



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

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Refiners' Delight: 2021 looking good

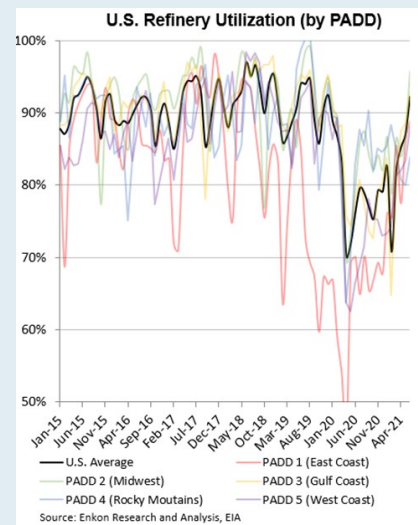
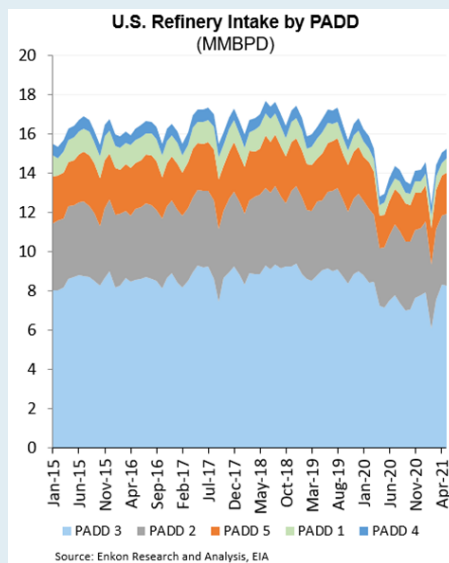
U.S. oil refiners largely managed to survive the COVID-19 demand shock. Sometimes, as Dunkirk proved, survival is victory. With the worst of COVID seemingly behind the U.S. due to widespread uptake of safe and effective vaccines, economic demand and mobility are approximating pre-pandemic levels. While COVID variants continue to pose a risk to the U.S./world economic and public health recovery, we remain optimistic that vaccines will continue to enable a return to "normal" life – and better conditions for refineries. Even so, PADD 1 refineries in the U.S. east coast face serious problems that predate COVID.

The U.S. refinery complex has stabilized

The U.S. refinery complex is largely centered in the Gulf Coast (PADD 3) and the Midwest (PADD 2). In 2020, the two regions accounted for approximately 54% and 24%, respectively, of all U.S. refinery intake. As you can see from the chart below, refinery inputs have gradually increased over time and are slowly returning to pre-pandemic levels. Indeed, PADD 2 throughputs are exceeding same-period 2019 levels, as demand for crude products (such as gasoline, diesel, and jet fuel) is returning across the country.

Demand for crude products is generally rising across the board: the TSA [reports](#) that jet plane passenger throughput has exceeded 2019 same-period levels some days in July; weekly gasoline demand reached an all-time high in early July, according to the EIA; and YTD diesel demand is roughly flat from 2019 levels. The Delta COVID-19 variant circulating in the United States and abroad will likely dampen near-term domestic and international sales, but we suspect that products demand will continue to improve as vaccinations reach more and more individuals.

An examination of refinery utilization rates aligns with this narrative: for the first time since January 2020, U.S. refineries are operating above 90% utilization rates, with Midwest facilities running above 96%. There are two elements in the rebounding utilization story: growing demand – and closing capacity in the East Coast.



Trouble on the East Coast

The past decade has been rough for East Coast refineries, and their future isn't bright. Today, there are just 7 operable refineries in PADD 1, according to the EIA, down from 14 in 2011.



“The northeast will likely substantially reduce its consumption of petroleum products in the coming decade. New York and New England are perhaps the two regions in the country most inhospitable for internal combustion engines.”

Green Hydrogen:

[Australia rejects application to build world's largest green hydrogen project—S&P](#)

[Shell starts up Europe's biggest PEM electrolyser at German refinery—Hydrogen Economist](#)

[IOC to build India's first green hydrogen plant—Times of India](#)

Crude Oil News:

[US Treasury order extends Citgo protection from Venezuelan creditors—S&P Global](#)

[Europe's gasoline, diesel car sales slump to 60% of market as EVs gain ground—S&P Global](#)

[GM, Ford each unveil new EV investments for next decade—S&P Global](#)

[Commodity trader Freeport faces U.S. bribery probe, sources say—Reuters](#)

[Oil Demand Is Surging, Just Not How You Might Think—Bloomberg](#)

[U.S. mulls crackdown on Chinese imports of Iranian oil—Reuters](#)

Refiners' Delight: 2021 looking good (continued)

Throughputs are off considerably, as the region is struggling to refine even 0.7 million barrels per day (MMBPD), down from 1.1 MMBPD as late as May 2019. East Coast utilization rates reached a shocking 45% in April 2020. While the EIA estimates utilization rates have recently recovered to nearly 90% amid capacity closures (and we expect PADD 1 utilization rates will remain elevated for at least 2-3 years), there are some dark storm clouds on the horizon.

The northeast will likely substantially reduce its consumption of petroleum products in the coming decade. New York and New England are perhaps the two regions in the country most inhospitable for internal combustion engines. Public transit is a viable option for the vast majority of New York city residents, while New Jersey is the country's densest state. Regional voters and policy-makers are staunchly pro-renewables and opposed to hydrocarbons: New York City is instituting congestion pricing; local and state governments are encouraging electric vehicle adoption. We believe PADD 1 EV adoption will dramatically accelerate, particularly in the latter half of the decade.

Still, the northeast's pace of transition is a major wild card. COVID-19 has led to substantial increases in automobile purchases and driving, while consumers pared back transit ridership. According to the U.S. Department of Transportation, public transit riderships have fallen by more than half from pre-pandemic levels. We expect public transit ridership to continue to rebound as more individuals are vaccinated, but a return to pre-pandemic levels is not guaranteed. (By the by, if you're interested in our outlook for PADD 1 EV uptake, public transit ridership, and their implications for petroleum products demand, drop us a line at info@enkonenergy.com).

Refineries have stabilized, PADD 1 in trouble over the medium-term

With the worst of COVID seemingly behind us, the refining complex's near-term prospects are bright. U.S. consumers are returning to the pump, international demand for U.S. finished petroleum products appears to be gradually returning to pre-pandemic levels, and the shuttering of some excess domestic refining capacity is a boon to the refineries that survived the 18 months. In the near-term, U.S. refineries will likely continue to enjoy high utilization rates, although East Coast refineries will face growing structural pressures.

EU Methane Standards and U.S. LNG Exports

We were [shook last October](#) when Engie announced that it had not only scrapped a proposed SPA with NextDecade, but it was backing out due to fears surrounding NextDecade's methane emissions. The implications for U.S. LNG were potentially seismic: the European Union is arguably the LNG industry's most important market.

While we're not as startled by the [EU's newest proposed curbs on methane](#), we continue to believe that the EU's ESG turn will prove highly challenging for U.S. LNG producers. If the EU passes more stringent methane regulations, existing U.S. LNG exporters will almost certainly face higher costs and lower netbacks to Europe. Proposed U.S. LNG projects will face even greater hurdles, should the proposed regulations move forward. Still, it's not all bad news for U.S. LNG exporters. Stricter methane standards will largely disadvantage gas in fuel-on-fuel competition, but U.S. LNG may be able to outcompete other natural gas suppliers if upstream producers can lower their methane emissions profile.

EU Climate Policies and Methane

The EU is seeking to reach net zero greenhouse gas (GHG) emissions by 2050, and plans to cut 55% of GHG from 1990s levels. Importantly, the EU plans to increase renewable energy's share of power consumption from [~32% currently to about 40% by 2030](#). Natural gas – and U.S. LNG imports in particular – may be displaced as the EU shifts to a zero GHG posture.

There is increasing transparency and environmental concern surrounding methane emissions. Due to cost reductions for satellites, non-governmental organizations (NGOs) such as the Environmental Defense Fund, or EDF, can affordably and accurately monitor methane emissions from space. While methane persists only a short time in the atmosphere, there is a growing scientific consensus suggesting that [methane emissions are larger than previously thought](#). Moreover, since methane is an extremely potent greenhouse gas, environmental groups and regulators are increasingly directing their attention to this form of emissions.

Greater scrutiny of methane could pose risks for U.S. LNG exporters. Some U.S. basins are notoriously methane emission intensive. The Bakken, for instance, has [acquired a reputation for extensive flaring and even venting](#). European offtakers and regulators will surely continue to scrutinize the entire U.S. LNG complex, from upstream production all the way to liquefaction and transport – wellhead to burner tip.

Or will U.S. LNG outcompete Russian Pipeline Natural Gas?

But we're not convinced that U.S. LNG will lose the most from stricter methane emission standards. First, the U.S. O&G complex has proved highly innovative and will very likely find ways to reduce methane emissions under a proper incentives structure. Second, Russian natural gas – even shipped through pipelines – may have a worse methane emissions profile than U.S. LNG. In 2018, the latest full-year figure according to the World Bank, Russia produced 36% more methane than the U.S. on an absolute basis. Gazprom has also come under fire after it produced the most severe release of methane attributed to O&G since September 2019. We'll wait and see for more data collection and analysis on each country's methane profile, but it's not clear as of this writing that Gazprom's methane profile will be any better than U.S. LNG's.

EU Methane Standards and U.S. LNG Exports (continued)

In fact, U.S. LNG could conceivably become more competitive relative to many of its intra-fuel competitors.

EU renewables are incoming, but natural gas is still needed

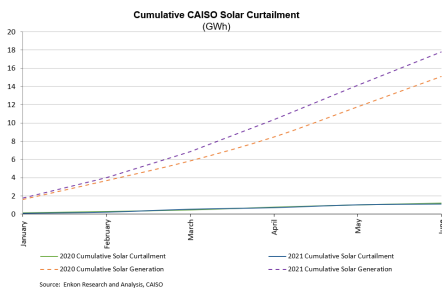
The EU's new methane regulations pose risks, potentially severe ones, to U.S. LNG exporters. As the cost of producing methane rises, EU and EU-area clean energy solutions will become more competitive vis-à-vis natural gas. Still, natural gas and U.S. LNG may find a role as a needed fuel for a decade – or perhaps even much longer. Stricter methane restrictions will raise the price of coal, natural gas is a highly reliable baseload fuel source, and the EU – particularly Germany – is skeptical of nuclear power. Moreover, U.S. LNG exports may ultimately prove to be less carbon intensive than Russian pipeline natural gas. We'll keep tracking developments in this space.

CAISO curtailment falling on batteries?

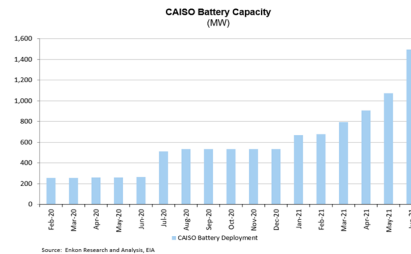
There is some limited evidence that California's solar "curtailment" problem is receding on battery deployment. Curtailment, or the involuntary reduction of output of solar or wind generation due to system oversupply, could restrict renewables penetration. Indeed, most renewables and electricity experts continue to warn that solar penetration will face hard ceilings without long-duration storage availability. It seems, however, that CAISO is successfully reducing solar and wind curtailment – at least for now. While batteries are only one variable in extraordinarily complex electricity markets, California's experience suggests that the rest of America could soon see more at-scale battery deployment, mitigating renewables' "intermittency" problems and increasing their share of the fuel mix. We'll know more after data from California's low baseload Autumn comes in.

California's Solar Curtailment Trends

According to CAISO statistics through June, YTD solar generation is up 18% while YTD curtailment is down by about 9%. In other words, solar operators have been able to produce more with fewer curtailments.

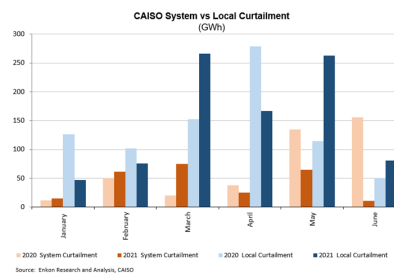


Why are curtailments down? Large-scale battery deployment is having some impact, although the magnitude is unclear. CAISO battery deployments are up nearly 500% since January 2020 and now total about 1.5 GW, [according to the EIA](#) – although much of the build-out has occurred only in recent months.



Still, electricity markets are enormously complex and multivariate. Vaccines and weather patterns sharply lifted [load demand from 2020 levels](#), peakload increased, and hydropower production fell. These factors also led to reduced curtailment. While we can confidently assert that battery deployment is reducing curtailment, we may have to wait for a sense of its magnitude until data from the low-demand months of October and November come in.

Curtailments are categorized into either systemwide curtailments (i.e. due to oversupply) or localized curtailments (i.e. due to transmission congestions). We'll be keeping a close eye on CAISO's autumn "system curtailments," which will be closely linked to battery build-outs.



More on the way?

"Long-duration" daily electricity storage would be a game-changer for the power sector and renewables, full-stop. If batteries are able to economically store energy for more than 8 hours, electricity markets could better align renewables' peak generation times with peak demand. Solar energy generation tends to peak around noon; wind output varies by market but tends to reach its apex in the 2 AM. Electricity demand, however, tends to peak around 6 PM.

[Form Energy claims to have created an iron-air battery](#) that will enable economical, long-duration electricity storage by 2025. We'll wait and see if the technology becomes operational, but if it does achieve commercial scale the implications will be massive. Economical, long-duration battery storage could sharply reduce (and possibly even eliminate) systemwide curtailment. It could also reduce local curtailment in some contexts. These factors would go a long way towards [easing CAISO's solar value deflation problem](#) and enabling more renewables penetration.

In the meantime, we'll continue monitoring the relationship between CAISO battery deployment and curtailment. We expect CAISO's experience will have major relevance for other electricity markets, particularly ERCOT. Stay tuned.

Coal News:

[Thermal coal prices soar as demand for electricity rebounds—FT](#)

[Plumes of Potent Methane Gas Spotted Near Australia Coal Mines—Bloomberg](#)

[China's Heat Wave Is Pushing Coal Prices Toward Record Level—Bloomberg](#)

[Despite Climate Concerns, Germany Bulldozes Land To Expand Coal Mines—NPR](#)

LNG News:

[US LNG rebrands with vows to be greener—Argus Media](#)

[Russia to build first LNG-powered icebreakers for Arctic sea route—Reuters](#)

[Column: Japan's power plan will rattle coal, LNG exporters, especially Australia—Reuters](#)

[The Carbon-Neutral LNG Market: Creating a Framework for Real-Emissions Reductions—Erin Blanton and Samer Mosis for Columbia CGEP](#)

Commodity Outlook (90 days out)

The July Heat Dome

By the time you're reading this, Texas and much of the U.S. will very likely be experiencing the most severe weather event to hit the country since February's Winter Storm Uri. [According to the Washington Post](#), temperatures in Dallas, Bismarck, Phoenix, and Las Vegas will exceed 100 degrees Fahrenheit. We expect that the heat dome event(s) will carry enormous implications for commodity markets in general and electricity markets in particular.

Natural Gas Market Movers:

The heat dome (or heat domes!) will be the biggest game in town for natural gas for at least the next month. Each heat dome will send U.S. cooling degree days higher, providing potentially huge support for Henry Hub prices.

Or not. Natural gas' share of the power sector fuel mix has disappointed a bit this summer, largely due to fuel-on-fuel competition with coal and renewables. Despite y-o-y growth in electricity consumption this summer on vaccination success, natural gas power sector demand is flat or even down.

Still, natural gas consumption will likely rise along with temperatures. Record temperatures will likely further reduce hydropower inventories and generation, necessitating natural gas burn for power use, particularly along the West Coast. At the same time, however, LNG feed gas flows might actually fall if offtakers exploit arbitrage opportunities and "sell back" into the domestic market. On balance we expect natural gas demand and prices to rise—perhaps sharply—in July and August.

Electricity Market Movers:

The next few weeks could determine the future of electricity markets. If any ISO or RTO experiences a catastrophic failure on par with ERCOT's February disaster, seismic changes are likely. Investors, regulators, and legislators would almost certainly come under intense public pressure to respond to a deadly electricity outage. If the experience of Winter Storm Uri is suggestive, hydrocarbon and renewables producers will blame one another for any outages. The public policy implications of that debate would be enormous.

As mentioned above, hydropower resources will be stretched amid potentially record-setting temperatures and droughts. This will benefit all alternative fuel sources: natural gas, coal, nuclear, and wind/solar.

Wind and solar performance will be carefully scrutinized. "Systemwide" (economic) curtailments of renewable energy are already rare during peak summer months, and will likely fall to minimal levels amid record-setting temperatures.

Crude Oil Market Movers:

The COVID-19 "Delta" variant and gradual increases to OPEC+ supply are dampening WTI and Brent prices. The next few weeks will be brutal for much of the world, as the most transmissible COVID strain appears set to overwhelm healthcare capacities across many regions. Rising cases will very likely weigh on crude demand, perhaps even sharply.

We expect crude demand to rebound favorably in the coming months—with a MAJOR caveat.

Hundreds of millions of new COVID-19 infections could very well incubate a dangerous variant that "escapes" existing vaccine protections. Most public health experts believe the probability of vaccine escape is low, but it still presents a major risk to the energy outlook.

Venezuelan and Iranian oil volumes still face significant U.S. sanctions, although the U.S. recently approved some LPG exports to Venezuela. The U.S. and Venezuela will likely continue to rollback bilateral tensions, giving some support to world production volumes.

A return to triple-digit crude oil prices appears highly unlikely in the near-term: Chinese economic growth may be stalling, the Delta variant is ripping through unvaccinated portions of the world, and crude supply is rebounding.

Refined Products Market Movers:

PADD 4 (the U.S. Rocky Mountain Region) is facing very low motor gasoline stocks. Still, the region's crude inventories are high and refinery utilization lags most of the U.S. Notably, PADD 4 and PADD 5 gasoline price differentials are at their lowest point since 2014.

We expect U.S. products demand to resume its upward trajectory after "Delta" variant cases subside. Assuming no new "breakthrough" variants occur, even most COVID-cautious consumers are likely to treat the coronavirus as an ongoing fact-of-life that can be mitigated through vaccination.

LNG Market Movers:

The next few weeks could be slightly rocky for LNG, due to developments in U.S. natural gas markets. If record U.S. temperatures send HH spot prices sharply upward, exports netbacks could face pressure, and many offtakers will be tempted to sell into the domestic market. Another major electricity outage could pose major operational risks to some LNG export terminals, particularly Freeport LNG's facility, which uses electric motors for its compressors.

Perhaps more worrying than a heat wave is another extreme weather event: hurricanes. [Forecasters are predicting 3-4](#) major hurricanes this year, although they anticipate a more moderate hurricane season than 2020. Barring hurricanes, some major electricity disruption, or some other exogenous event, we expect that U.S. LNG facilities will continue to operate at close to 100% utilization.

NGL Market Movers:

Ethylene crackers are running at max utilization, and balances are tightening. Ethane is already trading above 30 cpg and may have some room to run.

Propane fundamentals remain strong as prices trade above \$1/gal. Exports have ticked down in recent weeks amid relatively weak arbs.

Recent declines in crude prices could weigh on butane, but butane inventories appear to be limited and are supportive of prices.

"The next few weeks could determine the future of electricity markets. If any ISO or RTO experiences a catastrophic failure on par with ERCOT's February disaster, seismic changes are likely."

Natural Gas News:

[Henry Hub gas tops \\$4 as hot weather fuels concern over supply constraints, storage—S&P Global](#)

[U.S. natural gas exports to Mexico established a new monthly record in June 2021—EIA](#)

[City considering ban of natural gas appliances in existing homes—Daily Post \(Palo Alto\)](#)

[DeWine signs bill blocking Ohio cities from banning natural gas—Ohio Capital Journal](#)

Renewables News:

[Curtailment Tracker: Solar, wind generation curtailments fall 55% year on year—S&P Global](#)

[World's first offshore green hydrogen project on an oil platform gets go-ahead—Recharge](#)

[Malta, Siemens partner to develop heat pump for potential 20,000 MWh storage project—Utility Dive](#)

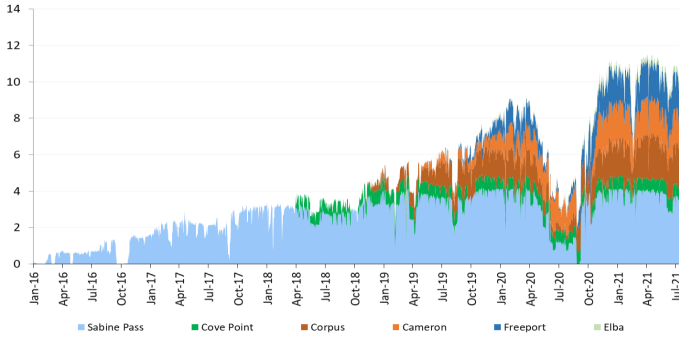
Photo credits:

Refinery photo from [WClarke](#)

All other photos in public domain

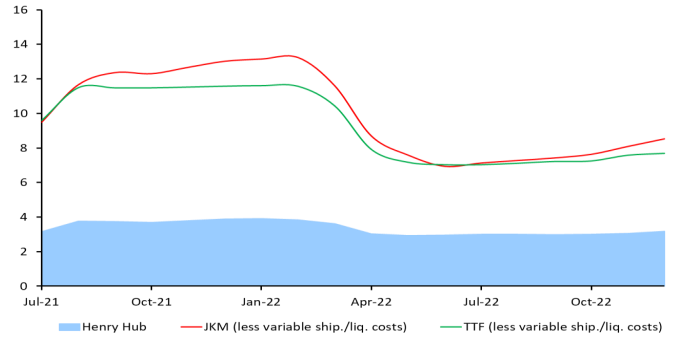
Key Market Dashboards

Firm Feed Gas Receipts into U.S. LNG Terminals



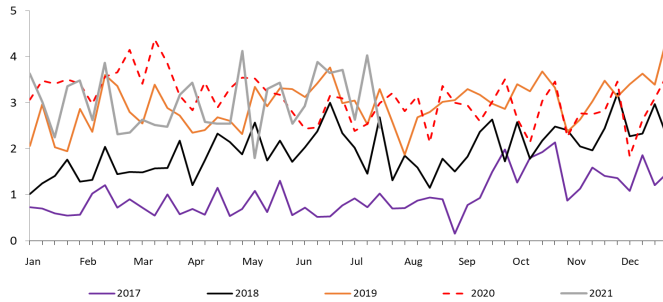
Keep an eye on ERCOT and natural gas markets amid heat wave—hurricanes could also trouble LNG

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



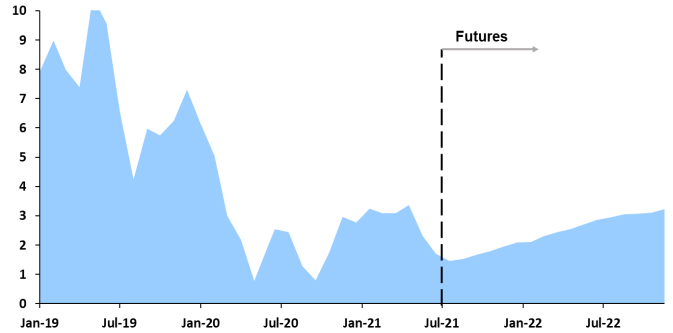
Netbacks to Asia and Europe fully supportive of LNG exports

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



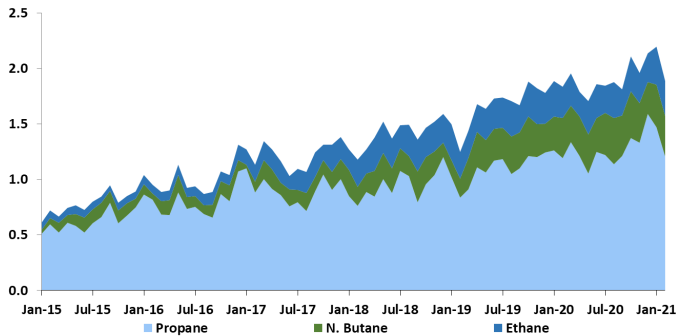
U.S. crude exports largely tracking prior-year totals—risks are largely to upside later in the year

Brent—WTI Spread (\$/Barrel)



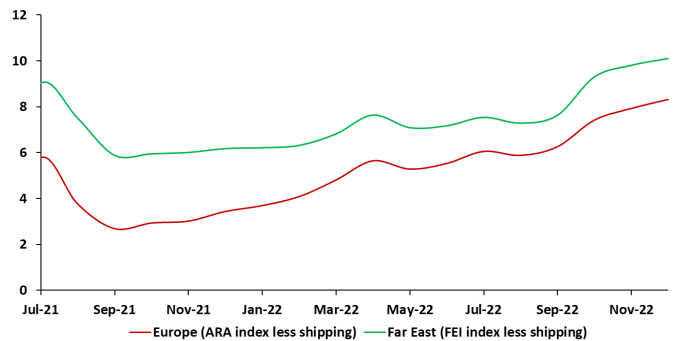
Differentials still limiting export arbitrage

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



Tug-of-war between domestic and export buyers emerging for propane; Ethane export growth subject to ramp-up in cracker capacity

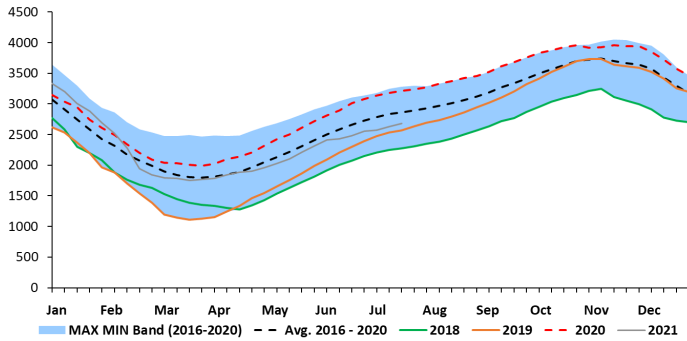
International Propane Netbacks (to Mt. Belvieu) (Cents Per Gallon)



Asian demand pull still raising prices—netbacks also rising

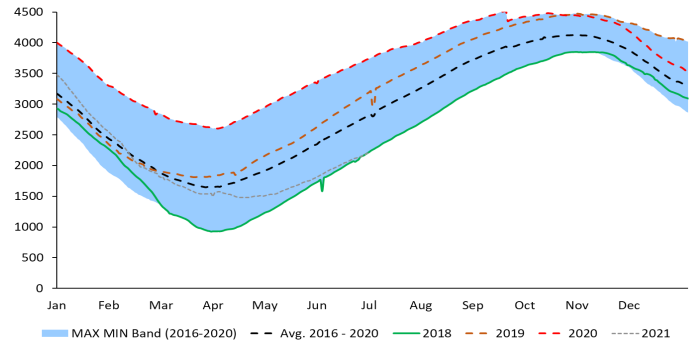
Key Market Dashboards

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



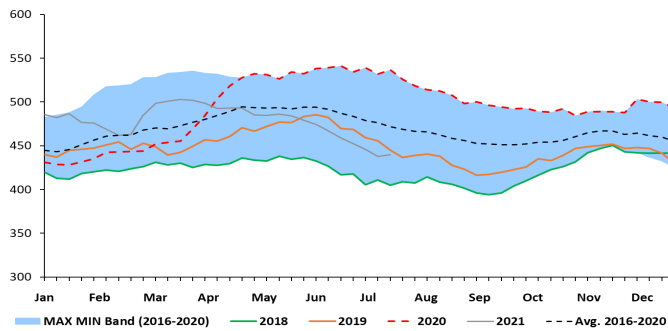
All eyes on ERCOT and southern U.S. amid heat wave. Henry Hub expected to receive support from inventories and LNG demand.

European Natural Gas in Storage
(Billion Cubic Feet)



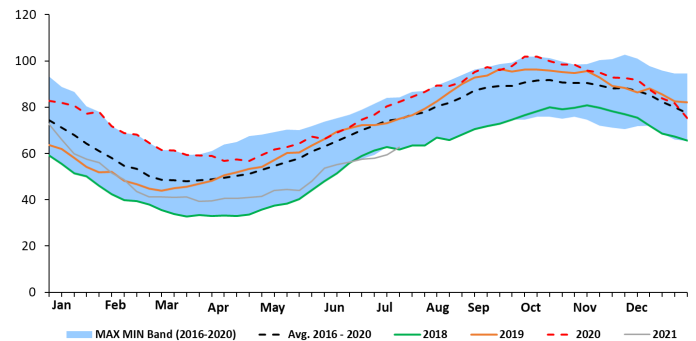
Nord Stream 2 expected to alleviate some of Europe's natural gas storage constraints.

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



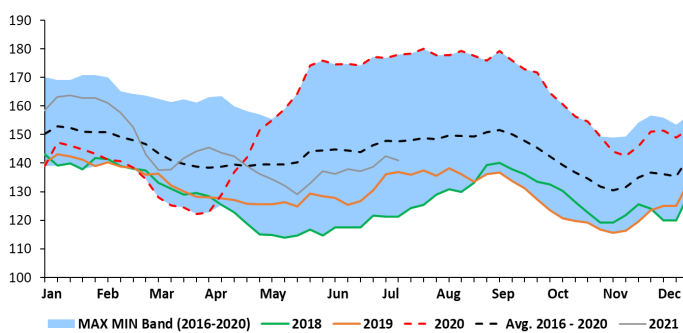
SPR inventories are at their lowest level since 2003

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



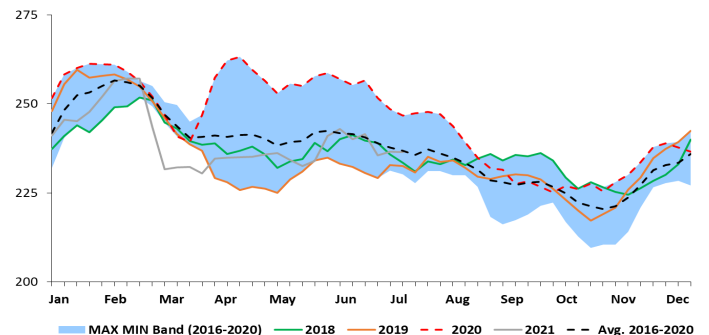
U.S. propane inventories remain supportive of prices amid strong domestic + international demand

U.S. Diesel Storage Inventory
(Million Barrels)



Diesel consumption expected to hold up regardless of COVID situation

U.S. Gasoline Storage Inventory
(Million Barrels)



Gasoline demand likely to be hit from Delta variant over next several weeks, although we expect a sharp Q4 recovery

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.

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.