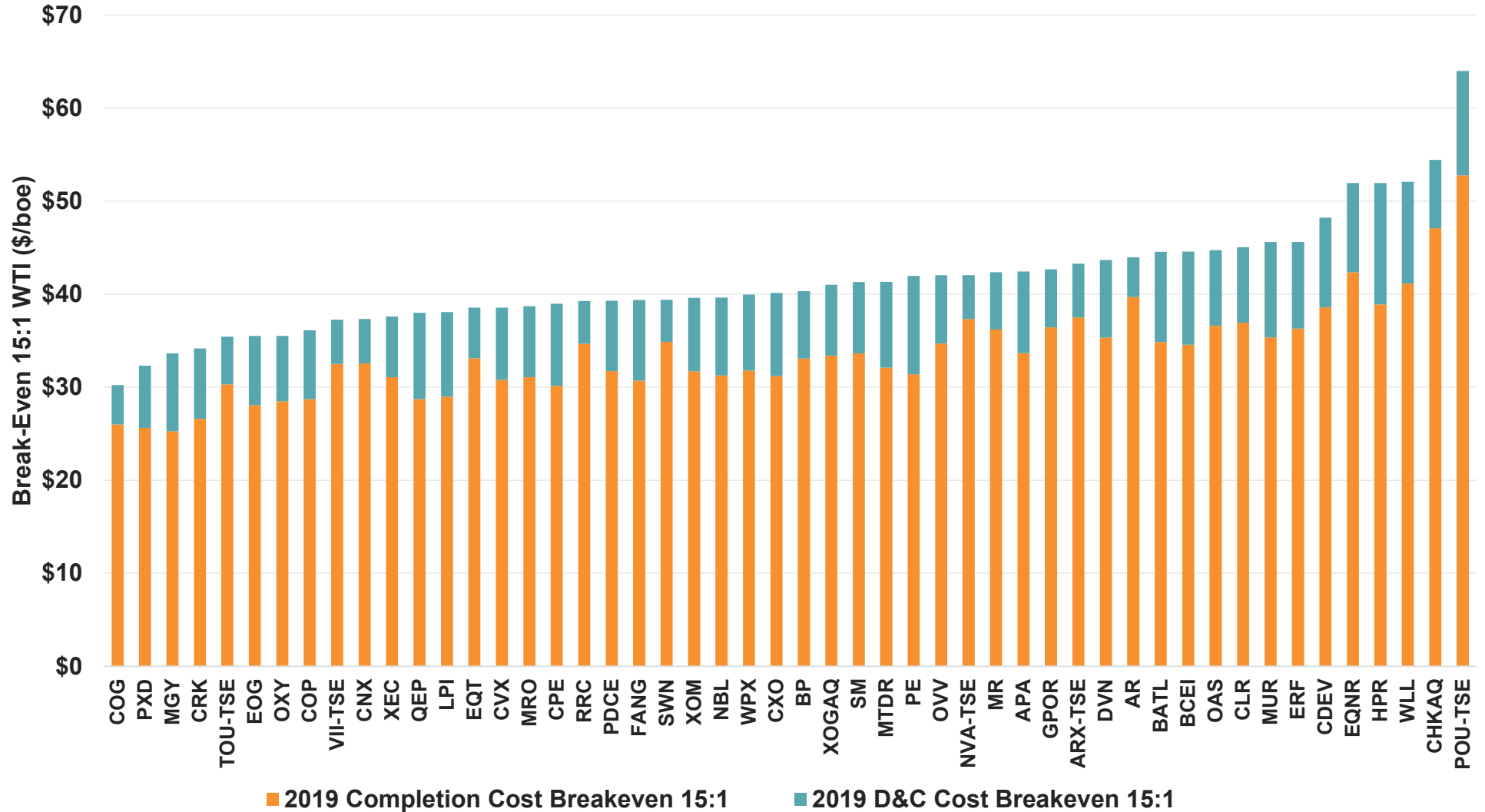




DUCs Thin the Bill

Drilled but uncompleted wells will allow for greater capital efficiency in the coming years

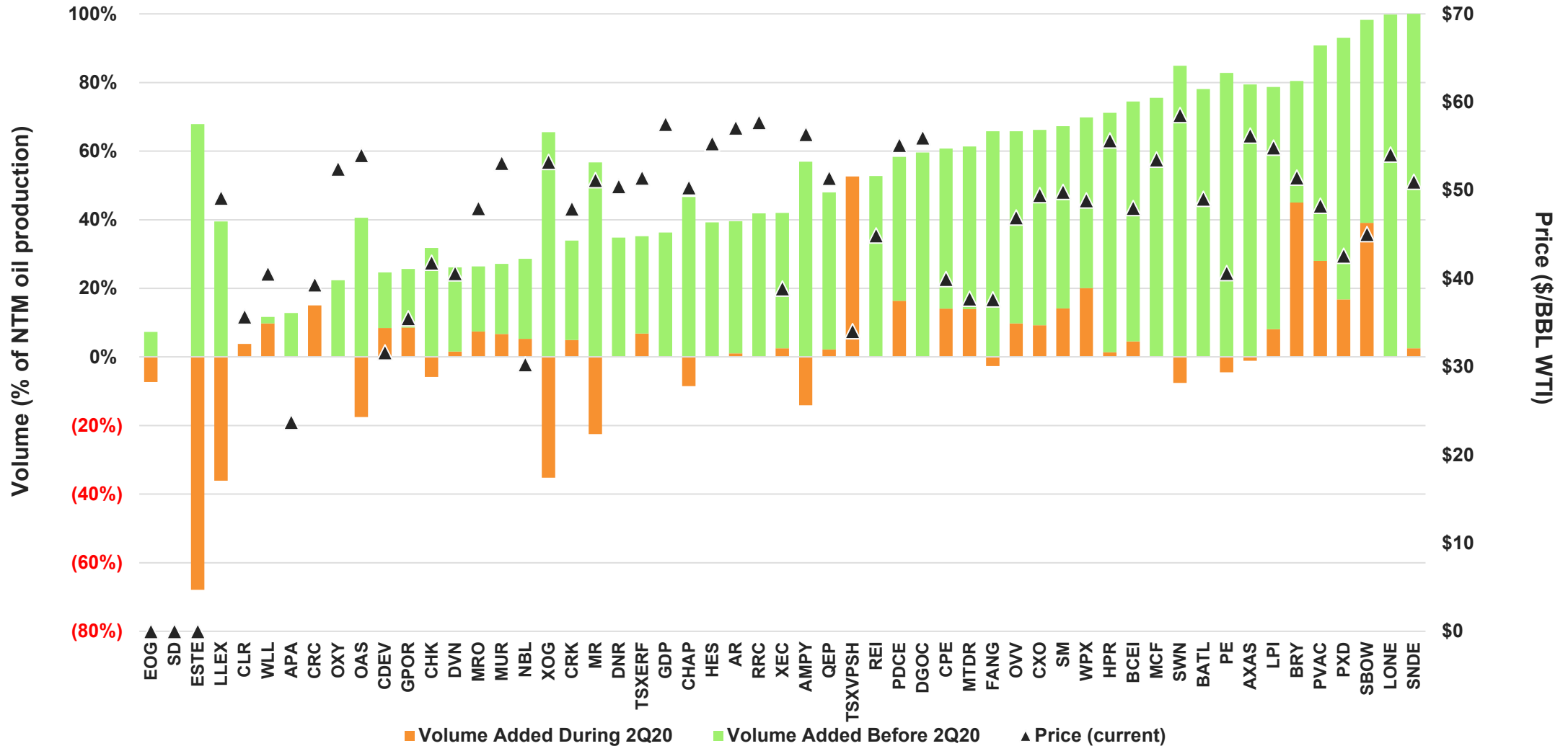
2019 Operator-Specific Quarter and Half-Cycle Breakevens



Oil Hedges

Operators are steering away from typical hedging strategies as prices remain low

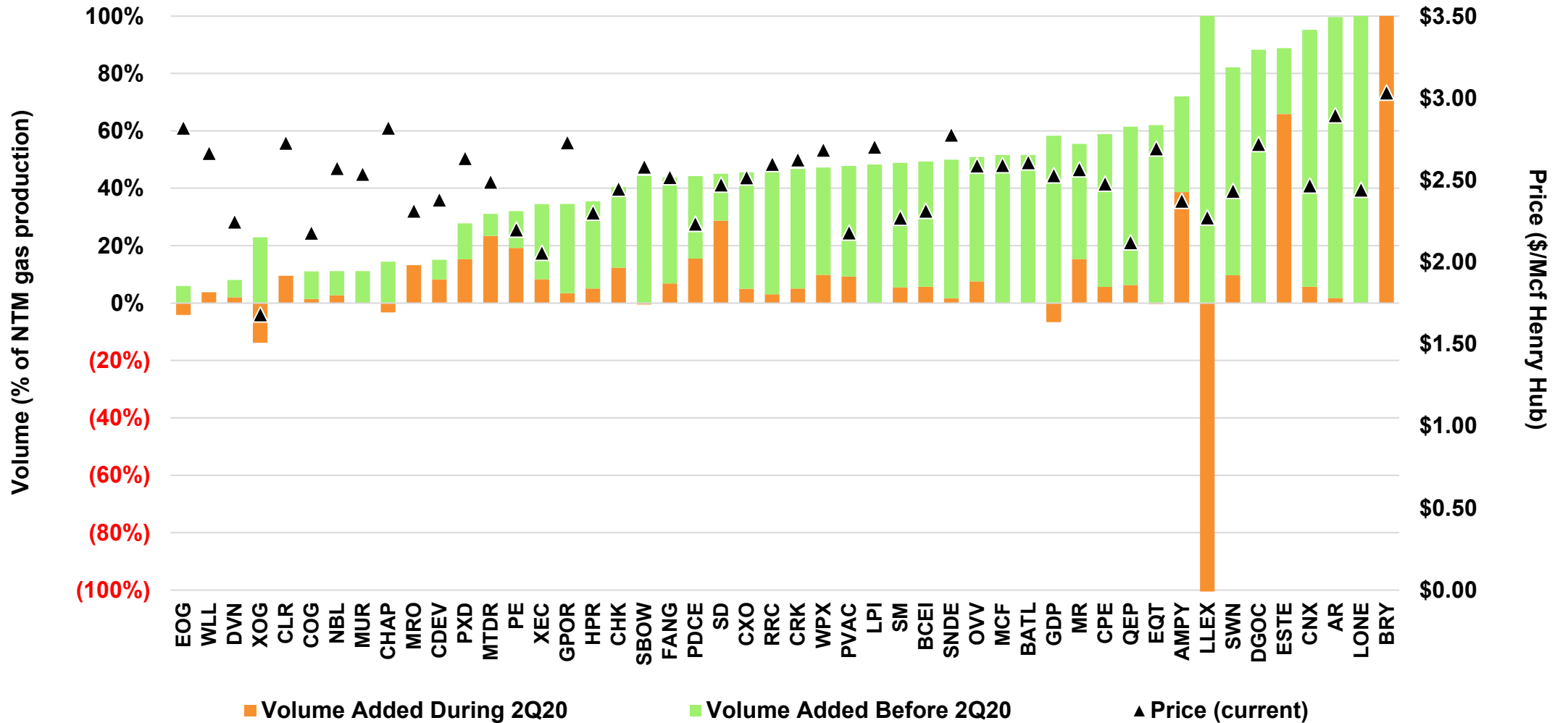
Oil Hedge Positions: Proportion of NTM Production Hedged and Hedge Prices



Gas Hedges

Operators are steering away from typical hedging strategies as prices remain low

Gas Hedge Positions: Proportion of NTM Production Hedged and Hedge Prices





Key Takeaways



Crude

- **Crude oil** prices recovered steadily over the summer as demand for transportation fuels (except for jet) rebounded from the lows of April-May. **Unfortunately, the demand recovery has since lost momentum, and WTI is currently struggling to tread water at \$40/Bbl.**
 - Refinery margins are still low, storage levels are still high, and we're heading in to the weak winter period.
 - Meanwhile, OPEC+ is struggling to maintain compliance, and Libyan supplies are coming back to the market after being absent since January.
- As a result....we have taken a more bearish stance on oil prices at the turning of the new year (\$35/Bbl in Q1 21).

Natural Gas

- With crude oil prices expected to remain depressed in 2021, associated natural gas is not expected to return next year. To offset the drop in associated gas, higher prices will be required to incentivize production gains from dry plays.
- Enverus expects natural gas prices to average \$3.49/MMBtu in 2021 and \$3.00/MMBtu starting in 2022 as oil prices recover to \$55-\$60/Bbl.

Earnings Season Preview

- The industry is watching E&Ps to determine sentiment and activity.
 - Well costs are at historical lows,
 - DUC counts are at historical highs
 - ...both will allow for a greater capital efficiency and lower capex next year.
 - Hedging activity is also limited, with operators reluctant to lock in the lows.



CONTACT

Strategy & Analytics Group

sag@enverus.com

1-888-290-7697

Enverus

8000 S. Chester St., Suite 100

Centennial, CO 80112