ENKON OIL AND GAS NEWSLETTER

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:

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Inside this issue:

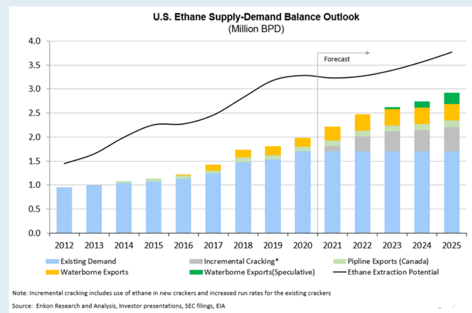
What's next for U.S. ethane exports?

U.S. ethane markets have evolved from being "ethane short" pre-2012 to "ethane long," owing to the success of the U.S. shale revolution. Successful shale drilling started in gas-rich basins such as the Barnett and the Haynesville, quickly spread to NGL-rich gas drilling in the Appalachian basin, and by 2012, U.S. E&P companies had replicated shale drilling techniques in tight oil patches in Bakken, Eagle Ford, Mid-Con, and the Permian. NGL production quickly grew along with "associated gas" production: development of NGL-rich shale plays caused aggregate ethane extraction potential in the U.S. to increase substantially from ~1.5 Million BPD in 2012 to ~3.2 Million bpd by the 2nd quarter of 2020, or a whopping post-2012 11% CAGR.

Let's define an important term for non-specialist readers before diving in. Ethane potential refers to the theoretical volume of ethane that can be extracted from the inlet gas stream subject to the technical maximum limits of each gas processing plant in the U.S. Realistically, the maximum ethane that can be extracted may be further constrained by availability of downstream pipeline or fractionation capacity. Ethane potential increased with significant contributions from Appalachian, Permian, and Eagle Ford.

The U.S. market was unable to use all this ethane, however, as demand from domestic U.S. steam crackers consumption and ethane exports failed to match the growth in ethane supply potential. While U.S. ethane consumption has grown by ~1.0 Million bpd since 2021, this consumption still does not utilize all of U.S. ethane potential. Consequently, by 2020, ~1.3 Million of ethane was rejected in the U.S.

Shale regions with high T&F fees (i.e. those regions farthest from the Mont Belvieu complex, such as Appalachian, Bakken and Rockies) accounted for ~60% of total 2020 ethane rejection. As seen from the figure below, there is plenty of U.S. ethane available (even at current reducing drilling levels). At the right price, the U.S. can meet incremental demand from U.S. crackers and ethane export terminals.



Recent Developments in Ethane Exports

Since the US industry started in 2016, ethane terminals Marcus Hook and Morgan's Point have incrementally increased the US's waterborne exports to about 175 Mb/d in 2020 . The new year brought Energy Transfer's new Orbit Ethane Export Terminal, which could export up to 150 Mb/d of Ethane to a new Chinese customer. Finally, Energy Transfer announced a 135 Mb/d expansion at its Marcus Hook facility; the expansion project is expected to be in service by 3Q 2023.

U.S. ethane potential is expected to stay one step ahead of demand despite the third wave of U.S. steam cracker projects and the ramp-up in export terminal capacity; new U.S. crackers and new ethane export terminals will likely enjoy ample future supply. While ethane exports and new U.S. ethane crackers will relatively tighten U.S. ethane balances (and provide tailwinds to Mont Belvieu ethane price), our analysis suggest that additional volumes of ethane can be exported. The key difficulty for any new ethane export projects will be cultivating ethane export markets.

International Demand is so Hard to Find These Days

Most of the "low hanging fruits" in export markets have been snatched already. Less complex crackers with maritime access (such as INEOS, Borealis, Shell, Exxon, Reliance, Braskem etc) have already been converted to ethane. The remaining opportunities have much less favorable economics: additional cracker conversions are less technically plausible and/or more expensive.

What’s next for U.S. ethane exports? (continued)

“HH futures at this writing exceed $3/MMBtu from July 2021 – March 2022. While noting our standard disclaimer that a new, dangerous COVID variant is possible, albeit unlikely, we believe that optimism about U.S. natural gas markets is warranted for the medium term. Natural gas markets will likely remain tight for at least the next year.”

Asian greenfield cracker development, on the other hand, has its own unique infrastructure challenges: the procurement of Very Large Ethane Carriers, receiving tanks, pipeline connectivity in destination markets, and an exceedingly small set of credit worthy ethane buyers that can commit to long-term contracts (say, 10-15 years) with U.S. export projects.

“Creating” new demand for export projects will be difficult due to a dearth of potential credit-worthy customers. Global ethane trade is currently characterized by long-term contracts: spot markets are virtually non-existent and serve only a handful of creditworthy buyers. Ethane export markets are comparable to LNG export markets 40 years ago – a point-to-point pipeline over water! In other words, the spot market is non-existent. Currently, there are only a handful of customers who fit the title of credit-worthy, and they are all taken. In sum, we believe that ethane availability in the U.S. will not be the challenge for new ethane export projects. Finding credit worthy partners will be the greatest obstacle.

Natural gas markets: 2021 will likely be tight

Natural gas risks are largely to the upside and gas markets will likely be tight for the remainder of the year. We’ve said for a while that Henry Hub prices may be undervalued and the forward strip is starting to reflect that optimism: HH futures at this writing exceed $3/MMBtu from July 2021 – March 2022. While noting our standard disclaimer that a new, dangerous COVID variant is possible, albeit unlikely, we believe that optimism about U.S. natural gas markets is warranted for the medium term. Natural gas markets will likely remain tight for at least the next year.

A Rough 2020

Before we dive into our perspective on future natural gas demand, let’s first ruminate a bit on 2020. The year from hell was terrible for natural gas markets which saw a decline in total domestic consumption from about ~85.2 Bcf/d in 2019 to ~83.3 Bcf/d in 2020 (all figures are from the EIA). Residential, commercial and industrial consumption fell by 1 Bcf/d, 1 Bcf/d, and 0.5 Bcf/d, respectively. While weather and extreme weather affect consumption patterns, the analyst consensus is that the demand drop was largely caused by COVID. On the positive side, however, natural gas demand for electric power consumers rose by 0.7 Bcf/d. Export capacity for pipeline and LNG exports also expanded significantly, as we’ll discuss later.

Strong Natural Gas Demand

We think 2021 could be an outstanding year for natural gas. Vaccines are rapidly returning the US economy to normal conditions: US 2021 annual GDP growth will probably exceed 5.0%. If residential, commercial, and industrial natural gas demand rebound to 2019 levels (which will be difficult but not impossible) U.S. natural gas consumption will rise by about 2.5 Bcf/d.

Total U.S. natural gas demand is not just determined by domestic consumption but also by exports. LNG and pipeline exports will almost surely rise well above 2020 levels. LNG exports in 2020 stood at about 6.5 Bcf/d; pipeline exports (to both Mexico and Canada) reached nearly 7.9 Bcf/d. We predict these trends will continue: pipeline exports to Mexico and LNG exports have stood at all-time highs in recent weeks. While there is some uncertainty surrounding hurricane season, U.S. LNG exporters will very likely enjoy strongly positive netbacks for at least the remainder of 2021; export terminals will run at 100% utilization for the remainder of the year; and the U.S. LNG complex could add about 0.8-1.6 Bcf/d in capacity by the end of the year, depending on how quickly Sabine Pass Train 6 and Calcasieu Pass can startup. Higher LNG and pipeline exports alone will likely grow by about 5-6 Bcf/d from 2020 levels.

Fuel-on-fuel competition

Natural Gas for electric power use is more difficult to predict. Last year it stood at 31.7 Bcf/d, up slightly from 31 Bcf/d in 2019. Will gas volumes for power burn continue to grow? We’re more skeptical: gas will compete with coal and, increasingly, renewables for the rest of the year.

We’ve written extensively about how coal is back, but perhaps not for long. Coal production and coal’s share of electricity generation will likely continue to rebound, at least in 2021. Coal is natural gas’ primary competitor for baseload summer and winter electricity demand. We therefore suspect that competition for baseload supply will be fierce in 2021 and 2022: coal will likely eat into natural gas’ share at the margins.

Renewables will also continue to reduce natural gas power sector consumption throughout 2021, as the EIA projects that around 32 GW of solar, wind, and batteries will be deployed in the U.S. this year. Renewable penetration will vary by locality: ERCOT alone is expected to deploy about 12 GW of utility-scale renewables capacity to the grid before August. Renewables tend to run at relatively low capacity factors, however, limiting their share of total electricity generation until more and better battery storage comes online.

Supply: Domestic and International

Dry gas production will very likely rise this year on higher domestic production and imports. Domestic dry natural gas production stood at 93 Bcf/d in 2019 then fell to 91.6 Bcf/d in 2020 on declining rig counts. On the other hand, rising gas-to-oil ratios (GOR) in the Permian and other basins limited the slide in volumes. In 2021, rig counts are clearly rising but dry production volumes have remained steady at around 92 Bcf/d. While dry gas production will likely grow throughout 2021, we will be very surprised if 2021 annual production reaches 100 Bcf/d: the US could set an annual dry gas production record this year but likely won’t exceed 95 Bcf/d. Pipeline gas imports from Canada could grow by ~1.5 – 2.5 Bcf/d.

Crude Oil News:

OPEC+ oil quota overproduction rises to 3.316 million b/d: document—S&P Global

Environmentalists take aim to stop permitting new deepwater oil port off Louisiana coast — The Advocate

Diamondback sheds US Williston, non-core Permian assets for $832 million—S&P Global

Iran to open Jask crude export terminal soon: Correct—Argus Media

EVs will be cheaper than petrol cars in all segments by 2027, BNEF analysis finds—Transport & Environment

Natural gas markets: 2021 will likely be tight (continued)

Drawdowns are likely; hurricanes, temps, and variants are big unknowns

We expect U.S. annual natural gas demand to grow by about 6-9 Bcf/d in 2021 from previous year levels subject to the timing of new LNG trains; supply growth will probably only total around 5-7 Bcf/d. We therefore expect to see significant inventory drawdowns, particularly later in the year. While inventories are well above their same-period 2019 levels, the gap is already narrowing. The market will likely therefore balance in the form of higher prices: Henry Hub will likely remain above $3/MMBtu for at least the remainder of the year, and most of the risks are to the upside. At the same time, uncertainties remain: COVID variants could completely upend all our assumptions, while hurricanes and temperatures create significant unknowns. Still, these risks appear manageable. Strong post-COVID demand will likely power Henry Hub spot prices above $3/MMBtu for at least the remainder of the year.

Crude outlook: smoother ride, micro is (almost) back

Barring an exogenous event, such as the development of a new COVID-19 variant, a pipeline hack, an armed conflict, etc, world oil markets will likely be characterized by low volatility and relatively stable prices for the rest of 2021. While world crude demand is rising on vaccination successes, crude supply appears adequate. With U.S. and world GDP growth potentially facing supply constraints, we see a near balance between downside than upside risks: WTI will generally trade within a $60 – 70/barrel range for the remainder of the year, although crude prices could spike in the next couple of months as part of a secular rise in inflation. We expect any surge in prices to be temporary, however, and expect macroeconomic growth to clock in at around 5%, less than what we previously hoped but still highly supportive of energy demand. If the U.S. can resolve some of its supply chain constraints within the next month or two, however, we will revise our expectations higher.

For over a year, we've consistently said that the macroeconomy is determining energy markets, and that the COVID-19 novel coronavirus drives the macroeconomy. That's still true – but the situation is changing rapidly due to highly effective and safe vaccines. Within the next three months, barring a dangerous new variant, COVID cases will continue to fall in nearly every market and macroeconomic uncertainty will diminish. While there is some uncertainty regarding inflation (and whether the U.S. will face a one-off bout of inflation or something nastier and more persistent), "macro" factors are increasingly less important to energy markets. Microeconomic factors (which we'll define as inventories, breakeven costs, transportation costs, etc) are always important, of course, but they will once again become ascendant if, as expected, the coronavirus begins to permanently recede later this year in nearly every market.

Crude demand and a disappointing April jobs report

The U.S. economy only added 266,000 jobs according to the latest jobs report, well below expectations of 1 million. The reasons for the shortfall are hotly debated and beyond the scope of this article. Needless to say, however, the disappointing jobs report makes 2021 U.S. annual GDP growth of 6%+ much less likely.

The jobs report ran counter to otherwise remarkably good news. U.S. and European COVID-19 cases are falling sharply on vaccines and favorable, outdoor-friendly weather; vaccine production is increasingly rapidly; Western and Indian vaccines have thus far proven effective against all variant strains; and the world is deploying nearly 24 million vaccine doses every day – a rate that will likely double or even triple by the end of the year. While another strain could emerge, the world appears to have reached the end of the beginning in the fight against COVID.

Supply constraints are weighing on the U.S. economic rebound. Many economists believe that labor supply has been constrained by COVID dynamics, overly generous unemployment benefits, and childcare/closed schools resulting in more burdens for parents; other economists disagree. Whatever the case, economists are in near-universal agreement that shortages of some commodities and supplies are constraining growth. Microchip shortages are causing automakers to shutter plants, while soaring softwood lumber costs are partially responsible for surging housing prices. Inflation risks seem manageable, for now, but that could change.

We believe, at least for now, that 2021 U.S. annual GDP growth will more likely come in close to 5%, down from expectations of 6%+ earlier this year. If the U.S. can accelerate its vaccination campaign and/or resolve its labor, softwood lumber, and microchip supply-chain issues, then growth could rebound sharply. Since energy demand is highly correlated with macroeconomic growth, we're scaling back some of our optimism about 2021 crude exports and gasoline demand – although we still think it will be an excellent year for the U.S. oil and gas complex.

Crude supply: OPEC+

OPEC+ production is rising as the cartel struggles to maintain production quota compliance. According to S&P Platts, OPEC+ oil quota overproduction currently stands at about 3.3 Million Barrels per day (MMBPD). More international supply will likely come online in the next few months. Iran production has already reached 2.2 MMBPD, even though exports remain (for now) at around only 0.65 MMBPD. According to Argus Media, if sanctions are lifted, Iranian crude exports could reach 2.5 MMBPD, adding up to 1.8 MMBPD of medium and heavy crude grade supply to world markets. Similarly, Venezuela's troubled oil industry may receive sanctions relief in the months ahead. Sanctions relief on Iranian + Venezuelan volumes could add approximately 1.5 – 2.0 MMBPD of crude supply in the coming months. Sanctions relief would have only an indirect impact on Permian and U.S. production, since U.S. crude grades tends to be lighter and sweeter than Iranian and Venezuelan production.

Coal News:

Updated analysis of Pa. carbon-cutting rule shows emissions decline, grim outlook for coal plants—Pittsburgh Post-Gazette

Report: Coal's decline hits Powder River Basin mines differently –WyoFile

Coal industry feels heat as Germany doubles down on climate goals— FT

Utah's largest coal plant converting to [green] hydrogen power—ABC 4

Australian grid used the least coal on record last summer as renewables shone—Hellenic Shipping

LNG News:

France's Total declares force majeure on Mozambique LNG project—S&P Global

Venture Global says Zachry-KBR JV to build Plaquemines LNG plant—Reuters

Uniper plans green hydrogen hub instead of LNG terminal at German North Sea port—Recharge

'Seismic shift' at FERC could kill natural gas pipelines [and LNG approvals] —E&E News

Crude outlook: smoother ride, micro is (almost) back (continued)

U.S. crude: a comeback – but constrained

United States crude production will likely grow this year, albeit not to the same degree witnessed in recent history. We expect crude production to grow to 11.3 – 11.5 MMBPD by 4Q2021, up from the ~11 MMBPD of production reported by the EIA in recent weeks. A few uncertainties will determine the trajectory of U.S. crude. The first, of course, is the U.S. economic recovery. If 2021 annual GDP growth reaches 6%+ then 4Q2021 crude production will almost certainly be closer to 12 MMBPD. Second, production from the Permian and other basins is becoming "gassier" as US producing wells age. According to S&P Global Analytics, current gas-to-oil ratios stand at 3 Mcf per barrel of oil, up from pre-pandemic levels of about 2.5 Mcf/b. "Gassier" production will limit crude oil production – particularly if producers turn to flaring. This brings us to our third uncertainty: how much will ESG constrain production? We think that ESG is here to stay: even in a best-case scenario, investors will be highly wary of returning to the sector unless ESG concerns are adequately addressed

Smoother, more certain

The gradual reduction of COVID in U.S. and world markets is likely to significantly reduce crude price volatility. The next month or two will tell us a lot: if the U.S. can resolve its supply chain constraints, accelerate vaccination uptake, and return to "normal," crude production and prices could surprise on the upside. We'll know more, soon.

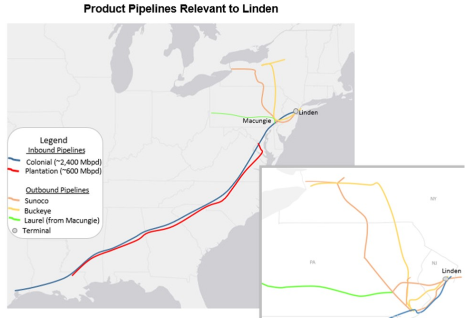
Colonial Pipeline Outage: First Thoughts

By now, you've probably read about the Colonial Pipeline, which experienced a ransomware cyberattack and was forced to shut down temporarily. Colonial is a ~2.4 Million Barrel per Day (MMBPD) capacity pipeline shipping crude products from the Gulf Coast to the Eastern seaboard. After experiencing a debilitating cyberattack on May 6th, Colonial was able to begin restoring services on May 12th. We expect this temporary outage to have relatively few long-term effects – unless, of course, the outage returns. Still, the Colonial Pipeline cyberattack is a warning about infrastructure resilience and will likely contribute to greater uptake of distributed energy systems.

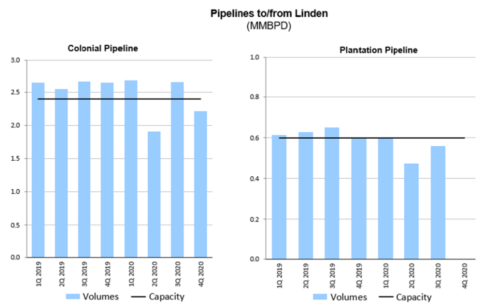
Colonial Pipeline: landscape and utilization

Colonial Pipeline and the Plantation Pipeline deliver petroleum refined products from production and refining centers in the Gulf Coast to consumers in the southeast and northeastern United States. Colonial Pipeline is owned by a consortium of domestic and international investors; the ~0.6 MMBPD Plantation PL is owned by Kinder Morgan.

Product Pipelines Relevant to Linden



Both pipelines are highly utilized. According to FERC data, both Colonial and Plantation have more than fully utilized their nameplate capacity, except during the COVID-19 shutdown. We've heard and read that the pipelines were running in excess of name-plate capacity immediately before the attack suspended operations.



Source: Enkon Research and Analysis, Investor presentations, SEC filings, FERC, EIA

Near-term implications for crude and crude products

Since pipeline services have already been restored few impacts are expected. Unsurprisingly, there were reports of gasoline shortages and even panic-buying in Georgia, North Carolina, and Virginia. National retail gasoline prices rose to their highest prices since 2014 and exceeded $3/gallon, although the restoration of the pipeline has tempered prices.

Medium and Long-term implications

Will non-specialists remember the Colonial Pipeline incident within a year? Probably not – but the implications of the cyberattack will probably resonate with industry leaders, policymakers, and some high-information residential and commercial consumers. The Colonial Pipeline cyberattack will likely only accelerate more emphasis on resiliency, distributed energy resources, and behind-the-meter generation.

Residential customers were already turning to residential solar + storage solutions after the ERCOT disaster. There are also alarming reports about grid blackouts in the summer; we are also concerned about ERCOT meeting August peak electricity demand. Due to even more headlines about failing infrastructure, we expect that more residential customers and some small businesses will create their own energy independence. Don't sleep on this trend: Tesla is now requiring all new solar customers to pair Powerwall batteries and solar purchases. Tesla's 13.5 kWh Powerwall 2 isn't economical or necessary for most users, but further technology advances and consumer adoption are highly likely.

In sum, the most recent cyberattack will mildly accelerate distributed energy resources uptake. The cyberattack on the Colonial Pipeline will also increase IT costs for other oil and gas operators. Service disruptions are very expensive for the industry, and regulators have been warning the industry about IT risks for over a decade. New legislation may be forthcoming, which could raise compliance costs. The impact of the cyberattack appears limited but will likely, at the margins, encourage businesses, investors, and consumers to adopt distributed energy resources.

"The impact of the cyberattack appears limited but will likely, at the margins, encourage businesses, investors, and consumers to adopt distributed energy resources."

Utility & Infrastructure News:

Major Duke investor calls for utility to break into 3 companies, unlock up to $15B in shareholder value—Utility Dive

Electric utilities try for smooth customer experience during transition to variable rates—Bakersfield.com

New Mexico utilities prepare for electric vehicles—NM Political Report

Green Hydrogen:

Green hydrogen venture aims for $1.50/kg for LA by 2030—pv mag

Oman's OQ and Partners Plan 25-Gigawatt Green Hydrogen Plant—Bloomberg

Koch units sign on to green hydrogen project slated for Louisiana—pv mag

Western Australia sets 'aggressive' 200GW green hydrogen target—Upstream Online

Green Hydrogen Plants Scale Up in North America—ENR

Commodity Outlook (90 days out)

COVID and energy demand: things are looking better
After over a year of social and economic restrictions due to the COVID-19 novel coronavirus, life is returning to normal in the United States as more and more individuals take life-saving vaccines. U.S. cases have fallen dramatically, and the vast majority of COVID cases are now from individuals who have not taken the vaccine.

A study from Cleveland showed that 99.7% of caregivers who tested positive were not fully vaccinated, while 99.75% of 4,300 patients admitted to Cleveland Clinic hospitals between January 1st and April 13th were not fully vaccinated. More and more U.S. employers, (including, notably, some Houston-area hospitals), are beginning to require vaccines. While a new variant could emerge, we are increasingly confident that the domestic and international vaccine drive will tame COVID, even if it is never entirely eliminated. Going forward, we do not plan to include the "COVID and energy demand" section in the Commodity Outlook: as COVID's importance fades we will increasingly analyze the "micro" fundamentals of energy markets.

Crude Oil Market Movers:
WTI and Brent per-barrel prices remain, as of this writing, in the mid-to-upper $60s. As we wrote above, we believe WTI prices will remain range-bound from about $60-70 barrel for the remainder of the year (although a near-term inflationary spike is possible).

A near-term spike in oil prices, while possible, likely won't be enough to convince investors to return to the shale patch. In an FT report from last month (which we'll link to again—it's worth your time), private equity funds are exiting the sector due to limited returns and ESG considerations. While some valuing-seeking investors might take a harder look at the shale patch if current and projected earnings rise, the sector's required rates of return on capital projects, or hurdle rates, are likely to remain permanently higher. Barring some major technological breakthrough the U.S. will likely never see 14 MMBPD production—or possibly even 13 MMBPD. There's a decent probability that the U.S. has already experienced "peak oil."

But the news isn't all bad for the O&G sector. The next few years will likely see very strong domestic and international demand for U.S. crude and refined products.

Refined Products Market Movers:
The Colonial Pipeline cyberattack and outage could have some minor (albeit significant) impact on future medium and long-term energy consumption patters, as discussed in our article above. In the near-term, however, the Colonial Pipeline's outage had only a localized but disruptive effects in the U.S. southeast, as many consumers panic-bought gasoline, leading to shortages and rising gasoline prices. Gasoline prices and services have more or less normalized across the southeastern U.S., although driving levels almost surely declined last week.

Work-from-home (WFH) uptake will have modest implications for gasoline consumption this summer—and beyond. Gallup reports that 44% of all current U.S. remote workers prefer to continue their work arrangements; 39% want to return to the office. Overall, about 23% of all workers (including remote and non-remote) would prefer to stay remote, if given the option. The Atlanta Federal Reserve and the University of Chicago's Survey of Business Uncertainty finds that "paid working days at home as a percent of all working days" will total about 14.6% after the pandemic, up from 5.2% in 2017.

Work-from-home could impact gasoline demand: commuting vehicle-miles-traveled (VMT) accounted for about 28% of all VMT in 2017, according to the U.S. Department of Transportation. Obviously, many variables impact WFH and gasoline demand, but our back-of-the-envelope calculations suggest that gasoline demand could permanently fall by about 200,000 barrels per day, or about 2-3% from a pre-pandemic baseline —all things being equal.

Of course, other elements aren't equal. Consumers have cut their public transit ridership in half, at least for now, and are increasingly driving used cars, which are at historically high prices (due to demand and chip shortages for new vehicles). We suspect WFH and car ownership trends are roughly cancelling each other out, for now. After the pandemic is over, however, we suspect that consumers will slowly ditch their cars and return to public transit.

Natural Gas and LNG Market Movers:
As we discussed above, we are relatively bullish on natural gas, barring some exogenous event(s). Domestic demand could reach records this year, domestic inventories are not unduly high, Mexican demand is rising, European inventory levels are supportive of LNG exports, and LNG netbacks to Asia and Europe are very strong. ESG concerns will likely keep investors/new production on the sidelines and we'll likely see $3/MMBtu Henry Hub prices for the remainder of the year—perhaps even higher or much higher.

NGL Market Movers:
The vast majority of ethylene crackers are running at max utilization, but ethane inventories are still high due to Winter Storm Uri.

We expect ethane to trade under 25 cpg for 2Q2021 but is likely to trade at or above 30 cpg by the end of 4Q2021—the USGC is still working through inventory.

Propane price fundamentals remain strong: inventories are well below year-ago levels and 5-year averages, while netbacks have generally been supportive. As we enter the third quarter we expect to see a price war between domestic and export buyers.

Many international LPG markets are demanding high levels of butanes. This dynamic, along with strong USGC olefins demand, will provide fundamental support for nC4 to trade at ~70% of WTI for the rest of 2Q2021. We believe C5+ will be 90-95% linked to crude movements.

Electricity/Renewables:
Summer, especially in August during peak temperature/electricity demand, could be a VERY interesting time in electricity markets. Western states are already warning that grids may lack capacity to meet demand, transmission lines could threatened by fires, and droughts could limit hydropower generation. We're also not confident in ERCOT's grid management capacities. This summer could prove to be a turning point for electricity markets.

"We can confidently say in April 2021—barring the emergence of a new variant or some other exogenous event—overall energy demand will get better before it gets even better."

Solar and Wind News:

Silicon for batteries moves to commercial production—pv mag

Guggenheim Solar Index: PV industry facing headwinds—pv mag

Price pressures may delay 15% of utility-scale solar projects this year, Roth Capital warns—pv mag

More solar modules are being shipped at lower prices, EIA data shows—pv mag

Is solar manufacturing a highly automated business? - FT

NGL News:

Indonesia to stop LPG and fuel imports by 2030- official—NASDAQ

FEATURE: Soaring VLGC rates unlikely to spark fresh wave of new-buildings—S&P Global

Could EPA Regulate Methane And Ethane As Volatile Organic Compounds Under The Clean Air Act? - JD Supra

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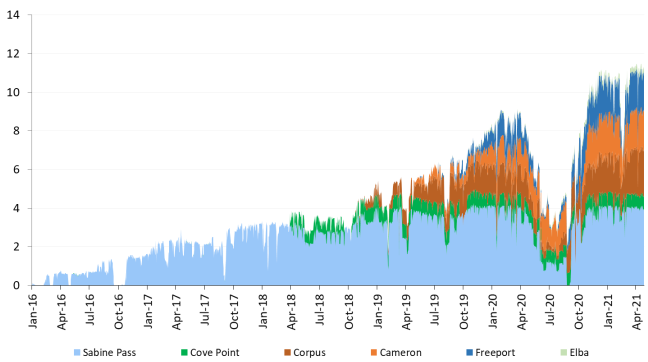
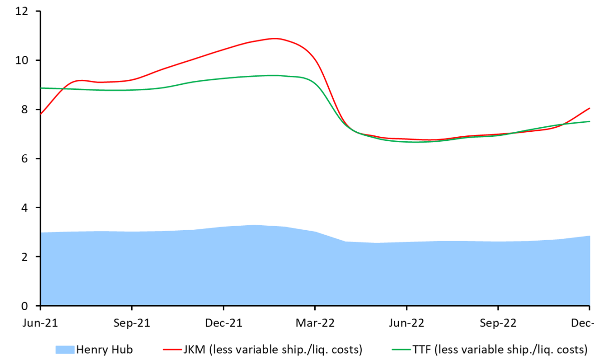
Key Market Dashboards

Firm Feed Gas Receipts into U.S. LNG Terminals



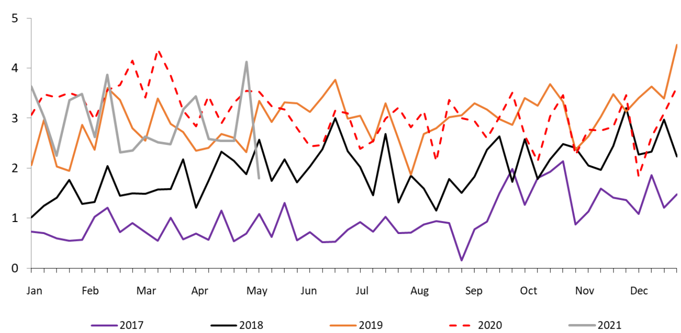
LNG Netbacks to U.S. (on Cash Basis)
($/MMBtu)



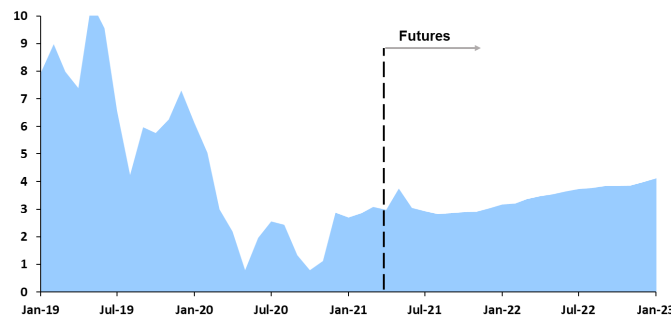
Let the good times roll: U.S. LNG exports are expected to maintain near 100% utilization for the next year —keep an eye on hurricanes though

Very strong netbacks, particularly in winter months. Sabine Pass T6 and Calcasieu Pass surely attempting to ship cargoes in winter

U.S. Crude Oil Exports
(Million Barrels per Day)



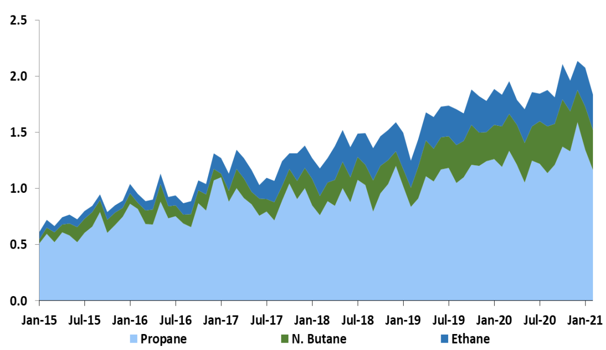
Brent—WTI Spread
($/Barrel)



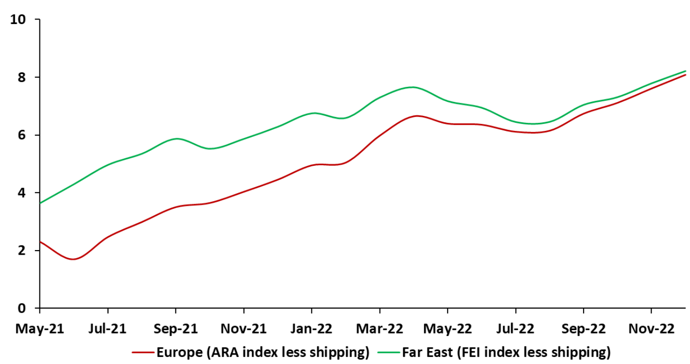
U.S. crude exports could increase in future months due to vaccine drives in export markets—but domestic refinery runs likely to also grow

Differentials are not highly supportive of export arbitrage, although shipping could be volatile later in the year

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



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

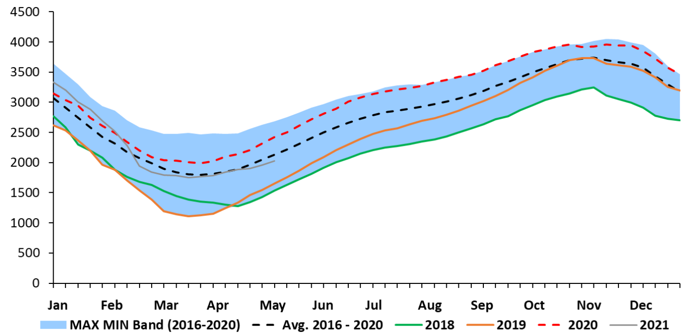


International arbs are supporting exports despite strong domestic demand pull; Tug-of-war between domestic and export buyers certain

International LPG netbacks are expected to rise over time given high demand pull from Asia (despite COVID induced softness in India)

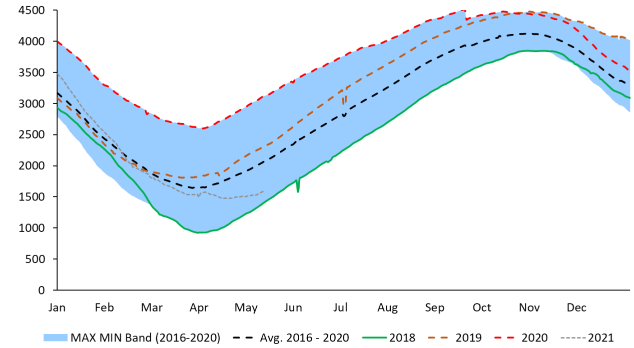
Key Market Dashboards

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



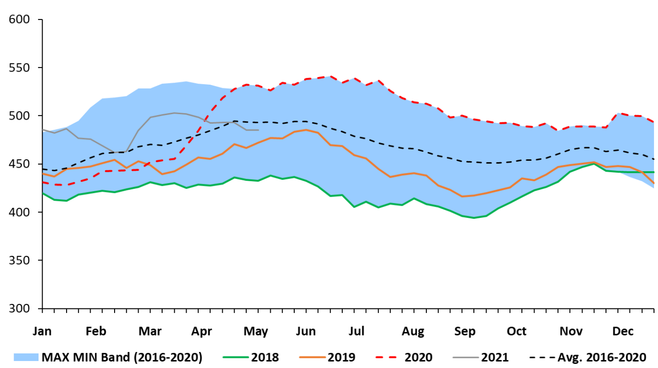
Gap between 2019 and 2021 inventory levels is declining, supporting Henry Hub prices

European Natural Gas in Storage
(Billion Cubic Feet)



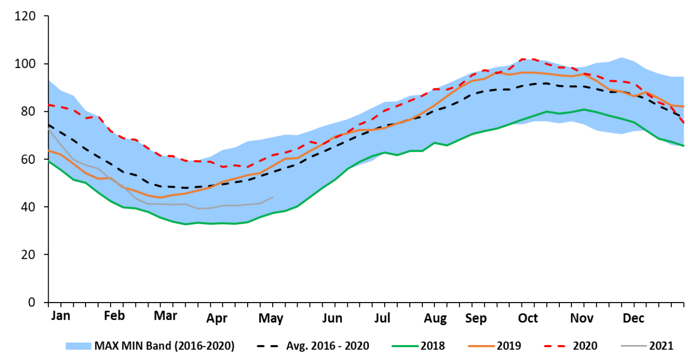
Low European (EU + Ukraine) inventory levels are supporting U.S. LNG exports

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



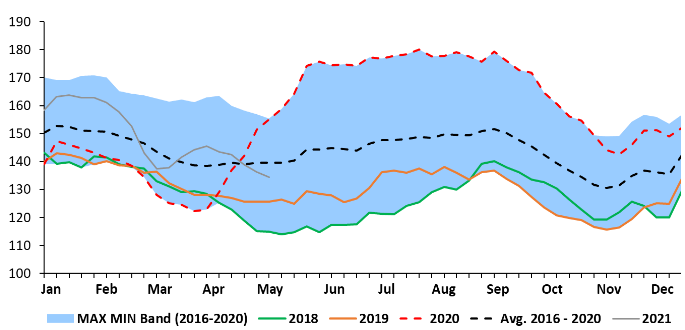
The return of Colonial Pipeline, rebounding auto driving demand, and refinery optimism could send crude inventories lower

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



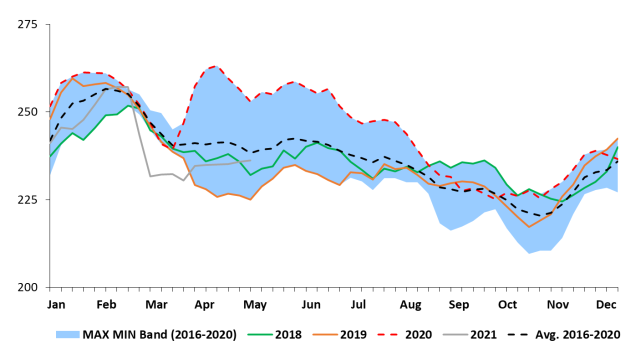
U.S. propane inventories are supportive of prices as domestic + international demand remains strong

U.S. Diesel Storage Inventory
(Million Barrels)



Diesel consumption is already above 2019 levels with inventories at or around the 5-yr average

U.S. Gasoline Storage Inventory
(Million Barrels)



Wild ride for gasoline inventories set to continue as driving season demand looks very robust post vaccination

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

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	
Barbers Hill (Mont Belvieu)	Hull
Stratton Ridge	Spindletop
Markham	Fannett
Clemens	Sour Lake
Pierce Junction	Boiling
West/Panhandle Texas	East Texas

Louisiana Cavern Coverage	
Sulphur	Bayou Choctow
West Hackberry	Napoleonville
Arcadia	Sorrento
Pine Prairie	Venice
Anse La Butte	Section 28

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.

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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