



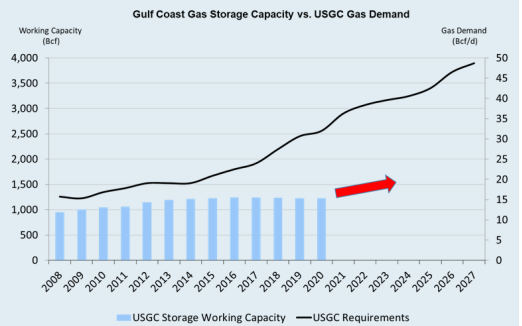
### Natural Gas Storage Assets — Coming Back to Life?

Tight U.S. natural gas supply-demand balances has generated renewed interest in natural gas storage assets among end-users, marketers/traders, operators, developers, and the financial community. After almost a decade of lackluster performance for natural gas assets, the midstream community is taking a second look at natural gas storage assets that thrive during periods of market tightness.

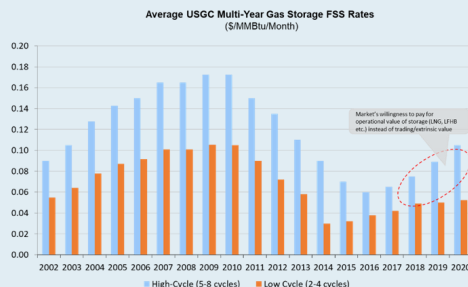
Let's briefly discuss some natural gas history. Pre-2006 was an era of declining U.S. gas production and increasing LNG imports – the U.S. was running out of gas! The resulting tightness in the market supported high natural gas prices and elevated price volatility, important ingredients for supporting healthy valuations of natural gas storage capacity. High volatility and rising seasonal spreads also provided strong signals for new cycle of investment in high-deliverability gas storage space between 2004-2010. As a result, ~400 Billion cubic feet (Bcf) of greenfield high-deliverability storage capacity was developed just in the USGC (a ~50% increase from 2006 levels).

Post-2010, however, the success of shale gas led to a structural shift in U.S. gas markets. The U.S. no longer needed imports, except in some local northern states, and U.S. gas markets transformed from import dependency to self-sufficiency. Eventually, LNG exports were needed to balance abundant domestic supply. The supply overhang reduced gas prices, flattened forward curves, and compressed seasonal spreads or intrinsic value of storage. The supply overhang and low prices also reduced the intensity of price dislocations, lowering price volatility (or extrinsic value of storage) – all detrimental to gas storage lease rates and valuations. The following graphic charts average lease rates for high-cycle and low-cycle firm storage service ("FSS") in the U.S. Gulf Coast.

FSS rates fell dramatically, stalling the investment cycle and leading to no natural gas storage capacity additions since 2015 – despite a ~72% increase in USGC gas demand. Due to tight conditions in the current U.S. natural gas market, FSS rates have begun to inch up again, driving significant interest amongst operators, traders, and investors. We believe significant structural changes in U.S. Gulf Coast will eliminate the supply overhang, increase volatility, and support the need for traditional and non-traditional storage services. Key drivers on the demand side include increasing LNG exports, sustained growth in exports to Mexico, and higher penetration of renewable/intermittent sources of power generation (i.e., wind and solar). All this momentum on the demand side is not likely to be matched by the supply side, which will likely not be able to keep pace with growth in demand. These factors would create a gas market resembling the one we experienced at the turn of this century. As USGC gas demand increases to 50 Bcf/d by 2027, FSS rates in USGC would need to increase to support greenfield storage development. At that point of time, we would have turned a complete circle...



Quantifying the need for storage will always be a difficult proposition. Long-term adequacy of storage capacity is highly dependent on the level of price volatility customers consider "acceptable," their tolerance for price risk, and how that risk is valued. However, it does appear that the stars may be finally aligning for natural gas storage assets.



#### Welcome to the Enkon Insights Newsletter

Every month, we feature three full-length articles, share critical stories in oil and gas commodities, and break down key trends.

Have opinions? Want to talk shop? Need more insights? Drop us a line:

[info@enkonenergy.com](mailto:info@enkonenergy.com)

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## Implications of an SPR withdrawal



Photo from DOE Office of Fossil Energy and Carbon Management

*“The significance of an SPR release would vary with the magnitude, release schedule, and timing of a sale.... However, a full-capacity release is extremely unlikely: we suspect that no more than 100 million barrels would enter the market.”*

### Green Hydrogen:

[Hy Stor Energy Developing First-Ever U.S. Zero-Carbon Green Hydrogen Storage Hub—Businesswire](#)

[Ineos plans \\$2.3 bil green hydrogen investment in Europe—S&P Global](#)

[COP26: Australia's FFI plans \\$8.4 billion green hydrogen project in Argentina—S&P Global](#)

[Vestas plans to open 400 MW wind plant in Saudi Arabia as more bids in region likely](#)

### Crude Oil News:

[OPEC Made Only Half of Planned Supply Hike Amid African Losses—Bloomberg](#)

[BP Says Oil Demand Is Back Above 100 Million Barrels a Day—Bloomberg](#)

[Inflation drives up drillers' costs in US shale oil patch—FT](#)

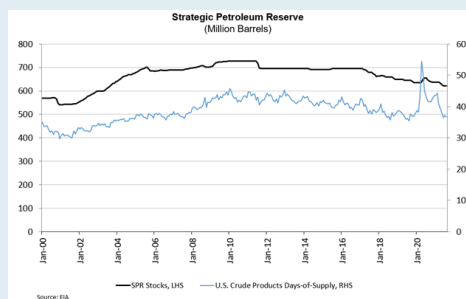
[Oil rises on demand outlook despite China fuel reserves release—Reuters](#)

[BP Looks Dirtier Than Exxon in New Data From Giant U.S. Oil Field—Bloomberg](#)

With WTI and Brent crude prices trading in the mid-80s and [OPEC+ failing to deliver planned supply hikes](#), talk of a release from the U.S. Strategic Petroleum Reserve (SPR) is getting louder and louder. While we think [triple-digit prices are a low probability event](#) (not to mention highly unsustainable), an SPR inventory drawdown is significantly more likely. While a U.S. SPR release would likely be limited and have only modest implications for prices, it could become more significant if it: 1) produces coordinated inventory sales from other major oil consumers, such as the EU and Japan; 2) leads to some settlement of Iran/Venezuela sanctions; or 3) triggers a supply response from U.S. and/or OPEC+ producers.

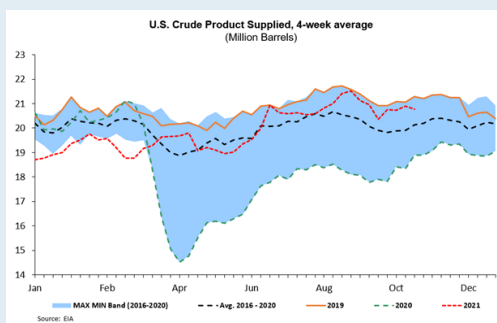
### A (very) brief history of the SPR and why it matters

The U.S. established a strategic petroleum reserve after the 1970s oil crisis revealed that petroleum supply shortages, even temporary ones, could metastasize into major economic and geopolitical consequences. During the 1990s, however, the SPR became less relevant amid very weak oil prices. The U.S. then gradually expanded SPR stocks in the 2000s due to supply uncertainties surrounding the War on Terror and the invasion of Iraq, and slowly drew down inventories in the mid-2010s as the shale revolution and domestic production relieved some upstream supply/import pressures. Finally, SPR inventories and crude products (i.e. gasoline, diesel, jet fuel, etc) days-of-supply surged in early 2020 due to the COVID pandemic, falling transportation mobility, and cratering oil prices; this trend reversed by March 2021 as vaccinations sharply lifted consumer demand.



### Rebounding crude products demand

U.S. and international oil demand has come back with a vengeance in 2021 and is once again flirting with record levels. Indeed, were it not for \$80+ oil prices (and the Delta coronavirus variant, of course), we believe crude product supplied would have reached historical highs.



This aggregation of all crude products doesn't provide the full picture, however: gasoline and diesel stock levels are well below 5-year averages, while jet fuel inventories are still slightly elevated due to the slow return of jet travel. Unsurprisingly, gasoline and diesel prices are at their highest levels since 2014 – at least as measured in nominal dollars. An SPR release could therefore expand crude supply for refineries and relieve some pressure on consumers.

### An SPR release would only have limited impact

The significance of an SPR release would vary with the magnitude, release schedule, and timing of a sale. [According to the DOE](#), the SPR can deliver oil to market within 13 days and has a maximum withdrawal rate of 4.4 million barrels per day for up to 90 days. However, a full-capacity release is extremely unlikely: we suspect that no more than 100 million barrels would enter the market. While that's a lot of supply, certainly, it's a drop in the bucket compared to total 2021 world annual crude demand, which will likely come in around 35-36 billion barrels.

### Unless...

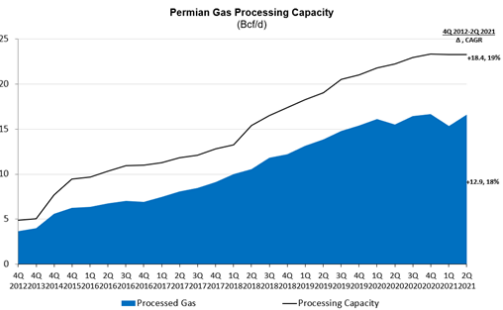
An SPR release could matter at the margins, however, if it's coordinated with other major oil consumers, such as the EU and Japan. Since the IEA requires each member country to hold at least 90 days of net oil imports, except in cases of severe oil supply disruption, a coordinated crude release could add significant (but not overwhelming) volumes to market, pushing down prices.

But a supply release wouldn't be that simple, as OPEC+ and other market actors get a vote. OPEC+ might respond to an SPR withdraw by cutting production. Moreover, an SPR release could actually harm U.S. crude producers, since WTI prices would likely face pressure from a major sale of light crude grades from the SPR. Indeed, the DOE might only release heavier crude grades to protect U.S. domestic suppliers, which tend to produce light, sweet crude.

There are a lot of moving pieces to the SPR story. We expect it won't be resolved for some time – and returning oil supply from Iran and/or Venezuela (or OPEC+) would have a much more significant impact on prices than a one-time inventory release. Assuming that COVID continues to gradually recede into a background risk for vaccinated individuals, however, we expect that prices will largely be driven by supply-side factors.

## Permian Entities Consolidate

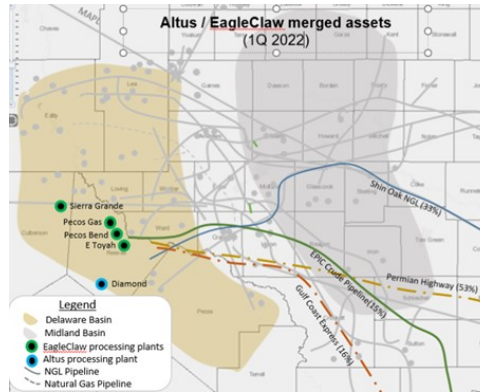
The Permian basin has gone through a prolific growth period since the shale boom began last decade. Permian basin natural gas production has almost grown 400% from late 2012 to mid-2021, surging from 4.5 Bcf/d in 4Q12 to 18 Bcf/d in 2Q21. During that time, there new entrants (in the upstream and midstream segments) to the production, midstream and pipeline sectors all tried to capture the production boom and build the infrastructure needed to get fuel to downstream oil, gas and NGL markets. The massive build out of infrastructure has recently leveled out, however. For example, gas processing capacity in the Permian basin remains under-utilized on an aggregate basis with little to no growth in gas processing capacity since 1Q 2020.



With growth prospects limited, we see more entities consolidate significant consolidation ahead in both the upstream and midstream segments. In the last few years, there have been numerous mergers and acquisitions of entities in the Permian Basin as the parties try to strengthen their financial positions through scale and more targeted strategic acquisitions scope. Since 2020, here are some of the mergers and acquisitions occurring in the Permian basin.

| Date       | Sector    | Buyer                             | Seller                              |
|------------|-----------|-----------------------------------|-------------------------------------|
| 1Q 2021    | Producer  | Pioneer Resources                 | Parsley Energy & Doublepoint Energy |
| 1Q 2021    | Producer  | Conoco Phillips                   | Concho                              |
| March 2021 | Producer  | Chevron                           | Noble Resources                     |
| 3Q 2021    | Producer  | Cabot (New entity Coterra Energy) | Cimarex Energy                      |
| 3Q 2021    | Producer  | Callon Petroleum                  | Primorex Energy                     |
| 2Q 2021    | Producer  | Vencor Energy                     | Hunt Oil                            |
| 4Q 2020    | Midstream | Stakeholder Midstream             | Santa Fe Midstream                  |
| 1Q 2022    | Midstream | Crestwood                         | Oasis Midstream                     |
| 1Q 2022    | Midstream | Altus Midstream                   | Eagle Claw Midstream                |

Why are they merging? What are their benefits? Let's take a deeper look at the most recent combination of Altus Midstream and Eagle Claw Midstream. Altus Midstream merged with BCP Raptor, the holding company of Eagle Claw Midstream. Combined, they would be the largest integrated midstream operator in the Delaware portion of the Permian basin. They would have earnings from multiple sectors of the value chain, strengthening their ability to generate more reliable revenue streams. Their combined assets include 850,000 acres under fee-based, long-term dedications for midstream activities, a combined gathering footprint, 2 Bcf/d of cryogenic natural gas processing facilities, and interests in four newly constructed pipelines from the Permian to the gulf coast – namely, the Permian Highway natural gas pipeline (27% from Altus, 26.7% from EagleClaw), the Gulf Coast Express natural gas pipeline (16% from Altus), the Shin Oak NGL pipeline (33% from Altus), and EPIC crude pipeline (15% from Altus). A map of their combined facilities highlights their key role in the Delaware.



This new entity may benefit from combined complementary vertical systems, an expanded footprint in the Delaware basin, a more diverse customer base, and enhanced reliability and flexibility for their customers. Economies of scale could reduce their operating, general and administrative costs, increase efficiencies, and make their company more competitive. Combined capital needs, meanwhile, could result in high free cash flow conversion from capital savings.

Permian operators continue to follow the logic of consolidation. What will help this combined entity (and other midstream players) is an uptick in crude and gas production – which is already happening with the private E&P players. It remains to be seen how long the publicly traded companies sit on the fence in these very favorable commodity cycle...only time will tell.

### Coal in ERCOT: which plants are at highest closure risk?

Closure of ERCOT coal electricity generation capacity is only a matter of timing due to a confluence of economic and social trends. Despite a temporary recovery in 2021 coal generation (thanks to soaring gas prices), we expect the most polluting electricity generation source to become increasingly uncompetitive compared to natural gas and renewables in the long run. Moreover, ESG concerns – including, yes, in ERCOT – will increasingly threaten coal. In this article we examine ERCOT's coal segment and determine which plants face the most immediate risk of closure. We find that two coal plants with capacity of ~4.2 GW are at severe risk of permanent closure, potentially opening opportunities for alternative generation sources such as natural gas, wind, solar, and batteries.

#### ERCOT coal generation: trending downwards

In a trend seen nearly everywhere in the U.S., ERCOT coal generation fell sharply as the shale revolution made natural gas the most affordable fuel source for power burn. U.S. coal mining production peaked in 2008, the number of U.S. producing mines fell more than 60% from 2008 to 2020, and coal generation at utility-scale facilities was down 55% since 2011. In ERCOT, coal generation from 2014-2020 fell by 45% to just under 70 million Gigawatt hours (GWh).

### Coal News:

[China's state planner says coal supply improving, prices stabilizing—Reuters](#)

[European Coal Price Drops Below \\$100 as China Boosts Output—Bloomberg](#)

[US, Canada coking coal exports shift towards Asia—Argus Media](#)

[Coal-fired generation expected to rise this year for first time since 2014—WV News](#)

[US coal use jumps as power generators switch from natural gas—FT](#)

[Coal consigned to history? Not yet, experts say—E&E News](#)

### LNG News:

[More US LNG headed to China amid disclosure of Venture Global-Unipec deal—S&P Global](#)

[China signs huge LNG deals with U.S. supplier Venture Global—Reuters](#)

[LNG sellers hold upper hand in long-term supply talks with buyers—Reuters](#)

[Cheniere and Glencore Sign Long-Term LNG Sale and Purchase Agreement—Cheniere](#)

### NGL News:

[Prepare for Propane Sticker Shock—WSJ](#)

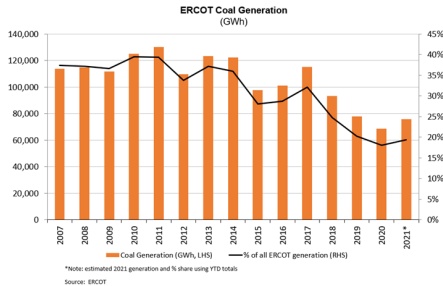
[Braskem unit in Mexico to go ahead with ethane terminal—Yahoo Finance](#)

[Higher PDH operations, winter demand stoke China LPG demand—S&P Global](#)



## Coal in ERCOT: which plants are at highest closure risk? (Continued)

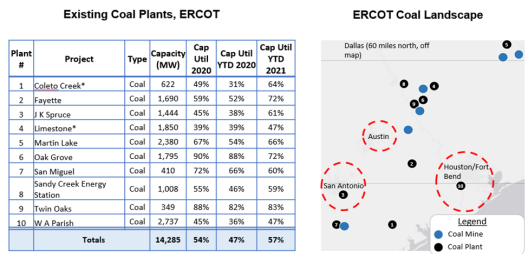
As we've discussed elsewhere, U.S. (and ERCOT) coal generation in 2021 has seen a slight rebound due to coal inventory gluts, elevated natural gas prices, and robust economic/electricity demand.



ERCOT coal generation faces severe macro and local headwinds over the medium-term, however. At the national level, investors are terrified of coal's ESG and financial risks; [most analyses find that coal is already uncompetitive vis-à-vis natural gas and renewables](#); U.S. coal producers are dependent on British Columbia, Virginia, and Maryland export ports; and some kind of penalty for greenhouse gas (GHG) emissions appears more probable over the medium-term. Local market conditions could also weigh heavily on ERCOT coal producers and force several closures.

### ERCOT Coal landscape: plant-by-plant

There are 10 operating coal plants of significant size in the ERCOT market, with ~14.3 GW of combined capacity. All are located in eastern Texas. As you can see below, many of the coal plants flirted with shut-down capacity utilization factors in 2020 but have since seen some recovery in generation.



\*Note: Coletto Creek and Limestone have already announced plans to close in 2027 and 2030, respectively. † Quality located just outside of San Antonio, will officially close in 2024 but is not currently operating.  
Source: EIA, ERCOT, EPA

Which plants are most likely to shut down? Well, for starters, Coletto Creek and Limestone have already announced plans to shut down by 2027 and 2030, respectively. The J T Deely plant (not pictured) has already stopped operating. We think at least two other plants are at very high risk of closure within the next five years. W A Parish and J K Spruce coal plants struggled during the worst days of the pandemic and face an uncertain future due to economics and ESG trends.

While we will have to see how the post-pandemic, post-Ur ERCOT market plays out, these two plants will face severe ESG headwinds due to their proximity to residential markets. Fort Bend County is the second or third-highest county by income the state of Texas, and we have a hard time believing that one of the wealthiest counties in Texas will continue to tolerate an ugly pollutant that weighs on local property values.

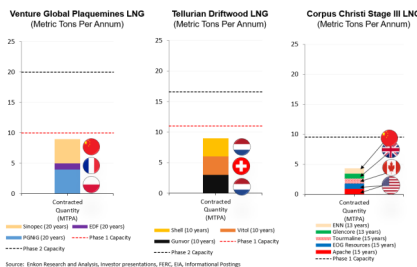
Similarly, the J K Spruce plant, located less than 20 miles from San Antonio's River Walk, will likely face a consumer backlash.

### Coal's ERCOT future: When, Not If

Many factors (such as local coal production, "midstream" rail and supply sourcing, and end-user demand) will determine how rapidly coal capacity closes. If you'd like a more comprehensive assessment, drop us a line at [info@enkonenergy.com](mailto:info@enkonenergy.com). Nevertheless, the writing is on the wall: coal is on its way out of the ERCOT (and U.S.) fuel mix. It's only a matter of timing.

## Bonus: New Chinese LNG contracts, and will European offtakers pull U.S. LNG projects across the finish line?

There's been another wave of LNG contracts signed in recent weeks. Venture Global Plaquemines signed a deal with China's Unipeq (the trading arm of Sinopec) for a total of 4 MTPA, Cheniere and Glencore announced an 0.8 MTPA agreement with implications for Corpus Christi Stage III, while China's ENN and Cheniere also announced a 0.9 MTPA tie-up. All good, right? Yes—but this development may not be as favorable for U.S. LNG projects as some believe. We'll wait and see how the creditors respond to contracts with Chinese buyers. Still, it might feel like early Christmas to some U.S. LNG projects, particularly if European offtakers sign new agreements amid elevated TTF prices and a potential geopolitical dispute with Russia.



While the LNG link-ups with Chinese buyers advance the probability of one or more LNG projects taking FID within the year, we caution that more data and analysis is needed. The People's Republic of China holds a unique perspective on property rights and contract law, and, should market and/or political conditions change, it is not clear to us that Chinese courts will enforce a contract for a U.S. LNG company. Notably, Chinese coal buyers have cancelled contracts with Australian exporters due to geopolitics and pressure from the central government. Seller beware.

On a more optimistic note for U.S. LNG projects, we suspect that one or more European contracts could be in the offing. Europe is experiencing a natural gas/energy crunch and is presumably seeking more diverse sources and types of supply. This could create an opportunity for U.S. LNG projects, particularly if they can demonstrate to environmentally-sensitive EU regulators that they will control methane emissions.

### ERCOT News:

[ERCOT OKs 2.6 GW of gas, storage, renewables capacity for commercial operation—S&P Global](#)

[Brazos' \\$2 billion bill lawsuit survives ERCOT effort to dismiss—Reuters](#)

[Public Utilities Commission announces new ERCOT board members, chair—KVUE ABC](#)

[Texas Isn't Ready for Another Deep Freeze—Bloomberg](#)

[California markets in the Lone Star State? Texas regulators consider 'quasi-capacity' market system—Utility Dive](#)

### Utilities/Electricity News:

[Maine voters reject Avangrid's \\$1 billion transmission project—Utility Dive](#)

[Alliant Energy plans to develop \\$750 million solar power project, largest in Iowa—Des Moines Register](#)

[Engie abandons Hawaii solar+storage project over supply chain, tariff concerns—Utility Dive](#)

### Batteries News:

[Battery storage applications have shifted as more batteries are added to the U.S. grid—EIA](#)

[Broad Reach Power Brings Two 100-Megawatt Battery Storage Projects Online in Central Texas—Businesswire](#)

## Commodity Outlook (90 days out)

### COVID and energy demand:

We continue to watch Canada, Denmark, and Singapore very closely: they are leading indicators for how the world will live with endemic COVID. All three countries are highly vaccinated and provide highly transparent data. So far the data is mixed, but mildly encouraging.

All three countries are seeing a rise in cases—but hospitalizations and deaths remain very low (and are largely concentrated in the unvaccinated portions of those populations). Extrapolating this to the U.S., where vaccination rates are somewhat lower, we expect that this winter be somewhat rough for public health—but still much better than last year. We expect that mobility demand will continue to rise and may begin to consistently exceed 2019 levels for some commodities and energy products.

We expect that stronger domestic vaccine uptake, therapeutic remedies (such as Merck's COVID antiviral pills), and greater international distribution of vaccines will return life and society to 90-95 percent "normal" by January or February. While variants constitute a major risk, our macroeconomic/public health/energy demand outlook heading into 2022 is bullish.

### Crude Oil Market Movers:

As we discussed in the article above, all eyes are on OPEC+ and the oil-consuming countries of the IEA. High prices could prove to be a double-edged sword for the industry in the long-term (see our section on electric vehicles below) but, for now at least, oil-producing companies and countries are shoring up balance sheets stressed by COVID.

Crude demand is generally expected to recover, but downside risks remain. Some middle-income and developing economies are still struggling with the public health and economic consequences of COVID, not to mention inflation from oil prices and constrained supply chains. Turkey is facing severe economic challenges; China's real estate market is a major uncertainty. [As we wrote last month](#), the Chinese real estate market likely accounts for at least 4-5% of total world oil demand. We'll continue to monitor this situation.

We—still—don't see great enthusiasm to expand domestic crude production, which has stalled at around ~11.3—11.5 Million barrels per day (MMBPD). Rig counts are flat at around ~550 rigs; we suspect they are approaching an asymptote. Rig counts were under pressure even in late 2018, before the pandemic, amid efficiency improvements, higher production per rig, etc. As Permian producers continue to consolidate we expect that production per rig will receive support and could even rise. All in all, we expect domestic production to continue its gradual ascent.

Crude exports remain soft at ~2.6—2.8 MMBPD as the Brent-WTI spread remains very weak. The forward curve indicates that exports will remain constrained.

### Refined Products Market Movers:

Refinery utilization is down amid seasonal maintenance. We expect capacity utilization to recover quickly, despite high crude prices. An SPR release would likely prove to be a boon to refiners.

### Natural Gas Market Movers:

Gas prices remain on a wild ride. As we noted last month, substantial price volatility is expected due to both winter temperatures. Henry Hub spot prices rose to ~\$6.40/MMBtu in early September, fell to ~\$4.80/MMBtu in mid-October, and are now trading around ~\$5.50/MMBtu as of this writing. We are calling for a tight gas market going into this winter and believe prices will likely stay above \$5.00/MMBtu.

### LNG Market Movers:

European price markers have fallen substantially since our last newsletter, with TTF trading at half its price from early October. While we expect further volatility for European and Asian natural gas prices we remain highly confident that U.S. LNG netbacks will be positive for the next 12 months, barring some exogenous shock.

### NGL Market Movers:

U.S. ethane prices have showed some softness due to the climbdown from stratospheric natural gas prices. However, we expect volatility in natural gas markets due to temperature/wind output, and expect ethane prices to trend up. High crude prices and low coproduct prices continue to support ethane as a competitive cracker feedstock, leaving room for ethane demand to rise. If we have a cold winter and natural gas prices continue to move higher, we won't be surprised if ethane prices eclipse 70 cpg.

Propane fundamentals remain very strong, although inventory has returned to 5-year ranges. Prices have ticked down due to seasonal factors but we expect this to be temporary. Recent increases in crude prices support butane prices.

### Electric Vehicles Market Movers:

Large rental vehicle fleet owners appear increasingly willing to consider electric vehicles (EVs) and, in some cases, are announcing plans to go all-electric. This is not unrelated to high crude prices and why we have been saying that high prices could prove to be disastrous for the O&G complex in the long-term.

As you may have read already, Hertz announced an order for 100,000 Teslas. Avis responded a week later by saying it was also considering purchasing electric vehicles. These maneuvers have sent the EV maker's stock price to over \$1 Trillion, while Hertz and Avis's stocks soared on day-traders and so-called "meme stock" buyers: Avis' shares more than tripled in intra-day trading.

The EV "meme stock" affair is absurd—but also deeply serious. The stock price run-up suggests that Tesla (and EVs) have a wealthy, motivated customer base with lots of excess cash. More substantively, it suggests that rental car companies and other large fleet owners are increasingly financially comfortable with an all-EV fleet. EVs face real obstacles and constraints, but high oil prices may be accelerating the energy transition.

*"Large rental vehicle fleet owners appear increasingly willing to consider electric vehicles (EVs) and, in some cases, are announcing plans to go all-electric. This is not unrelated to high crude prices..."*

### Wind News:

[The Biden Administration wants to open the Gulf for offshore wind power. Is Texas ready? - Houston Chronicle](#)

[TenneT plans 6GW offshore wind grid hub in German North Sea—Recharge](#)

[Freezing wind turbines expansion in France would be 'mistake' - Engie CEO—Reuters](#)

### Electric Vehicle News:

[Hertz Order for 100,000 EVs Sends Tesla Value to \\$1 Trillion—Bloomberg](#)

[Rivian Lures Blackstone, Coatue to IPO of Up to \\$8.4 Billion—Bloomberg](#)

[Avis Doubles in Meme Moment on Plans to Add More Electric Cars—Bloomberg](#)

[Tesla launches a new home charger that works with all electric cars—Electrek](#)

[Cars Are Going Electric. What Happens to the Used Batteries? - Wired](#)

[Toyota announces the bZ4X: the carmaker's first mass-produced electric vehicle—The Guardian](#)

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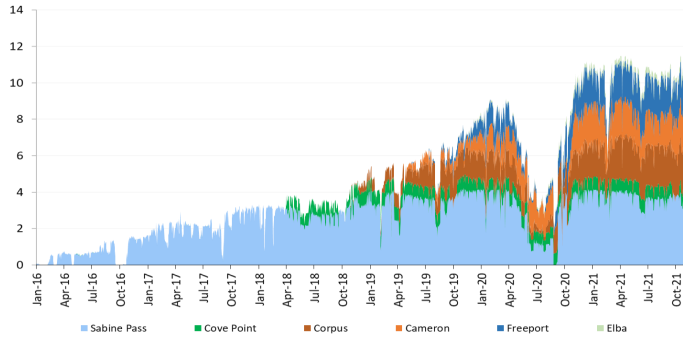
Gas station [photo](#) from Seattle Municipal Archives

All other photos in public domain

# Key Market Dashboards

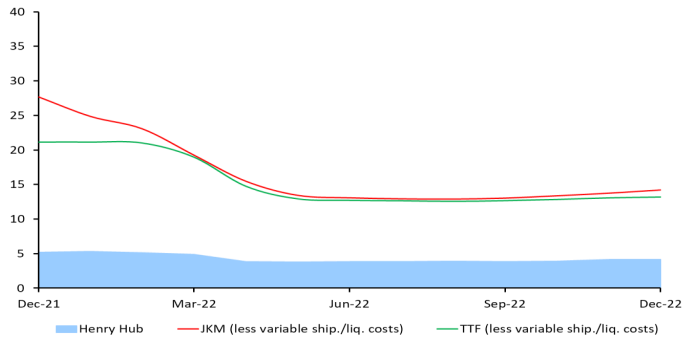


**Firm Feed Gas Receipts into U.S. LNG Terminals**  
(Billion Cubic Feet per Day)



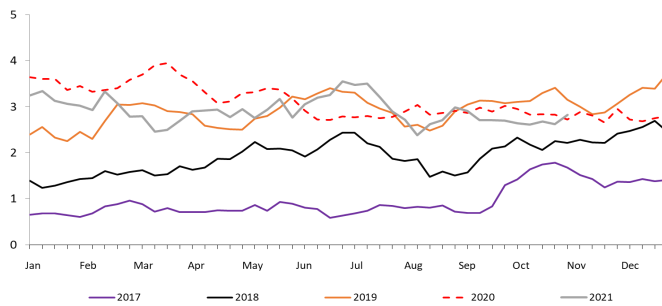
Brief operational hiccups at LNG terminals—Freeport expected to fully resume by next week. Strong fundamentals for all projects.

**LNG Netbacks to U.S. (on Cash Basis)**  
(\$/MMBtu)



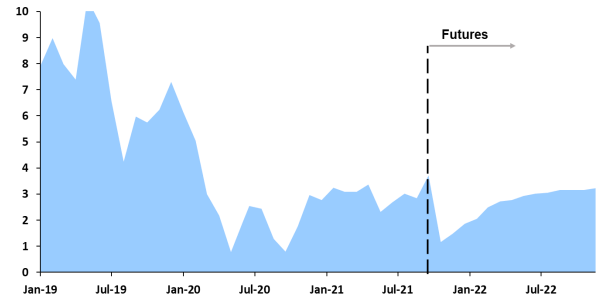
Still expect severe volatility for LNG netbacks as traders determine weather-driven fundamentals; netbacks fell from last month

**U.S. Crude Oil Exports**  
(Million Barrels per Day, 4-week average)



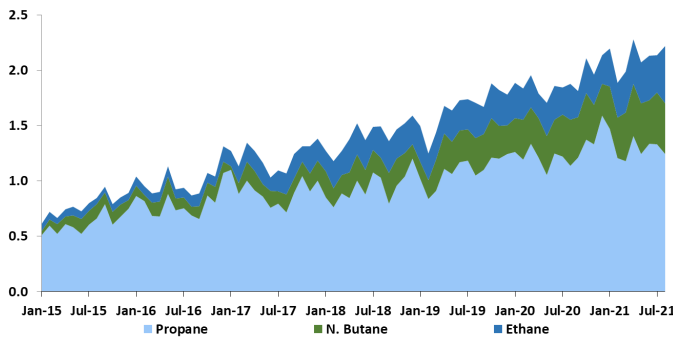
Strong domestic refinery pull, shipping rates, and constrained domestic production still limiting exports below 2019 levels

**Brent—WTI Spread**  
(\$/Barrel)



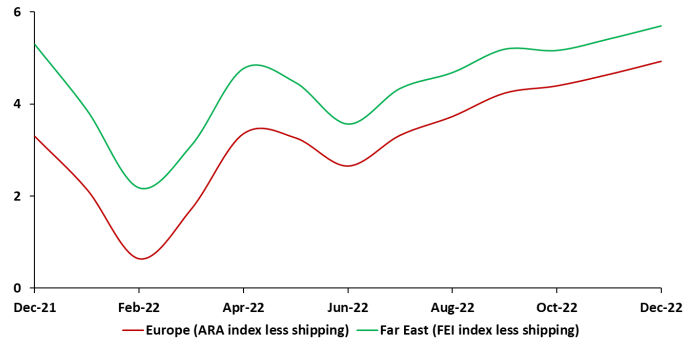
Differentials still limiting export arbitrage, but expected to improve in the future

**U.S. NGL Product Exports**  
(Million Barrels per Day)



Tug-of-war between domestic and export propane buyers continues

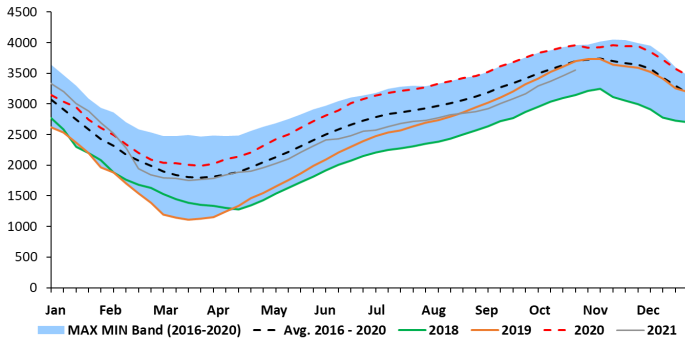
**International Propane Netbacks (to Mt. Belvieu)**  
(Cents Per Gallon)



Shipping costs and elevated domestic demand limiting international exports

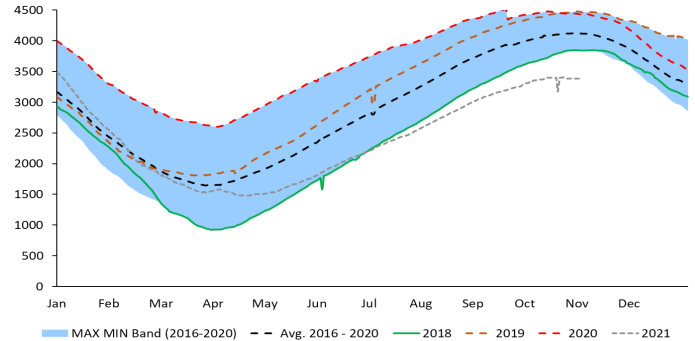
## Key Market Dashboards

**Natural Gas in Storage, Lower 48**  
(Billion Cubic Feet)



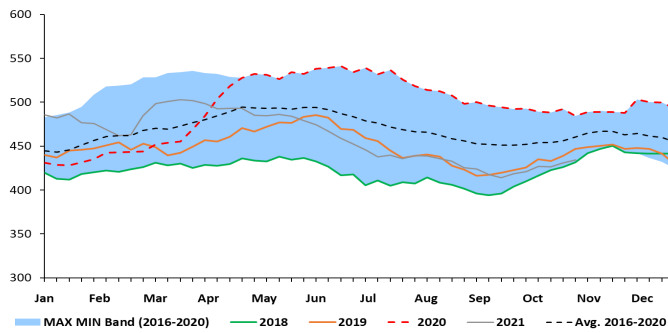
Natural gas price volatility expected amid lower inventories and strong domestic/export demand

**European (EU + Ukraine) Gas Storage**  
(Billion Cubic Feet)



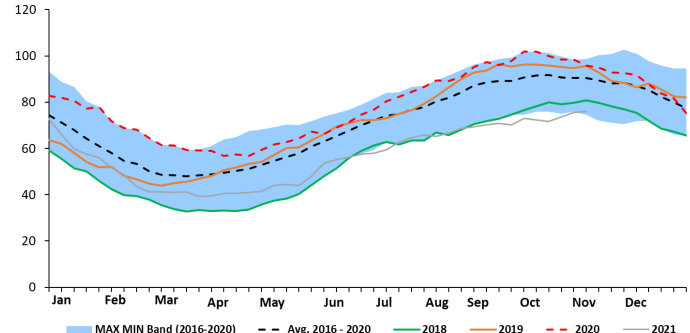
European inventories still very low. Interesting winter ahead, expect volatility

**U.S. Crude Oil Commercial Storage Inventory**  
(Million Barrels)



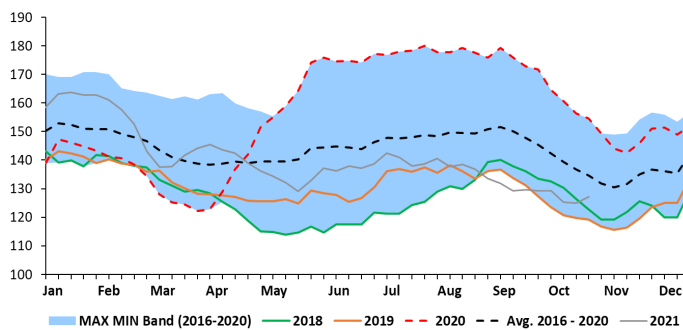
SPR release is becoming more probable this month amid very low inventories

**U.S. Propane/Propylene Storage Inventory**  
(Million Barrels)



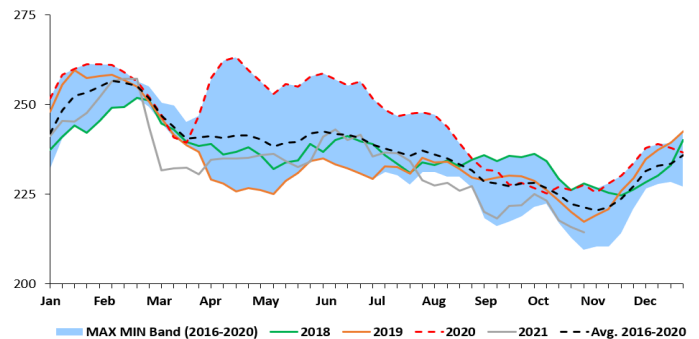
U.S. propane inventories still supportive of prices amid strong domestic + international demand

**U.S. Diesel Storage Inventory**  
(Million Barrels)



Watch holiday trucking demand—diesel prices have a lot of fundamental support

**U.S. Gasoline Storage Inventory**  
(Million Barrels)



Inventories remain constrained and demand likely to remain robust, or even rise—favorable price outlook for gasoline

## Our Subscription Product Offerings

### Regional NGL Benchmarking & Outlook

*(Research, intelligence and insights into Supply, Logistics, Pricing, Disposition and Outlook)*

Each quarter, Enkon provides clients a unique, bottom-to-top analysis of NGL supply, logistics, pricing, netbacks, product disposition and outlook for eight NGL producing basins in the U.S. The granularity of the analysis makes this product unique. The analysis identifies NGLs (by purity product) produced at each of the ~700 U.S. gas processing plants as the building block of the analysis to quantify asset utilizations across the midstream value chain.

|             |                   |                      |
|-------------|-------------------|----------------------|
| Appalachian | Rockies           | Haynesville- Bossier |
| Permian     | Bakken            | Barnett              |
| Eagle Ford  | STACK/SCOOP/MERGE | LA Gulf Coast        |

|   | Deliverables               | Format                      | Update Frequency |
|---|----------------------------|-----------------------------|------------------|
| 1 | NGL Benchmarking           | Report (MS PowerPoint)      | Quarterly        |
| 2 | Report discussion & review | In-Person Meeting/Conf Call | Quarterly        |
| 3 | Supporting data sets       | Secured online portal       | Quarterly        |
| 4 | Market insights            | Memo                        | Monthly          |

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### U.S. Gulf Coast Liquid Cavern Storage Benchmarking

*(Research, intelligence and insights into NGL, Olefins, Refined Product Cavern Storage)*

Once a year, Enkon provides clients a one-of-a-kind, comprehensive lay-of-the-land and granular benchmarking for ~250 non-crude liquid-hydrocarbon salt cavern storage wells in Texas and Louisiana. The report provides regional analysis of cavern storage capacity versus brine pond capacity in each of the dome locations. The report also identifies product storage in each of the cavern wells along with historical product injection, withdrawal, inventory and cavern utilization.

| Texas Cavern Coverage       |            | Louisiana Cavern Coverage |               |
|-----------------------------|------------|---------------------------|---------------|
| Barbers Hill (Mont Belvieu) | Hull       | Sulphur                   | Bayou Choctow |
| Stratton Ridge              | Spindletop | West Hackberry            | Napoleonville |
| Markham                     | Fannett    | Arcadia                   | Sorrento      |
| Clemens                     | Sour Lake  | Pine Prairie              | Venice        |
| Pierce Junction             | Boiling    | Anse La Butte             | Section 28    |
| West/Panhandle Texas        | East Texas |                           |               |

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### Regional Fractionation and NGL Export Terminal Benchmarking & Outlook

Each quarter, Enkon provides clients a provide a historical benchmarking and comprehensive outlook of Y-grade NGLs in the U.S. Gulf Coast with the objective of quantifying incremental need for fractionation capacity in various locations in US Gulf Coast, namely Mont Belvieu, Sweeny and Louisiana, and adequacy of NGL export capacity in the USGC and Northeast.

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### North America LNG Export Project Benchmarking & Outlook

*(Research, and insights into U.S. Liquefaction Projects)*

Each quarter, Enkon undertakes an exhaustive review of over 24 post and pre-FID North American LNG export terminals; summarizing the North American LNG export terminal landscape, LNG nameplate capacity and feed gas forecasts, key market trends, and a competitive assessment of pre-FID North American terminals. For each project, we report terminal attributes, commercial models, key regulatory milestones, risk assessments, and, for existing terminals, historical feed gas receipts (by pipeline), and estimated weighted average landed cost of feed gas into the terminal.

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