Energy Tidbits

Liberals to Unveil the Hard Emissions Reduction Targets For 2025 (Only 3 Years Away) For Oil & Gas Sector

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Key LNG trade highlights:
Week of March 14-20, 2022

- **Spot trade:** The share of spot volume in total global liquefied natural gas (LNG) trade was 34% for the week of March 14-20, rising from 23% the week before. This mostly results from higher spot deliveries to Northwest Europe. The region imported up to eight more spot cargoes than the previous week, with the majority of cargoes unloading in France and the U.K.
- **Contract deliveries:** Global LNG trade fell by 4% last week as a result of lower contract deliveries in both the Japan-Korea-China-Taiwan region and Europe. Japan saw a big decrease of 0.52 million tons of contract volume deliveries.
- **Calcasieu Pass cargo to Europe:** France's Dunkirk received the first cargo from the new Calcasieu Pass LNG project onboard Yiannis last week. Jera was reported to have taken this shipment. Another vessel, the Nohshu Maru, which BNEF assumes is chartered by Jera as well, also loaded at Calcasieu Pass and is headed for Dunkirk with an estimated arrival date of April 5.
  - See BNEF analysis: *Europe to Get More Japanese LNG Supply Than Asia in March* (terminal)
- **Europe LNG deliveries:** Northwest Europe and Italy received 1.6 million tons of LNG from March 14-20, almost 39% higher than the same period in the previous month. Supply from the U.S. surged to 58% of the total weekly imports, compared to 29% from the same week in February as deliveries to France almost tripled. Russian supply dropped by half from the previous month with all cargoes going to Belgium.
- **Egypt import:** Egypt's Ain Sokhna received a domestic cargo exported from Idku, onboard Golar Crystal on March 16. The country's last import occurred in April 2021.
- **Transits:** Weekly laden LNG vessel transits via key routes reached 10 cargoes, down six cargoes week-on-week. Panama Canal saw no crossings compared to five last week. Cape of Good Hope crossings dropped by one cargo from the previous week. Suez Canal transits stayed flat week-on-week. No U.S. cargo has taken the Suez route to deliver LNG to North Asia this month (as of March 20).
- **LNG on water:** Bloomberg's Index for loaded LNG tankers on the water for at least 20 days or more rose 28% week-on-week, as more cargoes from non-U.S. suppliers took longer journeys.
- **Weather forecasts** (as of March 10)**:** China could see lower-than-normal temperatures in the coming two weeks. However, this is unlikely to raise gas demand due to high gas prices and widespread Omicron outbreaks in the country. Japan, Korea and Europe should see a normal to mild end of winter.
  - *See BNEF analysis: Colder China Unlikely to Tap LNG Flows Geared at Europe (terminal)*

7.7 million tons

Total LNG deliveries for the week

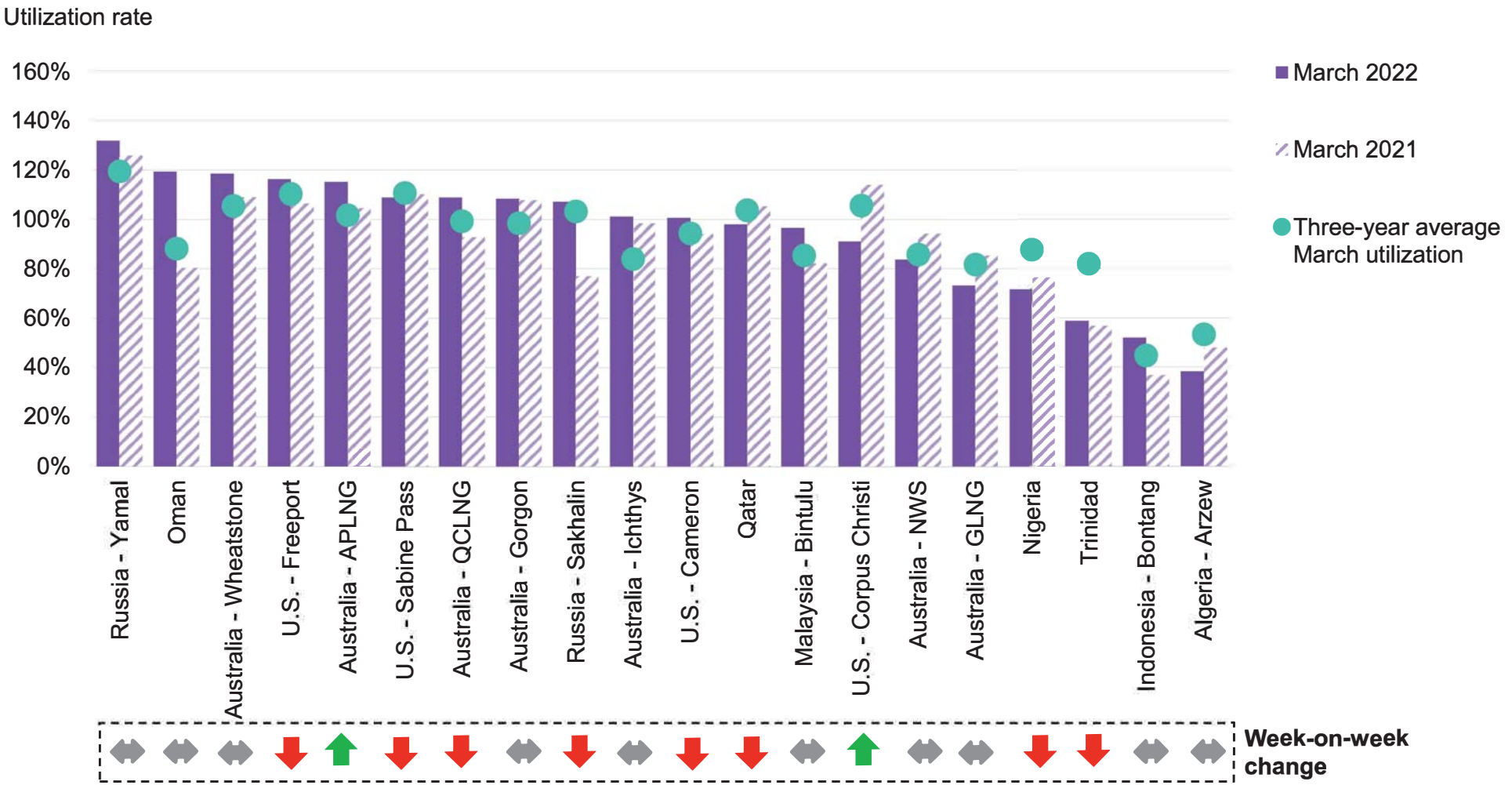
34%

Spot LNG share of total weekly trade

4 days

Panama Canal southbound wait time

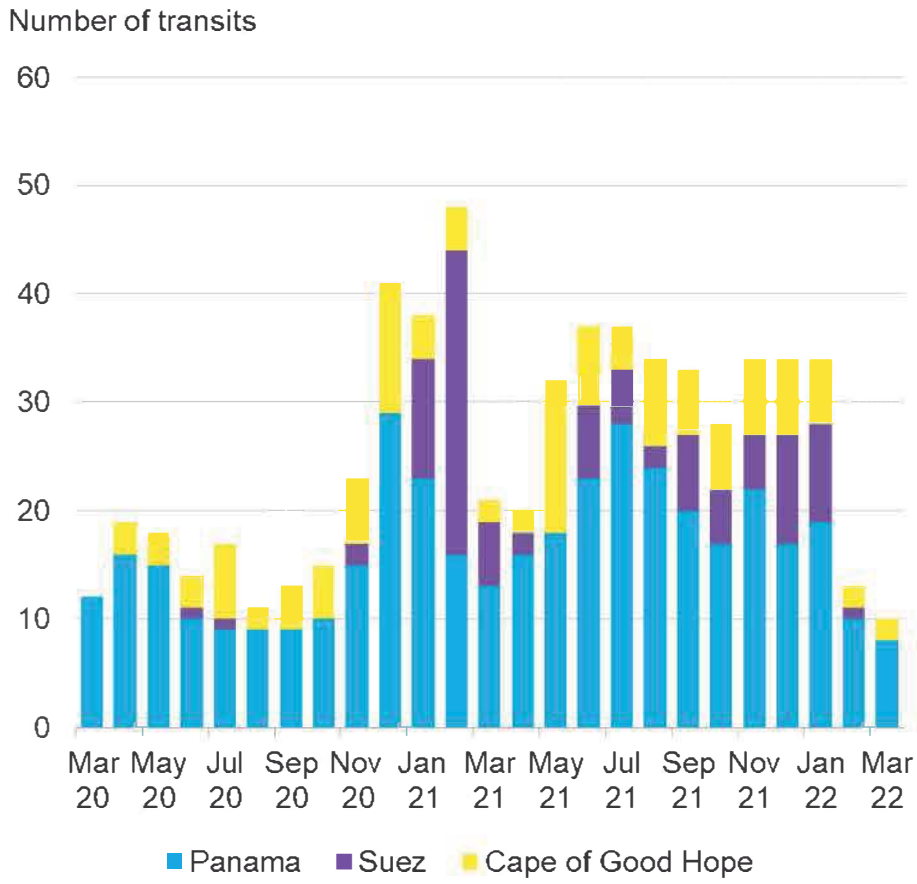
LNG plant utilization rates
(As of March 20, 2022)



Source: BloombergNEF, Bloomberg AHOY JOURNEY <GO>. Note: Current month utilization is as of the last day of this week's report period. Utilization is calculated on a pro-rated basis, export capacity is apportioned to corresponding days of the month. Chart only shows 20 largest LNG plants/complexes. Three-year average is 2019-2021. Week-on-week change refers to the week prior of this report date range. If the week-on-week change is within a cargo (~0.06 million tons), it is shown as flat.

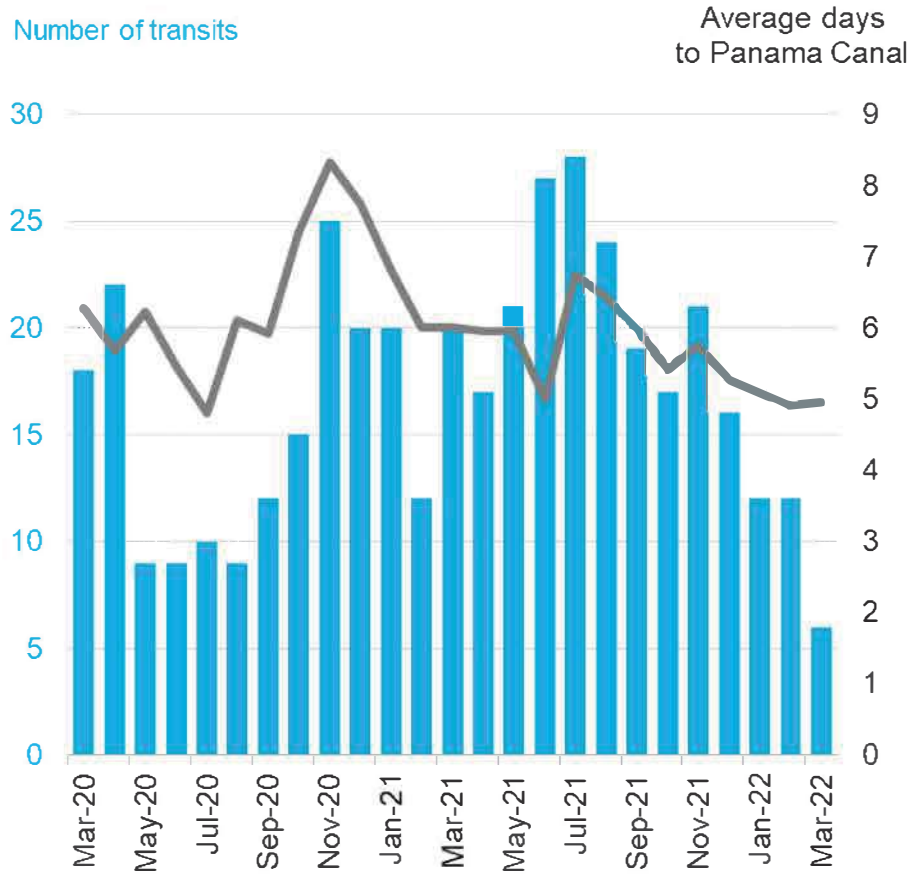
U.S. LNG transit routes
(As of March 20, 2022)

All U.S. LNG to Japan-Korea-China-Taiwan region by route



Source: BloombergNEF. Note: Date is by arrival date. Chart only shows laden journeys.

U.S. Gulf Coast LNG Panama Canal transits



Source: BloombergNEF. Note: Chart only shows laden journeys. Date is by crossing date. Days to Panama Canal refers to the time between vessel departure date from U.S. Gulf Coast loading point to entry of the Panama Canal.

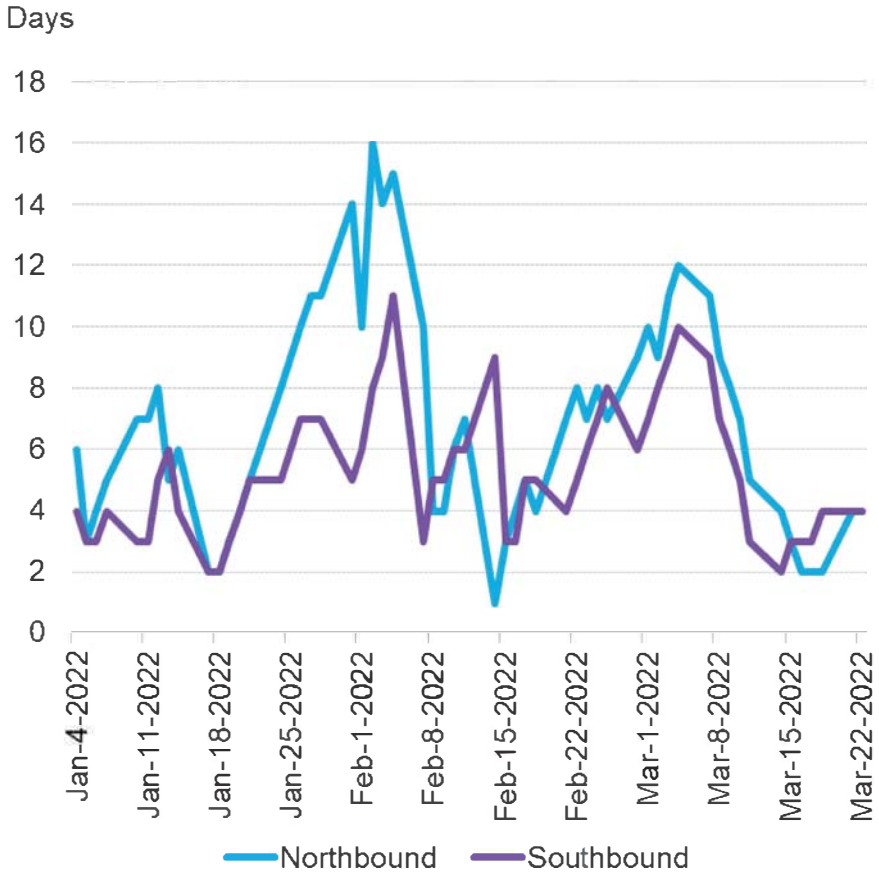
New! **Panama Canal transit wait times** available on Bloomberg Terminal

Panama Canal transit wait time

(As of March 20, 2022)

Panama Canal transit waiting time projections

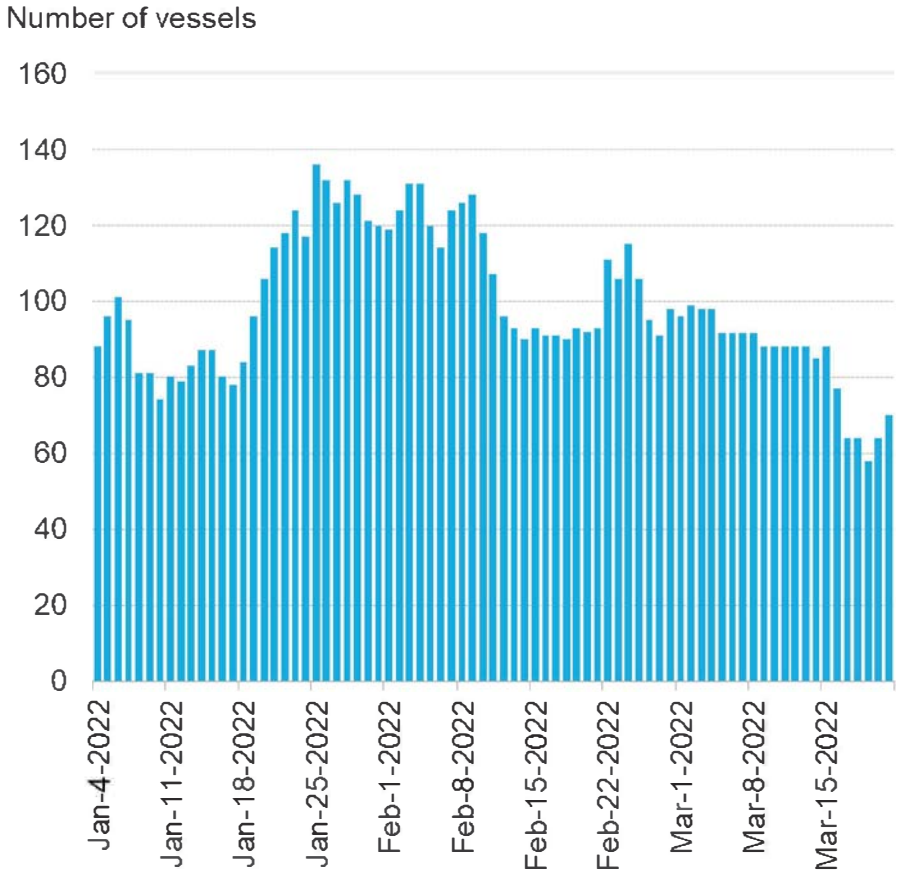
LNG tankers



Source: Panama Canal Authority – via Bloomberg Terminal. Note: Data between March 7 – March 11 is interpolated due to missing data points.

Panama Canal transit backlog

All vessels



Source: Panama Canal Authority – via Bloomberg Terminal. Note: Data between March 7 – March 11 is interpolated due to missing data points.

http://investors.next-decade.com/news-releases/news-release-details/nextdecade-and-guangdong-energy-announce-binding-heads-agreement

MARCH 24, 2022

NextDecade and Guangdong Energy Announce Binding Heads of Agreement

BACK TO NEWS & EVENTS

HOUSTON--(BUSINESS WIRE)--Mar. 24, 2022-- NextDecade Corporation ("NextDecade") (NASDAQ: NEXT) announced today the execution of a binding Heads of Agreement ("HOA") with Guangdong Energy Group Natural Gas Co., Ltd. ("Guangdong Energy") for the long-term supply of liquefied natural gas ("LNG") for 20 years from NextDecade's Rio Grande LNG export project in Brownsville, Texas.

The HOA provides that Guangdong Energy will purchase up to 1.5 million tonnes per annum of LNG indexed to Henry Hub. The LNG supply will initially be from train one of Rio Grande LNG, which is expected to start commercial operations in 2026. The HOA also provides that Guangdong Energy and NextDecade will complete the sale and purchase agreement ("SPA") in the second quarter of 2022.

"We are honored to have Guangdong Energy as the second foundation customer of our Rio Grande LNG project and our first Chinese customer," said Matt Schatzman, NextDecade's Chairman and Chief Executive Officer. "Guangdong Energy is one of the largest power generation enterprises in Guangdong and we are pleased they have entrusted us to supply their rapidly growing business."

"We are pleased to be entering into a long-term SPA with NextDecade. Henry Hub-linked LNG will be an important part of our LNG portfolio as we transit to a greener future and optimize our resource procurement," commented by Mr. Zhu Zhanfang, Chairman of Guangdong Energy Natural Gas Co., "We look forward to a long lasting and fruitful cooperation with NextDecade, not necessarily just in LNG supply, but potentially in carbon capture and storage as well."

Assuming the achievement of further LNG contracting and financing, NextDecade anticipates making a positive final investment decision on a minimum of two trains of the Rio Grande LNG project in the second half of 2022.

About NextDecade Corporation

NextDecade Corporation is a clean energy company accelerating the path to a net-zero future. Leading innovation in greener LNG and carbon capture solutions, NextDecade is committed to providing the world access to cleaner energy. Through our wholly owned subsidiaries Rio Grande LNG and NEXT Carbon Solutions, we are developing a 27 mtpa LNG export facility in South Texas along with one of the largest carbon capture and storage projects in North America. We are also working with third-party customers around the world to deploy our proprietary processes to lower the cost of carbon capture and storage and reduce CO_2 emissions at their industrial-scale facilities. NextDecade's common stock is listed on the Nasdaq Stock Market under the symbol "NEXT." NextDecade is headquartered in Houston, Texas. For more information, please visit www.next-decade.com.

Forward-Looking Statements

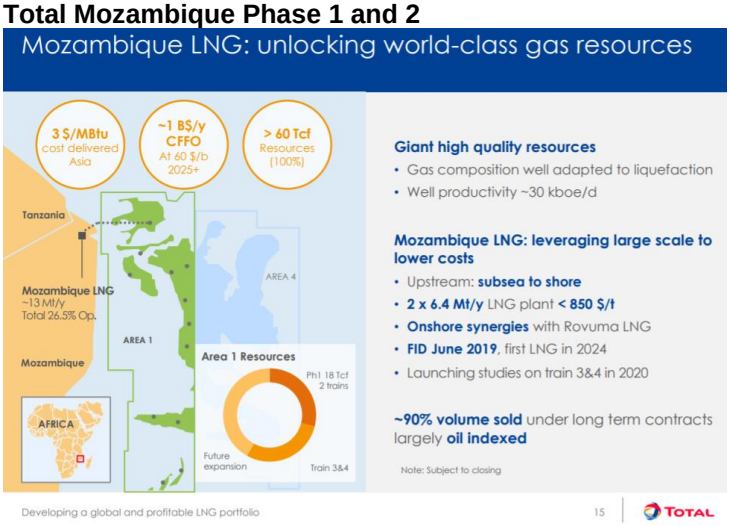
Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?

Posted Wednesday April 28, 2021. 9:00 MT

The next six months will determine the size and length of the new LNG supply gap that is hitting harder and faster than anyone expected six months ago. Optimists will say the Mozambique government will bring sustainable security and safety to the northern Cabo Delgado province and provide the confidence to Total to quickly get back to LNG development such that its LNG in-service delay is a matter of months and not years. We hope so for Mozambique's domestic situation, but will it be that easy for Total's board to quickly look thru what just happened? Total suspended LNG development for 3 months, restarted development on March 25, but then 3 days of violence led it to suspend development again on March 28, and announce force majeure on Monday April 26. Even if the optimists are right, Mozambique LNG is counted on for LNG supply and the major LNG supply project that are in LNG supply forecasts are now all delayed – Total Phase 1 of 1.7 bcf/d and its follow on Phase 2 of 1.3 bcf/d, and Exxon's Rozuma Phase 1 of 2.0 bcf/d. It is important to remember this 5.0 bcf/d of major LNG supply is being counted in LNG supply forecasts and starting in 2024. At a minimum, we think the more likely scenario is a delay of at least 2 years in this 5.0 bcf/d from the pre-Covid timelines. And this creates a much bigger and sooner LNG supply gap starting ~2025 and stronger outlook for LNG prices. Thermal coal in Asia will play a role in keeping a lid on LNG prices. But there will be the opportunity for LNG suppliers to at least review the potential for brownfield LNG projects to fill the growing supply gap. The thought of increasing capex was a non-starter six months ago, but there is a much stronger outlook for global oil and gas prices. Oil and gas companies are pivoting from cutting capex to small increases in 2021 capex and expecting for higher capex in 2022. We believe this sets the stage for looking at potential FID of brownfield LNG projects before the end of 2021 to be included in 2022 capex budgets. Mozambique is causing an LNG supply gap that someone will try to fill. And if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? Cdn natural gas producers hope so as this would mean more Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub.

Total declares force majeure on Mozambique LNG, Yesterday, Total announced [LINK] "*Considering the evolution of the security situation in the north of the Cabo Delgado province in Mozambique, Total confirms the withdrawal of all Mozambique LNG project personnel from the Afungi site. This situation leads Total, as operator of Mozambique LNG project, to declare force majeure. Total expresses its solidarity with the government and people of Mozambique and wishes that the actions carried out by the government of Mozambique and its regional and international partners will enable the restoration of security and stability in Cabo Delgado province in a sustained manner".* Total is working Phase 1 is ~1.7 bcf/d (Train 1 + 2, 6.45 mtpa/train) and was originally expected to being LNG deliveries in 2024. There was no specific timeline for Phase 2 of 1.3 bcf/d (Train 3 + 4, 5.0 mtpa/train), but was expected to follow Phase 1 in short order to keep capital costs under control with a continuous construction process with a potential onstream shortly after 2026.

Total Mozambique Phase 1 and 2



Source: Total Investor Day September 24, 2019

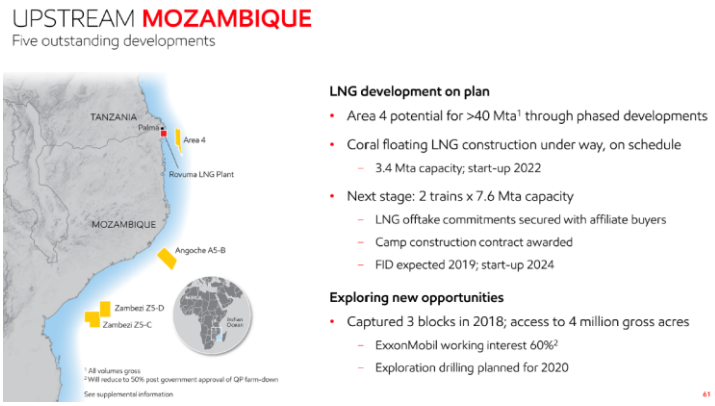
Total's Mozambique force majeure is no surprise, especially the need to the restoration of security and stability "in a sustained manner". Yesterday, Total announced [LINK] "*Considering the evolution of the security".* No one should be surprised by the force majeure or the sustained manner caveat. SAF Group posts a weekly Energy Tidbits research memo [LINK], wherein we have, in multiple weekly memos, that Total had shut down development in December for 3 months due to the violent and security risks. It restarted development on Wed March 24, violence/attacks immediately resumed for 3 consecutive days, and then Total suspended development on Sat March 27. Local violence/attacks shut development down in Dec, the situation gets settled enough for Total to restart in March, only to be shut down 3 days thereafter. No one should be surprised especially with Total's need to see security and stability "in a sustained manner".

Does anyone really think Total will risk another quick 2-3 month restart or even in 2021? The Mozambique government will be working hard to convince Total to restart soon. We just find it hard to believe Total board will risk a replay of March 24-27 in 2021. Unfortunately, Mozambique has had internal conflict for years. It reached a milestone to the positive in August 2019. Our SAF Group August 11, 2019 Energy Tidbits memo [LINK] highlighted the signing of a peace pact between Mozambique President Nyusi and leader of the Renamo opposition Momade. This was the official end to a 2013 thru 2016 conflict following a failure to hold up the prior peace pact. At that time, FT reported [LINK] "Mr Nyusi has said that "*the government and Renamo will come together and hunt" rebels who fail to disarm. The government has struggled to stem the separate insurgency in the north, which has killed or displaced hundreds near the gas-rich areas during the past two years. While the roots of the conflict remain murky, it is linked to a local Islamist group and appears to be drawing on disaffection over sharing gas investment benefits, say analysts*." This is just a reminder this is not a new issue. LNG is a game changer to Mozambique's economic future. It is, but also has been, a government priority to have the security and safety for Total and Exxon to move on their LNG developments. Its hard to believe the Mozambique government will be able to quickly convince Total and Exxon boards that they can be comfortable there is a sustained security/safety situation and they can send their people back in to develop the LNG. Total's board would allow any resumption of development before year end 2021. The last thing Total wants is a replay of March 24-27. The first question is how long will it take before the Total board is convinced its safe to restart. Could you imagine them doing a replay of what just happened? Wait three months, restart development and have to stop again right away? We have to believe that could lead the Total board to believe it is unfixable for years. We just don't think they are to prepared to risk that decision in 3 months. Its why we have to think there isn't a restart approval until at least in 2022 at the earliest ie. why we think the likely scenario is a delay of 2-3 years, and not a matter of months.

Mozambique's security issues pushes back 5.0 bcf/d of new LNG supply at least a couple years. The global LNG issue is that 5 bcf/d of new Mozambique LNG supply (apart from the Eni Coral FLNG of 0.45 bcf/d) won't start up in 2024 and

continuing thru the 2020s. And we believe all LNG forecasts included this 5.0 bcf/d to be in service in the 2020s as Mozambique had been considered the best positioned LNG supply to access Asia after Australia and Papua New Guinea. (i) Eni Coral Sul (Rovuma Basin) FLNG of 0.45 bcf/d planned in service in 2022. [LINK] This is an offshore floating LNG vessel that is still expected to be in service in 2022. (ii) Total Phase 1 to add 1.7 bcf/d with an in service originally planned for 2024. We expect the in service data to be pushed back to at least 2026 assuming Total gives a development restart approval in Dec 2021. In theory, this would only be a 1 year loss of time. However, Total has let services go, the project will be idle for 9 months, it isn't clear if the need to get people out quickly let them do a complete put the project on hold, and how many people will be on site maintaining the status of the development during the force majeure. Also what new procedures and safety will be put in place for a restart. These all mean there will be added time needed to get the project back to where it was when force majeure was declared ie. why we think a 12 month time delay will be more like an 18 month project delay. (iii) Exxon's Rozuma Phase 1 LNG will add 2.0 bcf/d and, pre-Covid, was expected to be in service in 2025. We believe the delays related to security and safety at Total are also going to impact Exxon. We find it highly unlikely the Exxon board would take a different security and safety decision than Total. Pre-pandemic, Exxon's March 6, 2019 Investor Day noted their operated Mozambique Rovuma LNG Phase 1 was to be 2 trains each with 1.0 bcf/d capacity for total initial capacity of 2.0 bf/d with FID expected in 2019 and first LNG deliveries in 2024. The 2019 FID expectation was later pushed to be expected just before the March 2020 investor day. But the pandemic hit, and on March 21, 2020, we tweeted [LINK] on the Reuters story "*Exclusive: Coronavirus, gas slump put brakes on Exxon's giant Mozambique LNG plan"* [LINK] that noted Exxon was expected to delay the Rovuma FID. There was no timeline, but the expectation was that FID would now be in 2022 (3 years later than original timeline0 and that would push first LNG likely to 2027. (iv) Total Phase 2 was to add 1.3 bcf/d. There was no firm in service date but it was expected to follow closely behind Phase 1 to maintain services. That would have put it originally in the 2026/2027 period. But if Phase 1 is pushed back 2 years, so will Phase 2 so more likely 2028/2029.. (v) Total Phase 1 + 2 and Exxon Rozuma Phase 1 total 5.0 bcf/d and would have been (and still are) in all LNG supply forecasts for the 2020s. (vi) We aren't certain if the LNG supply forecasts include Exxon Rozuma Phase 2 ,which would be an additional 2.0 bcf/d on top of the 5.0 bcf/d noted above. Exxon Rozuma has always been expected to be at least 2 Phases. This has been the plan since the Anadarko days given the 85 tcf size of the resource on Exxon's Area 4. There was no firm in service data for Phase 2, but it was expected they would also closely follow Phase 1 to maintain services. We expect that original timeline would have been 2026/2027 and that would not be pushed back to 2029/2030. (vii) It doesn't matter if its only 5 bcf/ of Mozambique that is delayed 2 to 3 years, it will cause a bigger LNG supply gap and sooner. The issue for LNG markets is this is taking projects that are in development effectively out of the queue for some period.

Exxon Mozambique LNG



Source: Exxon Investor Day March 6, 2019

Won't LNG and natural gas get hit by Biden's push for carbon free electricity? Yes, in the US. For the last 9 months, we have warned on Biden's climate change plan that were his election platform and now form his administration's energy transition map. We posted our July 28, 2020 blog "*Biden To Put US On "Irreversible Path to Achieve Net-Zero Emissions, Economy-Wide" Is a Major Negative To US Natural Gas in 2020s* "[LINK] on Biden's platform "*The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future*" [LINK]. Biden's new American Jobs Plan

[LINK] lines up with his campaign platform including to put the US "*on the path to achieving 100 percent carbon-free electricity by 2035*.". Our July 28, 2020 blog noted that it would require replacing ~60% of US electricity generation with more renewable and it could eliminate ~40% (33.5 bcf/d) of 2019 US natural gas consumption. If Biden is 25% successful by 2030, it would replace ~6.3 bcf/d of natural gas demand. It would be a negative to US natural gas and force more US natural gas to export markets. The wildcard when does US natural gas start to decline if producers are faced with the reality of natural gas being phased out for electricity. The other hope is that when Biden says "carbon-free", its not what ends up in the details of any formal policy statement ie. carbon electricity will be allowed with Biden's push for CCS.

Will Cdn natural gas be similarly hit by if Trudeau move to "emissions free" and not "net zero emissions" electricity? Yes and No. Our SAF Group April 25, 2021 Energy Tidbits memo [LINK] was titled ""*Bad News For Natural Gas, Trudeau's Electricity Goal is Now 100% "Emissions Free" And Not "Net Zero Emissions*". On Thursday, PM Trudeau spoke at Biden's global climate summit [LINK] and looks like he slipped in a new view on electricity than was in last Monday's budget and his Dec climate plan. Trudeau said "*In Canada, we've worked hard to get to over 80% emissions-free electricity, and we're not going to stop until we get to 100%."* Speeches, especially ones made on a global stage are checked carefully so this had to be deliberate. Trudeau said "*emissions free*" and not net zero emissions electricity. It seems like this language is carefully written to exclude any fossil fuels as they are not emissions free even if they are linked to CCS. Recall in Liberals big Dec 2020 climate announcement [LINK], Liberals said ""*Work with provinces, utilities and other partners to ensure that Canada's electricity generation achieves net-zero emissions before 2050*." There is no way Trudeau changed the language unless he meant to do so. And this is a major change as it would seem to indicate his plan to eliminate all fossil fuels used for electricity. If so this would be a negative to Cdn natural gas that would be stuck within Western Canada and/or continuing to push into the US when Biden is trying to switch to carbon free electricity. We recognize that there is still some ambiguity in what will be the details of policy and the Liberals aren't changing to no carbon sourced electricity at all. Let's hope so. But let's also be careful that politicians don't change language without a reason or at least with a view to setting up for some future hit. Plus Trudeau had a big warning in that same speech saying "*we will make it law to respect our new 2030 target and achieve net-zero emissions by 2050*". They plan to make it the law that Canada has to be on track for the Liberals 2030 emissions targets. This means that the future messaging will be that the Liberals have no choice but to take harder future emissions actions as it is the law. They will be just obeying the law as they will be obligated to obey the law. Everyone knows the messaging will be we have to do more get to Net Zero, that in itself will inevitably mean it will be the law if he actually does move to eliminate any carbon based electricity. So yes it's a negative, that is unless more Cdn natural gas can be exported via LNG to Asia. We believe this would be a plus to be priced against global LNG instead of Henry Hub.

Biden's global climate summit reminded there is too much risk to skip over natural gas as the transition fuel. Apart from the US and Canada, we haven't seen a sea shift to eliminating natural gas for power generation, especially from energy import dependent countries. There is a strong belief that hydrogen and battery storage will one day be able to scale up at a competitive cost to lead to the acceleration away from fossil fuels. But that time isn't yet here, at least not for energy import dependent countries. One of the key themes from last week's leader's speeches at the Biden global climate summit – to get to Net Zero, the world is assuming there wilt be technological advances/discoveries that aren't here today and that have the potential to immediately ramp up in scale. IEA Executive Director Faith Birol was blunt in his message [LINK] saying "*Right now, the data does not match the rhetoric – and the gap is getting wider*." And "*IEA analysis shows that about half the reductions to get to net zero emissions in 2050 will need to come from technologies that are not yet ready for market. This calls for massive leaps in innovation. Innovation across batteries, hydrogen, synthetic fuels, carbon capture and many other technologies.* US Special Envoy for Climate John Kerry said a similar point that half of the emissions reductions will have to come from technologies that we don't yet have at scale. UK PM Johnson [LINK] didn't say it specifically, but points to this same issue saying "*To do these things we've got to be constantly original and optimistic about new technology and new solutions whether that's crops that are super-resistant to drought or more accurate weather forecasts like those we hope to see from the UK's new Met Office 1.2bn supercomputer that we're investing in*." It may well be that the US and other self sufficient energy countries are comfortable going on the basis of assuming technology developments will occur on a timely basis. But, its clear that countries like China, India, South Korea and others are not prepared to do so. And not prepared to have the confidence to rid themselves of coal power generation. This is why there hasn't been any material change in the LNG demand outlook

We expect the IEA's blunt message that the gap is getting wider will be reinforced on May 18. We have had a consistent view on the energy transition for the past few years. We believe it is going to happen, but it will take longer, be a bumpy road and cost more than expected. This is why we believe the demise of oil and natural gas won't be as easy and fast as hoped for by the climate change side. The IEA's blunt warning on the gap widening should not be a surprise as they warned on this in June 2020. Birol's climate speech also highlighted that the IEA will release on May 18 its roadmap for how the global energy sector can reach net zero by 2050. Our SAF Group June 11, 2020 blog "*Will The Demise Of Oil Take Longer, Just Like Coal? IEA and Shell Highlight Delays/Gaps To A Smooth Clean Energy Transition*" [LINK] feature the IEA's June 2020 warning that the critical energy technologies needed to reduce emissions are nowhere near where they need to be. In that blog, we said "there was an excellent illustration of the many significant areas, or major pieces of the puzzle, involved in an energy transition by the IEA last week. The IEA also noted the progress of each of the major pieces and the overall conclusion is that the vast majority of the pieces are behind or well behind where they should be to meet a smooth timely energy transition. It is important to note that these are just what the IEA calls the "*critical energy technologies*" and does not get into the wide range of other considerations needed to support the energy transition. The IEA divides these "critical energy technologies "into major groupings and then ranked the progress of each of these pieces in its report "*Tracking Clean Energy Progress"* [LINK] by on track, more efforts needed, or not on track". Our blog included the below IEA June 2020 chart.

IEA's Progress Ranking For "Critical Energy Technologies" For Clean Energy Transition

Power	Renewable Power	Geothermal
	Solar PV	Ocean Power
	Onshore Wind	Nuclear Power
	Offshore Wind	Natural Gas-Fired Power
	Hydropower	Coal-Fired Power
	Bioenergy Power Generation	CCUS in Power
	Concentrating Solar Power	
Fuel Supply	Methane Emissions from O&G	Flaring Emissions
Industry	Chemicals	Pulp and Paper
	Iron and Steel	Aluminum
	Cement	CCUS in Industry and Transformation
Transport	Electric Vehicles	Transport Biofuels
	Rail	Aviation
	Fuel Consumption of Cars and Vans	International Shipping
	Trucks and Busses	
Buildings	Building Envelopes	Lighting
	Heating	Appliances and Equipment
	Heat Pumps	Data Centres and Data Transmission Networks
	Cooling	
Energy Integration	Energy Storage	Demand Response
	Hydrogen	Direct Air Capture
	Smart Grids	

Source: IEA

On Track More Efforts Needed Not on Track

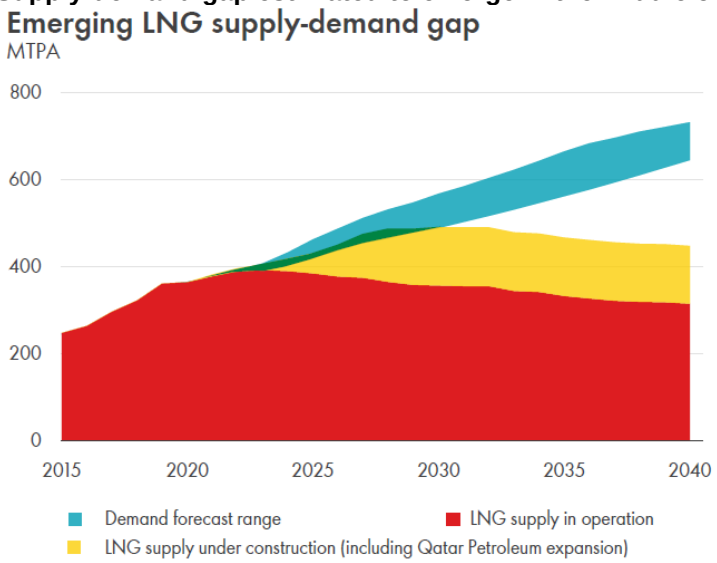
Source: IEA Tracking Clean Energy Progress, June 2020

We are referencing Shell's long term outlook for LNG We recognize there are many different forecasts for LNG, but are referencing Shell' LNG Outlook 2021 from Feb 25, 2021 for a few reasons. (i) Shell's view on LNG is the key view for when and what decision will be made for LNG Canada Phase 2. (ii) Shell is one of the global leaders in LNG supply and trading. (iii) Shell provides on the record LNG outlooks every year so there is the ability to compare and make sure the outlook fits the story. It does. (iv) Shell, like other supermajors, has had to make big capex cuts post pandemic and that certainly wouldn't put any bias to the need for more capex.

Shell's March 2021 long term outlook for LNG demand was basically unchanged vs 2020 and leads to a LNG supply gap in mid 2020s Shell does not provide the detailed numbers in their Feb 25, 2021 LNG forecast. We would assume they

would have reflected some delay, perhaps 1 year, at Mozambique but would be surprised if they put a 2-3 year delay in for the 5 bcf/d from Total Phase 1 +2 and Exxon Rozuma Phase 1. Compared to their LNG Outlook 2020, it looks like there was no change for their estimate of global natural gas demand growth to 2040, which looked relatively unchanged at approx. 5,000 bcm/yr or 484 bcf/d. Similarly, long term LNG demand looked unchanged to 2040 of ~700 mm tonnes (92 bcf/d) vs 360 mm tonnes (47 bcf/d) in 2020. In the 2021 outlook, Shell highlighted that the pandemic delayed project construction timelines and that the "*lasting impact expected on LNG supply not demand"*. And that Shell sees a LNG "*supply-demand gap estimated to emerge in the middle of the current decade as demand rebounds*". Comparing to 2020, it looks like the supply-demand gap is sooner.

Supply-demand gap estimated to emerge in the middle of the current decade



Source: Shell LNG Outlook 2021, Feb 25, 2021

Mozambique delays are redefining the LNG markets for the 2020s: Delaying 5 bcf/d of Mozambique new LNG supply 2-3 years means a much bigger supply gap starting in 2025.. Even if the optimists are right, there are now delays to all major Mozambique LNG supply from LNG supply forecasts. We don't have the detail, but we believe all LNG forecasts, including Shell's LNG Outlook 2021, would have included Total's Phase 1 and Phase 2 and Exxon Rozuma Phase 1. As noted earlier, we believe that the likely impact of the Mozambique security concerns is that these forecasts would likely have to push back 1.7 bcf/d from Total Phase 1 to at least 2026, 2.0 bcf/d Exxon Rozuma Phase 1 to at least 2027, and 1.3 bcf/d Total Phase 2 to at least 2028/2029 with the real risk these get pushed back even further. 5.0 bcf/d is equal to 38 mtpa. These delays would mean there is an increasing LNG supply gap in 2025 and increasingly significantly thereafter. And even if a new greenfield LNG project is FID's right away, it wouldn't be able to step in to replace Total Phase 1 prior startup timing for 2024 or likely the market at all until at least 2027. Its why the decision on filling the gap will fall on brownfield LNG projects.

And does this bigger, nearer supply gap force LNG players to look at what brownfield LNG projects they could advance? A greenfield LNG project would likely take at least until 2027 to be in operations. Its why we believe the Mozambique delays will effectively force major LNG players to look to see if there are brownfield LNG projects they should look to advance. Prior to the just passed winter, no one would think Shell or other major LNG players would be considering any new LNG FIDs in 2021. All the big companies are in capital reduction mode and debt reduction mode. But Brent oil is now solidly over $60 and LNG prices hit record levels in Jan and the world's economic and oil and gas demand outlook are increasing with vaccinations. And we are starting to see companies move to increasing capex with the higher cash flows. We would not expect any major LNG players to move to FID right away. But we see them watching to see if 2021 plays out to still support this increasing LNG supply gap. And unless new mutations prevent vaccinations from returning the world to normal, we suspect that major LNG players, like other oil and gas companies, will be looking to increase

capex as they approve 2022 budgets. The outlook for the future has changed dramatically in the last 5 months. The question facing Shell and others, should they look to FID new LNG brownfield projects in the face of an increasing LNG supply gap that is going to hit faster and harder than expected a few months ago. We expect these decisions to be looked at before the end of 2021. LNG prices will be stronger, but we expect the limiting cap in Asia will be that thermal coal will be used to mitigate some LNG price pressure.

Back to Shell, does increasing LNG supply gap provide the opportunity to at least consider a LNG Canada Phase 2 FID over the next 9 months? Shell is no different than any other major LNG supplier in always knowing the market and that the oil and gas outlook is much stronger than 6 months ago. No one has been or is talking about this Mozambique impact and how it will at least force major LNG players to look at if they should FID new brownfield LNG projects to take advantage of this increasing supply gap. We don't have any inside contacts at Shell or LNG Canada, but that is no different than when we looked at the LNG markets in September 2017 and saw the potential for Shell to FID LNG Canada in 2018. We posted a September 20, 2017 blog *"China's Plan To Increase Natural Gas To 10% Of Its Energy Mix Is A Global Game Changer Including For BC LNG*" [LINK]. Last time, it was a demand driven supply gap, this time, it's a supply driven supply gap. We have to believe any major LNG player, including Shell, will be at least looking at their brownfield LNG project list and seeing if they should look to advance FID later in 2021. Shell has LNG Canada Phase 2, which would add 2 additional trains or approx. 1.8 bcf/d. And an advantage to an FID would be that Shell would be able to commit to its existing contractors and fabricators for a continuous construction cycle following on LNG Canada Phase 1 ie. to help keep a lid on capital costs. No one is talking about the need for these new brownfield LNG projects, but, unless Total gets back developing Mozambique and keeps the delay to a matter of months, its inevitable that these brownfield LNG FID internal discussions will be happening in H2/21. Especially since the oil and gas price outlook is much stronger than it was in the fall and companies will be looking to increase capex in 2022 budgets

A LNG Canada Phase 2 would be a big plus to Cdn natural gas. A LNG Canada Phase 2 FID would be a big plus for Cdn natural gas. It would allow another ~1.8 bcf/d of Cdn natural gas to be priced against Asian LNG prices and not against Henry Hub. And it would provide demand offset versus Trudeau if he moves to make electricity "emissions free" and not his prior "net zero emissions". Mozambique may be in Africa, but, unless sustained peace and security is attained, it is a game changer to LNG outlook creating a bigger and sooner LNG supply gap. And with a stronger tone to oil and natural gas prices in 2021, the LNG supply gap will at least provide the opportunity for Shell to consider FID for its brownfield LNG Canada Phase 2 and provide big support to Cdn natural gas for back half of the 2020s. And perhaps if LNG Canada is exporting 3.6 bcf/d from two phases, it could help flip Cdn natural gas to a premium to US natural gas especially if Biden is successful in reducing US domestic natural gas consumption for electricity. The next six months will be very interesting to watch for LNG markets.

Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs

Posted 11am on July 14, 2021

The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog "*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*" and saw a much bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum's massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas.

Sea change in Asian LNG buyers is also the best validation of the LNG supply gap and big to LNG supply FIDs. Has the data changed or have the market participants changed in how they react to the data? We can't recall exactly who said that on CNBC on July 12, it's a question we always ask ourselves. In the LNG case, the data has changed with Mozambique LNG delays and that has directly resulted in market participants changing and entering into long term contracts. We can't stress enough how important it is to see Asian LNG buyers move to long term LNG deals. (i) Validates the sooner and bigger LNG supply gap. We believe LNG markets should look at the last two weeks of new long term deals for Asian LNG buyers as being the validation of the LNG supply gap that clearly emerged post Total declaring force majeure on its 1.7 bcf/d Mozambique LNG Phase 1 that was under construction and on track for first LNG delivery in 2024. Since then, markets have started to realize the Mozambique delays are much more than 1.7 bcf/d. They have seen major LNG suppliers change their outlook to a more bullish LNG outlook and, most importantly, are now seeing Asian LNG buyers changing from trying to renegotiate long term LNG deals lower to entering into long term LNG deals to have security of supply. Asian LNG buyers are cozying up to Qatar in a prelude to the next wave of Asian buyer long term deals. What better validation is there than companies/countries putting their money where their mouth is. (ii) Provides financial commitment to help push LNG suppliers to FID. We believe these Asian LNG buyers are doing much more than validating a LNG supply gap to markets. The big LNG suppliers can move to FID based on adding more LNG supply to their portfolio, but having more long term deals provides the financial anchor/visibility to long term capital commitment from the buyers. Long term contracts will only help LNG suppliers get to FID.

It was always clear that the Mozambique LNG supply delay was 5.0 bcf/d, not just 1.7 bcf/d from Total Phase 1. LNG markets didn't really react to Total's April 26 declaration of force majeure on its 1.7 bcf/d Mozambique LNG Phase 1. This was an under construction project that was on time to deliver first LNG in 2024. It was in all LNG supply forecasts. There was no timeline given but, on the Apr 29 Q1 call, Total said that it expected any restart decision would be least a year away. If so, we believe that puts any actual construction at least 18 months away. There will be work to do just to get back to where they were when they were forced to stop development work on Phase 1. Surprisingly, markets didn't look the broader implications, which is why we posted our 7-pg Apr 28 blog "*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*" [LINK] We highlighted that Mozambique LNG delays were actually 5 bcf/d, not 1.7 bcf/d. And this 5 bcf/d of Mozambique LNG supply was built into most, if not all, LNG supply forecasts. The delay in Total Phase 1 would lead to a commensurate delay in its Mozambique LNG Phase 2 of 1.3 bcf/d. Total Phase 2 was to add 1.3 bcf/d. There was no firm in service date, but it was expected to

follow closely behind Phase 1 to maintain services. That would have put it originally in the 2026/2027 period. But if Phase 1 is pushed back at least 2 years, so will the follow on Phase 2, so more likely, it will be at least 2028/2029. The assumption for most, if not all, LNG forecasts was that Phase 2 would follow Phase 1. Exxon Rozuma Phase 1 of 2.0 bcf/d continues to be pushed back in timeline especially following Total Phase 1. Exxon's Mozambique Rozuma Phase 1 LNG will add 2.0 bcf/d and, pre-Covid, was originally expected to be in service in 2025. The project was being delayed and Total's force majeure has added to the delays. Rozuma onshore LNG facilities are right by Total. On June 20, we tweeted [LINK] on the Reuters report "*Exclusive: Galp says it won't invest in Rovuma until Mozambique ensures security*" [LINK]. Galp is one of Exxon's partners in Rozuma. Reuters reported that Galp said they won't invest in Exxon's Rozuma LNG project until the government ensures security, that this may take a while, they won't be considering the project until after Total has reliably resumed work on its Phase 1, which likely puts any Rozuma decision until at least end of 2022 at the earliest. Galp has taken any Rozuma Phase 1 capex out of their new capex plans thru 2025 and will have to take out projects in their capex plan if Rozuma does come back to work. This puts Rozuma more likely 2028 at the earliest as opposed to before the original expectations of before 2025. Pre-pandemic, Exxon's March 6, 2019 Investor Day noted their operated Mozambique Rovuma LNG Phase 1 was to be 2 trains each with 1.0 bcf/d capacity for total initial capacity of 2.0 bf/d with FID expected in 2019 and first LNG deliveries sometime before 2025. LNG forecasts had been assuming Exxon Rozuma would be onstream around 2025. The 2019 FID expectation was later pushed to be expected just before the March 2020 investor day. But the pandemic hit, and on March 21, 2020, we tweeted [LINK] on the Reuters story "*Exclusive: Coronavirus, gas slump put brakes on Exxon's giant Mozambique LNG plan"* [LINK] that noted Exxon was expected to delay the Rovuma FID. There was no timeline, but now, any FID is not expected until late 2022 at the earliest, that would push first LNG likely to at least 2028. What this means is that the Mozambique LNG delays are not 1.7 bcf/d but 5.0 bcf/d of projects that were in all, if not most, LNG supply forecasts. There is much more in our 7-pg blog. But Mozambique is what is driving a much bigger and sooner LNG supply gap starting ~2025 and stronger outlook for LNG prices

<u>One of the reasons why it went under the radar is that major LNG suppliers played stupid on the Mozambique impact.</u> It makes it harder for markets to see a big deal when the major LNG suppliers weren't making a big deal of Mozambique or playing stupid in the case of Cheniere in their May 4 Q1 call. In our May 9, 2021 Energy Tidbits memo, we said we had to chuckle when we saw Cheniere's response in the Q&A to its Q1 call on May 4 that they only know what we know from reading the Total releases on Mozambique and its impact on LNG markets. It's why we tweeted [LINK] "*Hmm! $LNG says only know what we read on #LNG market impact from $TOT $XOM MZ LNG delays. Surely #TohokuElectric & other offtake buyers are reaching out to #Cheniere. MZ LNG delays is a game changer to LNG in 2020s, see SAF Group blog. Thx @olympe_mattei @TheTerminal #NatGas".* How could they not be talking to LNG buyers for Total and /or Exxon Mozambique LNG projects. In the Q1 Q&A, mgmt was asked about Mozambique and didn't know any more than what you or I have read. Surely, they were speaking to Asian LNG buyers who had planned to get LNG supply from Total Mozambique or Exxon Rozuma Mozambique or both. Mgmt is asked "*wanted to just kind of touch on the color use talking about for these supply curve. And are you able to kind of provide any thoughts on the Mozambique and a deferral with the project of that size on 13 and TPA being deferred by we see you have you noticed any impact to the market has is there any impact for stage 3 with that capacity? Thanks*." Mgmt replies "*No. Look, I only know about the Mozambique delay with what I read as well as what you read that from total and an Exxon. And it's a sad situation and I hope everybody is safe and healthy that were there to experience that unrest but no I don't think it's, again it's a different business paradigm than what we offer. So, we offer a full value product, the customer doesn't have to invest in equity, customer doesn't have to worry about the E&P side of the business because, we've been able to both the by at our peak almost 7 Dee's a day of US NAT gas from almost a 100 different producers on 26 different pipelines and deliver it to our to facilities. So we take care of a lot of what the customer needs".*

<u>There are other LNG supply delays/interruptions beyond Mozambique.</u> There have been a number of other smaller LNG delay or existing supply interruptions that add to Asian LNG buyers feeling less secure about the reliability of mid to long term LNG supply. Here are just a few examples. (i) Total Papua LNG 0.74 bcf/d. On June 8, we tweeted [LINK] *"Timing update Papua #LNG project. $OSH June 8 update "2022 FEED, 2023 FID targeting 2027 first gas". $TOT May 5 update didn't forecast 1st gas date. Papua is 2 trains w/ total capacity 0.74 bcf/d."* We followed the tweet saying [LINK] *"Bigger #LNG supply gap being created >2025. Papua #LNG originally expected FID in 2020 so 1st LNG is 2 years delayed.*

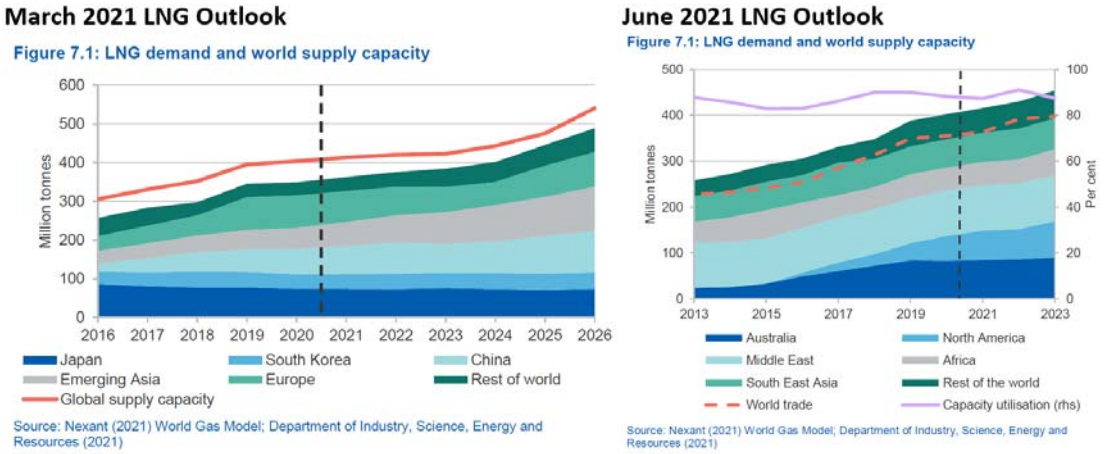
Common theme - new LNG supply is being delayed ie. [Total] Mozambique. Don't forget need capacity>demand due to normal maintenance, etc. Positive for LNG." (ii) Chevron's Gorgon. A big LNG story in H2/20 was the emergence of weld quality issues in the propane heat exchangers at Train 2, which required additional downtime for repair. Train 2 was shut on May 23 with an original restart of July 11, but the repairs to the weld quality issues meant it didn't restart until late Nov. The same issue was found in Train 1 but repairs were completed. However extended downtime for the trains led to lower LNG volumes. Gorgon produced ~2.3 bcf/d in 2019 but was down to 2.0 bcf/d in 2020. (iii) Equinor's Melkoeya 0.63 bcf/d shut down for 18 months due to a fire. A massive fire led to the Sept 28, 2020 shutdown of the 0.63 bcf/d Melkoeya LNG facility in Norway. On April 26, Equinor released "*Revised start-up date for Hammerfest LNG*" [LINK] with regard to the 0.63 bcf/d Melkoeya LNG facility. The original restart date was Oct 1, 2021 (ie. a 12 month shut down), but Equinor said "*Due to the comprehensive scope of work and Covid-19 restrictions, the revised estimated start-up date is set to 31 March 2022".* When we read the release, it seemed like Equinor was almost setting the stage for another potential delay in the restart date. Equinor had two qualifiers to this March 31, 2022 restart date. Equinor said "*there is still some uncertainty related to the scope of the work*" and "*Operational measures to handle the Covid-19 situation have affected the follow-up progress after the fire. The project for planning and carrying out repairs of the Hammerfest LNG plant must always comply with applicable guidelines for handling the infection situation in society. The project has already introduced several measures that allow us to have fewer workers on site at the same time than previously expected. There is still uncertainty related to how the Covid-19 development will impact the project progress."*

Cheniere stopped the game playing the game on June 30. Our July 4, 2021 Energy Tidbits memo noted that it looks like Cheniere has stopped playing stupid with respect to the strengthening LNG market in 2021. We can't believe they thought they were fooling anyone, especially their competitors. Bu that week, they came out talking about how commercial discussions have picked up in 2021 and it's boosted their hope for a Texas (Corpus Christi) LNG expansion. On Wednesday, Platts reported "*Pickup in commercial talks boosts Cheniere's hopes on mid-scale LNG project*" [LINK] Platts wrote "*Cheniere Energy expects to make a "substantial dent" by the end of 2022 in building sufficient buyer support for a proposed mid-scale expansion at the site of its Texas liquefaction facility, Chief Commercial Officer Anatol Feygin said June 30 in an interview." " As a result, he said, " The commercial engagement, I think it is very fair to say, has really picked up steam, and we are quite optimistic over the coming 12-18 months to make a substantial dent in that Stage 3 commercialization."* Platts also reported that Cheniere noted this has been a tightening market all year (ie would have been known by the May 4 Q1 call). Platts wrote "*We obviously find ourselves at the beginning of this year and throughout in a very tight market where prices today into Asia and into Europe are at levels that we frankly haven't seen in a decade-plus," Feygin said. "We've surpassed the economics that the industry saw post the Fukushima tragedy in March 2011, and that's happened in the shoulder period."* It's a public stance as to a more bullish LNG outlook

But we still see major LNG suppliers like Australia hinting but not outright saying that LNG supply gap is coming sooner. We have to believe Australia will be unveiling a sooner LNG supply gap in their September forecast. On June 28, we tweeted [LINK] on Australia's Resources and Energy Quarterly released on Monday [LINK] because there was a major change to their LNG outlook versus their March forecast. We tweeted "*#LNGSupplyGap. AU June fcast now sees #LNG mkt tighten post 2023 vs Mar fcast excess supply thru 2026. Why? $TOT Mozambique delays. See below SAF Apr 28 blog. Means brownfield LNG FID needed ie. like #LNGCanada Phase 2. #OOTT #NatGas".* Australia no longer sees supply exceeding demand thru 2026. In their March forecast, Australia said "*Nonetheless, given the large scale expansion of global LNG capacity in recent years, demand is expected to remain short of total supply throughout the projection period."* Note this is thru 2026 ie. a LNG supply surplus thru 2026. But on June 28, Australia changed that LNG outlook and now says the LNG market may tighten beyond 2023. Interestingly, the June forecast only goes to 2023 and not to 2026 as in March. Hmmm! On Monday, they said "*Given the large scale expansion of global LNG capacity in recent years, import demand is expected to remain short of export capacity throughout the outlook period. Beyond 2023, the global LNG market may tighten, due to the April 2021 decision to indefinitely suspend the Mozambique LNG project, in response to rising security issues. This project has an annual nameplate capacity of 13 million tonnes, and was previously expected to start exporting LNG in 2024*." 13 million tonnes is 1.7 bcf/d so they are only referring to Total Mozambique LNG Phase 1. So no surprise the change is Mozambique LNG driven but we have to believe the reason why they cut their forecast off this time at 2023 is that they are looking at trying to figure out what to forecast beyond 2023 in addition to Total Phase 1. And, importantly, we believe they will be changing their LNG forecast for more than Mozambique ie. India

demand that we highlight later in the blog. They didn't say anything else specific on Mozambique but, surely they have to also be delaying the follow on Total Phase 2 of 1.3 bcf/d and Exxon Rozuma Phase 1 of 2.0 bcf/d.

Australia's LNG Outlook: March 2021 vs June 2021 Forecasts

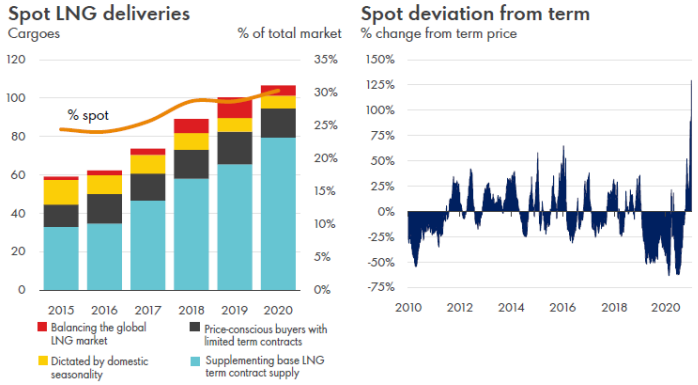


Source: Australia Resources and Energy Quarterly

Clearly Asian LNG buyers did the math, saw the new LNG supply gap and were working the phones in March/April/May trying to lock up long term supply. We wrote extensively on the Total Mozambique LNG situation before the April 26 force majeure as it was obvious that delays were coming to a project counted on for first LNG in 2024. Total had shut down Phase 1 development in December for 3 months due to the violence and security risks. It restarted development on Wed March 24, violence/attacks immediately resumed for 3 consecutive days, and then Total suspended development on Sat March 27. That's why no one should have been surprised by the April 26 force majeure. Asian LNG buyers were also seeing this and could easily do the same math we were doing and saw a bigger and sooner LNG supply gap. They were clearly working the phones with a new priority to lock up long term LNG supply. Major long term deals don't happen overnight, so it makes sense that we started to see these new Asian long term LNG deals start at the end of June.

A big pivot from trying to renegotiate down long term LNG deals or being happy to let long term contracts expire and replace with spot/short term LNG deals. This is a major pivot or abrupt turn on the Asian LNG buyers contracting strategy for the 2020s. There is the natural reduction of long term contracts as contracts reach their term. But with the weakness in LNG prices in 2019 and 2020, Asian LNG buyers weren't trying to extend long term contracts, rather, the push was to try to renegotiate down its long term LNG deals. The reason was clear, as spot prices for LNG were way less than long term contract prices. And this led to their LNG contracting strategy – move to increase the proportion of spot LNG deliveries out of total LNG deliveries. Shell's LNG Outlook 2021 was on Feb 25, 2021 and included the below graphs. The spot LNG price derivation from long term prices in 2019 and 2020 made sense for Asian LNG buyers to try to change their contract mix. Yesterday, Maeil Business News Korea reported on the new Qatar/Kogas long term LNG deal with its report "*Korea may face LNG supply cliff or pay hefty price after long-term supplies run out*" [LINK], which highlighted this very concept – Korea wasn't worried about trying to extend expiring long term LNG contracts. Maeil wrote "*Seoul in 2019 secured a long-term LNG supply contract with the U.S. for annual 15.8 million tons over a 15-year period. But even with the latest two LNG supply contracts, the Korean government needs extra 6 million tons or more of LNG supplies to keep up the current power pipeline. By 2024, Korea's long-term supply contracts for 9 million tons of LNG will expire - 4.92 million tons on contract with Qatar and 4.06 million tons from Oman, according to a government official who asked to be unnamed."*

Spot LNG deliveries and Spot deviation from term price



Source: Shell LNG Outlook 2021 on Feb 25, 2021

Asian LNG buyers moving to long term LNG deals provide financing capacity for brownfield LNG FIDs. We believe this abrupt change and return to long term LNG deals is even more important to LNG suppliers who want to FID new projects. The big LNG players like Shell can FID new LNG supply without new long term contracts as they can build into their supply options to fill their portfolio of LNG contracts. But that doesn't mean the big players don't want long term LNG supply deals, as having long term LNG contracts provide better financing capacity for any LNG supplier. It takes big capex for LNG supply and long term deals make the financing easier.

Four Asian buyer long term LNG deals in the last week. It was pretty hard to miss a busy week for reports of new Asian LNG buyer long term LNG deals. There were two deals from Qatar Petroleum, one from Petronas and one from BP. The timing fits, it's about 3 months after Total Mozambique LNG problems became crystal clear. And as noted later, there are indicators that more Asian buyer LNG deals are coming.

> Petronas/CNOOC is 10 yr supply deal for 0.3 bcf/d. On July 7, we tweeted [LINK] on the confirmation of a big positive to Cdn natural gas with the Petronas announcement [LINK] of a new 10 year LNG supply deal for 0.3 bcf/d with China's CNOOC. The deal also has special significance to Canada. (i) Petronas said "*This long-term supply agreement also includes supply from LNG Canada when the facility commences its operations by middle of the decade*". This is a reminder of the big positive to Cdn natural gas in the next 3 to 4 years – the start up of LNG Canada Phase 1 is ~1.8 bcf/d capacity. This is natural gas that will no longer be moving south to the US or east to eastern Canada, instead it will be going to Asia. This will provide a benefit for all Western Canada natural gas. (ii) First ever AECO linked LNG deal. It's a pretty significant event for a long term Asia LNG deal to now have an AECO link. Petronas wrote "*The deal is for 2.2 million tonnes per annum (MTPA) for a 10-year period, indexed to a combination of the Brent and Alberta Energy Company (AECO) indices. The term deal between PETRONAS and CNOOC is valued at approximately USD 7 billion over ten years.*" 2.2 MTPA is 0.3 bcf/d. (iii) Reminds of LNG Canada's competitive advantage for low greenhouse gas emissions. Petronas said "*Once ready for operations, the LNG Canada project paves the way for PETRONAS to supply low greenhouse gas (GHG) emission LNG to the key demand markets in Asia."*
>
> Qatar Petroleum/CPC (Taiwan) is 15 yr supply deal for 0.16 bcf/d. Pre Covid, Qatar was getting pressured to renegotiate lower its long term LNG contract prices. Now, it's signing a 15 year deal. On July 9, they entered in a new small long term LNG sales deal [LINK], a 15-yr LNG Sale and Purchase Agreement with CPC Corporation in Taiwan to supply it ~0.60 bcf/d of LNG. LNG deliveries are set to begin in January 2022. H.E. Minister for Energy Affairs & CEO of Qatar Petroleum Al-Kaabi said *"We are pleased to enter into this long term LNG SPA, which is another milestone in our relationship with CPC, which dates back to almost three decades. We look forward to commencing deliveries under this SPA and to continuing our supplies as a trusted and reliable global LNG provider."* The pricing was reported to be vs a basket of crudes.

BP/Guangzhou Gas, a 12-yr supply deal for 0.13 bcf/d. On July 9, there was a small long term LNG supply deal with BP and Guangzhou Gas (China). Argus reported [LINK] BP had signed a 12 year LNG supply deal with Guangzhou Gas (GG), a Chinese city's gas distributor, which starts in 2022. The contract prices are to be linked to an index of international crude prices. Although GG typically gets its LNG from the spot market, it used a tender in late April for ~0.13 bcf/d starting in 2022. BP's announcement looks to be for most of the tender, so it's a small deal. But it fit into the trend this week of seeing long term LNG supply deals to Asia. This was intended to secure deliveries to the firm's Xiaohudao import terminal which will become operational in August 2022.

Qatar/Korea Gas is a 20-yr deal to supply 0.25 bcf/d. On Monday, Reuters reported [LINK] "*South Korea's energy ministry said on Monday it had signed a 20-year liquefied natural gas (LNG) supply agreement with Qatar for the next 20 years starting in 2025. South Korea's state-run Korea Gas Corp (036460.KS) will buy 2 million tonnes of LNG annually from Qatar Petroleum".* There was no disclosure of pricing.

More Asian buyer long term LNG deals (ie. India) will be coming. There are going to be more Asian buyer long term LNG deals coming soon. Our July 11, 2021 Energy Tidbits highlighted how India's new petroleum minister Hardeep Singh Puri (appointed July 8) hit the ground running with what looks to be a priority to set the stage for more India long term LNG deals with Qatar. On July 10, we retweeted [LINK] "*New India Petroleum Minister hits ground running. What else w/ Qatar but #LNG. Must be #Puri setting stage for long term LNG supply deal(s). Fits sea change of buyers seeing #LNGSupplyGap (see SAF Apr 28 blog http://safgroup.ca) & wanting to tie up LNG supply. #OOTT".* It's hard to see any other conclusion after seeing what we call a sea change in LNG buyer mentality with a number of long term LNG deals this week. Puri tweeted [LINK] "*Discussed ways of further strengthening mutual cooperation between our two countries in the hydrocarbon sector during a warm courtesy call with Qatar's Minister of State for Energy Affairs who is also the President & CEO of @qatarpetroleum HE Saad Sherida Al-Kaabi".* As noted above, we believe there is a sea change in LNG markets that was driven by the delay in 5 bcf/d of LNG supply from Mozambique (Total Phase 1 & Phase 2, and Exxon Rozuma Phase 1) that was counted on all LNG supply projections for the 2020s. Puri's tweet seems to be him setting the stage for India long term LNG supply deals with Qatar.

Supermajors are aggressively competing to commit 30+ year capital to Qatar's LNG expansion despite stated goal to reduce fossil fuels production. It's not just Asian LNG buyers who are now once again committing long term capital to securing LNG supply, it's also supermajors all bidding to be able to commit big capex to part of Qatar Petroleum's 4.3 bcf/d LNG expansion. Qatar Petroleum received a lot of headlines following the their June 23 announcement on its LNG expansion [LINK] on how they received bids for double the equity being offered. And there were multiple reports that these are on much tougher terms for Qatar's partners. Qatar Petroleum CEO Saad Sherida Al-Kaabi specifically noted that, among the bidders, were Shell, Total and Exxon. Shell and Total have two of the most ambitious plans to reduce fossil fuels production in the 2020's, yet are competing to allocate long term capital to increase fossil fuels production. And Shell and Total are also two of the global LNG supply leaders. It has to be because they are seeing a bigger and sooner LNG supply gap.

Remember Qatar's has a massive expansion but India alone needs 3x the Qatar expansion LNG capacity. In addition to the competition to be Qatar Petroleum's partners, we remind that, while this is a massive 4.3 bcf/d LNG expansion, India alone sees its LNG import growing by ~13 bcf/d to 2030. The Qatar announcement reminded they see a LNG supply gap and continued high LNG prices. We had a 3 part tweet. (i) First, we highlighted [LINK] "*1/3. #LNGSupplyGap coming. big support for @qatarpetroleum expansion to add 4.3 bcf/d LNG. but also say "there is a lack of investments that could cause a significant shortage in gas between 2025-2030" #NatGas #LNG".* This is after QPC accounts for their big LNG expansion. The QPC release said "*However, His Excellency Al-Kaabi voiced concern that during the global discussion on energy transition, there is a lack of investment in oil and gas projects, which could drive energy prices higher by stating that "while gas and LNG are important for the energy transition, there is a lack of investments that could cause a significant shortage in gas between 2025-2030, which in turn could cause a spike in the gas market."* (ii) Second, this is a big 4.3 bcf/d expansion, but India alone has 3x the increase in LNG import demand. We tweeted [LINK] "*2/3. Adding 4.3 bcf/d is big, but dwarfed by items like India. #Petronet gave 1st specific forecast for what it means if #NatGas is to be 15%*

of energy mix by 2030 - India will need to increase #LNG imports by ~13 bcf/d. See SAF Group June 20 Energy Tidbits memo." (iii) Third, Qatar's supply gap warning is driven by the lack of investments in LNG supply. We agree, but note that the lack of investment is in great part due to the delays in both projects under construction and in FIDs that were supposed to be done in 2019. We tweeted [LINK] "3/*3. #LNGSupplyGap is delay driven. $TOT Mozambique Phase 1 delay has chain effect, backs up 5 bcf/d. See SAF Group Apr 28 blog Multiple Brownfield LNG FIDs Now Needed To Fill New #LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2? #NatGas*."

Seems like many missed India's first specific LNG forecast to 2030. Our June 20, 2021 Energy Tidbits memo highlighted the first India forecast that we have seen to estimate the required growth in natural gas consumption and LNG imports if India is to meet its target for natural gas to be 15% of its energy mix by 2030. India will need to increase LNG imports by ~13 bcf/d or 3 times the size of the Qatar LNG expansion. Our June 6, 2021 Energy Tidbits noted the June 4 tweet from India's Energy Minister Dharmendra Pradhan [LINK] reinforcing the 15% goal "*We are rapidly deploying natural gas in our energy mix with the aim to increase the share of natural gas from the current 6% to 15% by 2030."* But last week, Petronet CEO AK Singh gave a specific forecast. Reuters report "*LNG's share of Indian gas demand to rise to 70% by 2030: Petronet CEO"* [LINK] included Petronet's forecast if India is to hit its target for natural gas to be 15% of energy mix by 2030. Singh forecasts India's natural gas consumption would increase from current 5.5 bcf/d to 22.6 bcf/d in 2030. And LNG shares would increase from 50% to 70% of natural gas consumption ie. an increase in LNG imports of ~13 bcf/d from just under 3 bcf/d to 15.8 bcf/d in 2030. Singh did not specifically note his assumption for India's natural gas production, but we can back into the assumption that India natural gas production grows from just under 3 bcf/d to 6.8 bcf/d. It was good to finally see India come out with a specific forecast for 2030 natural gas consumption and LNG imports if India is to get natural gas to 15% of its energy mix in 2030. Petronet's Singh forecasts India natural gas consumption to increase from 5.5 bcf/d to 22.6 bcf/d in 2030. This forecast is pretty close to our forecast in our Oct 23, 2019 blog "*Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030*". Here part of what we wrote in Oct 2019. "*It's taken a year longer than we expected, but we are finally getting visibility that India is taking significant steps towards India's goal to have natural gas be 15% of its energy mix by 2030. On Wednesday, we posted a SAF blog [LINK] "Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030".* Our 2019 blog estimate was for India natural gas demand to be 24.0 bcf/d in 2030 (vs Singh's 22.6 bcf/d) and for LNG import growth of +18.4 bcf/d to 2030 (vs Singh's +13 bcf/d). The difference in LNG would be due to our Oct 2019 forecast higher natural gas consumption by 1.4 bcf/d plus Singh forecasting India natural gas production +4 bcf/d to 2030. Note India production peaked at 4.6 bcf/d in 2010.

Bigger, nearer LNG supply gap + Asian buyers moving to long term LNG deals = LNG players forced to at least look at what brownfield LNG projects they could advance and move to FID. All we have seen since our April 28 blog is more validation of the bigger, nearer LNG supply gap. And now market participants (Asian LNG buyers) are reacting to the new data by locking up long term supply. Cheniere noted how the pickup in commercial engagement means they "*are quite optimistic over the coming 12-18 months to make a substantial dent in that Stage 3 commercialization."* Cheniere can't be the only LNG supplier having new commercial discussions. It's why we believe the Mozambique delays + Asian LNG buyers moving to long term deals will effectively force major LNG players to look to see if there are brownfield LNG projects they should look to advance. Prior to March/April, no one would think Shell or other major LNG players would be considering any new LNG FIDs in 2021. Covid forced all the big companies into capital reduction mode and debt reduction mode. But Brent oil is now solidly over $70, and LNG prices are over $13 this summer and the world's economic and oil and gas demand outlook are increasing with vaccinations. And we are starting to see companies move to increasing capex with the higher cash flows. The theme in Q3 reporting is going to be record or near record oil and gas cash flows, reduced debt levels and increasing returns to shareholders. And unless new mutations prevent vaccinations from returning the world to normal, we suspect that major LNG players, like other oil and gas companies, will be looking to increase capex as they approve 2022 budgets. The outlook for the future has changed dramatically in the last 8 months. The question facing major LNG players like Shell is should they look to FID new LNG brownfield projects in the face of an increasing LNG supply gap that is going to hit faster and harder and Asian LNG buyers prepared to do long term deals. We expect these decisions to be looked at before the end of 2021 for 2022 capex budget/releases. One wildcard that could force these decisions sooner is the already stressed out global supply chain. We have to believe that discussion there will be pressure for more Asian LNG buyer long term deals sooner than later.

For Canada, does the increasing LNG supply gap provide the opportunity to at least consider a LNG Canada Phase 2 FID over the next 6 months? Our view on Shell and other LNG players is unchanged since our April 28 blog. Shell is no different than any other major LNG supplier in always knowing the market and that the oil and gas outlook is much stronger than 9 months ago. Even 3 months post our April 28 blog, we haven't heard any significant talks on how major LNG players will be looking at FID for new brownfield LNG projects. We don't have any inside contacts at Shell or LNG Canada, but that is no different than when we looked at the LNG markets in September 2017 and saw the potential for Shell to FID LNG Canada in 2018. We posted a September 20, 2017 blog *"China's Plan To Increase Natural Gas To 10% Of Its Energy Mix Is A Global Game Changer Including For BC LNG*" [LINK]. Last time, it was a demand driven supply gap, this time, it's a supply driven supply gap. We have to believe any major LNG player, including Shell, will be at least looking at their brownfield LNG project list and seeing if they should look to advance FID later in 2021. Shell has LNG Canada Phase 2, which would add 2 additional trains or approx. 1.8 bcf/d. And an advantage to an FID would be that Shell would be able to commit to its existing contractors and fabricators for a continuous construction cycle following on LNG Canada Phase 1 ie. to help keep a lid on capital costs. We believe maintaining a continuous construction cycle is even more important given the stressed global supply chain. No one is talking about the need for these new brownfield LNG projects, but, unless some major change in views happen, we believe its inevitable that these brownfield LNG FID internal discussions will be happening in H2/21. Especially since the oil and gas price outlook is much stronger than it was in the fall and companies will be looking to increase capex in 2022 budgets.

A LNG Canada Phase 2 would be a big plus to Cdn natural gas. LNG Canada Phase 1 is a material natural gas development as its 1.8 bcf/d capacity represents approx. 20 to 25% of Cdn gas export volumes to the US. The EIA data shows US pipeline imports of Cdn natural gas as 6.83 bcf/d in 2020, 7.36 bcf/d in 2019, 7.70 bcf/d in 2018, 8.89 bcf/d in 2017, 7.97 bcf/d in 2016, 7.19 bcf/d in 2015 and 7.22 bcf/d in 2014. A LNG Canada Phase 2 FID would be a huge plus for Cdn natural gas. It would allow another ~1.8 bcf/d of Cdn natural gas to be priced against pricing points other than Henry Hub. And it would provide demand offset versus Trudeau if he moves to make electricity "emissions free" and not his prior "net zero emissions". Mozambique has been a game changer to LNG outlook creating a bigger and sooner LNG supply gap. And with a stronger tone to oil and natural gas prices in 2021, the LNG supply gap will at least provide the opportunity for Shell to consider FID for its brownfield LNG Canada Phase 2 and provide big support to Cdn natural gas for the back half of the 2020s. And perhaps if LNG Canada is exporting 3.6 bcf/d from two phases, it could help flip Cdn natural gas to a premium vs US natural gas especially if Biden is successful in reducing US domestic natural gas consumption for electricity. The next six months will be very interesting to watch for LNG markets and Cdn natural gas valuations. Imagine the future value of Cdn natural gas is there was visibility for 3.6 bcf/d of Western Canada natural gas to be exported to Asia.

Indonesian Tycoon's Firm to Spend $500 Million on Canada LNG (1)
2022-03-22 23:13:18.465 GMT

By Geoffrey Morgan and Robert Tuttle
(Bloomberg) -- An energy company backed by Indonesian tycoon Sukanto Tanoto plans to spend $500 million this year on a long-planned liquefied natural gas project in Canada, the clearest signal yet that it may move ahead with an LNG export facility on the country's west coast.
Woodfibre LNG, backed by Tanoto's Pacific Energy Corp., has yet to formally announce an investment decision. But Woodfibre President Christine Kennedy gave the spending details to local government officials in Squamish, British Columbia, on Tuesday. The $500 million figure is 31% of the expected$1.6 billion total cost of the project.
A copy of Kennedy's presentation was obtained by Bloomberg.
"While we have not yet issued our final notice to proceed, this confirmed investment is indicative of our intent to start pre-construction work this year, and complete this critical low-emission energy project in 2027," Kennedy said in an emailed statement.
Woodfibre's plan follows Shell Plc's decision to build the much-larger C$40 billion ($31.8 billion) LNG Canada project in Kitimat, British Columbia, which is 60% complete and scheduled to start operating by the middle of the decade.
Woodfibre is licensed to export about 2.1 million metric tons a year of gas chilled to a liquid so it can be shipped to faraway destinations on special tankers. The decision to boost spending comes as European countries scramble to find alternatives to Russian gas and cut the continent's dependence on the energy-producing giant following Vladimir Putin's invasion of Ukraine.
FortisBC, a unit of Fortis Inc., also gave Squamish officials an update on the Eagle Mountain-Woodfibre Gas Pipeline, which would connect the proposed project to an existing natural gas transmission line.
Fortis is proposing to increase the size of its planned work camp to accommodate as many as 600 people during peak periods.
"We listened and have made design changes to eliminate pressure on local housing, to address traffic congestion and to alleviate other pressures on community resources," Fortis BC's director for the project, Darrin Marshall, said in an emailed statement.

--With assistance from Carlos Caminada.

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S**hell Integrated Business Deep Dive Feb 21, 2022 Wael Sawan.**

Items in "i*talics*" are SAF Group created transcript

Approx 9:18am MT. Analyst asks if the future equity percentage you have for the natural gas supply be less than the offtake percentage you have for the LNG? Wael, *".. typically, what I would say, as much as possible, having access across the entire value chain in as close of a percentage as you can, helps ensure that wherever value might rate at any point in time, you are capturing that value. So in general. Take our LNG Canada investment that you just referenced in the second question, we would look to be able to at least assure ourselves that we are not caught up by vagaries of one part of the market. let's say the gas supply, but we would want to have enough on the gas supply equity side to be able to make sure if gas prices go up there, we benefit from them while maybe disadvantaging the midstream or vice versa depending on where prices go. So we are not in the game of necessarily taking undue risk. we are in the game of creating integrated value chains that we can leverage as part of the broader portfolio*. "

Scotiabank asks on the media report of the infrastructure issue on LNG Canada? Wael " *on the issues around LNG Canada, a few things to say. Firstly, we're just, what is it 3 years, 3, 4 months since we have taken FID on that project. Just last oct we crossed the 50% completion on the site in Kitmat. Good progress and this was despite some real challenges with Covid. A lot of the modules coming from various yards in Asia being challenged. Credit to the team, I think some heroic efforts to be able to by and large continue to be on track. I think the challenge that you are referencing is more related to the pipeline – the Coastal GasLink pipeline. Multiple reasons for that which I won't get into in detail. This is a question better addressed to CGL themselves directly. But suffice it to say that we do have some concerns around the cost of the pipeline, we are having deep discussions with TCE, who oversee the pipeline and therefore tying to see how we can mitigate some of these cost increases. But so far, we see TCE getting back on the ball and making sure they are able to move at the pace that ensures that we have pipe before we have the plant. The last comment I will make on that pipeline. Some of you may have picked up the press the incredibly sad events of a couple days ago where we strongly, strongly condemn some of the violence that was shown. Thankfully, no one got hurt in Houston, British Columbia when a specific part of the pipeline around the Maurice River. 20 or so people attacked those who were earning a living at night and thankfully, they all came out well and safe. These events are unfortunate and I'm sure TCE and RCMP will be able to address the issue sufficiently*"

Sl 6. 8:36am MT. Sawan "*That brings me to the future. Our current integrated gas business is doing what we said we would do and is on the right trajectory. But we are not yet where we want to be. We have opportunities that we are pursuing to do even better, with our existing assets, but also to position our growth portfolio to one with even stronger returns with lower carbon emissions. Let me expand on that a bit more. For our capital spend, we need to be even more focused with a continued emphasis on value over volume. We have a capital budget of $4 to $5 billion a year in the short to medium term. We are making good progress on our two LNG capacity expansion projects under construction. In Canada, Canada LNG surpassed recently the 50% completion mark last October, after three years of construction. The project remains dedicated to have the first cargo by the middle of this decade*." He then speaks of Nigeria and that construction there is now firmly underway, and then says "*both these projects are competitively positioned for LNG growth markets in Asia. The same goes for most of our long term project funnel. We have several attractive expansion and backfill projects. A limited number of greenfield LNG projects and several promising low carbon new gaseous projects in early stages of development. For the pre-FID projects, we have an expected average internal rate of return of between 14% and 18%, and a unit technical cost below $5/mmbtu. With most of these projects clearly having lower costs than the average in the industry. These are good numbers, but you will understand that we strive to push the IRR to the higher end and to push the unit costs down even further. But the long term role of gas depends on efforts to abate emissions and develop cleaner pathways for gas. This is why we continually try to reduce the carbon intensity of our new projects. Take LNG Canada currently under construction. It will run on hydropower and is set to deliver the lowest carbon intensity in the entire industry."*

https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/25/joint-statement-between-the-united-states-and-the-european-commission-on-european-energy-security/

Joint Statement between the United States and the European Commission on European Energy Security

MARCH 25, 2022•STATEMENTS AND RELEASES

The United States and the European Commission are committed to reducing Europe's dependency on Russian energy. We reaffirm our joint commitment to Europe's energy security and sustainability and to accelerating the global transition to clean energy. In condemning in the strongest terms Russia's further invasion of Ukraine, we express our solidarity and support for Ukraine. We share the objective of addressing the energy security emergency – to ensure energy supply for the EU and Ukraine. We welcome the continued progress toward the physical integration of Ukraine with the EU energy markets. The energy security and sustainability of the EU and Ukraine are essential for peace, freedom and democracy in Europe.

Through the Joint European action for more affordable, secure and sustainable energy (REPowerEU), the EU confirmed its objective to reach independence from Russian fossil fuels well before the end of the decade, replacing them with stable, affordable, reliable, and clean energy supplies for EU citizens and businesses.

The United States and the EU are committed to meeting the goals of the Paris Agreement, achieving the objective of net zero emissions by 2050, and keeping a 1.5 degrees Celsius limit on temperature rise within reach, including through a rapid clean energy transition, renewable energy, and energy efficiency. These policies and technologies will also contribute to making the EU independent from Russian fossil fuels. Natural gas remains an important part of the EU energy system in the green transition, including by ensuring its carbon intensity decreases over time.

The United States and European Commission confirm our strategic energy cooperation for security of energy supply and reducing dependence on fossil fuels. We share efforts to make available stable, affordable, reliable and clean energy supplies to citizens and businesses in the EU and its neighbouring partner nations. In this framework, we establish an immediate cooperation to address the emergency energy security objective of ensuring appropriate levels of gas storage ahead of next winter and the following one. We will continue our close cooperation on other measures to accelerate the green energy transition, lower energy consumption and reduce dependence on fossil fuels.

Task Force on Energy Security

The United States and the European Commission will immediately establish a joint Task Force on Energy Security to set out the parameters of this cooperation and execute its implementation. The Task Force will be chaired by a representative from the White House and a representative of the President of the European Commission.

This Task Force will focus on the following urgent issues:

- The United States will strive to ensure, including working with international partners, additional liquified natural gas (LNG) volumes for the EU market of at least 15 bcm in 2022 with expected increases going forward.
- The United States and European Commission will undertake efforts to reduce the greenhouse gas intensity of all new LNG infrastructure and associated pipelines, including through the use of clean energy to power onsite operations, the reduction of methane leakage, and the construction of clean and renewable hydrogen ready infrastructure.
- The United States commits to maintaining an enabling regulatory environment with procedures to review and expeditiously act upon applications to permit any additional export LNG capacities that would be needed to meet this emergency energy security objective and support the RePowerEU goals, affirming the joint resolve to terminate EU dependence on Russian fossil fuels by 2027.
- The European Commission will work with the governments of EU Member States to accelerate their regulatory procedures to review and determine approvals for LNG import infrastructure, to include onshore facilities and related pipelines to support imports using floating storage regasification unit vessels, and fixed LNG import terminals.

- The European Commission will work with EU Member States and market operators to pool demand through a newly established EU Energy platform for additional volumes between April and October 2022. The European Commission will also support long-term contracting mechanisms and partner with the U.S. to encourage relevant contracting to support final investment decisions on both LNG export and import infrastructure.
- The European Commission will work with EU Member States toward ensuring stable demand for additional U.S. LNG until at least 2030 of approximately 50 bcm/annum, on the understanding that the price formula of LNG supplies to the EU should reflect long-term market fundamentals, and stability of the cooperation of the demand and supply side, and that this growth be consistent with our shared net zero goals. In particular, price formula should include consideration of Henry Hub Natural Gas Spot Price and other stabilising factors.
- The EU is preparing an upgraded regulatory framework for energy security of supply and storage. This will enhance certainty and predictability regarding security of supply and storage needs and ensure closer cooperation within the EU and its neighbouring partner nations. The European Commission has proposed regulation on energy storage to ensure that the existing storage infrastructure is filled up to 90% of its capacity by 1 November each year, with specific phase-in provisions for 2022. The European Commission will coordinate with the Member States and provide transparency with respect to available LNG capacity in EU terminals.
- The United States and the European Commission will engage key stakeholders, including the private sector, to formulate immediate recommendations that will reduce overall gas demand through accelerating market deployment and utilization of clean energy technologies and measures in Europe and the United States such as:
- Partnering on technologies and energy efficiency solutions such as ramping up demand response devices (such as smart thermostats) and heat pump deployment and installations, scaling procurement for clean energy equipment, investing in innovative technologies and fuel-switching away from fossil fuels.
- Expediting planning and approval for renewable energy projects and strategic energy cooperation including in offshore wind technologies.
- Developing a strategy to accelerate workforce development to support the rapidly deployment of clean energy technologies, including an expansion of solar and wind.
- Collaborating to advance the production and use of clean and renewable hydrogen to displace unabated fossil fuels and cut greenhouse gas emissions, including by investing in technology development and supporting infrastructure.
- The European Commission is working to advance measures that reduce gas consumption by maximizing renewable energy generation and utilization, including by reducing curtailment rates.
- The United States and the European Commission are resolved to negotiate and then implement an ambitious emissions-based Global Arrangement on Steel and Aluminum Trade that incentives industrial decarbonization and lowers energy demand.

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03/25/2022, 00:58

NOVATEK liquefies with strength

The company concentrated on the first line of the Arctic LNG-2

NOVATEK, according to Kommersant, has froze work on all its promising projects, except for the first line of the Arctic LNG-2 liquefaction plant. And although, according to Kommersant's sources, work on it is behind schedule, the company still retains plans to begin transporting the first floating platform from Murmansk to the Gulf of Ob by the end of August. The fate of the second and third lines is less clear due to TotalEnergies' refusal to continue investing in the project, as well as possible difficulties in obtaining equipment.

NOVATEK has paused all processes for the implementation of its promising projects, with the exception of the first stage of Arctic LNG-2, according to Kommersant sources familiar with the situation. The project's liquefaction lines are assembled in Murmansk and installed on gravity platforms, which will then be towed to Yamal.

According to Kommersant's interlocutors, there are some delays on the first platform, but NOVATEK expects to send it from Murmansk to the Gulf of Ob at the end of August. The platform is almost complete, with major equipment being commissioned, but delivery of seven Baker Hughes gas turbines is still pending. If, however, the company does not have time to tow the platform during this year's navigation, the launch will be postponed. The head of TotalEnergies, Patrick Pouyanne, said in an interview with Bloomberg on March 24 that the readiness of the first line is 98%.

The first line of the Arctic LNG-2 plant is to be launched in 2023, the second was planned for 2024, and the third for 2025. Each of the three stages should have a production capacity of 6.6 million tons per year, in April 2021 all project partners entered into twenty-year contracts for the purchase of LNG from the plant in proportion to their share. NOVATEK owns 60% in Arctic LNG-2, while other shareholders, including French TotalEnergies, Chinese CNPC and CNOOC, and a consortium of Japanese Mitsui and JOGMEC, each own 10%.

Formally, the US and EU restrictions did not affect equipment for the production of LNG, and NOVATEK itself did not fall under new sanctions. The company has already contracted major equipment for the second and third lines of Arctic LNG-2, including Siemens compressors, Baker Hughes turbines and Linde heat exchangers. But, as the interlocutors of Kommersant note, in the current conditions it is impossible to be completely sure that the equipment will be shipped, moreover, delays are possible due to the tightening of export controls in the EU and failures in supply chains for deliveries to the Russian Federation.

Arctic LNG-2 is NOVATEK's second major LNG export project after the Yamal LNG plant with a capacity of 16.5 million tons per year, launched in 2017. They were to be followed by Ob GCC and Ob LNG (see Kommersant dated February 21) - now, according to Kommersant, these projects have been put on hold.

NOVATEK, due to sanctions, has already encountered difficulties in attracting external financing for Arctic LNG-2, since VEB.RF, Otkritie and Sberbank, which fell under the sanctions, actively participated in it (see Kommersant on March 3). Also, tankers with NOVATEK's spot cargo could not enter European ports, and buyers in the EU refuse to buy them, although formally no sanctions have been imposed on the purchase of Russian gas.

TotalEnergies said on March 22 that it was halting new investment in Arctic LNG-2 as EU sanctions ban investments in the Russian fuel and energy complex. The Japanese consortium has not yet made its position clear. The entire project was valued at $21 billion, and the shareholders had to provide half, the rest would be external financing. Thus, the total contribution of Total as a shareholder should have been about $1 billion.

As of the end of 2021, Arctic LNG-2 was 57% funded. It is not yet clear what will happen to the TotalEnergies stake and who will cover the missing funding. In theory, TotalEnergies may agree to reduce its share in proportion to the investments already made in favor of other shareholders. Otherwise, TotalEnergies may be left without the opportunity to receive dividends and without its representative in the governing bodies of Arctic LNG-2.

Liability measures against a participant who does not fulfill his investment obligations, says adviser to JSB S&K Vertical, lawyer Alena Bachinskaya, may consist in the forced collection of funds due, the collection of a penalty, as well as losses incurred - in the form of both actual damage and lost profits .

Tatyana Dyatel

https://www.thenews.com.pk/print/944554-singapore-based-guvnor-backs-out-from-4-lng-term-deliveries

Singapore-based Guvnor backs out from 4 LNG term deliveries

By Khalid Mustafa

March 26, 2022

ISLAMABAD: Singapore-based Guvnor has decided not to honour its contract to deliver four LNG term cargoes to Pakistan, which would force the dollar-starved country to purchase costly LNG from the spot market to fulfill its energy needs.

The cargoes were to be delivered in the remaining four months' tenure of Guvnor's five-year term agreement ending July 2022.

"This is a gigantic blow that will force authorities concerned with no option but to purchase costly LNG cargoes at higher prices currently oscillating in global spot market in the range of $32-38 per MMBTU instead of over $10 per MMBTU under term agreement," a senior official in the Energy Ministry privy to the development told The News.

He said the company sold the cargo destined for Pakistan in the spot market for higher profits.

Pakistan LNG Limited (PLL) had inked a five-year contract in June 2017 under which Guvnor was bound to provide the LNG term cargoes at 11.6247 per cent of Brent.

Guvnor has defaulted three times. The company backed out from delivering a cargo on November 19, 2021, then it backed out from the delivery of cargo on January 10, 2022, and then again a delivery for March 11, 2022 never arrived.

Guvnor was to provide Pakistan four LNG cargoes each in April, May and two in June, but the trading company has informed Islamabad that that it would not be able to provide LNG cargoes in its remaining tenure of the term agreement. Cargoes were scheduled to arrive on April 15, May 14, and June 4 and 9, 2022, the official informed.

Petroleum Division spokesman and Joint Secretary Development Syed Zakria Ali Shah has confirmed the cancellations; however, PLL managing director and Guvnor have not responded to the query about the default.

A top official of the Energy Ministry said PLL has decided to procure LNG from the global spot market and to this effect for the month of April, it has issued tenders.

In 2017, PLL also inked a 15-year term agreement with Italy-based ENI, which has defaulted four times. The first default happened in January 2021, when ENI delivered half the cargo. Next it defaulted in November 2021, with the latest cargo cancellation happening in March 2022.

The official record available with The News shows that with the latest defaults, Guvnor has defaulted on seven cargoes whereas ENI defaulted on four cargoes.

Under the 15-year contract, ENI is bound to provide LNG cargo at 12.14 per cent of Brent. In the first and second year, ENI provided LNG at 11.6247 per cent of Brent. In the third and fourth year ENI provided LNG at 11.95 per cent of Brent, whereas in the fifth year and onwards the cargoes were provided at 12.14 per cent of Brent.

March cargo was also fixed at 12.14 per cent of Brent. The agreement with ENI ends in 2032.

The official said that ENI would provide its term cargo due on April 10, 2022 at 12.14 per cent price of Brent under the term agreement.

"The term agreements with ENI and Guvnor signed in 2017 are flawed and not in the interest of the country," the official and Petroleum Division told The News. "In case LNG trading companies commit default, PLL can impose a penalty of 30 percent of the term cargo price and not more than that."

However, he said, the PLL is bound to pay 100 percent price of the term cargo under take or pay agreement if Pakistan, for any reason, cannot absorb the cargo in its system. In the wake of the flawed agreement, LNG trading companies do not hesitate to commit default as they are ready to pay 30 percent of the term cargo which they sell in the market for windfall profits.

Highlights for the month

- The consumption of petroleum products during April-November 2021 with a volume of 129.98 MMT reported a growth of 5.7% compared to the volume of 123 MMT during the same period of the previous year. Except SKO & petcoke all other petroleum products reported a growth in consumption during April-November 2021 compared to the same period of the previous year. The consumption of petroleum products during November 2021 recorded a de-growth of 11.4% compared to the same period of the previous year.
- Indigenous crude oil and condensate production during November 2021 was lower by 2.2 % than that of November 2020 as compared to a de-growth of 2.2 % during October 2021. OIL registered a de-growth of 0.7 % and ONGC registered a de-growth of 3.0 % during November 2021 as compared to November 2020. PSC registered de-growth of 0.7 % during November 2021 as compared to November 2020. De-growth of 2.7 % was registered in the total crude oil and condensate production during April- November 2021 over the corresponding period of the previous year.
- Total Consumption of Natural Gas (including internal consumption) for the month of November 2021 was 5024 MMSCM which was 1% lower than the corresponding month of the previous year. The cumulative consumption of 43814 MMSCM for the current year till November 2021 was higher by 8.1% compared with the corresponding period of the previous year.
- Crude oil processed during November 2021 was 21.5 MMT, which was 3.4 % higher than November 2020 as compared to a growth of 14.0 % during October 2021. Growth of 11.8 % was registered in the total crude oil processing during April-November 2021 over the corresponding period of the previous year.
- Production of petroleum products saw a growth of 4.3 % during November 2021 over November 2020 as compared to a growth of 14.4 % during October 2021. Growth of 10.6 % was registered in the total POL production during April- November 2021 over the corresponding period of the previous year.
- Ethanol blending with Petrol was 7.1% during November 2021 and cumulative during December 2020- November 2021 was 8.1%.

•	Gross production of natural gas for the month of November 2021 was 2869 MMSCM which was higher by 23.1% compared with the corresponding month of the previous year. The cumulative gross production of natural gas of 22777 MMSCM for the current financial year till November, 2021 was higher by 21.8% compared with the corresponding period of the previous year.
•	LNG import for the month of November, 2021(P) was 2226 MMSCM which was 20.8 % lower than the corresponding month of the previous year. The cumulative import of 21593 MMSCM for the current year till November, 2021 was lower by 3.7% compared with the corresponding period of the previous year.
•	Crude oil imports increased by 0.5% and 11.4% during November 2021 and April-November 2021 respectively as compared to the corresponding period of the previous year. Decrease in POL products imports during April-November 2021 was due to decrease in imports of petcoke, high speed diesel (HSD), naphtha and superior kerosene oil (SKO).
•	POL products imports decreased by 26.6% and 7.7% during November 2021 and April-November 2021 respectively as compared to the corresponding period of the previous year. Decrease in POL products imports during April-November 2021 was due to decrease in imports of petcoke, high speed diesel (HSD), naphtha and superior kerosene oil (SKO).
•	Exports of POL products increased by 26.8% and 7.1% during November 2021 and April-November 2021 respectively as compared to the corresponding period of the previous year. Increase in POL products exports during April-November 2021 (P) was due to increase in exports of all products except LOBS/Lubes and petcoke.
•	The price of Brent Crude averaged $81.44/bbl during November,2021 as against $83.66/bbl during October 2021 and $42.66/bbl during November 2020. The Indian basket crude price averaged $80.64/bbl during November 2021 as against $82.11/bbl during October 2021 and $43.34 /bbl during November 2020.

1. Selected indicators of the Indian economy

	Economic indicators	Unit/ Base	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
1	Population (Census 2011)	Billion	1.2	-	-	-	-	-
2	GDP at constant (2011-12 Prices)	Growth %	8.3	6.8 3rd RE	6.5 2nd RE	4.0 1st RE	-7.3 PE	13.7 E (H1, 2021-22)
3	Agricultural Production (Food grains)	MMT	275.1	285.0	285.2	297.5	308.7 4th AE	150.5 1st AE (Kharif)
		Growth %	9.4	3.6	0.1	4.3	3.7	-
4	Gross Fiscal Deficit (as percent of GDP)	%	3.5	3.5	3.4	4.6	9.5 RE	6.8 BE

	Economic indicators	Unit/ Base	2019-20	2020-21 (P)	November		April-November	
					2020-21 (P)	2021-22 (P)	2020-21 (P)	2021-22 (P)
5	Index of Industrial Production (Base: 2011-12)	Growth %	-0.8	-8.4	4.5*	3.2* QE	-17.3#	20.0#
6	Imports^	$ Billion	474.7	394.4	33.8	52.9	219.8	384.3
7	Exports^	$ Billion	313.4	291.8	23.6	30.0	174.2	263.6
8	Trade Balance	$ Billion	-161.3	-102.6	-10.2	-22.9	-45.7	-120.8
9	Foreign Exchange Reserves @	$ Billion	475.6	579.3	574.8	637.6	-	-

IIP is for the month of *October and #April-October; @2019-20-as on March 27, 2019, 2020-21-as on March 26, 2021, October 2020- as on October 30, 2020 and October 2021-as on October 24, 2021; ^Imports & Exports are for Merchandise; E: Estimates; PE: Provisional Estimates; AE-Advanced Estimates; RE-Revised Estimates; QE-Quick Estimates.

Source: Ministry of Commerce & Industry, Ministry of Statistics and Programme Implementation, Ministry of Agriculture & Farmer's Welfare, Ministry of Finance, Reserve Bank of India

2. Crude oil, LNG and petroleum products at a glance

Details		Unit/ Base	2019-20	2020-21 (P)	November		April-November	
					2020-21 (P)	2021-22 (P)	2020-21 (P)	2021-22 (P)
1	Crude oil production in India[#]	MMT	32.2	30.5	2.5	2.4	20.4	19.9
2	Consumption of petroleum products*	MMT	214.1	194.3	19.3	17.1	123.0	130.0
3	Production of petroleum products	MMT	262.9	233.5	21.4	22.3	147.6	163.3
4	Gross natural gas production	MMSCM	31,184	28,672	2,331	2,869	18,704	22,777
5	Natural gas consumption	MMSCM	64,144	60,815	5,075	5,024	40,531	43,814
6	Imports & exports:							
	Crude oil imports	MMT	227.0	196.5	18.3	18.4	122.9	136.9
		$ Billion	101.4	62.2	5.5	10.6	32.5	71.7
	Petroleum products (POL) imports*	MMT	43.8	43.2	4.8	3.5	28.8	26.6
		$ Billion	17.7	14.8	1.2	2.2	8.0	15.2
	Gross petroleum imports (Crude + POL)	MMT	270.7	239.7	23.0	21.9	151.7	163.5
		$ Billion	119.1	77.0	6.7	12.8	40.4	86.9
	Petroleum products (POL) export	MMT	65.7	56.8	4.1	5.2	37.4	40.1
		$ Billion	35.8	21.4	1.5	3.7	11.8	25.4
	LNG imports*	MMSCM	33,887	33,031	2,812	2,226	22,428	21,593
		$ Billion	9.5	7.9	0.6	1.1	4.7	8.1
7	Petroleum imports as percentage of India's gross imports (in value terms)	%	25.1	19.5	19.9	24.2	18.4	22.6
8	Petroleum exports as percentage of India's gross exports (in value terms)	%	11.4	7.3	6.3	12.3	6.8	9.7
9	Import dependency of crude (on consumption basis)	%	85.0	84.4	86.5	85.1	83.6	84.9

[#]Includes condensate; *Private direct imports are prorated for the period Oct-2021 to Nov-2021

3. Indigenous crude oil production (Million Metric Tonnes)

Details	2019-20	2020-21	November			April-November		
			2020-21	2021-22 Target*	2021-22 (P)	2020-21	2021-22 Target*	2021-22 (P)
ONGC	19.2	19.1	1.6	1.7	1.5	12.7	13.5	12.3
Oil India Limited (OIL)	3.1	2.9	0.2	0.3	0.2	2.0	2.1	2.0
Private / Joint Ventures (JVs)	8.2	7.1	0.6	0.7	0.6	4.8	5.2	4.7
Total Crude Oil	**30.5**	**29.1**	**2.4**	**2.6**	**2.3**	**19.5**	**20.8**	**19.0**
ONGC condensate	1.4	1.1	0.1		0.1	0.8		0.6
PSC condensate	0.3	0.3	0.02		0.03	0.17		0.21
Total condensate	**1.6**	**1.4**	**0.1**		**0.1**	**0.9**		**0.8**
Total (Crude + Condensate) (MMT)	**32.2**	**30.5**	**2.5**	**2.6**	**2.4**	**20.4**	**20.8**	**19.9**
Total (Crude + Condensate) (Million Bbl/Day)	0.64	0.61	0.61		0.59	0.61		0.60

*Provisional targets inclusive of condensate.

4. Domestic oil & gas production vis-à-vis overseas production

Details	2019-20	2020-21	November		April-November	
			2020-21	2021-22 (P)	2020-21	2021-22 (P)
Total domestic production (MMTOE)	63.4	59.2	4.8	5.3	39.1	42.6
Overseas production (MMTOE)	24.5	21.9	1.8	1.8	14.6	14.7
Overseas production as percentage of domestic production	**38.7%**	**37.0%**	**37.4%**	**33.4%**	**37.4%**	**34.4%**

Source: ONGC Videsh, GAIL, OIL , IOCL, HPCL & BPRL

5. High Sulphur (HS) & Low Sulphur (LS) crude oil processing (MMT)

Details		2019-20	2020-21	November		April-November	
				2020-21	2021-22 (P)	2020-21	2021-22 (P)
1	High Sulphur crude	192.4	161.4	15.3	16.4	102.0	117.7
2	Low Sulphur crude	62.0	60.3	5.5	5.0	37.3	38.0
Total crude processed (MMT)		**254.4**	**221.8**	**20.8**	**21.5**	**139.3**	**155.7**
Total crude processed (Million Bbl/Day)		5.09	4.45	5.08	5.25	4.19	4.68
Percentage share of HS crude in total crude oil processing		**75.6%**	**72.8%**	**73.7%**	**76.5%**	**73.2%**	**75.6%**

6. Quantity and value of crude oil imports			
Year	Quantity (MMT)	$ Million	Rs. Crore
2019-20	227.0	1,01,376	7,17,001
2020-21	196.5	62,248	4,59,779

7. Self-sufficiency in petroleum products (Million Metric Tonnes)							
Particulars		2019-20	2020-21	November		April-November	
				2020-21	2021-22 (P)	2020-21	2021-22 (P)
1	Indigenous crude oil processing	29.3	28.0	2.4	2.4	18.6	18.0
2	Products from indigenous crude (93.3% of crude oil processed)	27.3	26.1	2.2	2.2	17.3	16.8
3	Products from fractionators (Including LPG and Gas)	4.8	4.2	0.4	0.3	2.8	2.8
4	Total production from indigenous crude & condensate **(2 + 3)**	32.1	30.3	2.6	2.5	20.2	19.6
5	Total domestic consumption	214.1	194.3	19.3	17.1	123.0	130.0
% Self-sufficiency (4 / 5)		**15.0%**	**15.6%**	**13.5%**	**14.9%**	**16.4%**	**15.1%**

8. Refineries: Installed capacity and crude oil processing (MMTPA / MMT)										
Company	Refinery	Installed capacity (1.11.2021) MMTPA	Crude oil processing (MMT)							
			2019-20	2020-21	November			April-November		
					2020-21	2021-22 (Target)	2021-22 (P)	2020-21	2021-22 (Target)	2021-22 (P)
IOCL	Barauni (1964)	6.0	6.5	5.5	0.6	0.6	0.5	3.2	3.9	3.3
	Koyali (1965)	13.7	13.1	11.6	1.1	1.0	1.1	7.4	9.3	8.4
	Haldia (1975)	8.0	6.5	6.8	0.7	0.6	0.7	4.0	5.5	5.4
	Mathura (1982)	8.0	8.9	8.9	0.8	0.6	0.9	5.5	5.9	5.9
	Panipat (1998)	15.0	15.0	13.2	1.4	1.3	1.3	8.3	10.6	9.9
	Guwahati (1962)	1.0	0.9	0.8	0.08	0.1	0.1	0.51	0.5	0.4
	Digboi (1901)	0.65	0.7	0.6	0.06	0.06	0.06	0.4	0.4	0.5
	Bongaigaon(1979)	2.35	2.0	2.5	0.2	0.2	0.2	1.6	1.6	1.8
	Paradip (2016)	15.0	15.8	12.5	1.3	1.3	1.1	7.8	8.5	8.0
	IOCL-TOTAL	**69.7**	**69.4**	**62.4**	**6.2**	**5.7**	**6.0**	**38.8**	**46.3**	**43.5**
CPCL	Manali (1969)	10.5	10.2	8.2	0.7	0.9	0.8	4.8	6.4	5.3
	CBR (1993)	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CPCL-TOTAL	**11.5**	**10.2**	**8.2**	**0.7**	**0.9**	**0.8**	**4.8**	**6.4**	**5.3**
BPCL	Mumbai (1955)	12.0	15.0	12.9	1.2	1.3	1.3	7.8	9.5	9.3
	Kochi (1966)	15.5	16.5	13.3	1.3	1.3	1.4	7.6	10.7	9.7
BORL	Bina (2011)	7.8	7.9	6.2	0.6	0.6	0.7	3.7	4.7	4.7
	BPCL-TOTAL	**35.3**	**39.4**	**32.4**	**3.2**	**3.1**	**3.4**	**19.0**	**24.9**	**23.7**
NRL	Numaligarh (1999)	3.0	2.4	2.7	0.2	0.2	0.2	1.7	1.8	1.8

Company	Refinery	Installed capacity (1.11.2021) (MMTPA)	Crude oil processing (MMT)							
			2019-20	2020-21	November			Apr-November		
					2020-21	2021-22 (Target)	2021-22 (P)	2020-21	2021-22 (Target)	2021-22 (P)
ONGC	Tatipaka (2001)	0.066	0.087	0.081	0.007	0.005	0.007	0.051	0.041	0.048
MRPL	Mangalore (1996)	15.0	14.0	11.5	1.0	1.4	1.5	6.1	9.4	9.1
	ONGC-TOTAL	**15.1**	**14.0**	**11.6**	**1.0**	**1.4**	**1.5**	**6.1**	**9.5**	**9.1**
HPCL	Mumbai (1954)	7.5	8.1	7.4	0.6	0.7	0.5	4.8	4.3	2.6
	Visakh (1957)	8.3	9.1	9.1	0.8	0.8	0.8	5.9	6.1	5.2
HMEL	Bathinda (2012)	11.3	12.2	10.1	1.0	0.9	1.1	7.2	7.4	8.7
	HPCL- TOTAL	**27.1**	**29.4**	**26.5**	**2.5**	**2.4**	**2.4**	**17.9**	**17.7**	**16.5**
RIL	Jamnagar (DTA) (1999)	33.0	33.0	34.1	2.9	2.9	3.0	22.7	22.7	22.9
	Jamnagar (SEZ) (2008)	35.2	35.9	26.8	2.6	2.6	2.5	17.2	17.2	19.4
NEL	Vadinar (2006)	20.0	20.6	17.1	1.5	1.5	1.7	11.0	11.0	13.5
All India (MMT)		**249.9**	**254.4**	**221.8**	**20.8**	**20.8**	**21.5**	**139.3**	**157.4**	**155.7**
All India (Million Bbl/Day)		**5.02**	**5.09**	**4.45**	**5.08**		**5.25**	**4.19**		**4.68**

Note: Provisional Targets; Some sub-totals/ totals may not add up due to rounding off at individual levels.

9. Major crude oil and product pipeline network (as on 01.12.2021)

Details		ONGC	OIL	Cairn	HMEL	IOCL	BPCL	HPCL	Others*	Total
Crude Oil	Length (KM)	1,283	1,193	688	1,017	5,301	937			**10,419**
	Cap (MMTPA)	60.6	9.0	10.7	11.3	48.6	7.8			**147.9**
Products	Length (KM)		654			9,400	2,596	3,775	2,395	**18,820**
	Cap (MMTPA)		1.7			47.5	23.0	34.1	9.4	**115.7**

*Others include GAIL and Petronet India. HPCL and BPCL lubes pipeline included in products pipeline data

11. Production and consumption of petroleum products (Million Metric Tonnes)												
Products	2019-20		2020-21		November 2020		November 2021 (P)		Apr-Nov 2020		Apr-Nov 2021 (P)	
	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons
LPG	12.8	26.3	12.1	27.6	1.1	2.4	1.1	2.3	7.7	18.0	7.8	18.4
MS	38.6	30.0	35.8	28.0	3.3	2.7	3.7	2.6	22.4	17.4	25.6	20.1
NAPHTHA	20.6	14.3	19.4	14.1	1.8	1.4	1.6	1.1	12.3	9.2	13.2	9.4
ATF	15.2	8.0	7.1	3.7	0.7	0.4	1.1	0.5	3.9	1.9	6.2	3.0
SKO	3.2	2.4	2.4	1.8	0.2	0.2	0.2	0.1	1.6	1.2	1.2	1.0
HSD	111.1	82.6	100.4	72.7	9.5	7.0	9.5	6.5	63.3	44.9	69.1	48.8
LDO	0.6	0.6	0.7	0.9	0.06	0.07	0.08	0.07	0.4	0.5	0.5	0.7
LUBES	0.9	3.8	1.1	4.1	0.1	0.4	0.1	0.4	0.7	2.5	0.7	2.8
FO/LSHS	9.3	6.3	7.4	5.6	0.5	0.5	0.8	0.5	4.8	3.6	5.3	4.0
BITUMEN	4.9	6.7	4.9	7.5	0.5	0.7	0.4	0.6	2.6	4.0	2.7	4.5
PET COKE	14.6	21.7	12.0	15.6	1.1	1.1	1.3	1.0	7.7	11.3	9.3	8.8
OTHERS	31.0	11.4	30.2	12.8	2.6	2.5	2.5	1.4	20.1	8.5	21.6	8.5
ALL INDIA	**262.9**	**214.1**	**233.5**	**194.3**	**21.4**	**19.3**	**22.3**	**17.1**	**147.6**	**123.0**	**163.3**	**130.0**
Growth (%)	**0.2%**	**0.4%**	**-11.2%**	**-9.3%**	**-4.8%**	**4.5%**	**4.3%**	**-11.4%**	**-14.9%**	**-13.6%**	**10.6%**	**5.7%**

Note: Prod - Production; Cons - Consumption

15. LPG consumption (Thousand Metric Tonne)

LPG category	2019-20	2020-21	November			April-November		
			2020-21	2021-22 (P)	Gr (%)	2020-21	2021-22 (P)	Gr (%)
1. PSU Sales :								
LPG-Packed Domestic	23,076.0	25,128.1	2,096.0	2,102.5	0.3	16,676.3	16,604.1	-0.4
LPG-Packed Non-Domestic	2,614.4	1,886.0	201.5	194.8	-3.4	1,035.4	1,427.5	37.9
LPG-Bulk	263.5	361.9	33.1	27.6	-16.5	209.4	242.6	15.9
Auto LPG	171.9	118.4	12.0	10.9	-9.5	67.8	80.1	18.1
Sub-Total (PSU Sales)	26,125.7	27,494.3	**2,342.6**	**2,335.8**	**-0.3**	**17,988.9**	**18,354.3**	**2.0**
2. Direct Private Imports*	204.0	64.2	9.2	7.4	-19.1	37.9	58.8	55.1
Total (1+2)	26,329.8	27,558.4	**2,351.8**	**2,343.2**	**-0.4**	**18,026.8**	**18,413.1**	**2.1**

*Oct -Nov 2021 DGCIS data are prorated

16. LPG marketing at a glance

Particulars (As on 1st of April)	Unit	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	1.12.21 (P)
LPG Active Domestic Customers	(Lakh)						1486	1663	1988	2243	2654	2787	2895	3021
	Growth							11.9%	19.6%	12.8%	18.3%	5.0%	3.9%	5.4%
LPG Coverage (Estimated)	(Percent)						56.2	61.9	72.8	80.9	94.3	97.5	99.8	-
	Growth							10.1%	17.6%	11.1%	16.5%	3.4%	2.3%	-
PMUY Beneficiaries	(Lakh)								200	356	719	802	800.4	880.0
	Growth									77.7%	101.9%	11.5%	-0.2%	9.8%
LPG Distributors	(No.)	9686	10541	11489	12610	13896	15930	17916	18786	20146	23737	24670	25083	25181
	Growth	3.4%	8.8%	9.0%	9.8%	10.2%	14.6%	12.5%	4.9%	7.2%	17.8%	3.9%	1.7%	1.2%
Auto LPG Dispensing Stations	(No.)	536	604	652	667	678	681	676	675	672	661	657	651	634
	Growth	19.9%	12.7%	7.9%	2.3%	1.6%	0.4%	-0.7%	-0.1%	-0.4%	-1.6%	-0.6%	-0.9%	-3.5%
Bottling Plants	(No.)	182	183	184	185	187	187	188	189	190	192	196	200	199
	Growth	0.0%	0.5%	0.5%	0.5%	1.1%	0.0%	0.5%	0.5%	0.5%	1.1%	2.1%	2.0%	0.5%

Source: PSU OMCs (IOCL,BPCL and HPCL)

1.Growth rates as on 1.12.2021 are w.r.t. figures as on 1.12.2020. All growth rates as on 1 April of any year are w.r.t. figures as on 1 April of previous year.

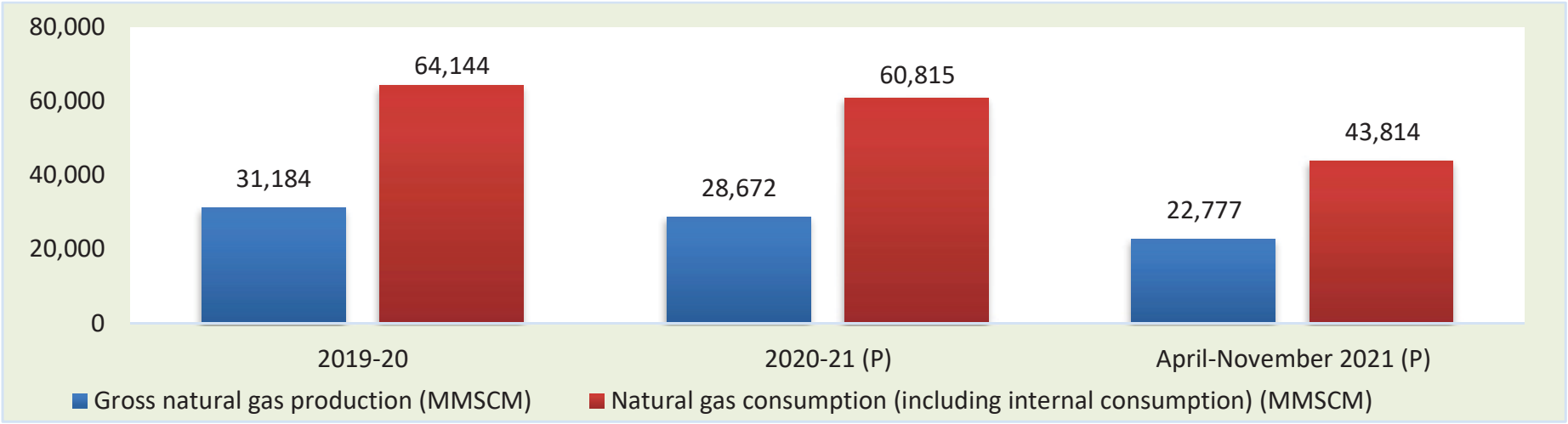
2. The methodology used for estimating LPG coverage by PSU OMC's is under review.

18. Natural gas at a glance

(MMSCM)

Details	2019-20	2020-21 (P)	November			April-November		
			2020-21 (P)	2021-22 (Target)	2021-22 (P)	2020-21 (P)	2021-22 (Target)	2021-22 (P)
(a) Gross production	31,184	28,672	2,331	3,291	2,869	18,704	24,732	22,777
- ONGC	23,746	21,872	1,824	1,946	1,727	14,687	15,480	13,785
- Oil India Limited (OIL)	2,668	2,480	204	242	249	1,668	1,972	1,949
- Private / Joint Ventures (JVs)	4,770	4,321	304	1,102	893	2,349	7,281	7,043
(b) Net production (excluding flare gas and loss)	30,257	27,784	2,263		2,798	18,103		22,222
(c) LNG import#	33,887	33,031	2,812		2,226	22,428		21,593
(d) Total consumption including internal consumption (b+c)	64,144	60,815	5,075		5,024	40,531		43,814
(e) Total consumption **(in BCM)**	64.1	60.8	5.1		5.0	40.5		43.8
(f) Import dependency based on consumption (%), {c/d*100}	52.8	54.3	55.4		44.3	55.3		49.3

#Jul 2020-Nov 2021 DGCIS data prorated



23. Domestic natural gas price and gas price ceiling (GCV basis)		
Period	**Domestic Natural Gas price in US$/MMBTU**	**Gas price ceiling in US$/MMBTU**
November 2014 - March 2015	5.05	-
April 2015 - September 2015	4.66	-
October 2015 - March 2016	3.82	-
April 2016 - September 2016	3.06	6.61
October 2016 - March 2017	2.5	5.3
April 2017 - September 2017	2.48	5.56
October 2017 - March 2018	2.89	6.3
April 2018 - September 2018	3.06	6.78
October 2018 - March 2019	3.36	7.67
April 2019 - September 2019	3.69	9.32
October 2019 - March 2020	3.23	8.43
April 2020 - September 2020	2.39	5.61
October 2020 - March 2021	1.79	4.06
April 2021 - September 2021	1.79	3.62
October 2021 - March 2022	2.9	6.13

24. CNG/PNG prices			
City	**CNG (Rs/Kg)**	**PNG (Rs/SCM)**	**Source**
Delhi	53.04	35.11	IGL website
Mumbai	61.50	33.93	MGL website

http://www.teamstersrail.ca/Work_Stoppage_at_Canadian_Pacific_is_Over.html

Work Stoppage at Canadian Pacific is Over

Calgary, March 22, 2022 – The Teamsters Canada Rail Conference (TCRC) and Canadian Pacific (CP) have agreed to final and binding arbitration. In such a process, both parties agree to accept the arbitrator's decision as final.

“The decision to agree to final and binding arbitration is not taken lightly,” said Dave Fulton, TCRC spokesperson at the bargaining table. “While arbitration is not the preferred method, we were able to negotiate terms and conditions that were in the best interest of our members. Our members will return to work at 12:00 (noon) local time today.”

Wages and pensions remain stumbling blocks.

There will be no comment from union spokespersons to the media until the arbitration process is complete.

The Teamsters Union represents the interests of 125,000 members in Canada, 16,000 of whom work in rail transportation. They are affiliated with the International Brotherhood of Teamsters, which has 1.4 million members in North America.

-30-

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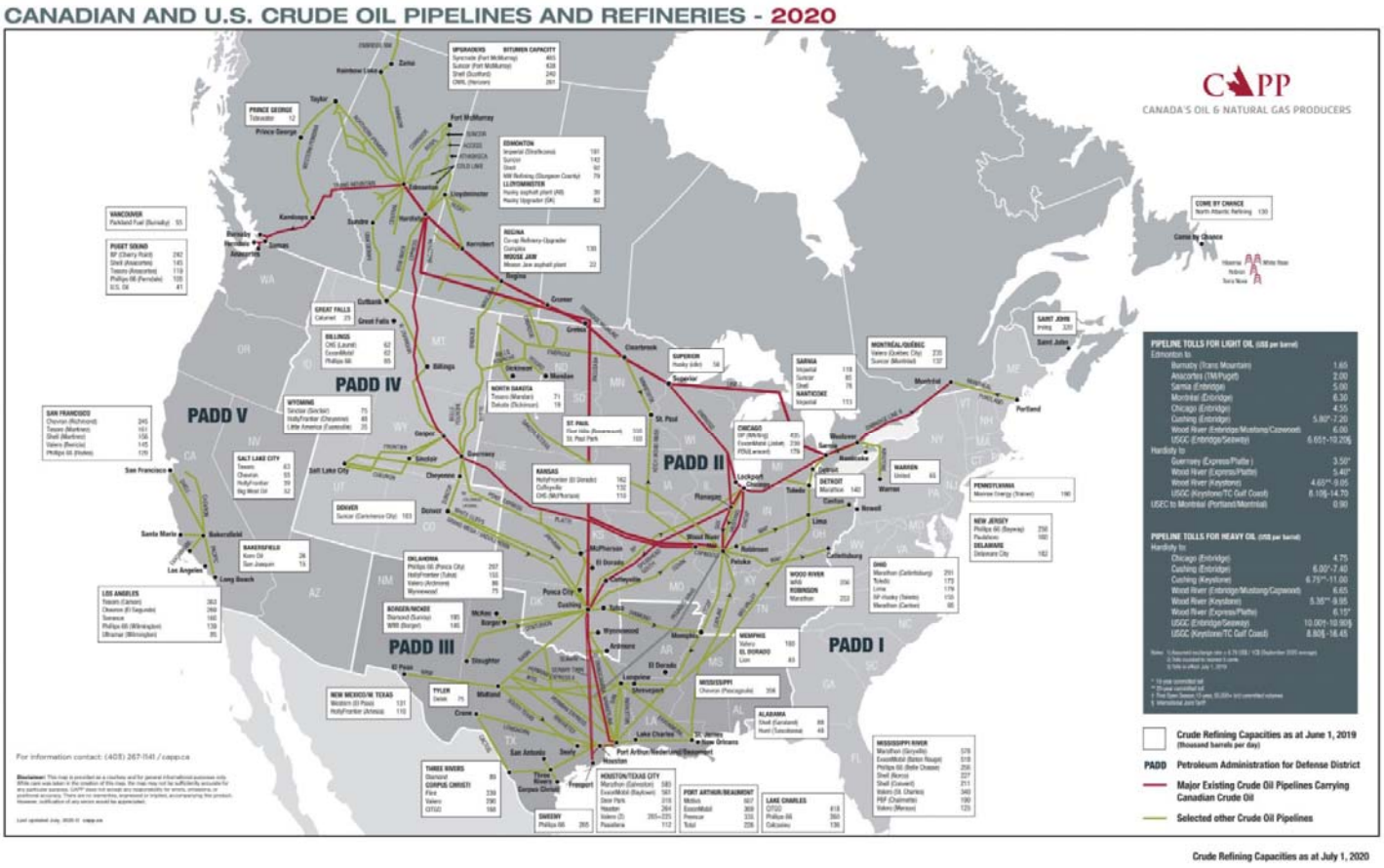
SLacroix@teamsters.ca

https://www.capp.ca/wp-content/uploads/2021/04/2020-CAPP-Pipeline-and-Refinery-Map-LARGE-fo-linking-only.jpg



https://www.wsj.com/articles/chevron-waiting-it-out-in-venezuela-tells-u-s-now-is-the-time-to-pump-oil-11647959248?mod=newsviewer_click&adobe_mc=MCMID%3D43904269652561322512265019543051439235%7CMCORGID%3DCB68E4BA55144CAA0A4C98A5%2540AdobeOrg%7CTS%3D1647963540

Chevron, Waiting It Out in Venezuela, Tells U.S. Now Is the Time to Pump Oil

An oil refinery in Venezuela, where the U.S. has banned American oil companies from operating since 2019. YURI CORTEZ/AFP/GETTY IMAGES

By Christopher M. Matthews and José de Córdoba
March 22, 2022 10:27 am ET

HOUSTON—For months, Biden administration officials snubbed top executives and lobbyists for Chevron Corp. who had pressed officials in Washington to ease sanctions so the company could boost production in Venezuela, where the U.S. has banned such activities since 2019.

Then Vladimir Putin invaded Ukraine.

Now the Biden administration is listening closely to Chevron, say people familiar with the conversations, which says it can help double Venezuela's 800,000 barrels-a-day production within months. That could replace the loss of roughly 700,000 barrels a day the U.S. was importing from Russia before it attacked Ukraine. And it could help lower gasoline prices—a major concern for the Biden administration in a tough election year.

"Chevron came in November, they pitched it around, but got laughed out of town," said Juan Cruz, a former National Security Council official in charge of the Western Hemisphere who has closely followed the Biden administration's policy toward Venezuela. "But what was really funny in November is a plan today."

Since the Russians invaded on Feb. 24 and Mr. Biden canceled Russian oil imports, Chevron Chief Executive Officer Mike Wirth has offered the company's help to Secretary of Energy Jennifer Granholm in shoring up U.S. energy supplies by ramping up production in Venezuela, according to people briefed on the talks. Chevron is the only major U.S. producer to retain assets in Venezuela following nationalizations by the Socialist government and, much later, U.S. sanctions.

Granting the San Ramon, California-based company and other U.S. producers permits to operate could boost Venezuelan production while keeping other sanctions in effect. Broadly easing sanctions on Venezuela faces stiff opposition in the U.S. over concerns it would prop up the country's autocratic regime. U.S. officials are divided over the issue, say people familiar with the situation.

Asked recently by CNN about the outreach to Venezuela and Saudi Arabia for more oil, Ms. Granholm, said, “I think Americans should see the administration calling right now for an increase in supply as something that helps them,” naming the benefit of reducing costs at the pump.

Shortly after Mr. Wirth talked to the energy secretary, three senior U.S. officials—Juan Gonzalez, the senior National Security Council official in charge of Latin America; James Story, the U.S. ambassador to Venezuela; and Roger D. Carstens, a special envoy—flew to Caracas on March 5 and met with President Nicolás Maduro and other top Venezuelan officials.

Another person who spoke with senior Venezuelan officials after the invasion was Ali Moshiri, a charismatic Iranian-American who had headed Chevron’s Latin America division and was considered a “dear friend” by the late Hugo Chávez, the founder of the political movement now led by Mr. Maduro, with whom Mr. Moshiri also has close a close relationship. Mr. Moshiri retired from Chevron in 2017 but now consults for the company in Venezuela, where he has deep ties with senior officials, say people familiar with the matter.

Many oil industry executives say that Mr. Moshiri was essential to Chevron’s controversial decision to stay in the country even as other Western oil companies exited after the Venezuelan government in 2007 nationalized billions of dollars of assets owned by ConocoPhillips, Exxon Mobil Corp. and others. He has also lobbied Biden officials to loosen sanctions on Venezuela, where Chevron has operated for nearly a century.

“You cannot ignore Venezuela,” Mr. Moshiri said in an interview last week. “Venezuela will always be part of our energy security.”

The White House declined to comment about Chevron’s possible role or its own talks in Venezuela. The Energy Department declined to comment.

People briefed on the talks say Mr. Moshiri has argued to U.S. officials that the U.S. can’t cede influence of Venezuelan energy to rivals like China and Russia, which have increased their activities in the country in recent years. He has also spoken with Venezuelan officials for months to try to win the release of Americans imprisoned in Venezuela, these people said.

A Chevron spokesman said Mr. Moshiri isn’t representing the company in negotiations with the U.S. or with Venezuelan officials. Mr. Moshiri declined to provide details about his contract with Chevron. After leaving Chevron, he founded a firm, Amos Global Energy, which seeks investment opportunities in Venezuela, people familiar with the matter said.

A few days after the March 5 meeting in Caracas with U.S. officials, the Maduro government freed two American captives, one of them an executive of Citgo, the U.S. refining subsidiary of state-run oil company Petróleos de Venezuela SA, or PdVSA. The government also agreed to restart negotiations in Mexico with representatives of Venezuela's opposition, who want officials to agree to free and fair presidential elections in 2024.

News of the meeting in Caracas, though, has caused a political backlash in Washington and in Florida, where exiled Venezuelans live and have forged links to the state's powerful and conservative Cuban American community.

"The democratic aspirations of the Venezuelan people, much like the resolve and courage of the people of Ukraine, are worth much more than a few thousand barrels of oil," New Jersey Sen. Robert Menendez, the Democratic chairman of the Senate Foreign Affairs Committee, wrote in a statement. Those sentiments were echoed by both Democratic and Republican lawmakers in Florida.

SHARE YOUR THOUGHTS

Should the U.S. ease sanctions on Venezuela to get more oil? Why or why not? Join the conversation below.

Venezuelan opposition leader Juan Guaidó, whom the U.S. recognizes as Venezuela's legitimate president, was told of the U.S.-Venezuela meeting after it had taken place. Mr. Guaidó wrote a letter to Mr. Biden, according to a person with knowledge of the matter, saying that lifting sanctions on Venezuela would do little to ease the world's crude supply shortages while rewarding Mr. Maduro, a Putin ally whose rule is blamed for leading six million Venezuelans to flee the country.

"Today, more than ever we should be firm and morally consistent," said Mr. Guaidó in a video press conference from Caracas last week. He said any lifting of sanctions on Venezuela or permission for Chevron to pump oil there should only come in exchange for democratic concessions by the regime.

Answering reporters' questions last week White House press secretary Jen Psaki said, "There is no dialogue between us and the regime." She said the administration would consider lifting sanctions on the basis of progress in talks between Mr. Maduro and the opposition.

Chevron officials still say the company could win a license permitting it, along with European oil companies such as Eni Spa and Repsol SA, to operate in Venezuela.

A refinery of state-owned Petróleos de Venezuela in El Palito. Venezuelan oil production has plummeted since the 1990s due to mismanagement.

PHOTO: MANAURE QUINTERO/BLOOMBERG NEWS

Venezuela claims to have the world's largest proven oil reserves. But years of mismanagement, corruption and nationalization of oil ventures led production to fall from 3.2 million barrels a day in

the 1990s to a 10th of that in 2020. Since then, production has more than doubled as Venezuela turned to opaque foreign companies to boost production, say industry executives. Chevron's lobbyists assert that the recent production increases show that the U.S. sanctions aren't working as intended.

But though Chevron has told U.S. officials it could jack up production quickly, some oil analysts who closely track Venezuela doubt the company could deliver. Even in good times, Venezuela had never increased production anywhere near the level of recent optimistic projections, according to Francisco Monaldi, director of the Latin America Energy Program at Rice University's Baker Institute. Chevron's perseverance in Venezuela has come as the company has tried to get Venezuela to pay money owed under production-sharing agreements. The company wrote down all of its assets there in 2020, taking a charge of $2.6 billion. Nonetheless, it stayed, receiving periodic licenses from the U.S. government to retain but not operate assets.

—Timothy Puko in Washington contributed to this article.

Write to Christopher M. Matthews at christopher.matthews@wsj.com and José de Córdoba at jose.decordoba@wsj.com

https://www.bloomberg.com/news/articles/2022-03-22/russia-oil-ban-would-bring-eastern-germany-to-halt-oil-strategy

A Ban on Russian Oil Would Bring Eastern Germany to a Halt

By Julian Lee
March 22, 2022, 6:04 AM MDT

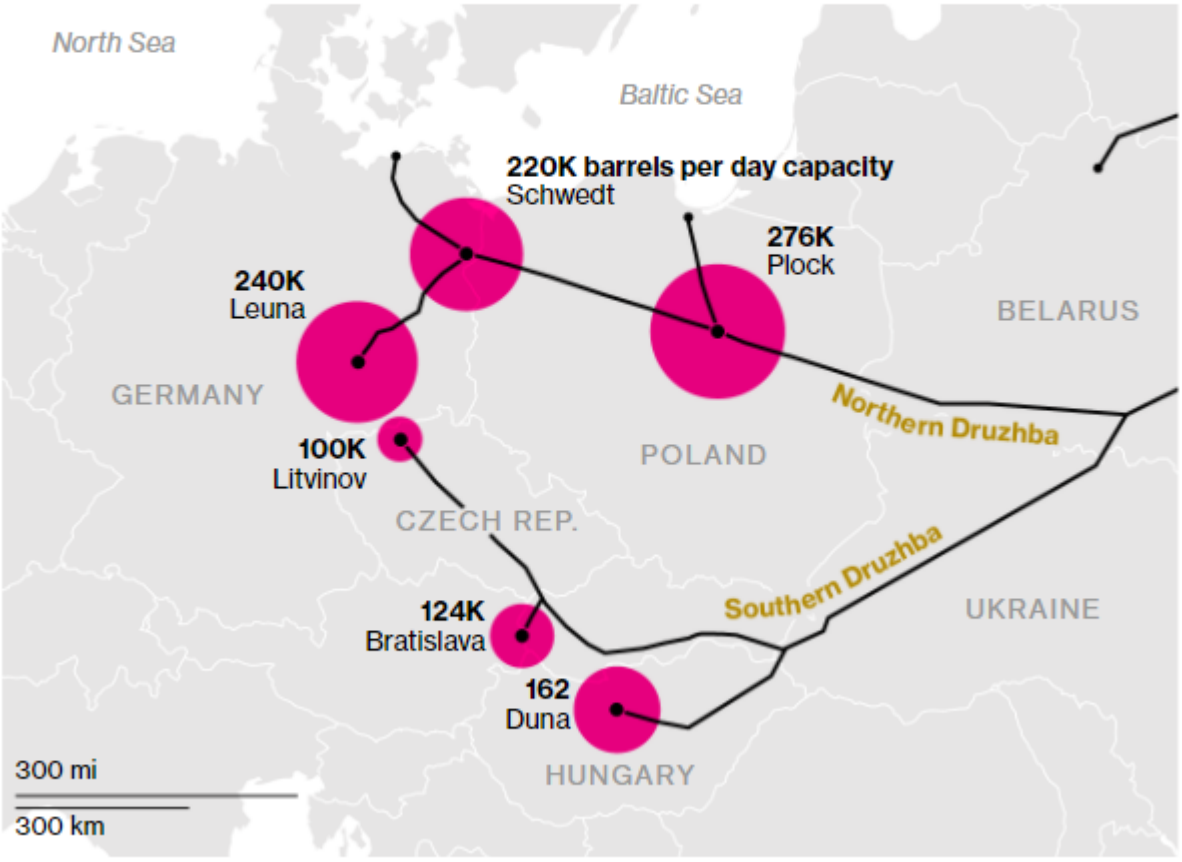
Stop the flow of oil from Russia and large parts of Germany would grind to a halt.

While neighboring Poland is weaning itself off the Kremlin's crude, Europe's industrial powerhouse remains so dependent that it would struggle to support the ban on Russian fuel supplies that's under debate in the European Union this week, writes Bloomberg oil strategist Julian Lee.

This dependence at the heart of the continent greatly limits the economic punishment the EU can mete out to Vladimir Putin for his invasion of Ukraine.

Druzhba's Dependents

Six European refineries depend on crude delivered through the Druzhba system for all, or part of, their feedstock



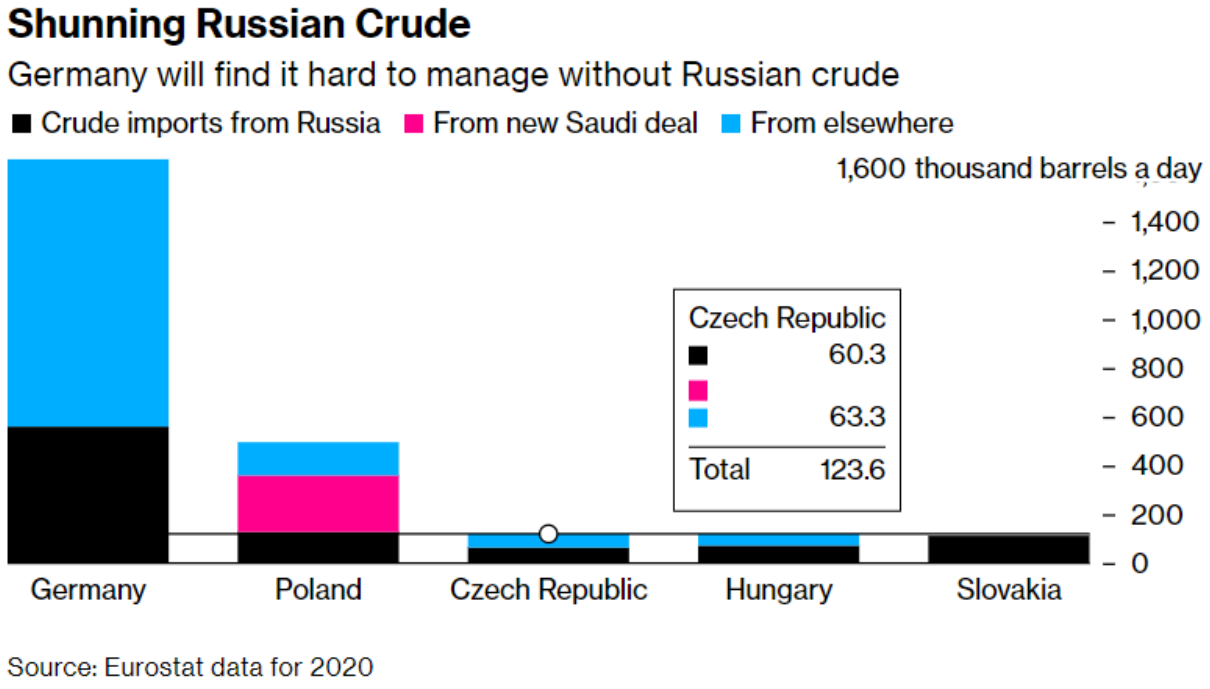
Sources: Bloomberg; AW Consulting

The Druzhba pipeline is a vital source of crude for Germany's Schwedt and Leuna refineries. The plants process nearly 500,000 barrels a day of crude, most of it originating in Russia. If that supply is cut off, much of eastern Germany will quickly run short of fuel.

Schwedt supplies 90% of the gasoline, jet fuel, diesel and heating oil consumed in Berlin and Brandenburg, according to the refinery's website. Leuna is the primary supplier of fuels to the Thuringia, Saxony and Saxony-Anhalt regions -- including the cities of Dresden and Leipzig.

The Schwedt refinery does have an alternative source of supply through a pipeline from the German port of Rostock, which could in theory receive crude from other parts of the world. But the line's capacity is just 140,000 barrels a day -- enough to cover only 60% of the feedstock the plant needs. Leuna has no other source of pipeline deliveries.

To complicate matters further, Schwedt's biggest shareholder is Rosneft PJSC, a Russian company controlled by the Kremlin. It was in the process of buying Shell Plc's 37.5% stake in the plant to take its holding to almost 92%, but that plan is being reviewed by the German government.



Other EU countries face a similar problem, but less severe.

Refineries at Litvinov in the Czech Republic, Bratislava in Slovakia and near Budapest in Hungary, owned by MOL Hungarian Oil and Gas Plc, all receive crude delivered through the Druzhba pipeline system.

An alternative supply route, delivering seaborne crude through a pipeline from the Croatian port of Omisalj, could provide some relief, but the capacity of that line to deliver

crude to those refineries is limited to 200,000 barrels a day, according to operator Jadranski Naftovod d.d., more commonly known as Janaf.

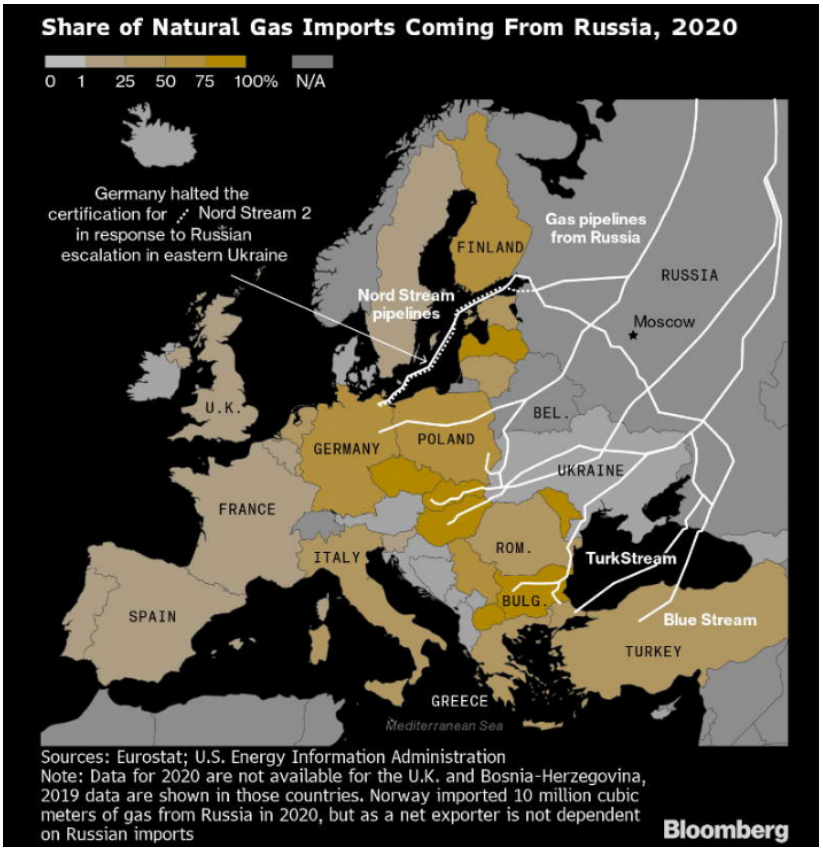
If the EU were ever to ban imports of crude through Druzhba, or if Russia itself were to cut the flows, the markets served by these refineries would find themselves dependent on securing scarce volumes of refined products from elsewhere, and reliant on expensive delivery by truck and rail.

For the Czech Republic and Slovakia, but most of all for Germany, the cost of sanctioning Russia oil would be prohibitive.

NOTE: Julian Lee is an oil strategist who writes for Bloomberg. The observations he makes are his own and are not intended as investment advice

Germany to Wean Itself Off Russian Oil and Gas in Next Two Years
2022-03-25 09:57:30.571 GMT

By Arne Delfs
(Bloomberg) -- Germany plans to quickly wean itself off Russian fossil fuels, aiming to broadly end purchases of the nation's oil and coal this year and almost completely halt imports of Russian gas by the middle of 2024.
Economy Minister Robert Habeck made the announcement in Berlin Friday while reiterating Germany's stance that an immediate embargo on Russian energy is not possible because of the damage it would cause to Europe's biggest economy. Even his own plan poses an immense challenge for a country that's become heavily dependent on Russia for energy supplies.
"In recent weeks, we have made intensive efforts together with all relevant players to import fewer fossil fuels from Russia and to put supply on a broader footing," Habeck said. "The first important milestones have been reached in order to free ourselves from the grip of Russian imports."



The invasion of Ukraine has shocked Germany and its European Union allies into a radical shift in energy policy, and the bloc is rushing to cut its dependence on Russia.
Read more: U.S. Strikes Deal to Help Europe Replace Russian Gas Imports
As part of the radical shift, the EU and U.S. on Friday unveiled a political pact aimed at paving the way for additional imports of U.S. liquefied natural gas. The deal provides a platform for the commercial agreements that will need to follow

for shipments to begin.
Habeck, a member of the Greens party who is also the vice chancellor, has also held talks recently with officials in Norway and Qatar in a bid to diversify its energy supplies. Germany, which has limited natural resources of its own, allowed itself to become reliant on Russia for around half of its gas and coal and about a third of its oil.
Habeck said Germany wants to halve imports of Russian oil by mid-year and be "almost independent" by the end of 2022. It could be completely free of coal imports by the fall, he said. "Companies are letting contracts with Russian suppliers expire, they're not extending them and are switching to other suppliers," he added. "And at an insane pace."
The government acknowledged it would be difficult to remove Russian oil quickly from supply chains, and is rushing to make complex plans to line up deliveries by sea, truck and train.
Read more: Germany Faces Reckoning for Relying on Russia's Cheap Energy
Cutting Germany's reliance on Russian gas is also a challenge, partly due to a lack of the necessary infrastructure like LNG terminals, Habeck said. An expansion of renewables, a broad reduction in demand, diversification of suppliers and ramping up production of clean hydrogen are also essential elements, he added.
"Even if we become less dependent on Russian imports, it is too early for an energy embargo at this point in time," Habeck said. "The economic and social consequences would still be too serious. But every supply contract that is terminated harms Putin."
The Economy Ministry published a paper Friday entitled "Progress Report Energy Security" which set out some of the measures the government is taking. These include:
* Options on three floating LNG terminals through energy companies RWE AG and Uniper SE
* The companies are negotiating contracts to rent the floating storage and regasification units
* The government is looking at potential locations on the North Sea and Baltic Sea
* The facilities can be used at short notice -- in some cases as early as next winter
* Ramping up imports via truck, rail; talks ongoing with Poland on importing oil through Danzig
* Legislation to be approved Friday that ensures gas storage facilities are sufficiently filled

--With assistance from Birgit Jennen, Patrick Donahue, Julian Lee and Emma Ross-Thomas.

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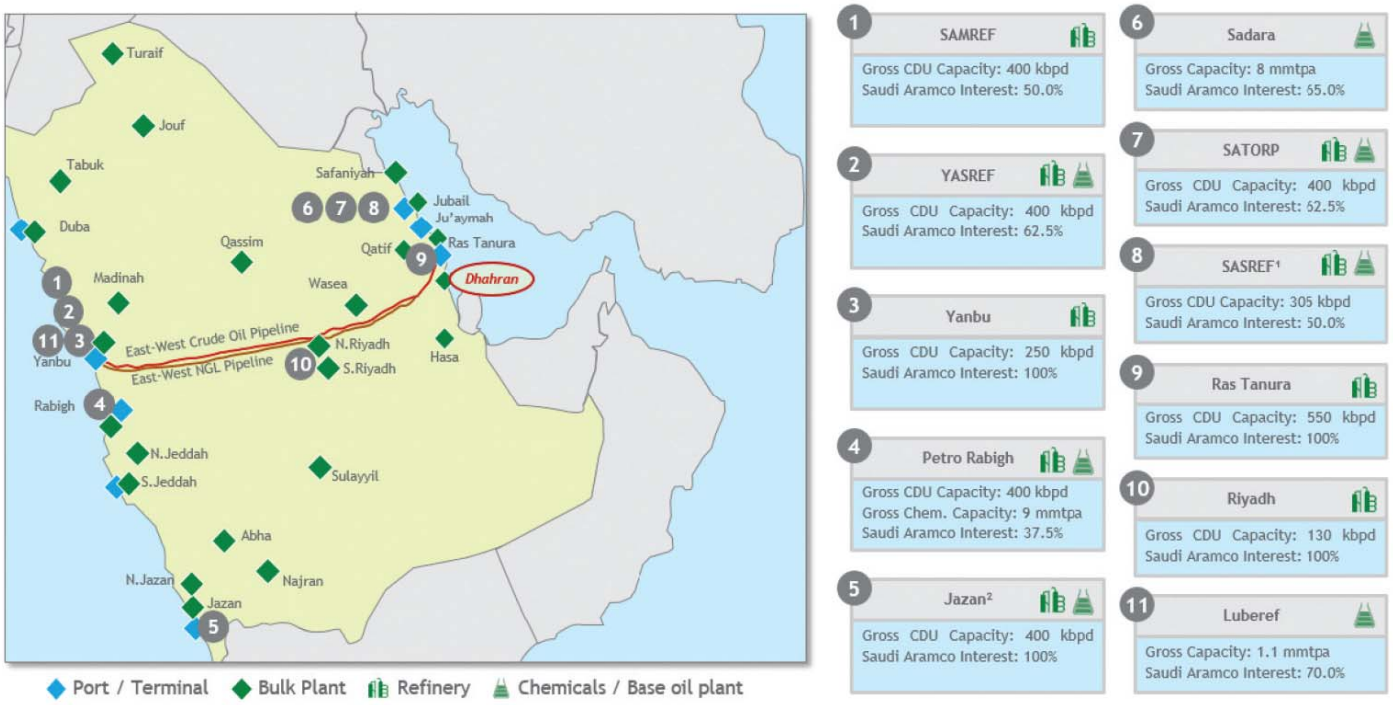
Ben Sills at bsills@bloomberg.net
Iain Rogers, Chad Thomas

Exhibit 24: The Company's key domestic downstream infrastructure as at 31 December 2018G



Source: Company.

(1) On 18 September 2019G, the Company acquired Shell's 50% interest in SASREF and subsequently changed the name of SASREF to Saudi Aramco Jubail Refinery Company.

(2) Jazan is expected to begin operations at the end of 2019G and be fully operational in the second half of 2020G.

Riyadh. The Riyadh Refinery is located in the Kingdom's central area and receives its crude from the East-West pipeline. The refinery has a gross refining capacity and net refining capacity of 130,000 barrels of crude oil per day.

YASREF. YASREF is a joint operation between the Company and Sinopec that owns and operates a full conversion refinery located in the Yanbu' manufacturing complex on the west coast of the Kingdom, Yanbu' Industrial City. The Yanbu' facilities include a complex refinery with a gross refining capacity of 400,000 barrels of crude oil per day and a net refining capacity of 250,000 barrels of crude oil per day. YASREF is planned to increase its gross refining capacity from 400,000 barrels of crude oil per day to 430,000 barrels of crude oil per day by 2020G.

https://www.spa.gov.sa/viewfullstory.php?lang=en&newsid=2336518#2336518

An Official Spokesman at the Ministry of Energy Condemns Terrorist Drone Attack and Sabotage on Riyadh Refinery, Targeting the Security of Energy Supply

Friday 1443/8/8 - 2022/03/11

Riyadh, Mar. 11, 2022, SPA -- An official spokesman at the Ministry of Energy stated that at around 04:40 AM of yesterday, the Riyadh oil refinery was attacked by a drone, resulting in a small fire that has been brought under control. The attack did not result in any injury or death nor was the supply of oil or its derivatives affected.

In his statement, the spokesman stressed that the Kingdom strongly condemns this cowardly attack. The Kingdom asserts that such acts of sabotage and terrorism, repeatedly committed against vital installations and civilian facilities, do not target the Kingdom alone, but more broadly the security and stability of energy supply to the world, and thus negatively affecting the global economy.

The spokesman renewed the Kingdom's call to all nations and organizations of the world to stand together against such acts of sabotage and terrorism, and to stop all groups carrying out or supporting these attacks.

— SPA

01:42 LOCAL TIME 22:42 GMT

Note: Riyadh Saudi Arabia is 3 hours ahead of Greenwich Mean Time ie. 3:47 GMT is 6:47 Riyadh time

OIL TENDER: Aramco Seeks Diesel for Saudi Arabia in Rare Move
2022-03-10 03:47:32.152 GMT

By Elizabeth Low and Sharon Cho
(Bloomberg) -- Aramco Trading is seeking an unusually large volume of diesel for prompt delivery to Saudi Arabia in a rare move for the country, which is usually an exporter of the fuel, according to traders who asked not to be identified.
* Co. sought ~1.2m-4.6m barrels of 10ppm sulfur gasoil for delivery to Ras Tanura, Jizan, Jeddah and Duba via a tender
* Delivery period from mid-March to mid-April
* Offers due March 10, valid until next day

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To view this story in Bloomberg click here:
https://blinks.bloomberg.com/news/stories/R8IE5XDWLU6C

https://www.spa.gov.sa/viewfullstory.php?lang=en&newsid=2336518#2336518

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01:42 LOCAL TIME 22:42 GMT

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U.S. Says Iran Nuclear Deal Not Imminent Amid Deadlock Over IRGC
2022-03-27 09:07:44.95 GMT

By Simone Foxman, Verity Ratcliffe and Arsalan Shahla (Bloomberg) -- The U.S. said the revival of a nuclear deal with Iran may not happen soon following recent requests from Tehran, including that Washington removes the Islamic Revolutionary Guard Corps from its list of terrorist organizations.
"I can't be confident it's imminent," Robert Malley, U.S. Special Envoy for Iran, told reporters on Sunday at a conference in Qatar. "A few months ago we thought it was imminent."
The comments come as the U.S. reassesses the political costs of reviving the 2015 pact that limited Iran's nuclear activities in return for sanctions relief, including on oil exports. Russia's war on Ukraine is also complicating the negotiations, which involve Moscow.
Russia's War Has Changed the Iran Nuclear Deal Calculus
Talks in Vienna between Iran and the European Union, U.K. Russia and China have dragged on for a year. Tehran and the U.S. are negotiating indirectly.
The status of the IRGC, a military organization that's armed Iranian proxy groups around the Middle East and been blamed for numerous attacks on the U.S. and its allies, isn't directly linked to the 2015 agreement. But Iran has insisted that the group comes off the black list.
"It's one of the requests Iran has made," Malley said. "We haven't decided to delist the IRGC. The sooner we get back into the deal -- we think it's in our interest to be back in a deal and we think Iran's too -- the more faithfully we can implement it."
Lifting the designation could alienate Saudi Arabia, the United Arab Emirates and Israel, just as President Joe Biden works to rally them against Moscow.

Saudi Concerns

Saudi Arabia and the UAE have been attacked by Iranian-backed Houthi rebels based in Yemen several times this year. The most recent strikes came on Friday, when the Houthis targeted several sites in Saudi Arabia with missiles and drones and caused a large fire at a fuel depot in Jeddah, where Sunday's Formula 1 race is taking place.
Gulf Arab states have criticized Washington for responding too slowly to Houthi aggression and pursuing the nuclear negotiations with Iran, which they fear will hand Tehran an oil windfall.
The Saudis and Emiratis have resisted U.S. calls to pump more crude and help bring down prices after their surge to around $120 a barrel in the wake of Russia's attack on Ukraine.
That's in part because they're unhappy with U.S. policy toward Iran and the Houthis.

No Rush

Malley denied the White House is pushing harder for a deal because of the run up in oil prices, which has caused gasoline costs for American drivers to jump to an average of about $4.70 a gallon. Energy traders expect Iran to be able to increase oil production by around 500,000 to 1 million barrels a day within months of any new deal.
"There's been zero sense of: 'Now, you really need to rush for a deal because of the need to get oil on the market,'" Malley said on a panel in Qatar. "I've not heard that once." Doha Forum @DohaForum

Is there an escalation towards striking a deal with Iran due to the Ukraine-Russia crisis? Robert Malley, United States Special Representative for Iran, tackles this question while speaking at the #DohaForum.
@Rob_Malley @USEnvoyIran Sent via Twitter Web App. View original tweet.
Iran said it had agreed with France, Germany and the U.K. on a draft text to restore the nuclear accord, but that a deal hinged on what happened with the IRGC.
The U.S. has "accepted" it must take steps to address "a few key remaining issues," Foreign Minister Hossein Amirabdollahian said to Iranian television on Saturday.
The status of the IRGC is "one of the issues," he said. Still, he said senior officials had told his team not to allow matters related to the IRGC to become "a barrier" to doing what is in the country's interests.
Iran has previously said it wants all sanctions imposed by former U.S. President Donald Trump lifted. It's also called for a number of individuals to be removed from the U.S. terror list.
Trump abandoned the nuclear accord in 2018 and designated the IRGC as a foreign terrorist organization a year later.

Oil Sanctions

Malley's comments were more pessimistic than those of European Union foreign policy chief Josep Borrell. He said on Saturday that a deal may be just days away.
Enrique Mora@enriquemora_
Travelling to Tehran tomorrow to meet @Bagheri_Kani. Working on closing the remaining gaps in the #ViennaTalks on the #JCPOA. We must conclude this negotiation. Much is at stake.
Sent via Twitter for Android. View original tweet.
"We are very close but there are still some issues pending," Borrell told reporters on the sidelines of the same forum in Qatar, according to AFP.
Enrique Mora, the European Union's main envoy for the Vienna talks, and Iranian counterpart Ali Bagheri Kani are expected to meet in Tehran on Sunday in a bid to break the deadlock.

--With assistance from Golnar Motevalli.
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SAF Group created transcript of Becky Anderson (CNN Abu Dhabi Managing Editor) clip with Robert Malley (Special Envoy for Iran at US State Department) at Doha Forum March 27
https://twitter.com/DohaForum/status/1507978912323801089

Items in "italics" are SAF Group created transcript"

Malley "*I will be very candid, I have not sensed any shift in the Administration's, White House's, State Dept's view about the eagerness or not to get a deal as a result of the war. I know you, I can see your sense of surprise. People may expect it but i think the guidance I have been given is get a deal if our interests are met. Get a deal if our concerns are met. Get a deal if we can overcome these differences. And there's been zero sense of now you really need to rush for a deal because of the need to get oil on the market. I've not heard that once. All I've heard is here's the parameters under which a deal is acceptable, because they meet, they address US national security concerns. If not, there'll be no deal*."

Oil price outlook – Snapshot: March 21, 2022

Disclaimer: Please note that BNEF does not offer investment advice. Clients must decide for themselves whether current market prices fully reflect the issues discussed in this note.

Category	Indicator	Signal	Comment
Fundamentals	**Refinery margins**	⇔	• Refinery margins were mixed over the past week, as weaker oil product cracks across the barrel weighed down margins in the U.S. Gulf Coast. Margins in Northwest Europe were lower as well due to weaker middle distillate cracks, but lower natural gas prices eased some of the losses. Margins in Singapore rose as product cracks rallied.
	Crude stocks	⇔	• In the week ending March 11, land crude-oil storage levels in BloombergNEF's tracked regions (U.S., ARA, Japan) rose by 1.4% to 522.8 million barrels (m bbl). The stockpile **deficit** against its five-year average (2015-19) **narrowed from 84.6m bbl to 83.1m bbl**. • Including global floating crude stockpiles from the same week, total crude oil inventories increased by 0.1% to 616.0m bbl, with the stockpile **deficit narrowing from 51.7m bbl to 47.0m bbl.**
	Product stocks	⇔	• In the week ending March 11, gasoline and light distillate stockpiles in BNEF's tracked regions (U.S., ARA, Singapore, Japan and Fujairah) were down 0.5% week-on-week to 282.9m bbl, with the stockpile **deficit** against its three-year average (2017-19) **narrowing from 4.9m bbl to 3.2m bbl**. Gasoil and middle distillate stockpiles in BNEF's tracked regions dropped by 0.3% to 143.2m bbl, with the stockpile **deficit** against its three-year average **narrowing from 42.5m bbl to 40.5m bbl**. • Total oil product stockpiles in tracked regions decreased by 0.6% to 883.0m bbl, with the stockpile **deficit** against its three-year seasonal average **widening from 68.8m bbl to 72.3m bbl**. Altogether, crude and product stockpiles dropped by 0.3% to 1,499.0m bbl, with the stockpile **deficit narrowing from 120.5m bbl to 119.4m bbl.**
	Demand indicators	↓	• In the week to March 15, global jet fuel demand from commercial passenger flights fell by 51,100 barrels per day (or 1.1%) week-on-week to 4.41 million barrels per day, putting an end to five consecutive weeks of growth. Jet fuel consumption by international passenger departures was down by 7,400 barrels per day (or 0.3%) week-on-week, while consumption by domestic passenger departures fell by 43,600 barrels per day (or 2.0%). • Global mobility indices were mixed over the past week. Apple's global driving activity index increased by 1.5% in the week to March 17, driven by growth in Asia Pacific ex-China (+4.7%) and the Americas (+2.1%). Google's global mobility index was up 0.2% in the week to March 17, reflecting growth in Asia Pacific ex-China (+2.0%). Road congestion in China decreased by 7.2 percentage points to 96.7% of January 2021 levels in the week to March 16, according to BNEF's calculation based on Baidu data. • Daily average Covid-19 cases rose by 6% to 1.8 million in the week to March 19. Europe was up 10% to 722,000 daily cases and Asia Pacific jumped by 29% to 930,000 daily cases, but the Americas fell by 17% to 106,700 daily cases. All numbers shown are the daily averages for the week ending March 19.
Financial	**Macro indicators**	⇔	• The dollar index averaged at 98.6 over the past week and was 0.2% lower than the week before.
	Hedge fund positioning	↓	• In the week to March 15, Managed Money net positioning in the oil complex decreased by 35.7m bbl (or 6.1%) week-on-week to 552.7m bbl and fell to the 23rd percentile of the past five years (versus the 28th percentile last week) .
	Options chains and volatility	⇔	• There was a drop in open interest for in-the-money (ITM) Brent and WTI calls, and an increase in open interest for out-of-the-money (OTM) calls. Brent and WTI 1M volatility skews fell over the past week.
Outlook	**Weekly call**	⇔	• BNEF is neutral on oil prices for the week ahead, with Brent May-22 trading at $112.35/bbl and WTI May-22 trading at $107.56/bbl at the time of writing. China's oil demand has taken a hit as Covid-19 restrictions took effect in major cities. Jet fuel demand has seen the biggest impact, as over half of flights at the country's 20 largest airports were canceled from March 11-17. Road traffic was relatively more resilient – congestion levels in the 15 cities with the most vehicles registered fell by 7.2 percentage points to 96.7% of January 2021 levels, but was still significantly higher than the Lunar New Year holiday lows. China also hiked retail gasoline and diesel prices to the highest level in at least over 10 years. Prices are likely to remain volatile as the market contends with short-term supply shortages and demand risks in China.

Past outlooks

Disclaimer: Please note that BNEF does not offer investment advice. Clients must decide for themselves whether current market prices fully reflect the issues discussed in this note

Date of report	Refinery margins	Crude stocks	Product stocks	Demand indicators	Commitment of traders	Options chain and volatility	BNEF week ahead call	Brent/WTI price at time of writing ($/bbl)	Web Link
March 21	⇔	⇔	⇔	↓	↓	⇔	⇔	Brent-May: 112.35 WTI-May: 107.56	
March 14	↑	↑	↑	⇔	↓	↓	⇔	Brent-May: 108.66 WTI-Apr: 104.77	
February 28	⇔	⇔	⇔	↑	⇔	⇔	⇔	Brent-May: 99.00 WTI-Apr: 96.38	
February 21	⇔	⇔	↑	↑	⇔	⇔	↑	Brent-May: 91.50 WTI-Apr: 90.17	
February 14	↑	⇔	↑	↑	↓	⇔	↑	Brent-Apr: 93.75 WTI-Mar: 92.46	
February 7	↑	↑	⇔	↑	⇔	⇔	⇔	Brent-Apr: 92.83 WTI-Mar: 91.43	
January 31	↑	⇔	⇔	↑	↓	⇔	↑	Brent-Apr: 89.17 WTI-Mar: 87.55	
January 24	⇔	↑	⇔	⇔	↑	↓	↑	Brent-Mar: 87.19 WTI-Mar: 85.25	
January 17	↑	↑	⇔	⇔	↑	↑	⇔	Brent-Mar: 85.78 WTI-Mar: 83.22	
January 10	↑	↓	⇔	↓	↑	↑	⇔	Brent-Mar: 81.71 WTI-Feb: 78.82	
January 3	⇔	⇔	↑	↓	⇔	⇔	↑	Brent-Mar: 78.84 WTI-Feb: 76.14	
December 13	↑	↑	⇔	↑	↓	⇔	↑	Brent-Feb: 75.25 WTI-Jan: 71.62	
December 6	↑	⇔	⇔	⇔	↓	↑	⇔	Brent-Feb: 71.63 WTI-Jan: 68.05	
November 29	↓	⇔	↑	⇔	↓	↓	⇔	Brent-Feb: 74.47 WTI-Jan: 71.14	

To view past reports on terminal, go to NI BNEFOIL, search for the report and click on the icon to the far right:

BloombergNEF

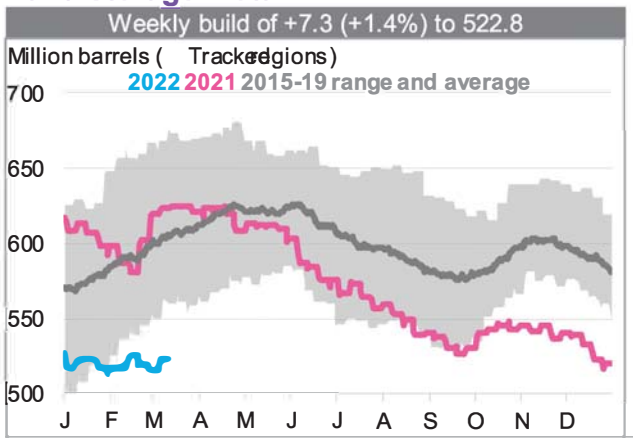
Crude stocks: Land

Note: We will continue to compare current inventory levels with the three-year (2017-19) seasonal average for the time being. Crude inventory data for Shandong teapots were excluded since January 10.

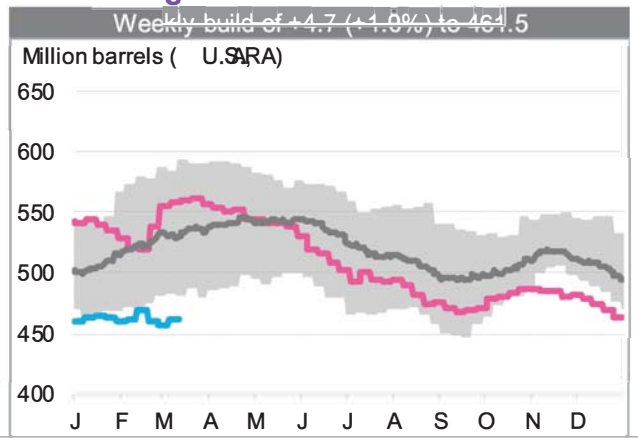
Neutral: Deficit narrowed from 84.6m bbl to 83.1m bbl against seasonal average

- Crude inventory rises when supply outstrips demand (meaning more physical oil is available than is needed). High or rising inventories are therefore a bearish factor for oil prices. Every year, storage levels fluctuate due to seasonal demand trends. The intra-year directional movement of stockpile levels is somewhat predictable, yet the magnitude of movement can differ significantly from expectations.
- A useful way to gauge if the intra-year storage levels differ from the norm is to measure the difference between the current and seasonal average inventory levels.

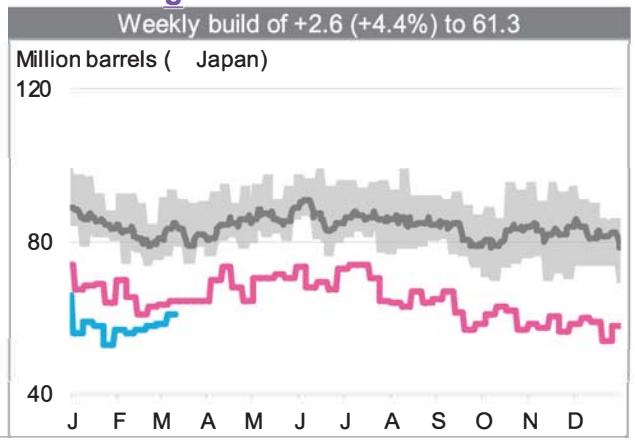
Land storage: Total



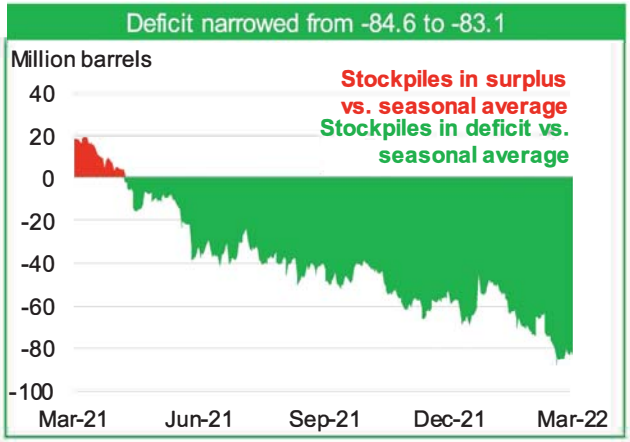
Land storage: West of Suez

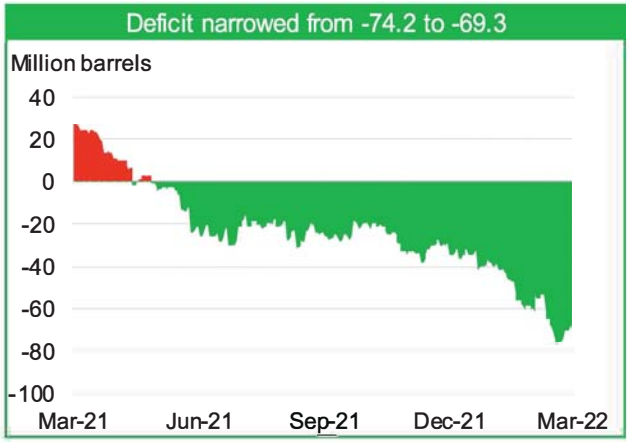


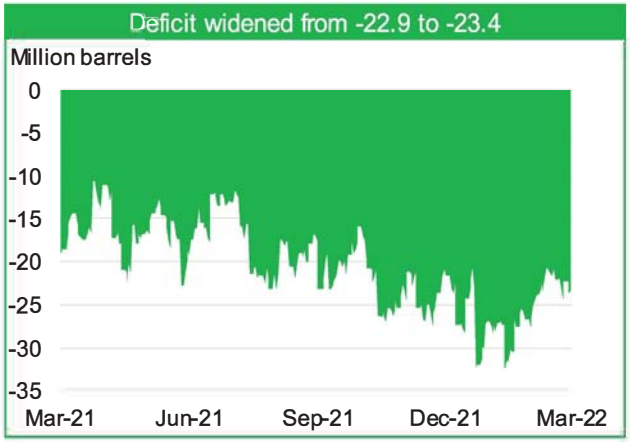
Land storage: East of Suez



Charts below subtract current stockpiles by the 2015-19 (five-year) seasonal average







*Source: BloombergNEF, U.S. EIA, Genscape, PAJ, SCIG. Note: As of the **week ending March 11.***

BloombergNEF

Crude stocks: Floating

Bearish: Surplus widened over the recent week

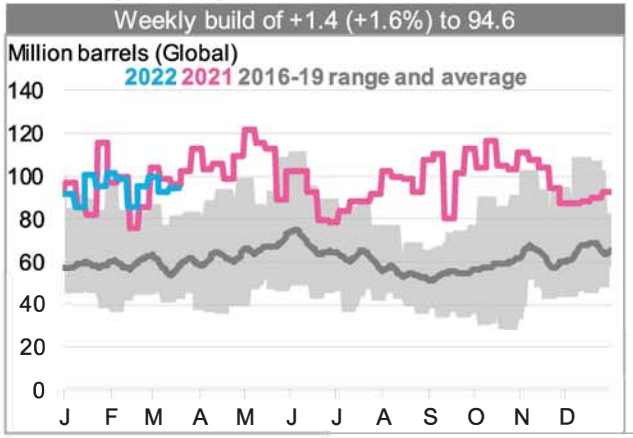
- Floating storage is only profitable if the strength of contango (future vs. prompt price) is greater than the tanker costs. Therefore, tankers become floating storage when the profit from a storage play exceeds the cost of the forward freight agreement (FFA).
- The floating storage data used in the "Oil Price Outlook" slide is for the previous week (i.e. the week before the latest data shown below). That data are available in the table to the right.

Vortexa's revision to global floating crude inventories

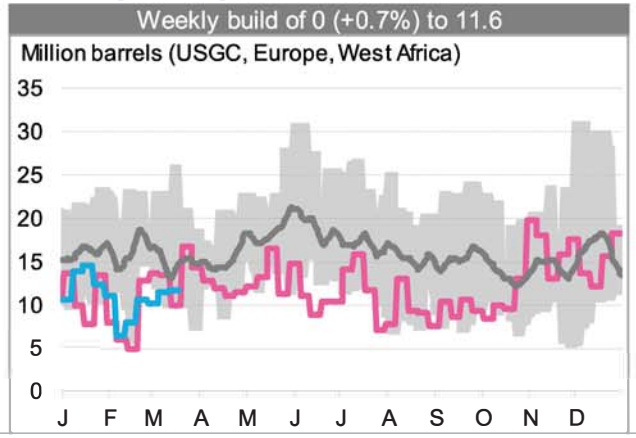
Million barrels	Previous report	Current report	Vortexa's revision
Inventories in week of Mar. 11	85.4	**93.2***	+7.8
Inventories in week of Mar. 4	95.4	100.1	+4.7

*Note: *Figure used to aggregate total oil inventories.*

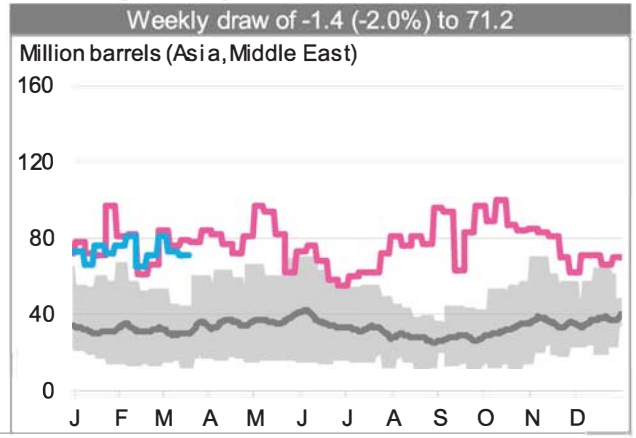
Floating storage: Total



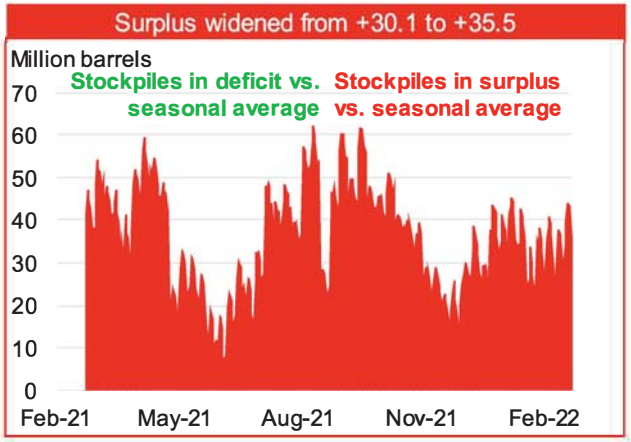
Floating storage: West of Suez

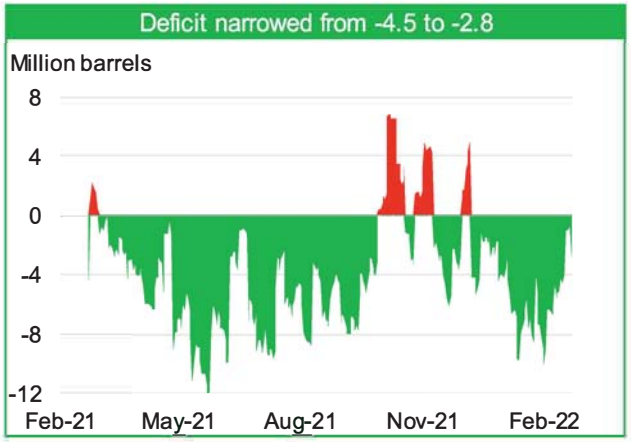


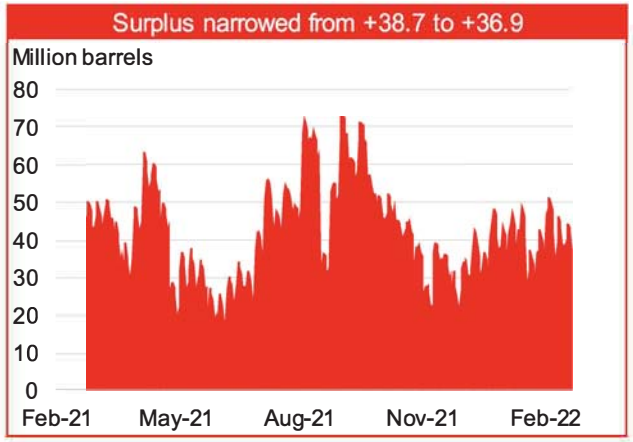
Floating storage: East of Suez



Charts below subtract current stockpiles by the 2016-19 (four-year) seasonal average







*Source: BloombergNEF, Vortexa. Note: As of the **week ending March 18**. ***Raw data from Vortexa is revised frequently, so the data in this report might change week-to-week.***

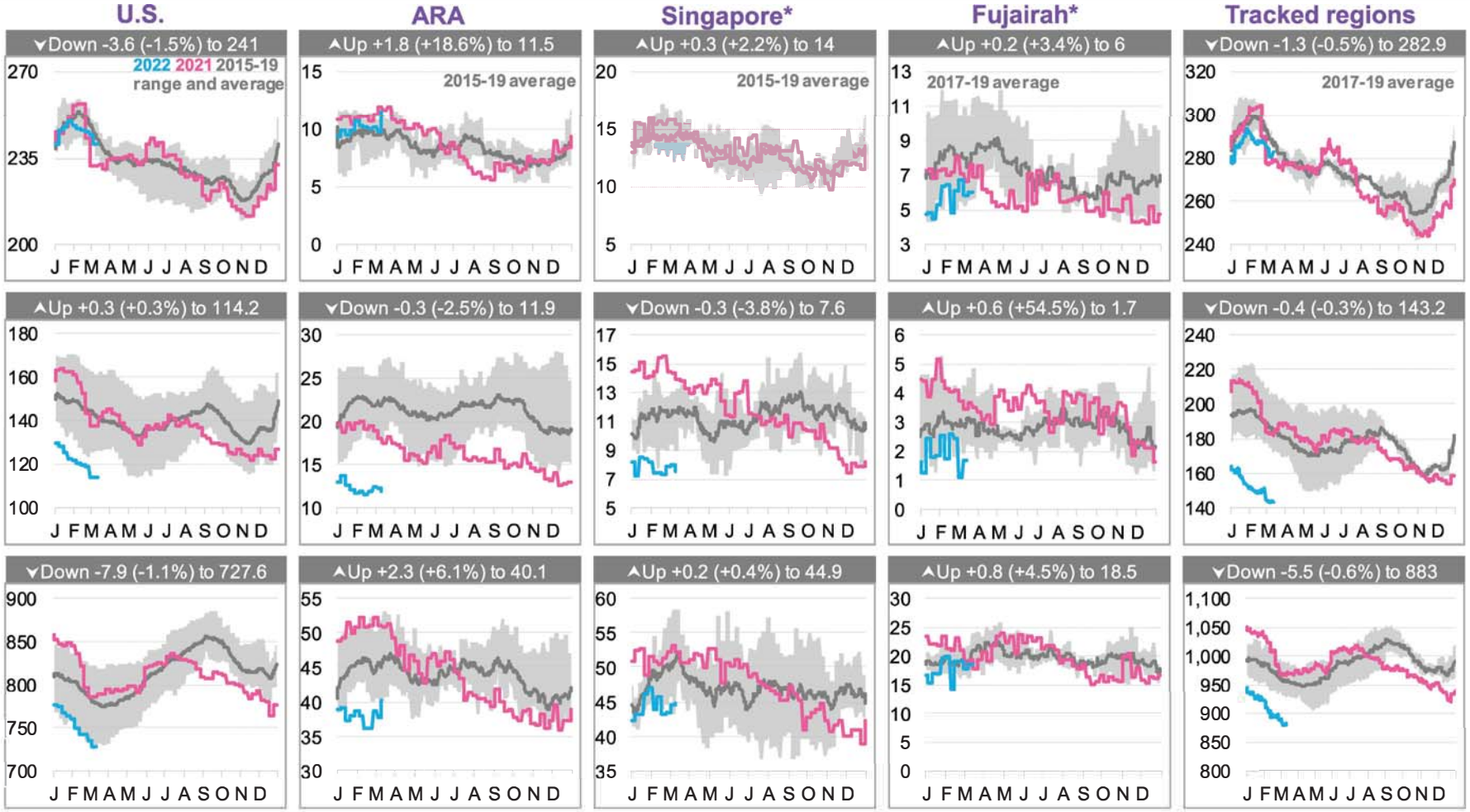
BloombergNEF

Product stocks: Current vs. seasonal average

Neutral: Oil product stockpiles in tracked regions fell by 0.6% week-on-week

- Chart legend are as follows: **2021**, **2020** and the **2015-19 range and average**. For Fujairah and tracked regions, the **2017-19 (three-year) seasonal range** is shown. Tracked regions include U.S., ARA, Singapore, Japan and Fujairah

**units are in million barrels*



*Source: BloombergNEF, U.S. EIA, PJK, IE Singapore, FEDCom/Platts, PAJ. Note: As of the **week ending March 11.***

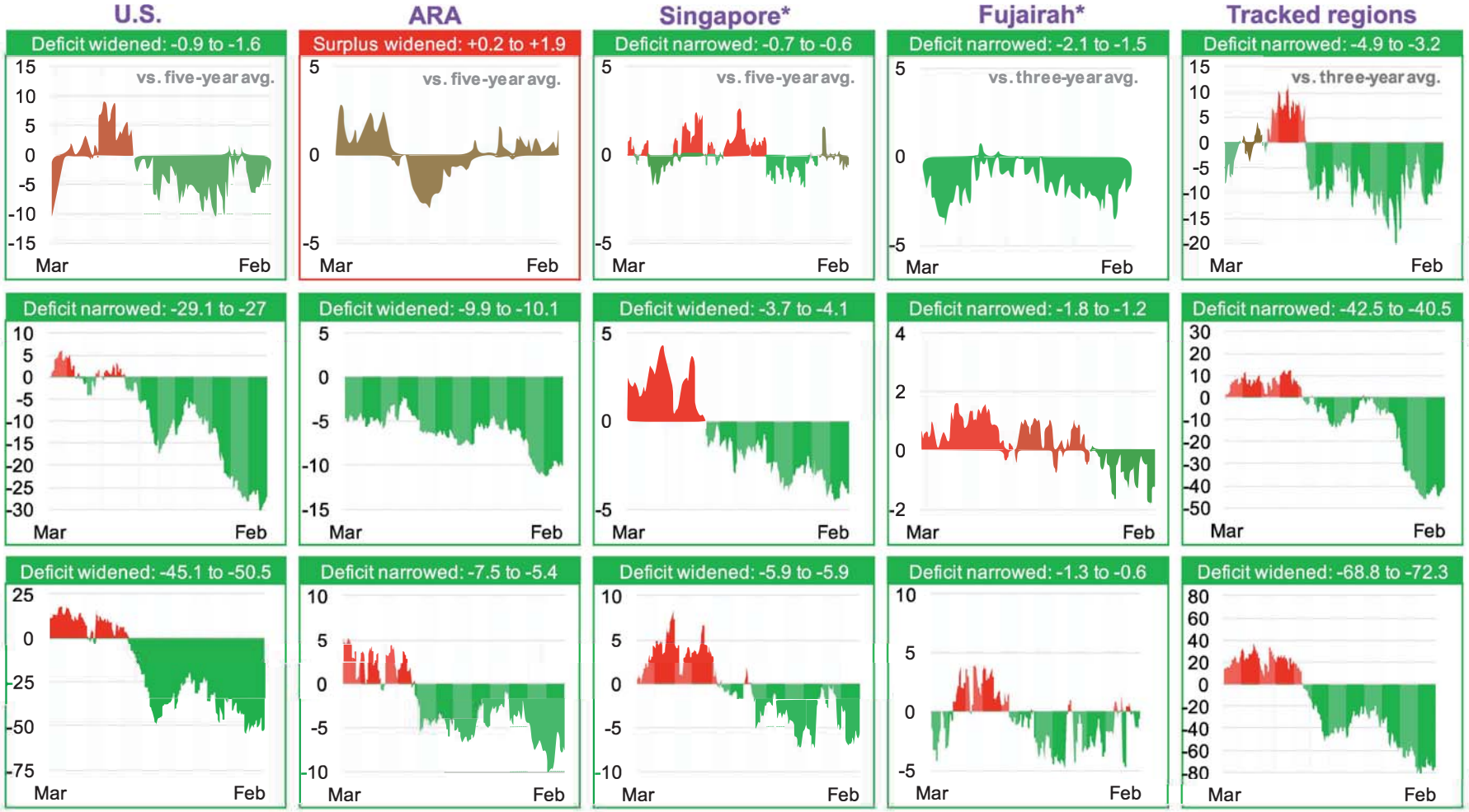
BloombergNEF

Product stocks: Current vs. seasonal average

Neutral: Oil product stockpile deficit against the seasonal average widened from 68.8m bbl to 72.3m bbl

- The charts below compare each respective regional product stockpile level against the seasonal average defined in the previous slide.
- **Red** signifies that the current stockpile levels are higher (in surplus) than the seasonal average, while **green** signals that the current stockpiles are lower (in deficit).

**units are in million barrels*



*Source: BloombergNEF, U.S. EIA, PJK, IE Singapore, FEDCom/Platts, PAJ. Note: As of the **week ending March 11.***

BloombergNEF

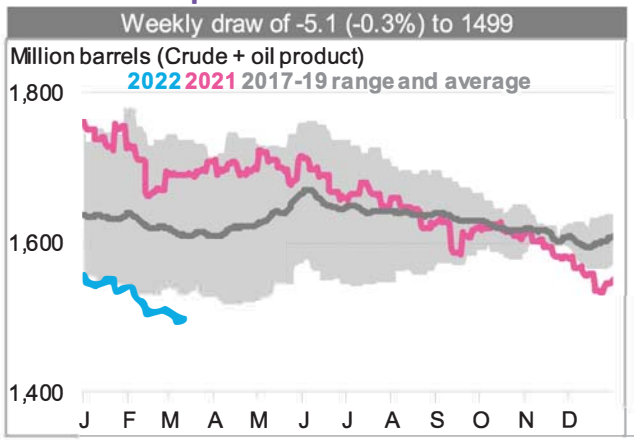
Aggregated oil stockpiles

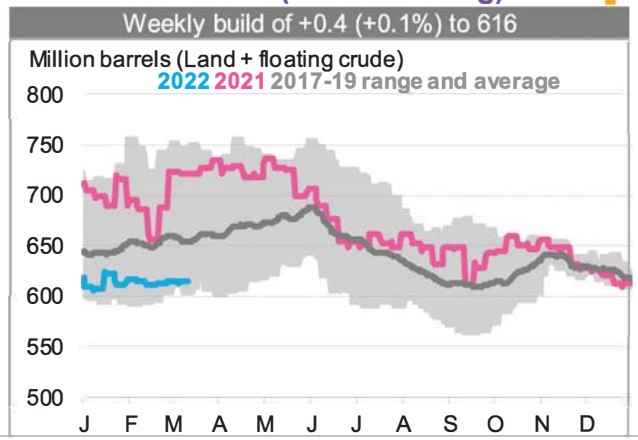
Note: We will continue to compare current inventory levels with the three-year (2017-19) seasonal average for the time being. Crude inventory data for Shandong teapots were excluded since January 10.

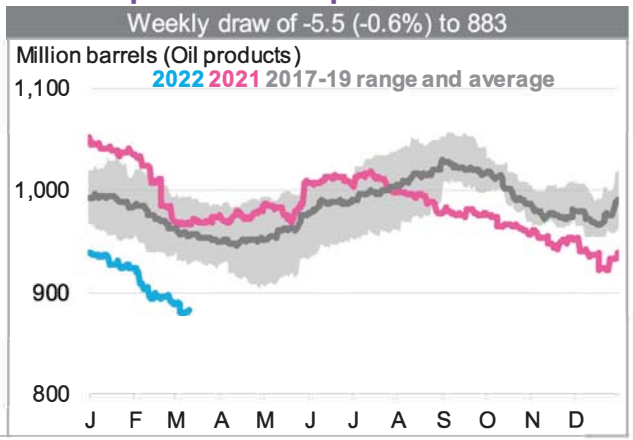
Neutral: Stockpiles deficit narrowed from 120.5m bbl to 119.4m bbl

- Charts below use the **2017-19** (three-year) seasonal stockpiles. All calculations are recalibrated to measure against their respective three-year seasonal averages, so the values below might differ from the previous slides.
- Land crude inventories include the U.S., ARA, Japan and Shandong Teapots. Floating storage data are global. Oil product storage includes the U.S., ARA, Japan, Singapore, Shandong Teapots and Fujairah. Floating crude inventories may have been adjusted since the previous report – see slide 8 for more info.

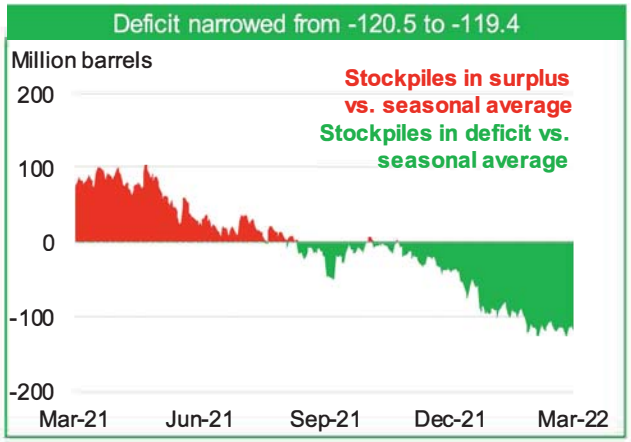
Total oil and product stocks = **Total crude stocks (land + floating)** + **Total oil product stockpiles**

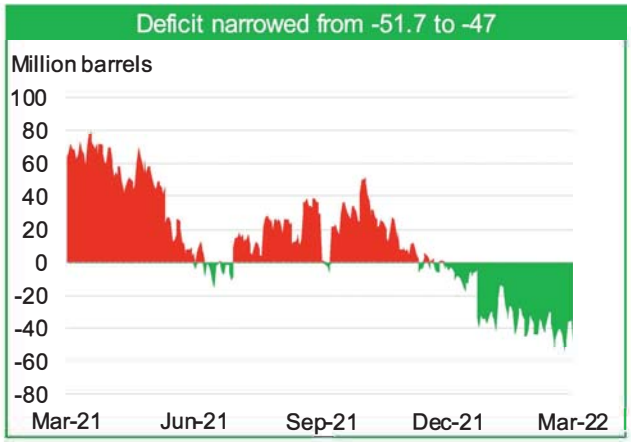


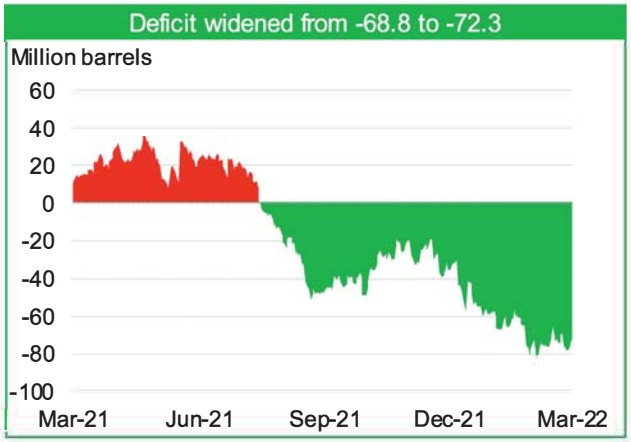




Charts below subtract current stockpiles by the 2017-19 (three-year) seasonal average







*Source: BloombergNEF, U.S. EIA, PJK, IE Singapore, FEDCom/Platts, PAJ , Vortexa, Genscape, SCIG. As of the **week ending March 11.***

Aviation Indicators Weekly

BloombergNEF is tracking the evolution of passenger flight schedules and departures globally. This note provides a weekly update of these data points to guide expectations of the demand for aviation fuel.

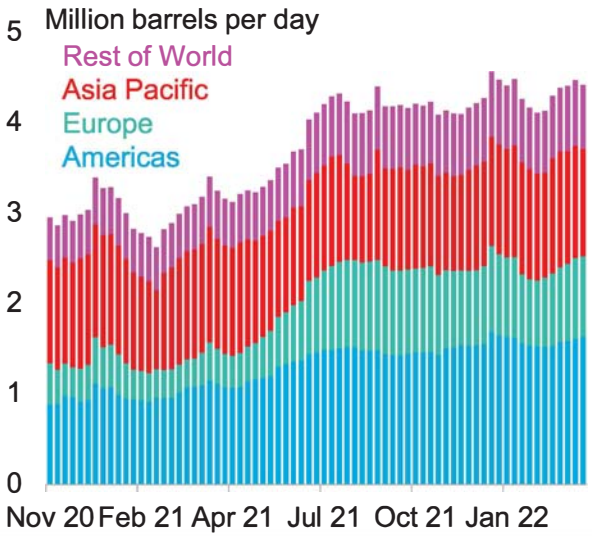
Metric	Frequency	March 10 to March 16
Passenger flight schedule	Weekly	Week-on-week scheduled departures decreased by a small amount.
Implied fuel consumption	Weekly	Week-on-week implied fuel consumption decreased by a small amount.
APAC jet fuel demand	Weekly	APAC jet fuel demand declined week-on-week and also year-on-year
Europe jet fuel demand	Weekly	Europe jet fuel demand grew week-on-week and year-on-year
Americas jet fuel demand	Weekly	Americas jet fuel demand grew week-on-week and year-on-year
Rest of World jet fuel demand	Weekly	Rest of world jet fuel demand declined week-on-week, but grew year-on-year

Source: DATA FLY<GO>, BloombergNEF. Note: Green signals an upturn from the disruption caused by Covid-19, red indicates no upturn, orange indicates a possible upturn.

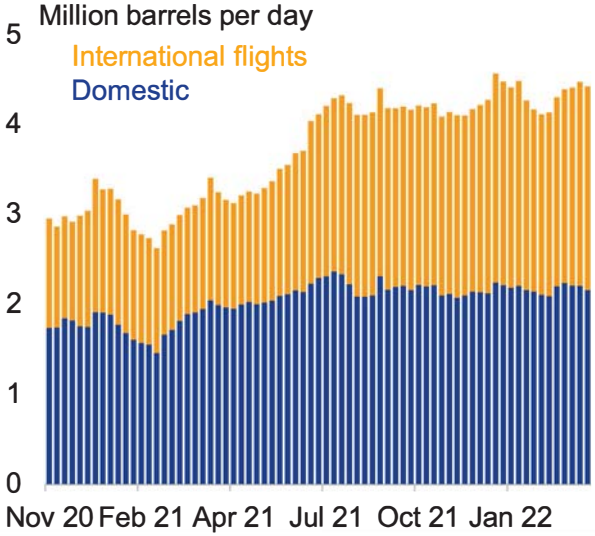
- Global passenger jet fuel demand decreased by 1.1% week-on-week, led by Asia Pacific. Based on the number of passenger flights scheduled, jet fuel demand over the next four weeks will average 5.01 million barrels per day – exceeding 5 million for the first time.
- Cancellations since last week have removed on average 249,450 barrels per day of jet fuel demand over the same four weeks.
- Sanctions and flight bans continue to impact activity in Russia, with S7 Airlines and Aeroflot most impacted. The number of flights scheduled to depart Russian airports this week is down by over 8.7% since last week, due to repercussions of the Russia-Ukraine war and the resultant sanctions.
- In Europe, departures in the Eurocontrol area increased by 2% week-on-week. British Airway, KLM, Ryanair and Turkish Airlines were among airlines to increase activity this week.
- U.S. passenger numbers rose by 6% week-on-week. Passenger numbers are at 86% of 2019 levels.
- In Asia Pacific, China has reduced flights for the week ahead by 7.21% compared to what was scheduled to depart this time last week, as lockdowns in Shenzhen and Jilin are imposed, impacting air travel. Both international and domestic passenger flights scheduled for the next month in the area have seen increased cancellations.

Commercial passenger flight jet fuel demand

Demand by departure region



Demand by flight type



- Global passenger jet fuel demand decreased 1.1% week-on-week.
- Asia Pacific experienced the largest growth reduction, followed by the rest of the world.
- Both international and domestic flights decreased week-on-week.
- Americas led growth, followed by Europe.
- For more cuts of this data see DATA FLY<GO>.

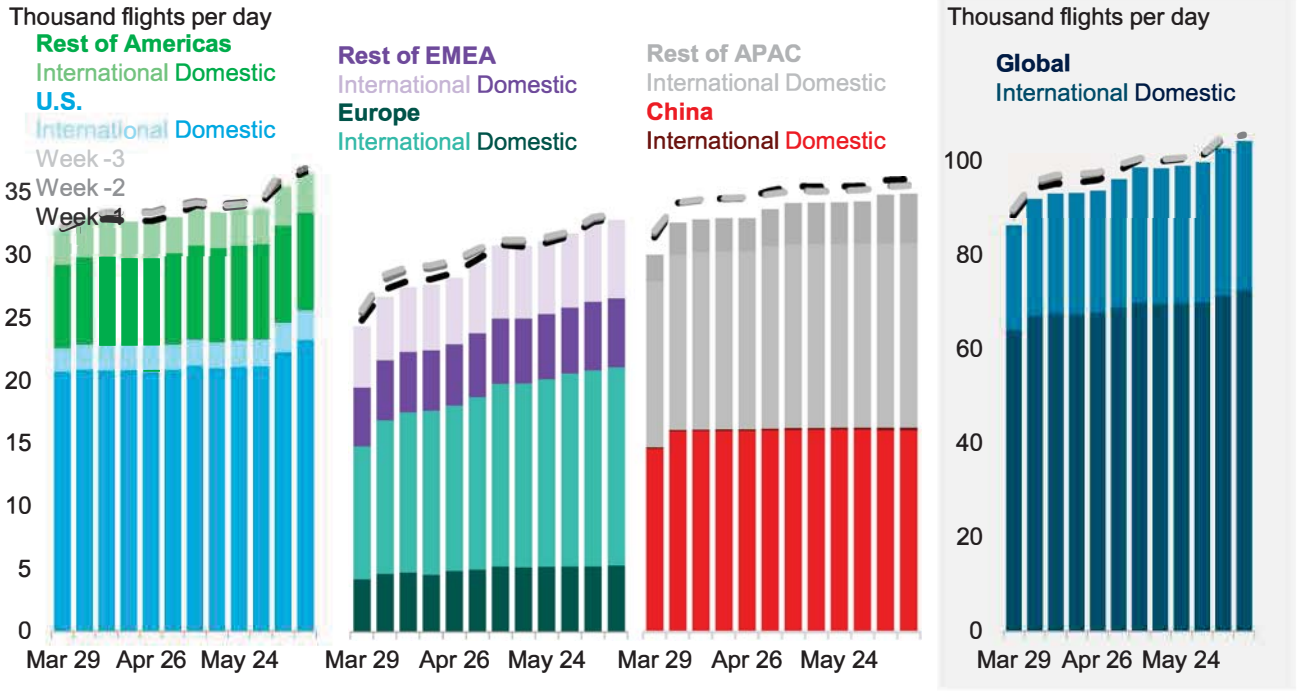
For more on demand and pricing fundamentals see
Oil Price Indicators Weekly

K bbl per day	Latest	Week Δ	Four-week Δ	Year-on-year Δ
World	**4,411**	-51.1 (-1.1%)	120.7 (+2.8%)	1341.0 (+43.7%)
Americas	**1,630**	17.9 (+1.1%)	98.6 (+6.4%)	559.5 (+52.2%)
Asia Pacific	**1,183**	-58.0 (-4.7%)	-87.8 (-6.9%)	-14.4 (-1.2%)
Europe	**890**	2.7 (+0.3%)	91.9 (+11.5%)	578.0 (+185.5%)
Rest of World	**707**	-13.7 (-1.9%)	18.0 (+2.6%)	217.8 (+44.5%)

K bbl per day	Latest	Week Δ	Four-week Δ	Year-on-year Δ
International	**2,253**	-7.4 (-0.3%)	161.3 (+7.7%)	1071.3 (+90.6%)
Domestic	**2,158**	-43.6 (-2.0%)	-40.6 (-1.8%)	269.6 (+14.3%)

Source: BloombergNEF, Bloomberg terminal DATA FLY<GO>. Note: The model does not account for load factors of aircraft, route inefficiencies or cargo flights.

12-week-ahead passenger departure schedule

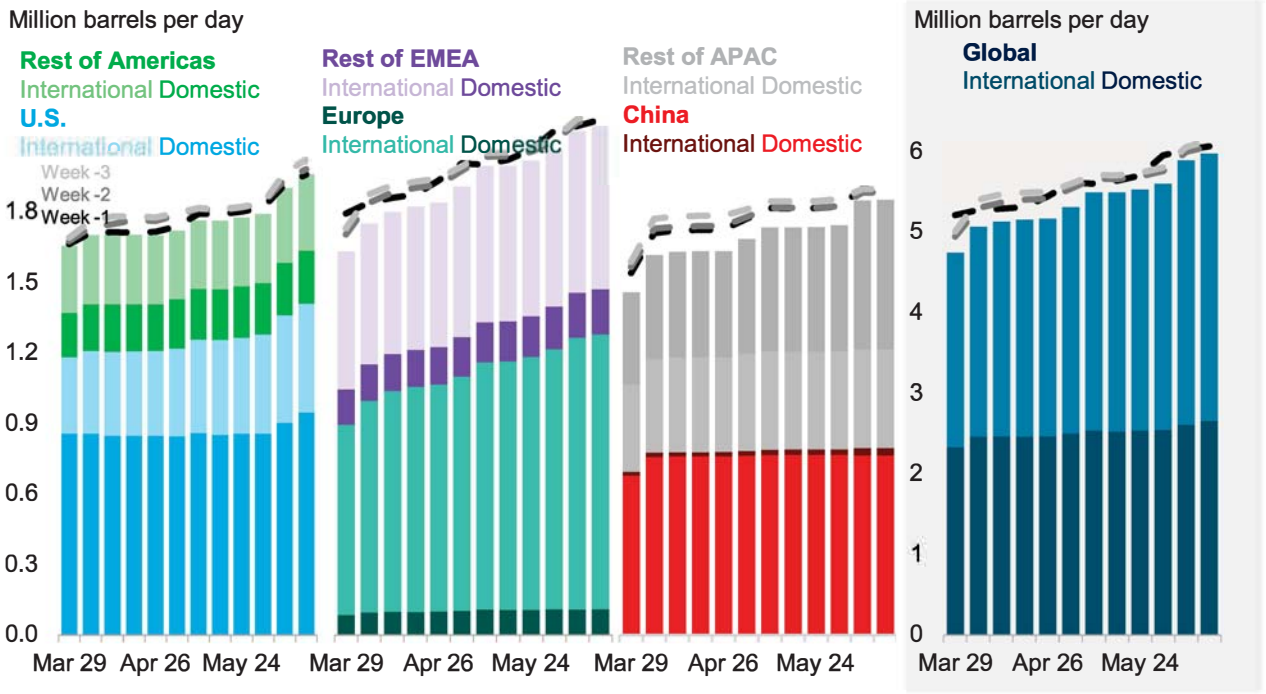


- Globally, the passenger flight schedule for the 12 weeks ahead is 1.9% lower week-on-week, with cuts remaining minimal for the sixth consecutive week.
- The number of flights scheduled to depart Russian airports this week is down by over 8.7% since last week. Furthermore, Aeroflot experienced a 20.9% drop in flights scheduled over the same timeframe, as the sanctions and war disruption continue to hamper the aviation market.
- Terminal users can track the Russian aviation market here.

Source: BloombergNEF, Bloomberg terminal DATA FLY<GO>.

Note: As of March 16. Based on more than 11,000 commercial airports, taking the average daily scheduled flight departures per week. Excludes cargo flights. Europe is defined as the EU 27, EFTA and the U.K. Intra-Europe flights are defined as international.

Jet fuel demand implied by scheduled flights



- Based on the number of passenger flights scheduled, jet fuel demand over the next four weeks will average 5.01 million barrels per day (b/d). Fuel consumed in cargo flights is not included in this number.
- Cancellations since last week have removed on average more than 249,450 b/d of jet fuel demand over the same four weeks.
- For more cuts of this data see DATA FLY<GO>.

Source: BloombergNEF, Bloomberg terminal DATA FLY<GO>.

Note: As of March 16. Oil consumption is based on the aircraft model, distance between origin and destination airport and the fuel efficiency of each aircraft type. Consumption is allocated to the departure airport and does not account for load factor, or inefficiencies such as longer routes or circling at an arrival airport. Intra-Europe flights are defined as international.

https://www.trucking.org/news-insights/ata-truck-tonnage-index-unchanged-february

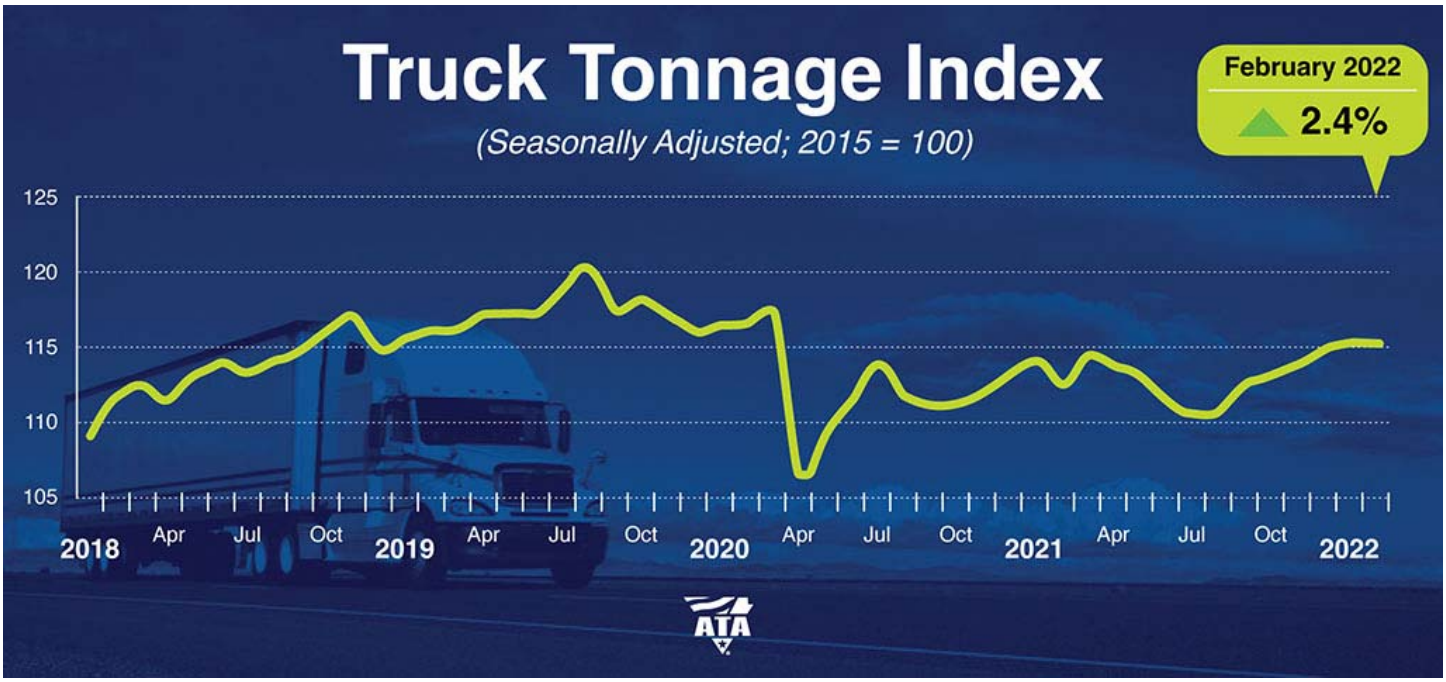
ATA Truck Tonnage Index Unchanged in February

MAR 22

BACK

Media Contact:
Sean McNally

Arlington, Virginia – American Trucking Associations' advanced seasonally adjusted (SA) For-Hire Truck Tonnage Index was unchanged in February after increasing 0.4% in January. In February, the index equaled 115.3 (2015=100) the same as January.



"February was the first month that the index didn't increase since July," said **ATA Chief Economist Bob Costello**. "Despite a string of gains, the index is still off 1.8% from March 2020. The index is also off 4.2% from the all-time high in August 2019. It is important to note that ATA's data is dominated by contract freight, not spot market.

"Demand for trucking freight services remains strong, but for-hire contract carriers are capacity constrained due to the driver and equipment markets. The spot market has been surging as these carriers can't haul all of the freight they are asked to move," he said. "So the fact that the tonnage index hasn't fully recovered is a supply problem, not a lack of demand. Other ATA data shows that for-hire carriers are operating around 7% fewer trucks, both company and independent contractor equipment, than prior to the pandemic."

January's increase was revised down slightly from our February 22 press release.

Compared with February 2021, the SA index increased 2.4%, which was the sixth straight year-over-year gain and the largest over that period. In January, the index was up 0.9% from a year earlier. In 2022, year-to-date and compared with same period in 2021, tonnage was up 1.7%.

The not seasonally adjusted index, which represents the change in tonnage actually hauled by fleets before any

seasonal adjustment, equaled 104.3 in February, 4.3% below the January level (109). In calculating the index, 100 represents 2015. ATA's For-Hire Truck Tonnage Index is dominated by contract freight as opposed to spot market freight.

Trucking serves as a barometer of the U.S. economy, representing 72.5% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 10.23 billion tons of freight in 2020. Motor carriers collected $732.3 billion, or 80.4% of total revenue earned by all transport modes.

ATA calculates the tonnage index based on surveys from its membership and has been doing so since the 1970s. This is a preliminary figure and subject to change in the final report issued around the 5th day of each month. The report includes month-to-month and year-over-year results, relevant economic comparisons, and key financial indicators.

U.S. Oil Indicators Weekly

Takeaways: Crude oil prices continue to whipsaw due to uncertainty gripping global oil markets in the weeks following Russia's invasion of Ukraine. West Texas Intermediate prices fell back to $95/bbl earlier this week, just eight days after surging to a high of nearly $130/bbl on March 8. As of Friday morning, prices have rebounded firmly above the $100 mark with volatility showing no sign of easing.

Fears that record-high prices at the pump will begin to eat away at gasoline demand have yet to come to fruition, with implied demand figures still tracking just below the 5-year average in this week's EIA report. Crude inventories at Cushing, Oklahoma saw a much-needed build, its first this year, providing some wiggle room for stockpiles that were rapidly approaching operational lows for the key oil hub.

	Frequency	Source	Snapshot: March 18, 2022
Overall market indicators:			
Mobility	Daily	Google mobility	North American mobility levels were mixed this week. Google mobility metrics held flat while TomTom congestion data dropped for a second week
Economic activity	Daily	New York MTA, Moovit, OpenTable, Prodco	U.S. restaurant activity has regressed from fresh pandemic highs set in February, sliding back to 10% below 2019 levels
Oil demand:			
Road congestion & gasoline	Weekly, Hourly	U.S. EIA, TomTom	There's no sign yet that record pump prices are causing motorists to cut back on their driving as gasoline demand continues to track just below typical levels
Air travel & jet fuel	Daily	U.S. TSA, FlightStats	U.S. airport activity is on the rise but has failed to make up ground relative to 2019 levels as jet fuel demand sits more than 200,000 b/d below the 5-year average
Refinery operations	Daily	U.S. EIA	Refinery utilization on the Gulf Coast firmed up above 90% of capacity. Rates of 93.5% are the highest since the summer, gaining for a fourth consecutive week as the maintenance season comes to an end
Crude/product inventories	Weekly	U.S. EIA	Crude oil inventories rose by 4.35 million barrels, above market expectations, as depleted Cushing stocks finally saw their first build since December 2021
Oil production	Weekly	U.S. EIA	Crude production remained unchanged, with output at 10.6 million barrels a day for a sixth straight week, despite the addition of 28 more drilling rigs this month

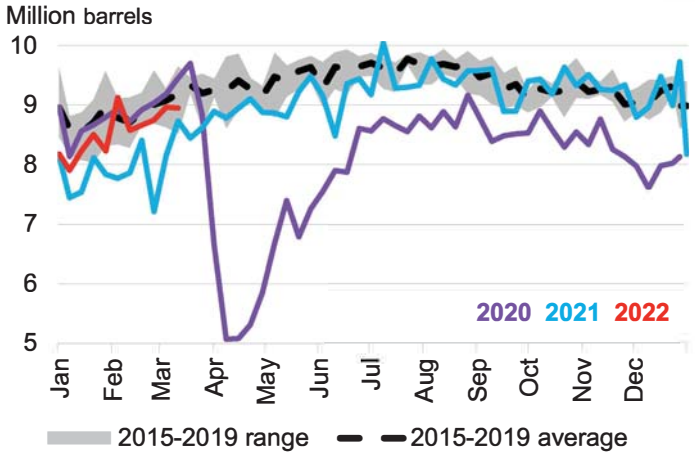
Source: BloombergNEF. Note: Green signals an upturn from the disruption caused by Covid-19, red indicates downturn, orange indicates no/mixed change. In most cases, the colors are indicative of changes from the prior week.

Gasoline demand

There's no sign yet that record pump prices are causing motorists to cut back on their driving as gasoline demand continues to track just below typical levels

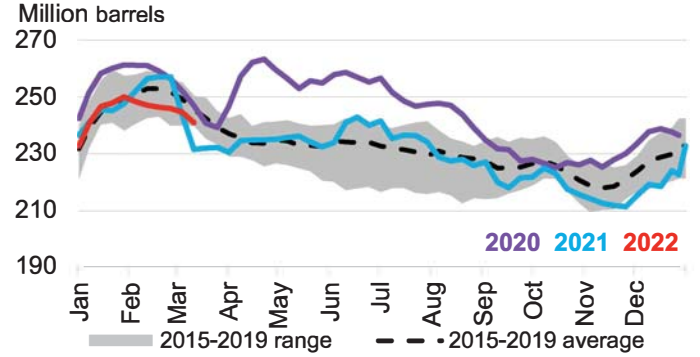
Implied demand

DOEDMGAS Index

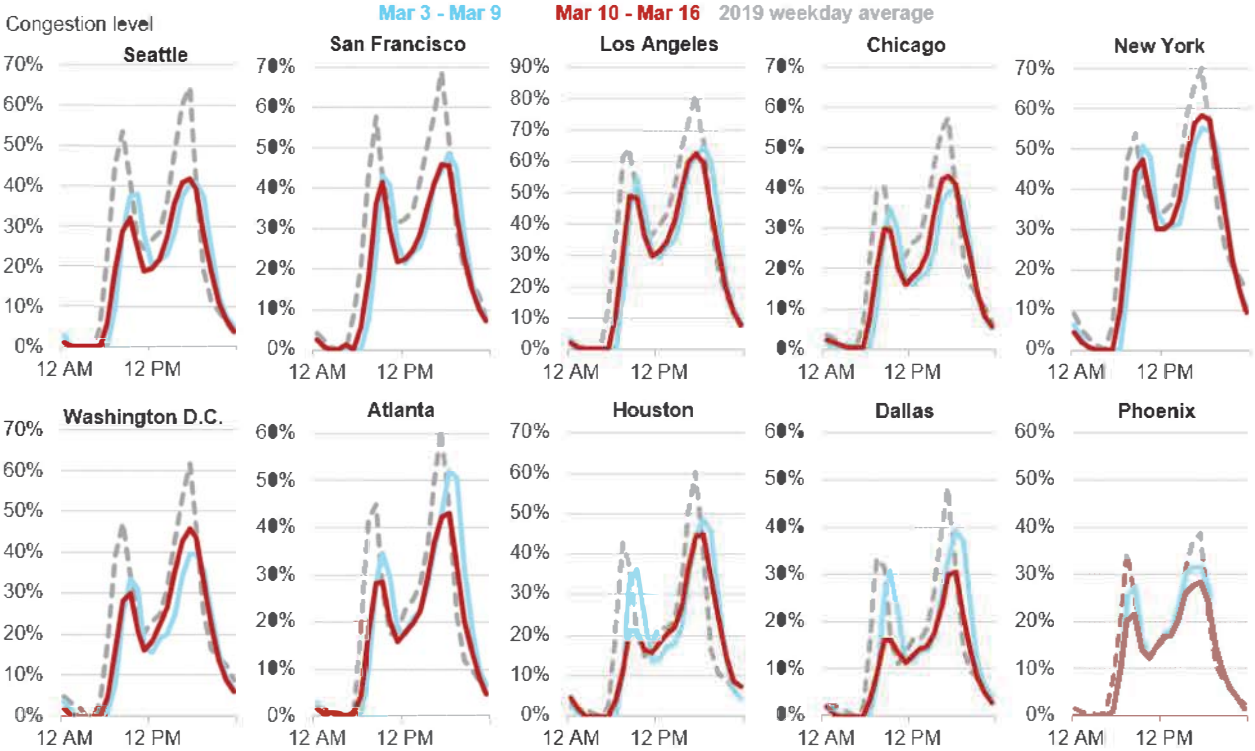


Gasoline inventory

DOESTMGS Index



Hourly congestion



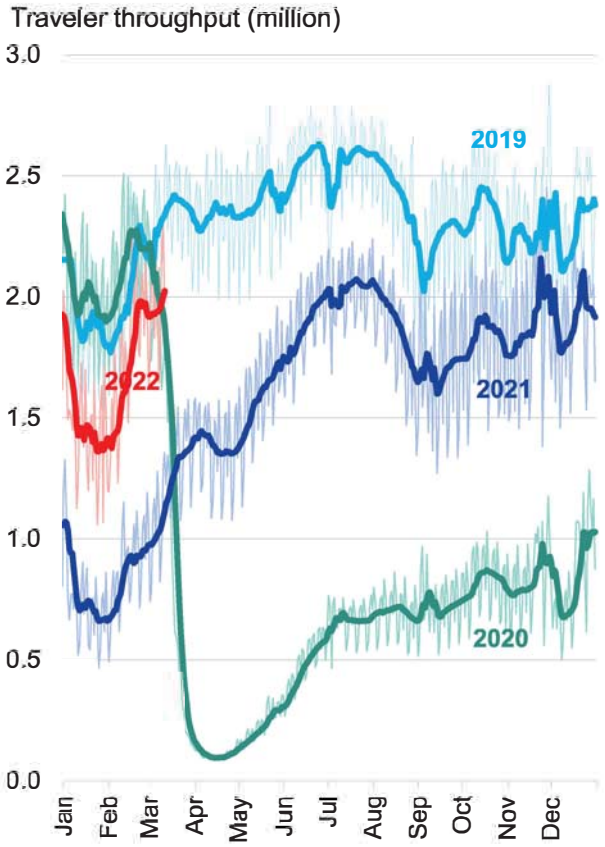
For more data on congestion around the world, see the BNEF Covid-19 Indicators: Road Traffic

Source: BloombergNEF, EIA, TomTom Traffic Index. Note: 'Congestion level' is an estimate of the increase in time that a journey within a city will take compared to uncongested conditions – so 40% congestion implies that a journey will take 40% longer than on empty roads. Charts show Mon-Fri average hourly congestion levels.

Jet fuel demand

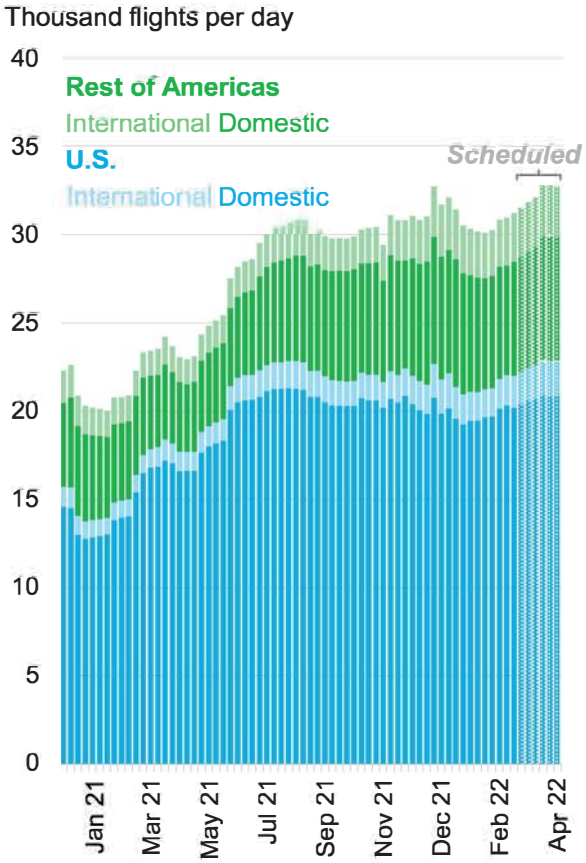
U.S. airport activity is on the rise but has failed to make up ground relative to 2019 levels as jet fuel demand sits more than 200,000 b/d below the 5-year average

TSA checkpoint traffic



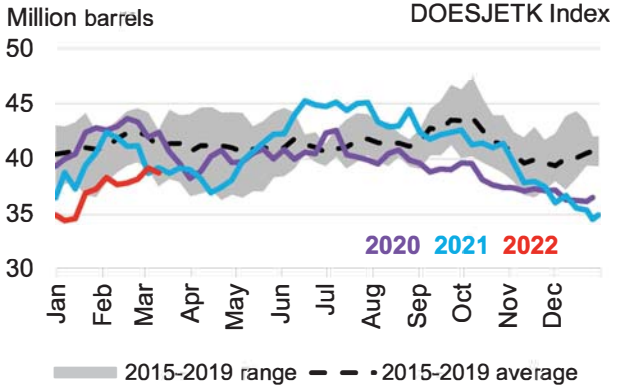
Source: BloombergNEF, TSA

Daily flight departures

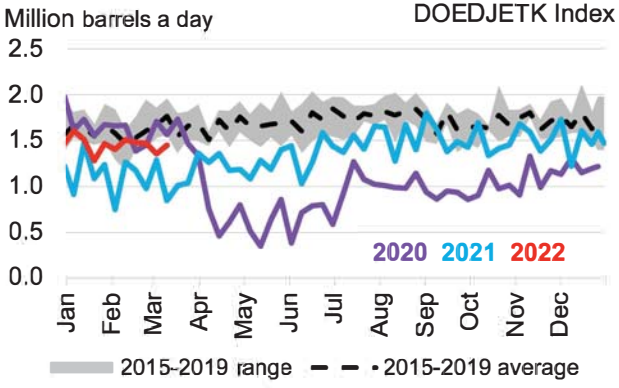


Source: BloombergNEF, FlightStats.

Jet kerosene storage



Jet kerosene implied demand



Source: BloombergNEF, EIA

For more data on congestion around the world, see the BNEF Covid-19 Indicators: Aviation

https://www.ipolitics.ca/opinions/emissions-reduction-plan-will-require-all-hands-on-deck

OPINIONS

Emissions Reduction Plan will require all hands on deck

'We will cap and lower pollution from our oil and gas sector, move to a net-zero electricity grid, switch to zero-emission vehicles, and retrofit our homes,' writes Environment Minister Steven Guilbeault.

Published Mar 25, 2022 at 1:26pm

Steven Guilbeault

Environment Minister Steven Guilbeault speaks during question period in Ottawa on Dec. 10, 2021. (Fred Chartrand/The Canadian Press)

Knowing where you want to go is the key to reaching your destination — whether you're building a transcontinental railway, a seaway, a telecommunications system, universal health care, or any of the other shared projects that have built the Canada we love.

Our Emissions Reduction Plan, slated for release later this month, will be a clear, ambitious and achievable road map to 2030 that reduces the emissions destabilizing the climate by 40 to 45 per cent. Our road map, updated annually, is built on our commitment to Canadians and the world to do our part to solve climate change. Canada is one of the world's top 10 greenhouse-gas polluters, and, on a per-capita basis, we rank near the top along with the United States.

Our government is committed to taking responsibility for our share of global pollution and to effective solutions that keep energy costs affordable. Our goal with the Emissions Reduction Plan is to drive investments that create economic opportunities, support workers, and control energy costs as we meet Canada's legislated 2030 emissions target.

In recent years, the climate stakes have been made all too clear — by wildfires, by flooding, by landslides, heat domes, and wind storms that are costing Canadians our health, our household security, our community infrastructure, and our public resources.

But the economic stakes are also coming into sharper focus. The low-carbon transition represents a global competition and a Canadian opportunity, if we have the foresight and fortitude to pursue it.

We're living in an era of dizzying change, and the challenges can seem daunting. But knowing where we want to go helps ground us.

We will, for example, cap and lower pollution from our oil and gas sector, move to a net-zero electricity grid, switch to zero-emission vehicles, and retrofit our homes to make life more affordable, to save energy, and to avoid the price shocks that energy instability brings to people's household budgets.

We will protect and grow our forests and restore wetlands, grasslands, and other natural habitats.

Our road map aims to lower greenhouse pollution, and to have cleaner air, healthier communities, and greater biodiversity.

And by embracing clean industries that will drive innovation and economic growth in the 21st century, we'll keep creating good, sustainable jobs, and a strong, competitive, and resilient economy.

None of this is entirely new.

Since 2016, there has been a whole-of-government, whole-of-society effort to bend the trajectory of Canadian pollution levels.

When our Liberal government took office at the end of 2015, Canada's emissions were heading for a 12 per cent increase by 2030 — despite more than 25 years of unfulfilled promises by successive national governments. Correcting Canada's climate course has been a monumental task: Since 2016, we've already committed more than $100 billion to climate and green-economy investments in more than 100 different measures.

Last summer, Canada showed we are finally on track to surpass our long-standing 2030 reduction target of 30 per cent. Since then, we have raised our ambition. Achieving Canada's updated 2030 emissions reduction target of 40 to 45 per cent will require all hands on deck. Every economic sector and region has a role to play.

This plan is the first instalment under the new Canadian Net-Zero Accountability Act enacted by our Liberal government, which will hold the feet of our government and future governments to the fire with legislated reporting requirements, so we can be sure we are on track.

This is why the Emissions Reduction Plan is a national project, worthy of national pride. Conservatives will tell Canadians we should carve out certain sectors, lower our ambition, pit region against region and rural against urban. The fact is, we're all in this together.

As Canadians, we know the kind of future we want depends on a stable climate, clean air, good jobs, and a strong, resilient economy. And, later this month, we'll put forward a national project worthy of every Canadian in every region and every economic sector to get there.

This is an opportunity to accelerate our commitment to take responsibility for Canada's contribution to rebalancing our climate — to work as a country for a healthier environment, and to diversify our economy and create sustainable jobs for generations to come.

Steven Guilbeault is Minister of Environment and Climate Change.

Independent Statistics & Analysis
U.S. Energy Information Administration

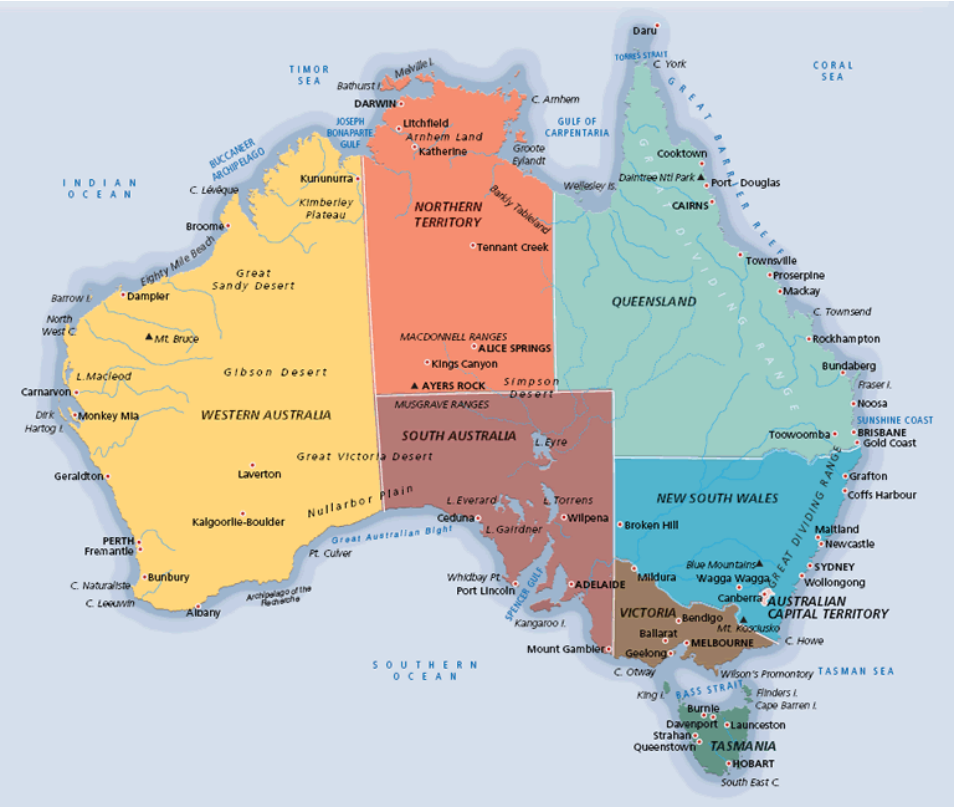
Country Analysis Executive Summary: Australia

Last Updated: March 18, 2022

Overview

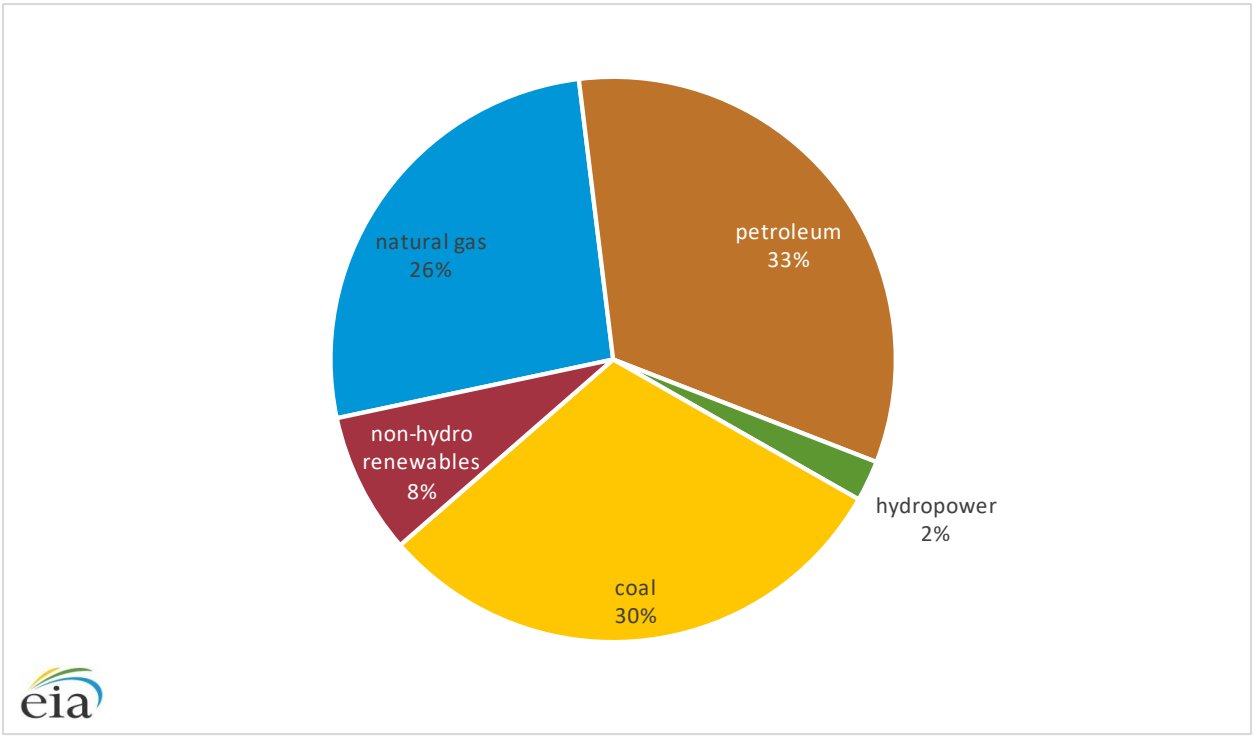
- Australia, a large producer of both coal and liquefied natural gas (LNG), exports the majority of its energy production. Australia's energy exports, excluding uranium, accounted for approximately 81% of its total energy production in 2020.[1]
- In 2020, Australia was the world's largest coal exporter based on energy content and the second-largest exporter based on weight, behind Indonesia. It was also the largest exporter of LNG in the world that year.
- Australia does not have any nuclear generation capacity, but it holds the largest uranium reserves in the world.[2] In 2020, it was the second-largest global uranium producer behind Kazakhstan.[3]
- In 2020, fossil fuels accounted for approximately 90% of Australia's total energy consumption; petroleum accounted for an estimated 33%, coal accounted for 30%, and natural gas accounted for 26% (Figure 2). The shares for petroleum and coal both decreased in 2020, accounting for the 2% drop in fossil fuel's overall share of energy consumption from 2019.[4]
- Renewable sources, including hydroelectricity, wind, and solar, accounted for 10% of total consumption in 2020. The growth in renewables has been driving the decrease in coal consumption.[5]

Figure 1. Map of Australia



Source: University of Nebraska, Omaha

Figure 2. Total primary energy consumption in Australia by fuel type, 2020

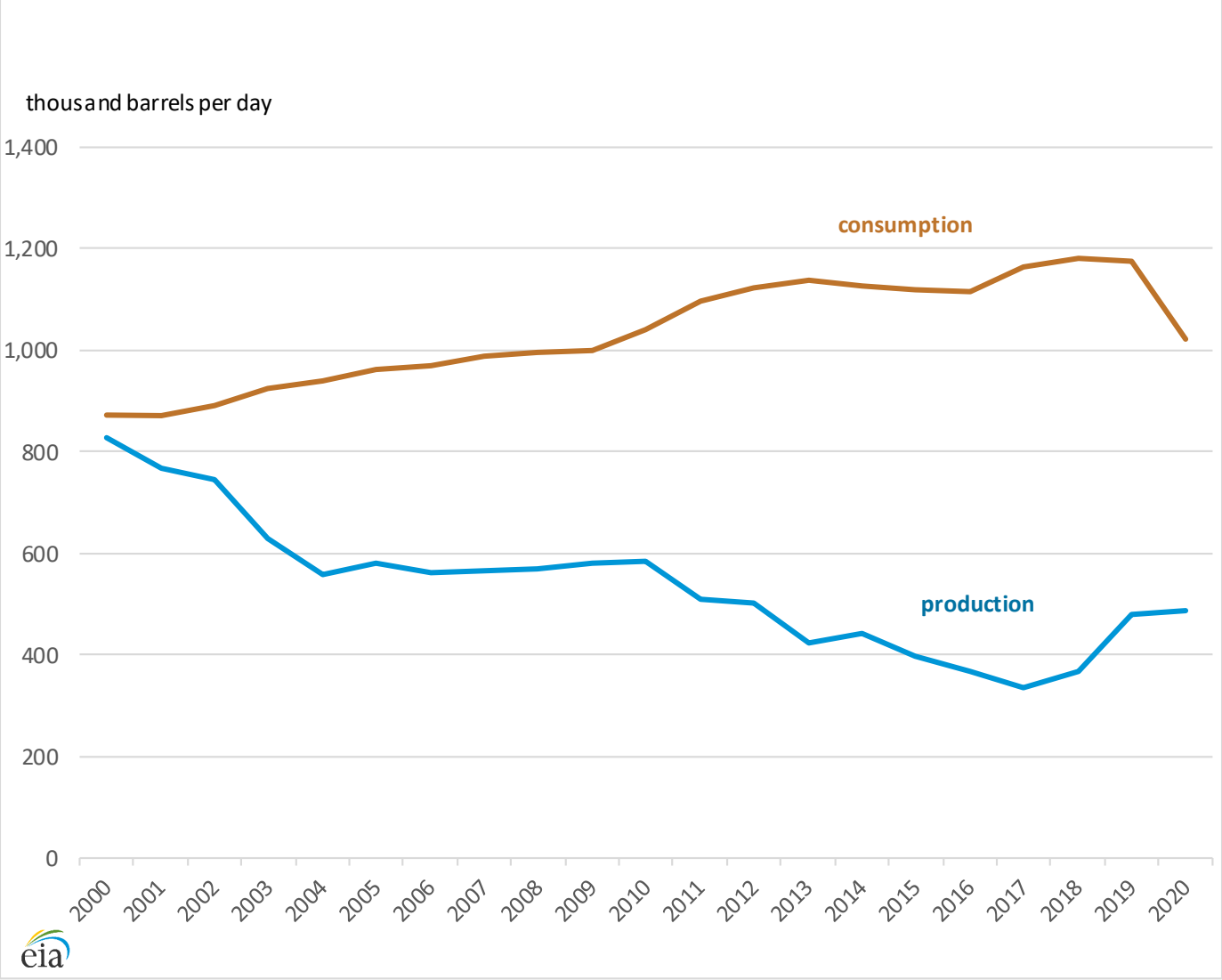


Source: Graph by the U.S. Energy Information Administration, based on data from BP Statistical Review of World Energy 2021

Petroleum and Other Liquids

- Australia's proved oil reserves were 2.4 billion barrels at the end of 2021.[6] Most of their reserves are located off the coasts of the states of Western Australia (Carnarvon and Browse basins), Victoria (Gipplsand basin), and the Northern Terrirtory (Bonaparte basin).
- Although Australia has significant undiscovered unconventional oil resources, exploration for these resources is still too early in its stages to assess the production potential.[7]

Figure 3. Australia's petroleum and other liquids production and consumption, 2000–2020



Source: Graph by the U.S. Energy Information Administration, *Short-Term Energy Outlook,* December 2021

Exploration and production

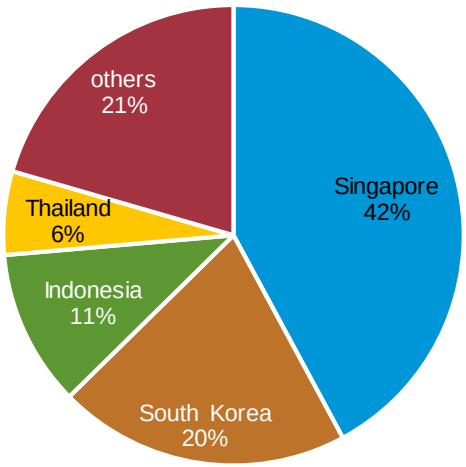
- Australia's petroleum and other liquids production, which includes crude oil, condensates, natural gas liquids, and refining gain, peaked at 828,000 barrels per day (b/d) in 2000. Production fell from its peak in 2000 because new development projects had not been able to offset production declines in mature fields.[8] After overall declining through 2017, production started to increase in 2018. Petroleum and other liquids production increased from 336,000 b/d in 2017 to an estimated 475,000 b/d in 2020 (Figure 3).[9]

- Petroleum and other liquids production was approximately 461,000 b/d in 2021, of which 26% was crude oil, 46% condensates, and 24% natural gas liquids. The remaining 4% were other liquids and refining gain.[10]
- New projects coming online in the North West Shelf are partly driving the increased production of crude oil and condensate. In 2018, projects in the Northern Carnarvon Basin and Browse Basin increased oil and condensates production by 18% and increased natural gas liquids production by 32%, compared with 2017.[11]
- The Greater Enfield project in Northern Carnavon was approved in 2016 and started production in 2019. The project consists of 12 development fields, and it adds approximately 41,000 b/d of production plus reserves of 69 million barrels of oil equivalent (BOE).[12]
- The Prelude floating LNG project in the Browse Basin started production at the end of 2018. Although the majority of its production is natural gas, it produces 47,600 b/d of condensate and 12,700 b/d of liquefied petroleum gas (LPG).[13] The Ichthys Field, also located in the Browse Basin, started production in 2018. According to the project's largest interest holder Inpex Corp., it has a production capacity of 48,000 b/d of LPG and 100,000 b/d of condensate.[14]
- Australia does not have any new projects coming online for a few years. The earliest is the Barossa Project, which Santos expects to come online in 2025.[15] We expect that Australia's petroleum production will remain relatively unchanged through 2023.

Consumption

- Australia has consumed more petroleum and other liquids than it has domestically produced for several decades. In 2020, consumption exceeded production by 547,000 b/d.[16]
- Australia's petroleum consumption decreased in 2020 to slightly more than 1 million b/d from 1.2 million b/d in 2019.[17] This decrease resulted from the drop in passenger and air transportation at the start of the global COVID-19 pandemic.[18] In 2020, the share of petroleum relative to total energy consumed in Australia fell by 3%.

Figure 4. Australia's crude oil and condensate exports by destination, 2021

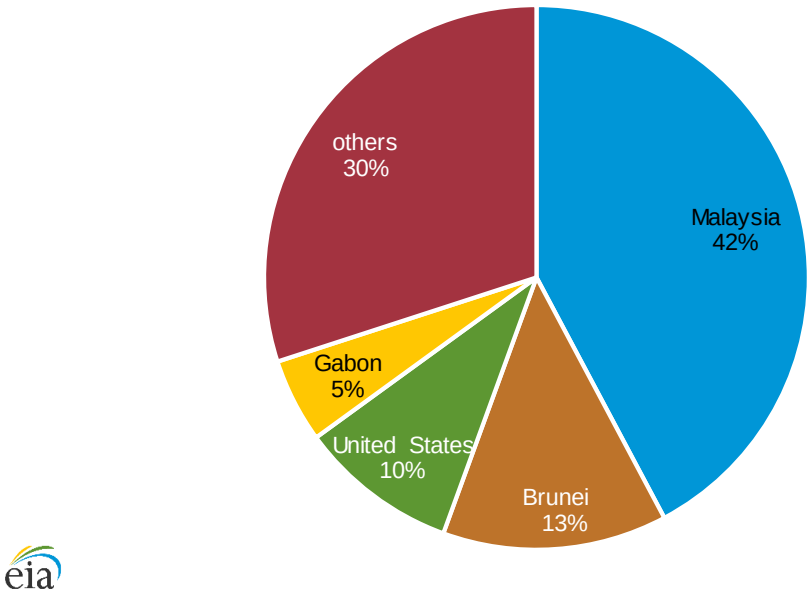


Source: Graph by the U.S. Energy Information Administration, based on data from ClipperData, LLC

Trade

- Australia became a net exporter of crude oil in 2020 for the first time since 1991 when their exports totaled 252,000 b/d and exceeded imports (237,000 b/d) by 15,000 b/d.[19] Crude oil imports decreased because of reduced demand in both 2020 and 2021. In 2021 imports decreased by 23% from 2020, this is a decline of 58,000 b/d.
- Australia has historically imported oil and refined petroleum product because consumption tends to be higher than domestic production. The country produces mainly light, sweet crude oil, which needs to be blended with heavy crude oils before it can be processed. Because oil production happens mostly on the North West Shelf, it is more cost effective to export crude oil and import petroleum products than to ship the oil to refineries on Australia's eastern coast.[20]
- Australia's crude oil exports were destined mainly for the Asia-Pacific region; Singapore (42%), South Korea (20%), Indonesia (11%), and Thailand (6%) received the most volumes in 2021 (Figure 4).[21]
- Australia's crude oil imports came mainly from Malaysia (42%) and Brunei (13%) in 2021 (Figure 5).[22]

Figure 5. Australia's crude oil and condensate imports by source, 2021



Source: Graph by the U.S. Energy Information Administration, based on data from ClipperData, LLC

Refining

- Australia had two refineries as of August 2021, with a total refining capacity of 229,000 b/d, operated by the Vitol Group and Ampol Ltd (Table 1).[23] The Altona refinery, operated by ExxonMobil, started it's decommission in early 2021 and shutdown in August. The facility is

being converted into the Mobil Melbourne Terminal, which will be one of the largest fuel import and storage facilities in Australia.[24]

- Since 2013, five refineries, with a total capacity of 557,000 b/d, closed in Australia (Table 2).
- Refinery runs decreased by 68,000 b/d in 2021 because the Kwinana refinery closed[25] in March[26] and the Altona refinery closed in August.[27] With these closures, refinery capacity in Australia has decreased by 570,000 b/d since 2013.[28]
- Australia passed the Fuel Security Bill in June of 2021. The bill provides approximately US $1.8 billion in funding to keep the two remaining refineries operational until 2027.[29] The bill provides funds for refinery upgrades as well as production payments for refiners making specific types of transport fuel when margins drop below AU $7.30 a barrel.[30]

Table 1. Oil refineries in Australia, 2021

Refinery	Nameplate refining capacity (thousand barrels per day)
Lytton	109
Geelong	120
Total	**229**

Source: Table by the U.S. Energy Information Administration, based on data from BP Statistics and Reuters

Table 2. Australia's oil refineries that have closed since 2013

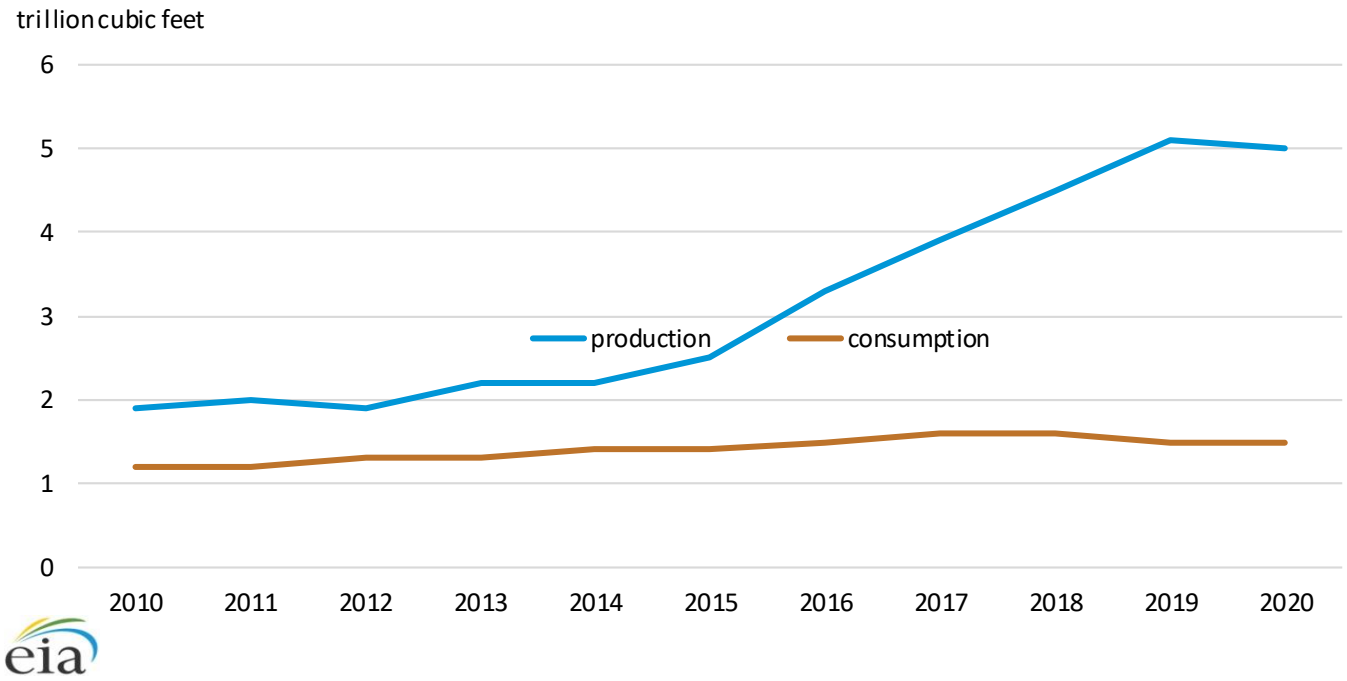
Refinery	Capacity (thousand barrels per day)	Closure year
Altona	109	2021
Kwiwana	146	2021
Bulwer Island	102	2015
Kurnel	135	2014
Clyde	85	2013
Total	**577**	

Source: Table by the U.S. Energy Information Administration, based on data from ExxonMobil, Ampol, and Viva Energy

Natural Gas

- Australia's proved natural gas reserves were 114 trillion cubic feet (Tcf) as of January 2022.[31]
- Coalbed methane (CBM) reserves were an estimated 29.8 Tcf, or 30% of total gas reserves, in 2019.[32] The majority of CBM reserves are located in Queensland, and New South Wales contains the rest.
- Unconventional gas reserves, not including CBM, were approximately 12.5 Tcf in 2019.[33]

Figure 6. Australia's dry natural gas production and consumption, 2010–2020



Source: Graph by the U.S. Energy Information Administration

Exploration and production

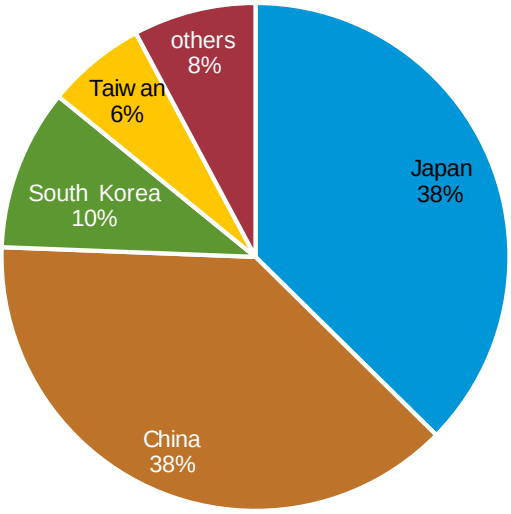
- Natural gas production in Australia was approximately 5 Tcf in 2020, nearly doubling since 2015 (Figure 6).[34]
- Between 2015 and 2020, nine new LNG liquefaction facilities with a total liquefaction capacity of 2.8 Tcf per year began operating.[35] The Northwest Shelf accounted for 65% of natural gas production, and the Bowen Basin and Surat Basin made up 26% in 2019.[36]
- The Bayu-Undan natural gas field, which supplies the Darwin LNG plant, will not produce natural gas after 2023,[37] according to the field's operator Santos.[38] The Barossa natural gas field, which is under development and is located offshore of the Northern Territory, will replace the Bayu-Undan field in supplying Darwin LNG.[39]
- The Leigh Creek Energy Project, located in the Telford Basin, was a coal gasification demonstration that showed the potential for producing synthesis gas, or *syngas*. Syngas is a mixture of carbon monoxide, carbon dioxide, and hydrogen that is produced from a carbon-based fuel, in this case coal. The gasification process converts coal in its solid form into a gaseous one. Leigh Creek Energy estimates the syngas reserves for this project are 1 Tcf.[40]
- According to Australia's 2021 National Gas Infrastructure Plan, domestic and export demand will likely exceed current natural gas supply by 2030, and the country will need at least one new basin to supply its government-projected demand.[41]

Consumption

- Australia consumed slightly less than 1.5 Tcf of natural gas in 2020 after remaining relatively flat between 2017 and 2020.[42]

- In 2019, electricity generation consumed approximately 36% of Australia's natural gas consumption. When on-site electricity generation was included, mining accounted for 32% of natural gas consumption, 28% for LNG plants and 24% for manufacturing.[43]

Figure 7. Australia's liquefied natural gas exports by destination, 2020



Source: Graph by the U.S. Energy Information Administration, based on data from BP Statistics

Liquefied natural gas

- In 2020, Australia passed Qatar to become the largest LNG exporter, at 3.7 Tcf,[44] or 0.1 Tcf more than in 2019.[45]
- Australia exports LNG almost exclusively to markets in Asia (Figure 7).[46] Australia is the largest supplier of LNG for the world's largest importers, supplying 43% of China's LNG imports and 39% of Japan's LNG imports in 2020. China was the second-largest LNG importer in the world, at 3.4 Tcf, and Japan ranked first, at 3.6 Tcf, that year.[47]
- At the beginning of 2021, Australia had 15 existing LNG liquefaction facilities with a total capacity of almost 4 Tcf per year.[48]
- Australia intends to add 6.6 Bcf per day of additional LNG capacity.[49] However, the prospective projects are facing supply challenges because Australia's natural gas production has declined. This limitation has forced producers to focus on meeting supply needs for existing facilities over building new ones.[50]
- The US $12 billion Scarborough LNG project is a joint venture between Woodside Petroleum and BHP Group. Woodside expects the project to produce 384 Bcf when its second train comes online in 2026. It will be supplied by the Scarborough gas field, which has reserves of 11.1 Tcf.[51]
- Because most of Australia's natural gas production occurs in the northwest, Australia's government is not expecting production in the south to keep up with demand in the area, according to the 2021 National Gas Infrastructure Plan. Import terminals are considered important in minimizing the risk of a supply shortage.[52] Port Kembla LNG in New South Wales

will be Australia's first LNG import terminal. Hoegh LNG expects the terminal to be operational by 2023.[53]

Table 3. Liquefied natural gas liquefaction plants in Australia, 2021

Refinery	Liquefaction capacity (billion cubic feet per year)	Year online
North West Shelf LNG T1-T2	240	1989
North West Shelf LNG T3	120	1992
North West Shelf LNG T3	221	2004
Darwin LNG T1	178	2006
North West Shelf LNG T5	221	2008
Pluto LNG T1	235	2012
GLNG T1	187	2015
Queensland Curtis LNG T1-T2	408	2015
GLNG T2	187	2016
Australian Pacific LNG T1-T2	432	2016
Gorgon LNG T1-T2	499	2016
Wheatstone LNG T1	214	2017
Wheatstone LNG T2	214	2018
Ichthys LNG T1-T2	427	2019
Prelude FLNG	173	2019
Total	**3,956**	

Source: Table by the U.S. Energy Information Administration, based on data from IGU 2021 World LNG Report

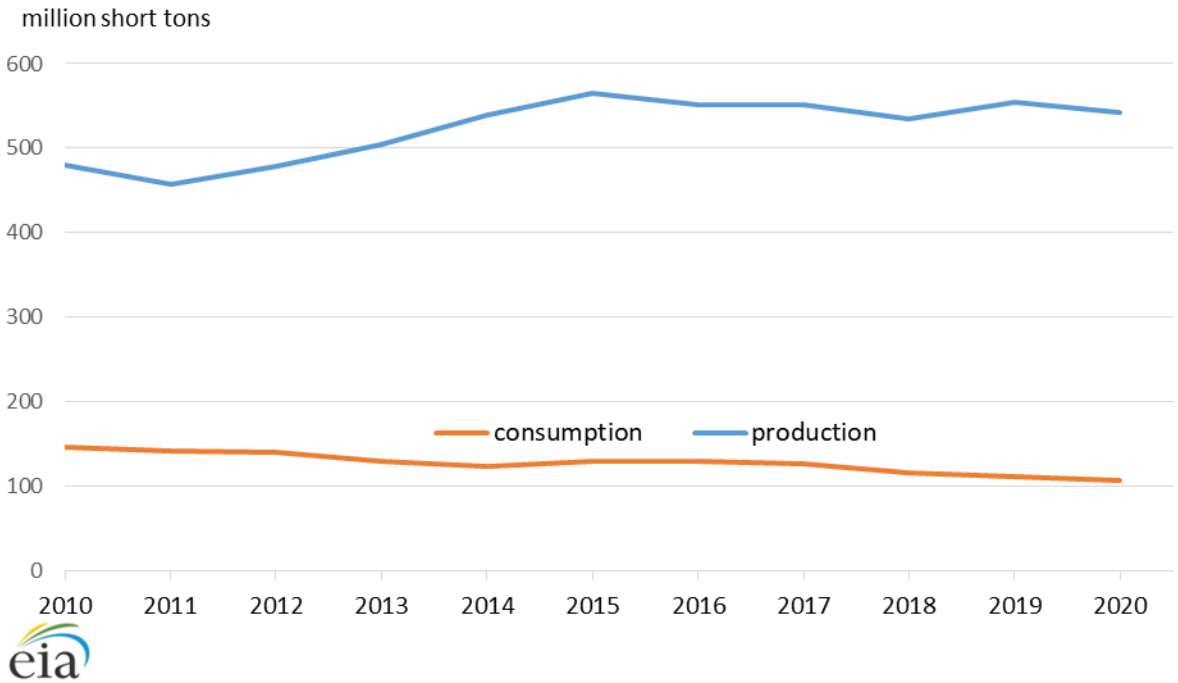
Pipelines

- Australia has over 24,233 miles (39,000 kilometers) of natural gas transmission pipelines.[54]
- The Northeast Gas Interconnector started operation in 2019. The 387-mile (622-kilometer) onshore pipeline is a joint venture of China's State Grid Corporation and Singapore Power, operated by Jemena.[55]

Coal

- Australia was the world's second-largest coal exporter by weight behind Indonesia, and first by energy content in 2020. Coal is the country's most abundant energy resource,[56] and coal ranks as the second-largest export commodity from Australia in terms of revenue.[57]
- Australia exported about US $69.6 billion worth of coal (both metallurgical and thermal coal used for electricity generation and other industries) in 2018, according to the latest data available.[58]
- In 2020, Australia held 166 billion short tons (Bst) of recoverable coal reserves, the third-largest in the world behind the United States and Russia.[59]
- The Australian government estimates recoverable proved and probable reserves to be 193 Bst at the end of 2019; slightly more than half comes from black coal and the remainder from brown coal.[60]

Figure 8. Australia's coal production and consumption, 2010–2020

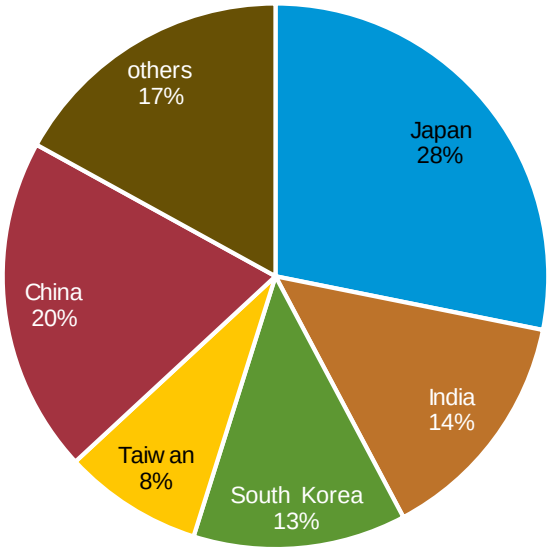


Source: Graph by the U.S. Energy Information Administration

Production and consumption

- Australia's coal production rose steadily from 2000 until it peaked in 2015 at 574 million short tons (MMst) (Figure 9). In 2020, the country produced an estimated 553 MMst of coal.[61]
- The Hydrogen Energy Supply Chain pilot project in Victoria is the world's first trial to show the effectiveness of producing hydrogen from brown coal. The resulting hydrogen is transported to Japan. The project started production in March 2021.[62]
- The Leigh Creek Energy Demonstration Project, completed in 2019, successfully used coal to produce syngas from the Telford Basin's 1.03 Tcf of natural gas reserves.[63] Leigh Creek Energy is working on the Leigh Creek Urea Project, which is the commercialization of the demonstration project. Once implemented, the project will produce syngas from deep and stranded coal reserves that will power a 5-megawatt (MW) power plant. Leigh Creek Energy expects the project to be constructed by March 2022. In subsequent phases, the plant will produce 1 million tons of nitrogen-based fertilizer. Other plans include the construction of a larger power plant and the production of urea fertilizer.[64]
- Most of Australia's coal is exported (446 Mst in 2020), and domestic demand accounted for less than one-quarter (107 Mst in 2020) of total production.[65]
- Coal plays a major role in meeting domestic energy needs, accounting for approximately 54% of Australia's electricity generation in 2020, according to government statistics.[66] In the past several years, Australia has focused on substituting some coal-fired generation with natural gas-fired power and renewable power. Coal consumption for electricity generation has decreased by 18% since 2016 as a result.[67]

Figure 9. Australia's coal exports by destination, 2020

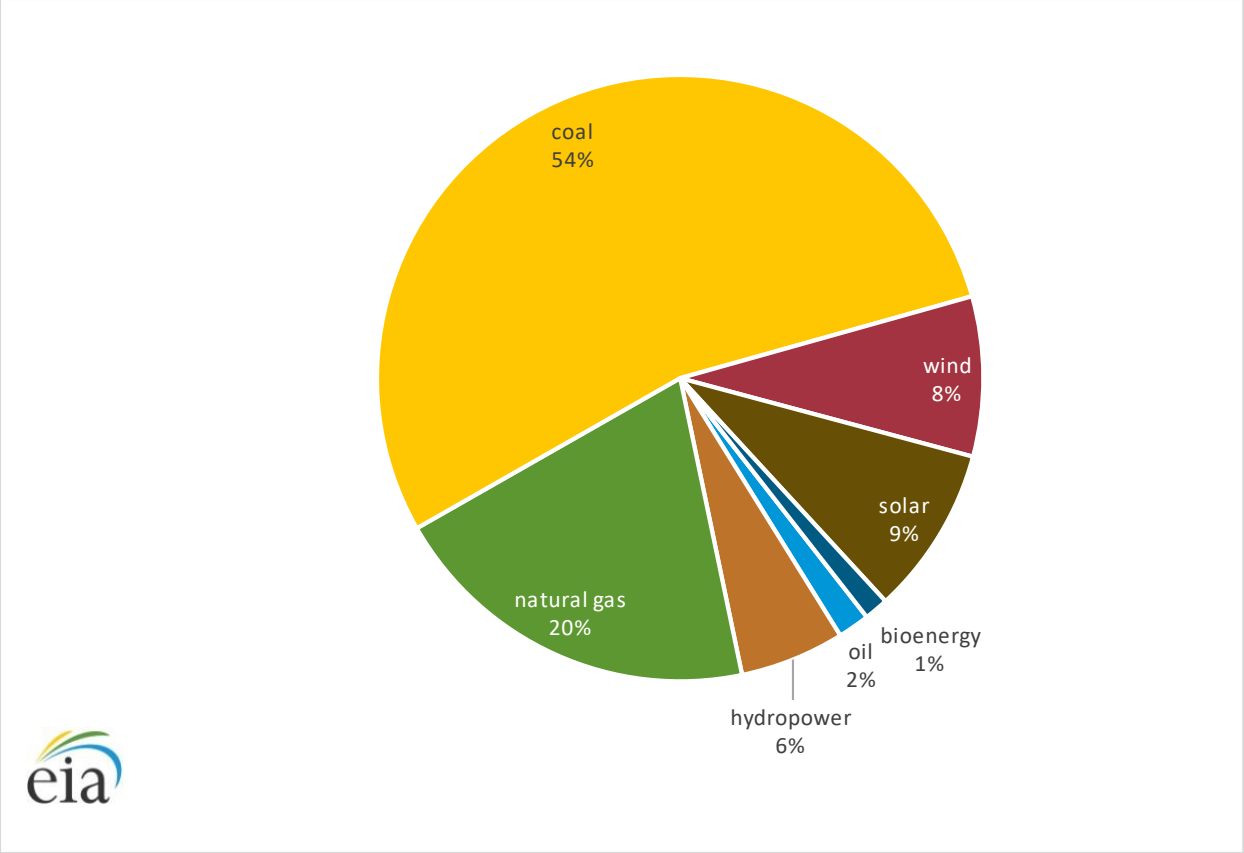


Source: Graph by the U.S. Energy Information Administration, based on data from Global Trade Tracker

Exports

- Australia remained the second-highest coal exporter on a weight basis in 2020 behind Indonesia. Total coal exports (almost 430 MMst in 2020) were only slightly lower than the 2019 total (433 MMst).[68]
- Most of Australia's coal exports go to countries in Asia. Japan (28%), China (20%), India (14%), and South Korea (13%) import most of Australia's coal (Figure 9).[69]
- China, Australia's second-largest importer of coal for the past several years, accounted for 20% of the country's coal exports in 2020. However, coal exports to China dropped to virtually zero in 2021. Tension between Australia and China had been rising since 2018 when Australia banned China's Huawei from their 5G cellular networks. In late 2020, after Australia called for an inquiry into the origins of COVID-19, China initiated trade restrictions on some Australian exports, including beef, barley, wine, and seafood.[70] China also placed an unofficial ban on coal from Australia. This unofficial ban left shipments of an estimated 1.1 MMst of coal from Australia stranded in China. As of the end of 2021, only small amounts of the stranded coal have been released into China.[71]

Figure 10. Australia's net electricity generation by fuel, 2020



Source: Graph by the U.S. Energy Information Administration with data from Australia's Department of Industry, Innovation and Science

Electricity

- Electricity generation in 2020 decreased approximately 3% from 250 terawatthours (TWh) in 2019, to 243 TWh.[72]
- Fossil fuels supplied about 76% of Australia's electric generation in 2020, decreasing approximately 3% from 2019. Coal made up the majority of electricity generation (Figure 10). Black coal (41%) and brown coal (13%) accounted for 54% of total generation. Natural gas-fired generation supplied 20% of total electricity generation.[73]
- Renewable sources, such as wind, bioenergy, and solar, have rapidly grown from less than 1% of total electricity generation in 2000 to more than 19% in 2020. Solar contributed the largest share of generation from renewables (9%), surpassing hydroelectricity as Australia's largest source of renewable energy.[74]
- Wind energy, the second-largest renewable source for electricity, has grown substantially in the past decade and accounted for 8.5% of total electricity generation in 2020.[75]
- Hydroelectricity, accounting for 6% of total electricity generation in 2020, is available in the states of Tasmania, Victoria, and New South Wales.[76]
- Australia hosts several battery storage projects in various stages of completion. These projects aim to make the national grid more efficient at both the transmission and distribution levels.[77] Currently, the largest operating battery is the Victorian Big Battery in Geelong.[78] The 300-MW

grid-scale lithium-ion battery storage system came online at the end of 2021 and stores enough energy to power over 1 million homes for up to 30 minutes.[79]

- In 2021, Australia released its National Hydrogen Strategy, which outlines its potential in the market. Currently, Australia has plans for green hydrogen projects with 69 gigawatts of proposed total capacity.[80]

Notes

- Data presented in the text are the most recent available as of March 4, 2022.
- Data are EIA estimates unless otherwise noted.

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https://www.neste.com/releases-and-news/renewable-solutions/neste-and-dhl-express-announce-one-largest-ever-sustainable-aviation-fuel-deals
21 March 2022

Neste and DHL Express announce one of the largest ever sustainable aviation fuel deals

Published in Releases and news under Renewable solutions, Aviation SAF, Sustainable aviation fuel, Neste MY Sustainable Aviation Fuel

Neste Corporation, Press Release, 21 March 2022 at 11.00 a.m. (EET)

Thorsten Lange, Executive Vice President Renewable Aviation at Neste and Frank Appel, CEO of Deutsche Post DHL Group. Photo: Deutsche Post DHL Group

DHL Express and Neste have announced a significant step towards decarbonizing aviation logistics by expanding their existing cooperation with a new strategic collaboration. In the next five years, Neste will supply DHL with approximately 320,000 tons (400 million liters) of Neste MY Sustainable Aviation Fuel™. The agreement is Neste's largest for Sustainable Aviation Fuel (SAF) to date and one of the largest SAF agreements in the aviation industry.

Neste and DHL have been working together since 2020 making Neste MY Sustainable Aviation Fuel available for DHL's operations. In 2020, DHL Express became the first cargo operator to use Neste MY Sustainable Aviation Fuel on flights departing from San Francisco International Airport and Amsterdam Airport. In 2021 DHL and Neste extended that cooperation to provide Neste's SAF for DHL Express' hub at the UK's East Midlands airport.

"This milestone agreement, our largest ever for SAF, underlines the growing need and urgency – as well as the commitment – to act on aviation-related emissions. We are pleased to take this significant step together with DHL, which shows the joint ambitions of both companies and is further progress in our journey towards creating a healthier planet for our children," says Peter Vanacker, President and CEO of Neste.

“Today’s announcement also reflects how we are concretely helping customers reduce greenhouse gas emissions by at least 20 million tons of CO2 equivalent annually by 2030. SAF is a cornerstone of the aviation industry’s efforts to achieve net-zero emissions by 2050. It requires a joint effort across the aviation value chain with all stakeholders, using all available renewable raw materials and solutions, to reach that goal.”

“As the world’s leading logistics provider, it is our commitment to provide green and more sustainable solutions for our customers. The landmark SAF deal with Neste marks a significant step for the entire aviation industry and validates the framework of our Sustainable Roadmap”, says Frank Appel, CEO of Deutsche Post DHL Group. “Using SAF is currently one of the aviation industry’s key routes to reducing CO2 emissions over the aviation fuel lifecycle with currently available aircraft types.”

In its Sustainability Roadmap, Deutsche Post DHL Group has committed to using 30 percent of SAF blending for all air transport by 2030. Neste’s SAF is produced from sustainably sourced, 100% renewable waste and residue raw materials. It can reduce greenhouse gas emissions by up to 80%*, in its neat form and over the life cycle, compared to the fossil jet fuel it replaces, thereby significantly reducing DP-DHL’s carbon footprint.

“With every SAF deal, we are increasingly aware of the huge task that lies ahead in utilizing alternative sustainable solutions to help our customers. Not a day goes by without our customers asking us about low-carbon logistics solutions and to partner them in our joint aspiration to be part of creating a more sustainable future”, says John Pearson, CEO DHL Express. “The new SAF deal with Neste is a milestone on this journey. Our key focus is to inspire more SAF suppliers to address the current supply gap. At the same time, we are calling on policy makers to set the right framework to accelerate market ramp up of SAF in the EU and worldwide, including an accounting mechanism that allows flexible SAF purchases and usage.”

Neste MY Sustainable Aviation Fuel is an available solution today. As a drop-in fuel it can be used with existing aircraft engines and airport fuel infrastructure, requiring no extra investment to them. With the ongoing expansion of Neste’s Singapore refinery and modification to its Rotterdam refinery, Neste will have an annual production capacity for sustainable aviation fuel of 1.5 million tons (approx. 1.875 billion liters) by the end of 2023.

**) Calculated with established life cycle assessment (LCA) methodologies, such as CORSIA methodology*

Neste Corporation

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Deutsche Post DHL Group: Media Relations, Sabine Hartmann, Phone: +49 228 182-9944, E-mail: pressestelle@dpdhl.com

Neste in brief

Neste (NESTE, Nasdaq Helsinki) creates solutions for combating climate change and accelerating a shift to a circular economy. We refine waste, residues and innovative raw materials into renewable fuels and sustainable feedstock for plastics and other materials. We are the world's leading producer of sustainable aviation fuel and renewable diesel and developing chemical recycling to combat the plastic waste challenge. We aim at helping customers to reduce their greenhouse gas emissions with our renewable and circular solutions by at least 20 million tons annually by 2030. Our ambition is to make the Porvoo oil refinery in Finland the most sustainable refinery in Europe by 2030. We are introducing renewable and recycled raw materials such as liquefied waste plastic as refinery raw materials. We have committed to reaching carbon-neutral production by 2035, and we will reduce the carbon emission intensity of sold products by 50% by 2040. We also have set high standards for biodiversity, human rights and supply chain. We have consistently been included in the Dow Jones Sustainability Indices and the Global 100 list of the world's most sustainable companies. In 2021, Neste's revenue stood at EUR 15.1 billion. Read more: neste.com

DHL – The logistics company for the world

DHL is the leading global brand in the logistics industry. Our DHL divisions offer an unrivalled portfolio of logistics services ranging from national and international parcel delivery, e-commerce shipping and fulfillment solutions, international express, road, air and ocean transport to industrial supply chain management. With about 380,000 employees in more than 220 countries and territories worldwide, DHL connects people and businesses securely and reliably, enabling global sustainable trade flows. With specialized solutions for growth markets and industries including technology, life sciences and healthcare, engineering, manufacturing & energy, auto-mobility and retail, DHL is decisively positioned as "The logistics company for the world". DHL is part of Deutsche Post DHL Group. The Group generated revenues of more than 81 billion euros in 2021. With sustainable business practices and a commitment to society and the environment, the Group makes a positive contribution to the world. Deutsche Post DHL Group aims to achieve zero-emissions logistics by 2050.

SAF Group created transcript of excerpts from the TotalEnergies Energy Landscape webcast Sept 27, 2021

Items in "*italics*" are SAF Group created transcript. Note that our created transcript is a little different than other posted transcripts.

On growth in power supply really being driven by wind and solar. In their prepared remarks, mgmt said "*In Momentum, the overall power demand is up some 2.5% per annum over the next 30 years. So what about power generation to accommodate for this increase in demand? Generation more than doubles by 2050 with solar and wind making up 85% of new capacities. Gas is the only fossil fuel to grow in the power mix due to its key role in coping with intermittency and demand seasonality. To the right, you see our assumptions in terms of gigawatts of solar and wind. The capacities are multiplied by 10 in 30 years."* Note that in their more aggressive Rupture scenario, its even more growth. The transcript we prepared says "*The associated need for wind and solar to the right is staggering. Every year between now and 2050, every year over the next 30 years, the world has to add all of the existing installed solar capacity Over all of the existing installed wind capacity because those two bases are actually very close. This will also require, of course massive storage solution, again be they battery based or green hydrogen or some other new technology that will be invented".*

A key underlying issue/challenge for wind/solar is that it takes up way more space to produce energy. In their prepared remarks, mgmt said "*Footprint of different energies is also to be considered. The footprint is linked to the density of the energies and to their engineering characteristics, which in the end, boils down to planned production yield. It's illustrated here in terms of square meters of land needed to power a 100-watt flat TV screen. You don't see oil on the chart because it's not really a good way to use oil to produce power. So hydro, of course is a little specific because it's not at all modular. But what you can see here that for the same amount of power, the land use required for wind or solar is way way bigger than the square meters needed for a coal power plant, a nuclear power plant or a gas power plant. This is a way of showing why there are acceptability issues linked to wind and solar, not everywhere, but in Europe, for instance, it is a mounting issue that has to be overcome."*

Then on overcoming NIMBY (they don't use the term NIMBY) issues that cause delays for approvals. In the Q&A, mgmt is asked about overcoming local opposition to wind and solar projects in France, and replies "*The problem is not only in France. I think by the way you have issues with communities because it's a question again of land use. In fact, you have competition for use, and you have people. It's not only in France, by the way we observed the same, exactly the same problem in Germany, in Italy, by the way. And we begin to observe it in Spain as well. So I think the reality is that Europe is, I would say is a humanized civilization. And we have a density of population, which compared to many other countries like the U.S. or Australia, for example." "China" "Which is much, much, we are much more dense. So I'm not surprised, and it's why I was insisting that it's a question of scarcity above surface for renewables. So that has to be taken into account. I read there was a study. It's an interested study, which has been published in Italy by the Ambrosetti Foundation. We try to translate this. The target that the European Commission has assigned by 2030, 40% of renewable in our mix in terms of. they made a study how long could it take to get through all the administrative process to build such capacities? And is the answer in this study by Ambrosetti, it's not 2030, but 2043 [ph] There is a message there to policymakers, I think to everybody. If, and that I think that's very good this exercise. I mean this willingness of Europe to go for 55% by 2050 -- to 2030, sorry because it raised many issues. It puts the people in front of the reality. How do we do that? And if yes. If we want to reach 40% of renewable in our mix, we need to build massive renewable for the next 10 years. And we need to have the land, and we will need to have the administrative process going through. And that's true that in our democracies, which is good, that makes raise questions. I think there is only way to think to that, which will oblige governments to plan properly like I think the French government begins to think to that. We need to make some planning, but to do the planning properly, you need to put people around the table and not to antagonize people. If you let just people going, if it's a jungle, it will not work. So that's true that. and for, let's be clear for our strategy of TotalEnergies, this is one advantage of our company is that we think, when we think renewable, we think on a worldwide basis. I will come back on that concept tomorrow."*

Prepared by SAF Group https://safgroup.ca/news-insights/

https://www.spglobal.com/commodity-insights/en/market-insights/blogs/oil/032222-sustainable-aviation-fuel-saf-2050

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Long-term demand for SAF could run into supply constraints

Author Evridiki Dimitriadou Corey Lavinsky

Commodity Agriculture, Oil

Topic Energy Transition, Environment and Sustainability

The number of countries that have proposed or adopted long-term blending targets for sustainable aviation fuel, or SAF, continues to increase. But with supply limitations potentially constraining growth to 2050, many countries may fall short of their blending targets.

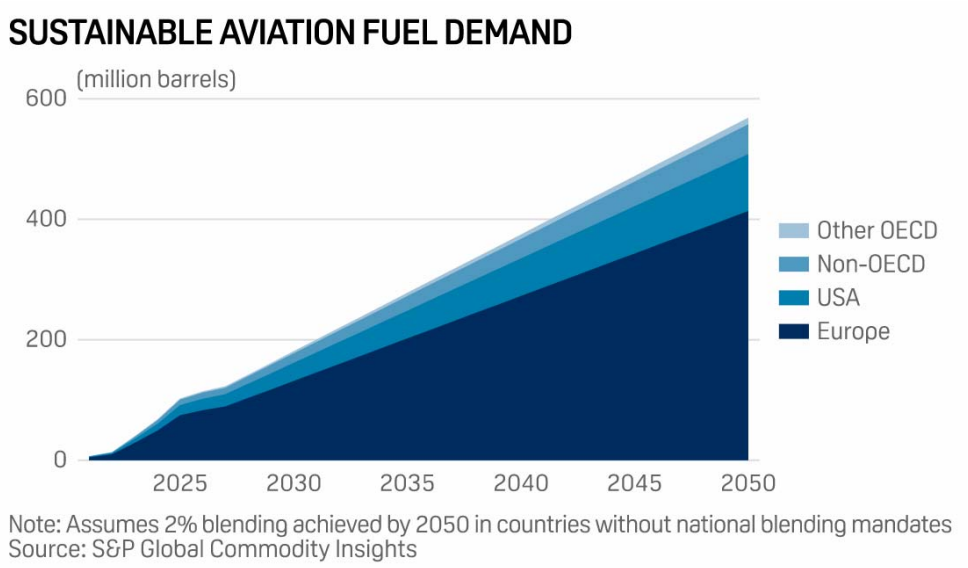
Based on current and announced commercial commitments, S&P Global Commodity Insights projects that SAF demand by 2050 could climb to 5.8% of global jet fuel demand, with country-level demands concentrated in Europe and the US.

If all countries were to meet their 2050 SAF blending targets, S&P Global has calculated that this would imply an annual supply requirement of 17.5 billion gallons equivalent (1.14 million boe/d) across all types of sustainable aviation fuels, including biofuels and synfuels.

Majority of the countries that have already proposed or have adopted blending targets for SAF are EU member states, which will be expected to comply with the EU's yet-to-be-finalized "Fit for 55" package that proposes a 2% SAF blending mandate by 2025, which goes up to 5% by 2030, and 63% by 2050.

Three European countries already have SAF blending mandates in place: Norway, Sweden and France. Norway introduced a 0.5% SAF blending mandate in 2020 while Sweden's SAF mandate was increased to 1.7% in 2022. Sweden's mandate is part of its broader greenhouse gas emissions reduction requirements for air travel. Meanwhile, France introduced a 1% blending mandate for SAF this year, which will double to 2% by 2025.

These policy measures are considered essential steps to reduce greenhouse gas emissions in aviation, which is viewed as a "hard-to-decarbonize" sector. S&P Global projects that fuel demand from the aviation sector will grow by an average of 2.6% annually, returning to pre-COVID levels by 2027.



Ranked by implied blending volumes, OECD member states account for 19 of the top 20 long-term SAF targets, collectively amounting to 16.4 billion gallons of required SAF in 2050 should national targets be met. Joining these countries is Indonesia, which has a 5% long-term blending target. Based on the S&P Global's view of total global aviation fuel demand by 2050, the national SAF blending targets would imply an 11.4% worldwide blending rate. This figure is likely to increase in the coming months as several other countries are expected to introduce mandates including Japan, where the government is considering a 10% SAF target by 2030, as well as New Zealand and Brazil.

Supply limitations

With current delivered SAF supply volumes estimated at just over 200 million gallons, achieving a minimum 17.5 billion delivered volumes by 2050 would require an astonishing 17.3% growth. Given the potential for more countries to announce targets or for blending to occur even in countries without targets in place, this growth requirement could actually be conservative.

To assess the likelihood of these supply requirements being met, S&P Global is tracking nearly 120 production facilities either currently in operation or in the planning stage. These amount to an aggregate nameplate capacity of around 11.5 billion gallons. But commercial realities drive the majority of these facilities to maximize production of renewable diesel rather than SAF.

This trend, coupled with limited availability of various biomass-based feedstocks for SAF production, is likely to constrain supply growth over the long-term.

Near-term capacity additions could provide a boost to available SAF volumes, and over the long run – as road transport increasingly becomes electrified and the diesel blending pool shrinks – producers may shift from RD to SAF, but feedstock availability is likely to be the key signpost driving total supply growth out to 2050.

Considering feedstocks specifically, the American Society for Testing Materials has approved seven production pathways for SAF. The maximum blending ratio for five of the seven processes is currently 50% of conventional jet fuel, with some production pathways restricted to a maximum of only 10% and a maximum 5% for any co-processing approach, representing a de facto feedstocks supply cap.

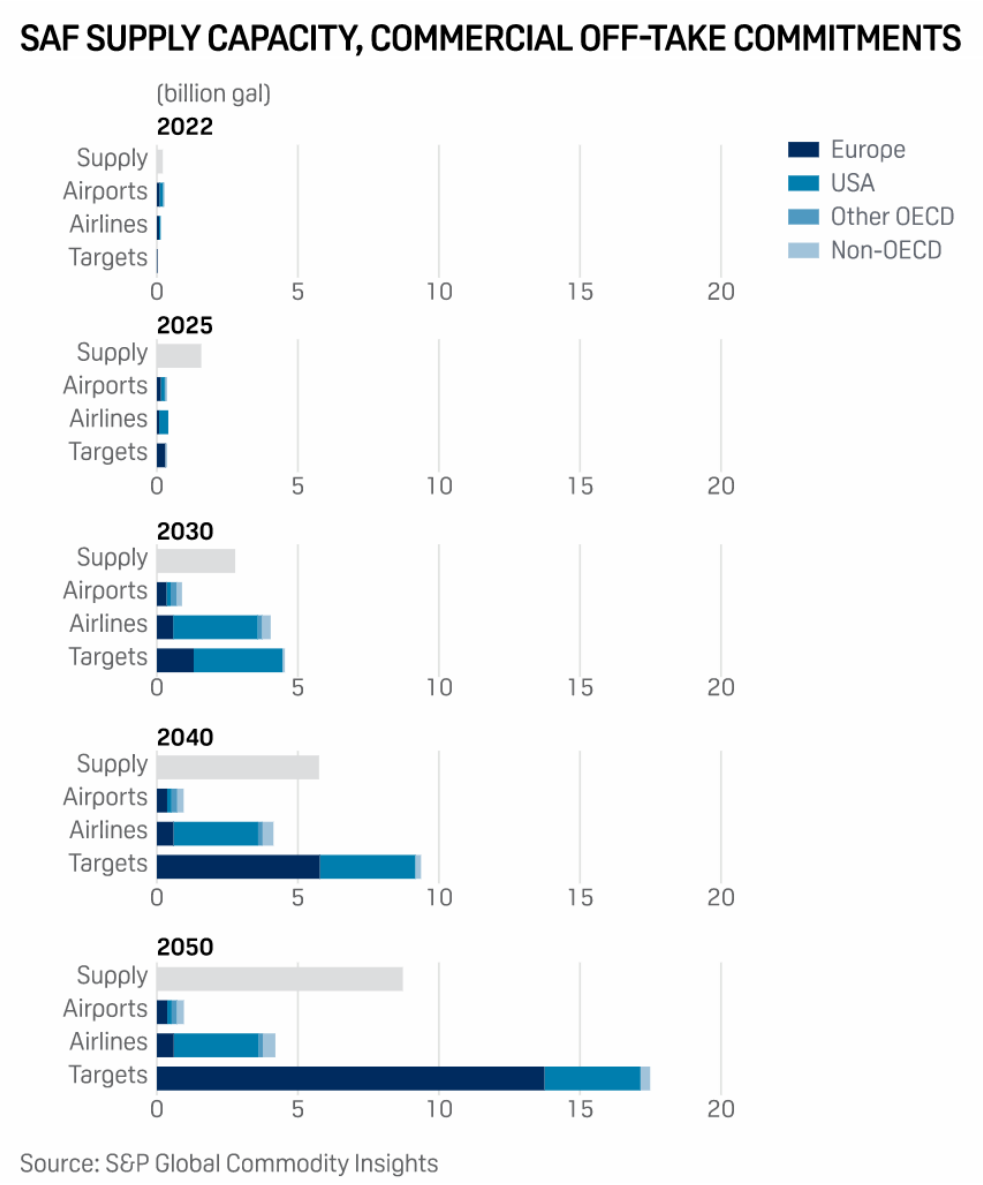
Used cooking oil is one feedstock that has shown substantial growth particularly in Europe and the US, although there are potential challenges related to scalability. A similar dynamic is expected for tallow and fats as potential feedstocks.

The feedstock projected to see the greatest relative growth over the medium term is vegetable oil, with production expected to rise 7% by 2025. But this growth is primarily driven by soy oil and canola oil. But with soy oil and palm oil being associated with deforestation and competition with the food chain, restrictions are already in place for these as feedstock for SAF in Europe.

Commercial commitments

S&P Global does expect supply to increase by nearly eight-fold by the middle of this decade – a remarkable growth and more than sufficient to meet all medium-term blending targets. But from 2030-2050 the picture reverses itself: expected supply availability falls considerably short of combined national blending targets.

Against the backdrop of this supply constraint, S&P Global has developed a database of commercial-level off-take commitments for SAF, tracking the more than 46 airports that have received regular SAF distribution (plus 36 that have received batch deliveries) as well as numerous airlines and industry consortia that have either already signed offtake agreements or set aspirational blending targets.



As of this writing, committed 2025 off-take at the airport level is estimated at just over 350 million gallons and over 400 million gallons at the airline level. This is far short of the over 1.5 billion gallons that should by available on the market at that time.

By 2030, S&P Global projects that committed commercial off-take of SAF at the airline level will exceed 4 billion gallons (while climbing to 0.9 billion gallons at the airport level). These figures have two direct implications: should all airline off-take commitments be met at a global level, this would imply that all global blending targets are met. At the same time, though, it would require the S&P Global SAF supply forecast to nearly double, as only 2.17 billion gallons of SAF are expected to be available in 2030.

Clearly, private sector commitments serve as a key driver for demand across the entire industry, including via industry consortia. The most prominent of these consortia is the "Clean Skies for Tomorrow" initiative, encompassing more than 60 corporate participants in the World Economic Forum which seeks to achieve 10% market penetration for SAF by 2030. In February, the Canadian Council for Sustainable Aviation Fuels was launched where 60 domestic members

develop a strategy for a competitive SAF market in Canada. In March, the Act For Sky was also established – consortium of 16 Asian market participants targeting the promotion and expansion of the use of domestic SAF. The latter is particularly important for the global market as the number of commercial commitments outside Europe and North America is much smaller.

Balancing supply and demand

S&P Global projects that there will be 8.7 billion gallons of SAF supply available by 2050 due to feedstock limitations. There is upside to this forecast as market drivers could shift RD production into SAF and as policy support measures continue to be developed that could improve the commercial case for SAF.

From the demand perspective, the upside potential is substantial as countries that are considered major growth markets for jet fuel demand – such as China and India – could begin to introduce some supportive policy framework for SAF penetration or as technological improvements increase the blending wall limit for SAF in commercial aviation.

Related feature: SAF garnering Asian support as key aviation decarbonization pillar

Balancing current projections of supply against the combination of country-level targets, airline off-take agreements, and known distribution at airport, S&P Global currently forecasts the EU-27, the UK, and the US to collectively account for 87% of long-term SAF demand, representing an implied blending of 14.4% in those countries.

With analysis from Mark Mozur, Bea Pupo, Loren Puette, Monika Rajoria

Australia's opportunity

Demand for critical minerals

The global demand for critical minerals is growing.

Critical minerals are essential for the energy, transport, aerospace, defence, medical, automotive and telecommunications sectors. They will also be used in further advanced manufacturing applications.

The International Energy Agency's World Energy Outlook 2021 predicts significantly increased demand for the critical minerals used in solar PV plants, wind farms, electric vehicles and battery storage.[1] For example, electric vehicles use many critical minerals, and the number of electric vehicles in the world is projected to increase 30% every year to 2050.[2]

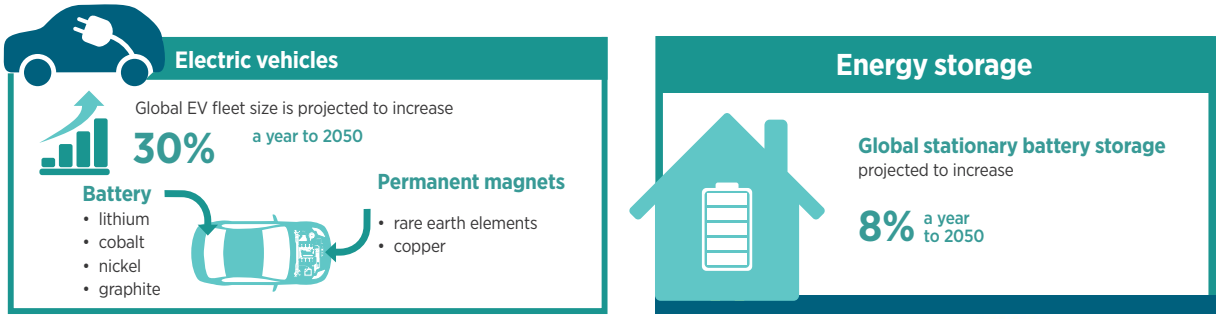


Image source: Office of the Chief Economist, Outlook for Selected Critical Minerals in Australia 2021 report

Lithium

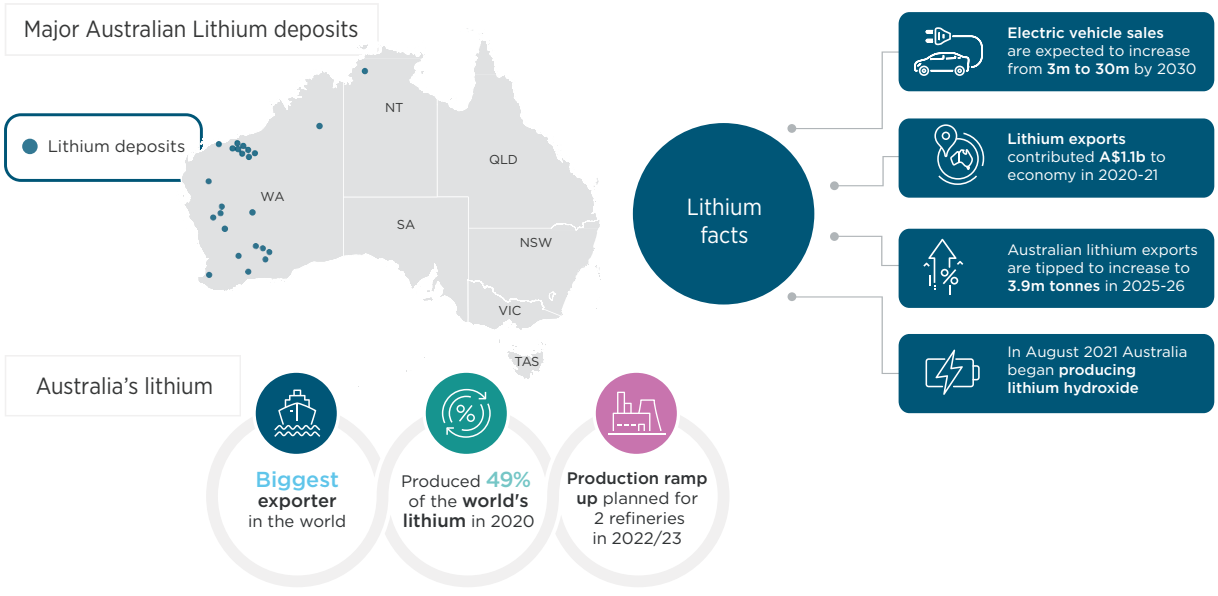


Image source: Office of the Chief Economist, Outlook for Selected Critical Minerals in Australia 2021 report

1 International Energy Agency (IEA), World Energy Outlook 2021, IEA, 2021, p 271, accessed 28 February 2022.

2 B Gasson, C Lewis and K Martin, Outlook for Selected Critical Minerals 2021, Department of Industry, Science, Energy and Resources (DISER), Australian Government, 2021, p 4, accessed 3 March 2022.

How Australia can benefit

Growing global demand creates a significant opportunity for Australia, thanks to our critical mineral reserves and our reputation as a trusted and reliable supplier.

Australia has some of the world's largest recoverable resources of several critical minerals, including cobalt, lithium, manganese, tungsten and vanadium.

Many countries want minerals that are sourced in an environmentally and socially responsible way. Australia has one of the world's strongest and most efficient regulatory environments, which makes us an attractive supplier of critical minerals products.

Becoming a critical minerals powerhouse will support thousands of jobs. For example, clean energy technologies need a range of minerals, including critical minerals like cobalt, lithium, and rare earth elements. Producing and exporting these minerals could create up to 52,000 jobs in regions like southern Western Australia, the Pilbara and South Australia by 2050.[3]

Moving into downstream processing will capture more value, keep economic benefit and jobs in Australia and boost our sovereign capability – all while helping meet growing global demand.

Expanding further along battery mineral value chains could support 34,700 jobs by 2030. To deliver on this potential, Australia needs to builds its capabilities in downstream refining, manufacturing, and battery integration and services.[4]

Critical minerals projects can help ensure the continued growth of our resources sector and provide high-paying, skilled jobs for Australians, particularly in regional areas and heavy industry hubs.

Rare Earth Elements

World supply dynamics

Country	2020 production (thousand tonnes rare earth oxides)	Share of world
China	140	57%
US	38	15%
Myanmar	30	12%
Australia	23	9%
Rest of world	18	7%

Rare earth elements are used for a variety of applications

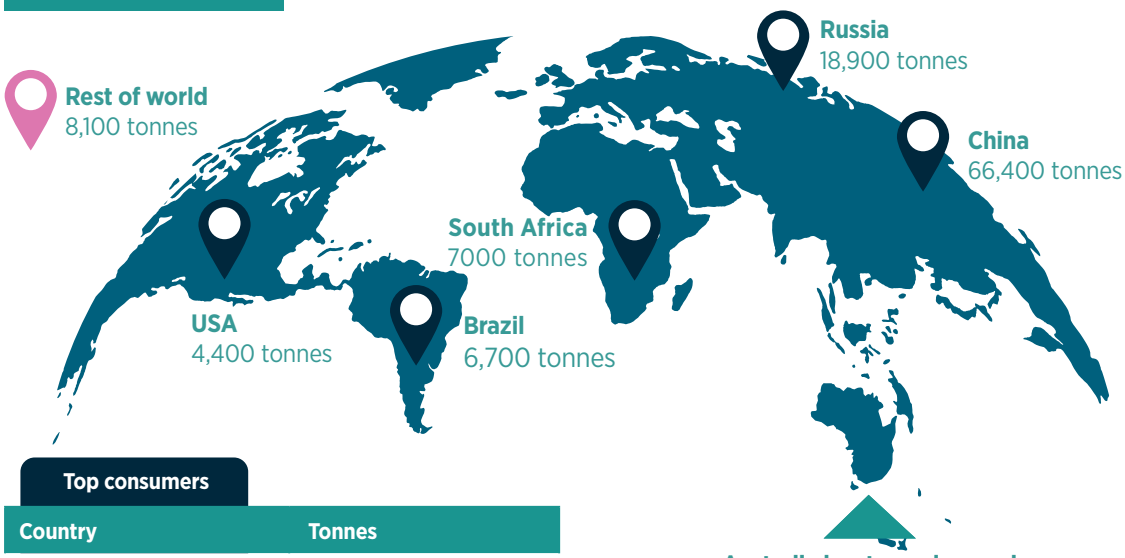
Image source: Office of the Chief Economist, Outlook for Selected Critical Minerals in Australia 2021 report

3 Department of Industry, Science, Energy and Resources (DISER), Australia's Long-Term Emissions Reduction Plan, DISER, Australian Government, 2021, p 84, accessed 14 Feb 2022.

4 Accenture, Future charge: Building Australia's Battery Industries, Future Battery Industries Cooperative Research Centre (FBICRC), 2021, p 3, accessed on 7 October 2021.

Vanadium

Top producers



Top consumers

Country	Tonnes
China	62,000
Europe	12,000
North America	10,000

Australia has two advanced projects evaluating mining as well as downstream processing.

Australia's Vanadium resources are the **3rd largest** in the world, accounting for **18 per cent** of world economic demonstrated resources but Australia's current production levels are **negligible.**

Image source: Office of the Chief Economist, Outlook for Selected Critical Minerals in Australia 2021 report

Cobalt

World production

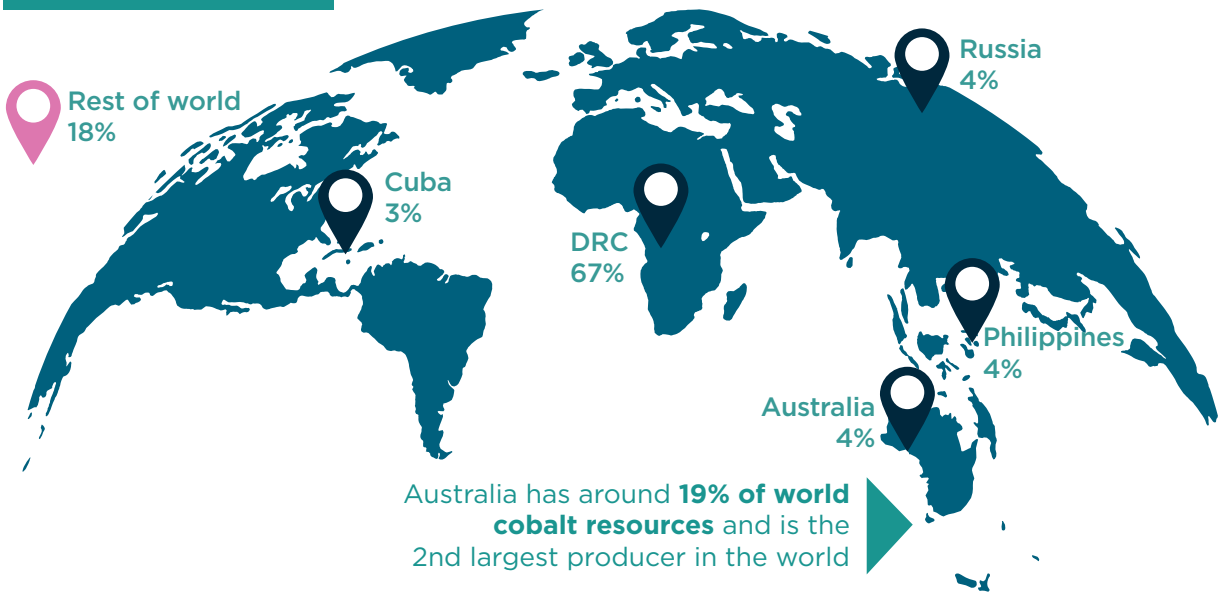


Image source: Office of the Chief Economist, Outlook for Selected Critical Minerals in Australia 2021 report

How Russia's War in Ukraine Is Choking the World's Supply of Natural Resources

By: Bloomberg News

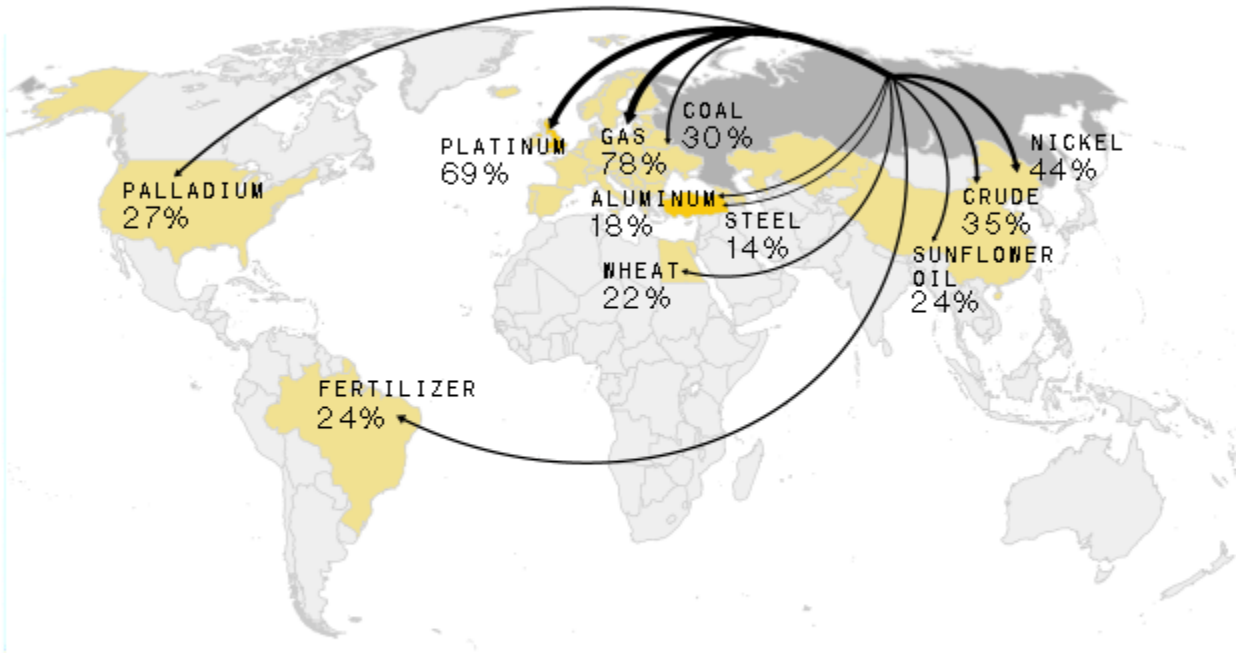
18 March 2022, 00:00 GMT-6

Russia is a commodities powerhouse, producing and exporting huge amounts of materials the world uses to build cars, transport people and goods, make bread and keep the lights on.

Its invasion of Ukraine is constraining those crucial supplies—or threatening to—as it becomes increasingly isolated from the global economy, driving up prices in the process.

Russia's Commodities Reach

The share of Russian exports that go to each destination



Note: Coal figures combine thermal and metallurgical; liquefied natural gas and pipeline gas are also combined.

Sources: UN Comtrade Database (metals); International Energy Agency (coal); UN's Food and Agriculture Organization (wheat; sunflower oil); Joint Organisations Data Initiative; Bloomberg; Eurostat; BP; (crude); Trade Data Monitor; Green Markets, a Bloomberg company (fertilizer); BP (gas)

Russia earns more than $1 billion a day exporting its oil and gas, much of which goes to Europe. Its aluminum and nickel end up in drinks cans, cars and electric

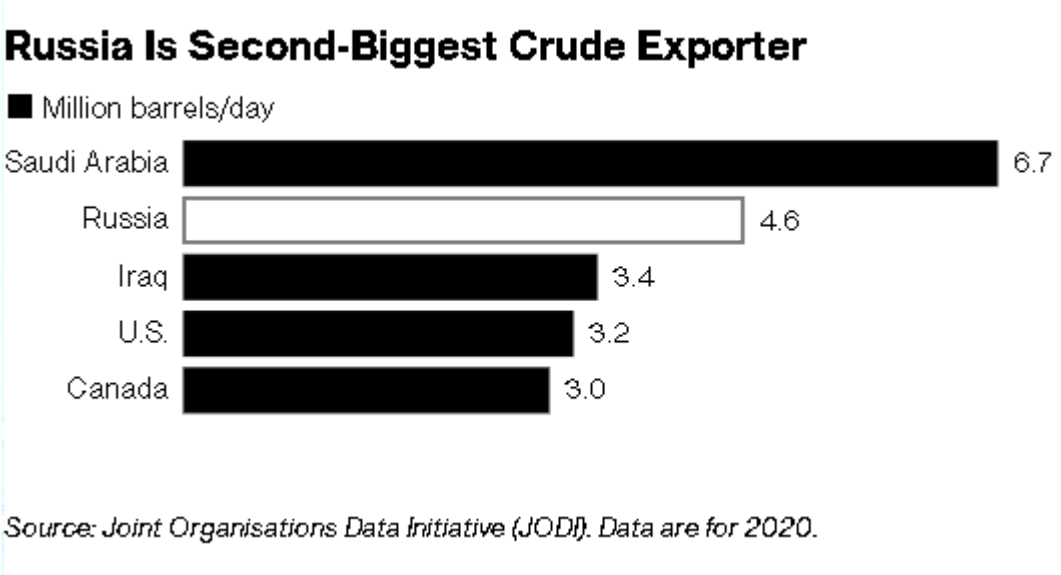
batteries, while its palladium is needed to curb vehicle emissions. It's also a giant wheat exporter and a key low-cost shipper of every kind of crop fertilizer.

Here's a look at some of Russia's key commodities exports, who relies on them and what choking those supplies means:

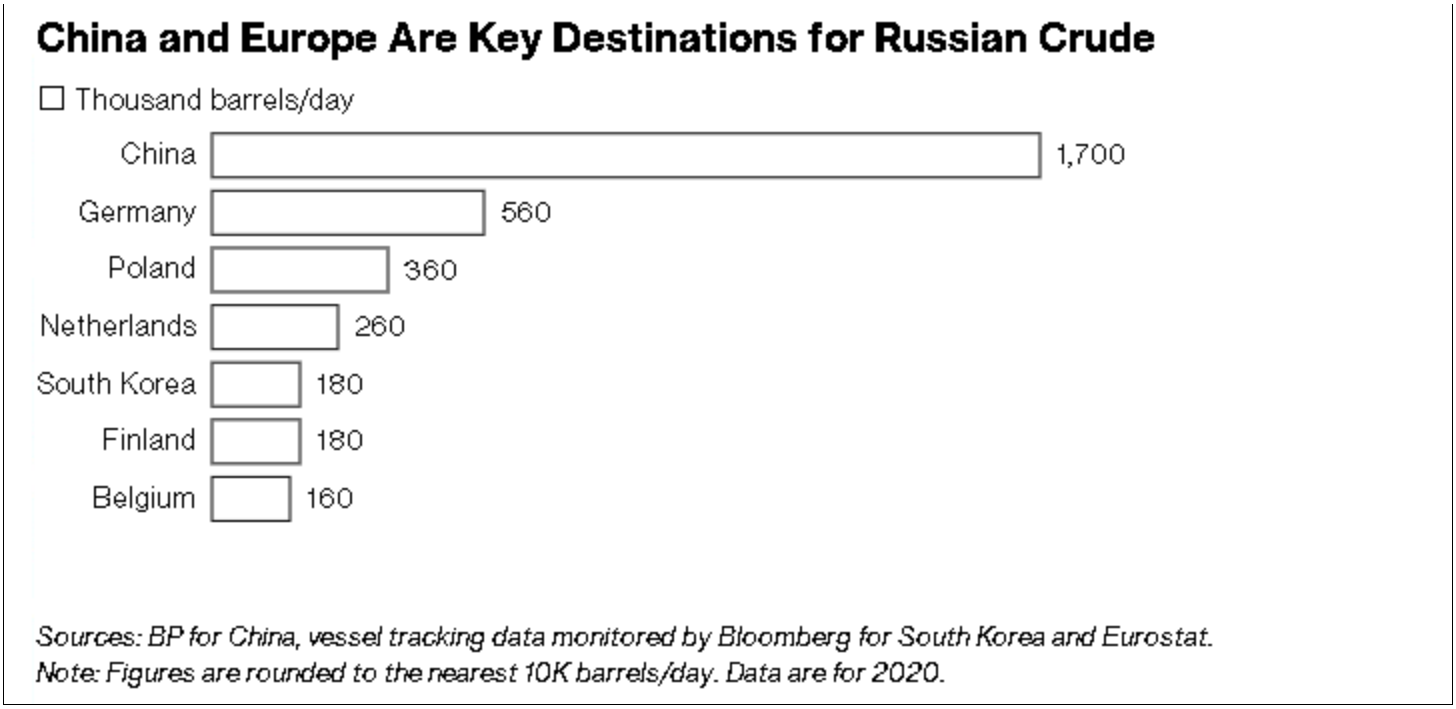
ENERGY

Crude

The U.S., U.K. and Canada have banned imports of Russian oil, and many companies are self-sanctioning, partly for fear of reputational damage.



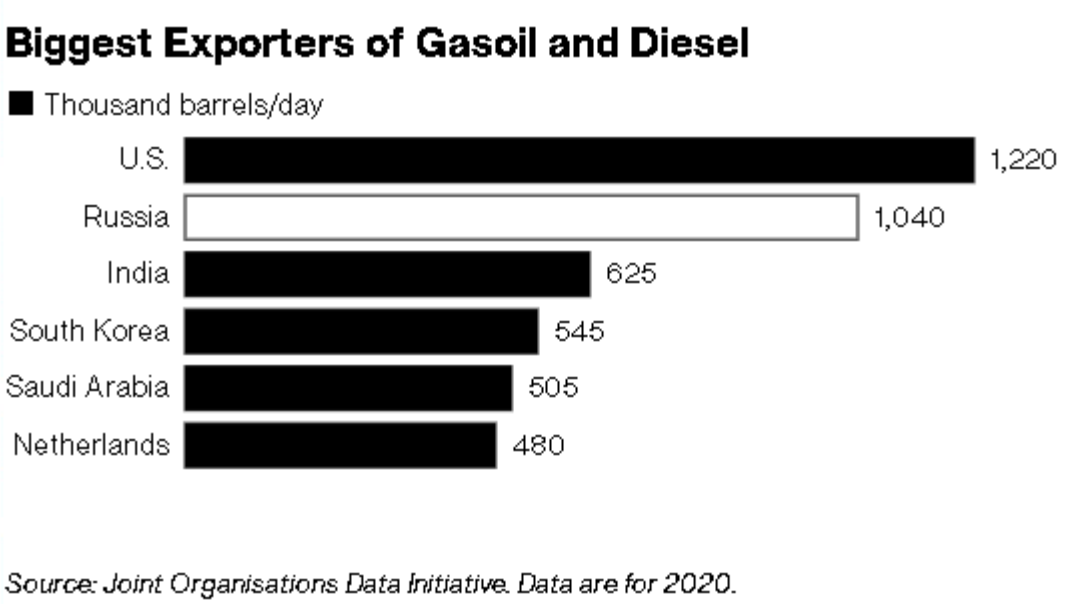
Germany, Poland and Hungary are among those most exposed to any loss of Russian oil as they have refineries dependent on deliveries via pipeline from the nation, and may find it hard to seek alternatives.



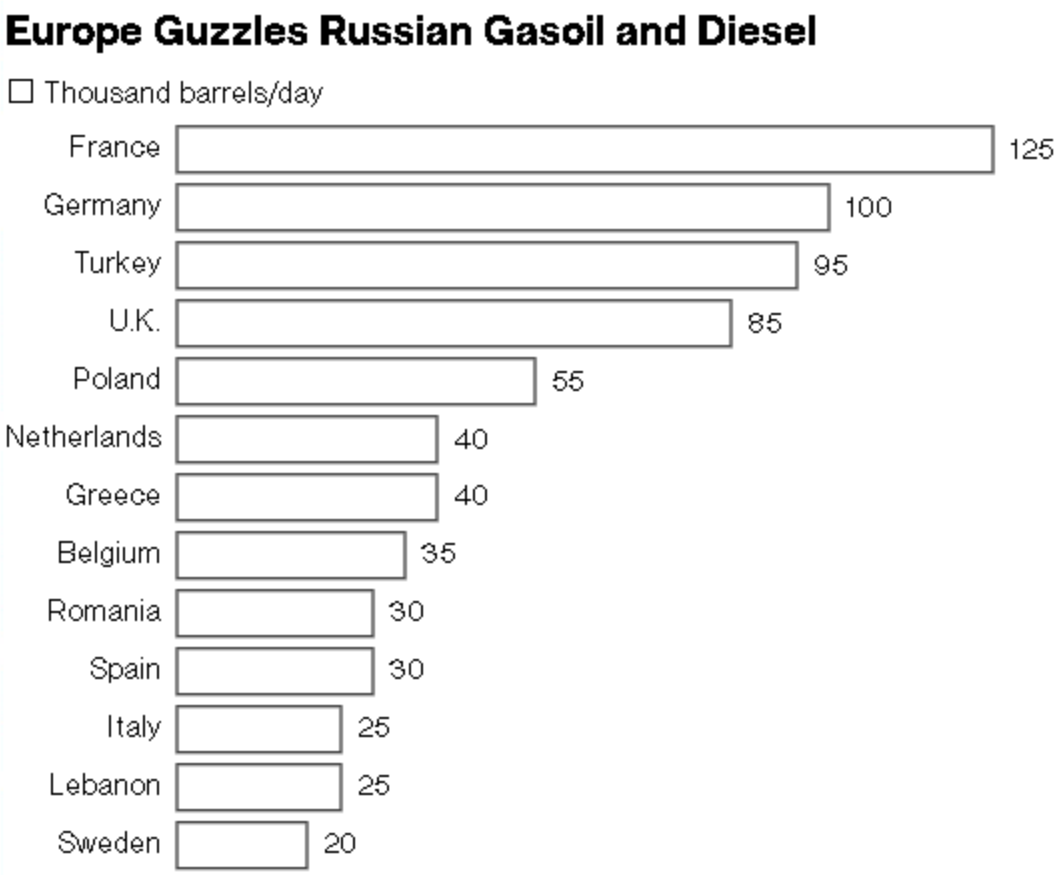
All oil producers would benefit from higher prices, but consumers from motorists to airlines face rising fuel bills. Key questions include whether European refiners will cut processing rates as they struggle to find alternative crudes and how much Russian supply is diverted to Asia from Europe.

Refined products

The European market is most exposed to the loss of Russian diesel and was already tight before the invasion, while Russian fuel oil—used as a feedstock for further processing—has been particularly important to U.S. refineries.



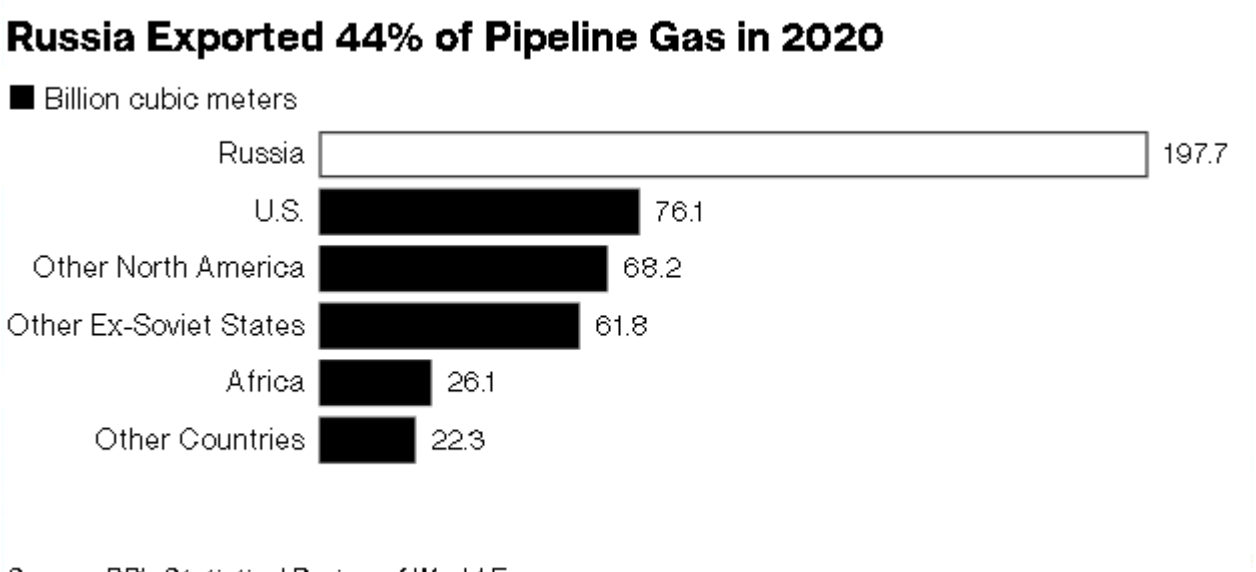
A European diesel shortage benefits refiners in the Middle East and Asia and traders have snapped up ships to haul barrels to Europe to fill the gap. Heavy crude producers would also be winners from a Russian supply shock, and it's been suggested the U.S. may turn to Venezuela—whose oil is currently subject to sanctions. Revival of the 2015 Iran nuclear deal could boost flows from the Persian Gulf country.



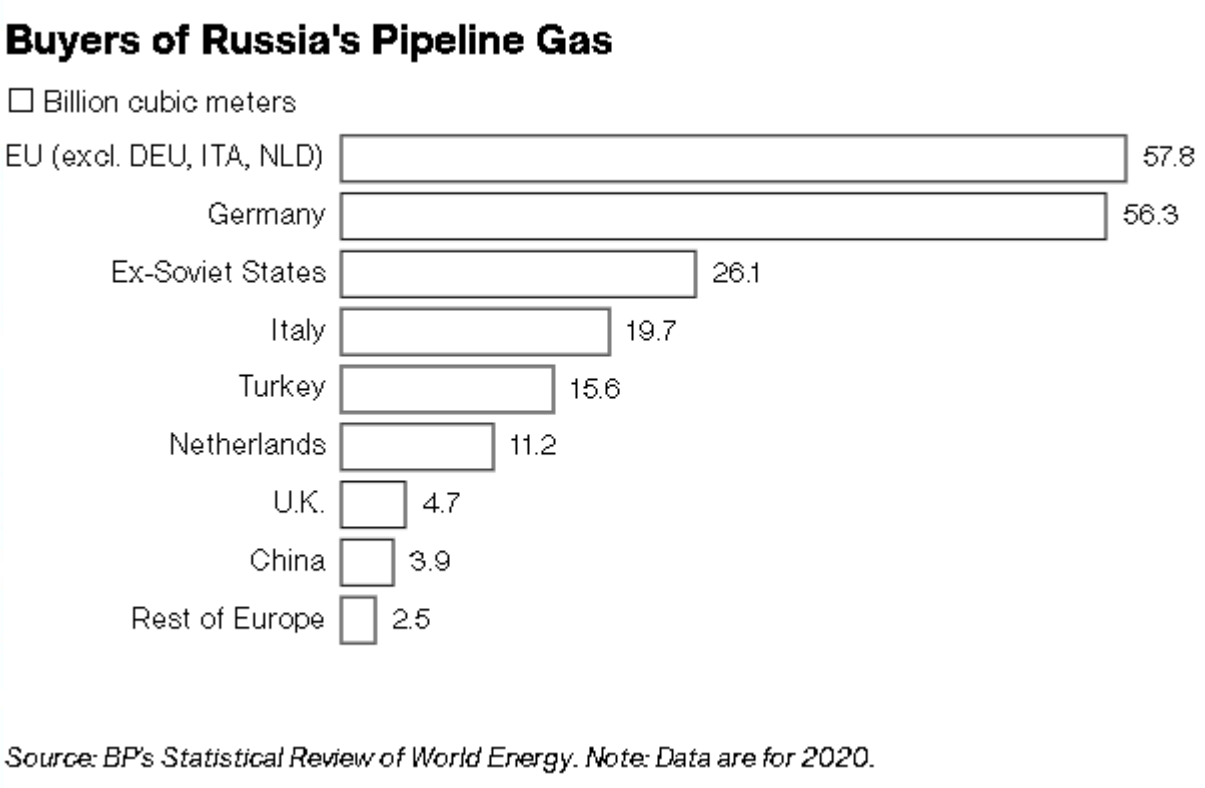
Source: Eurostat and Vortexa. Note: Figures are rounded to the nearest 5K barrels/day. Data are for 2020.

Natural Gas

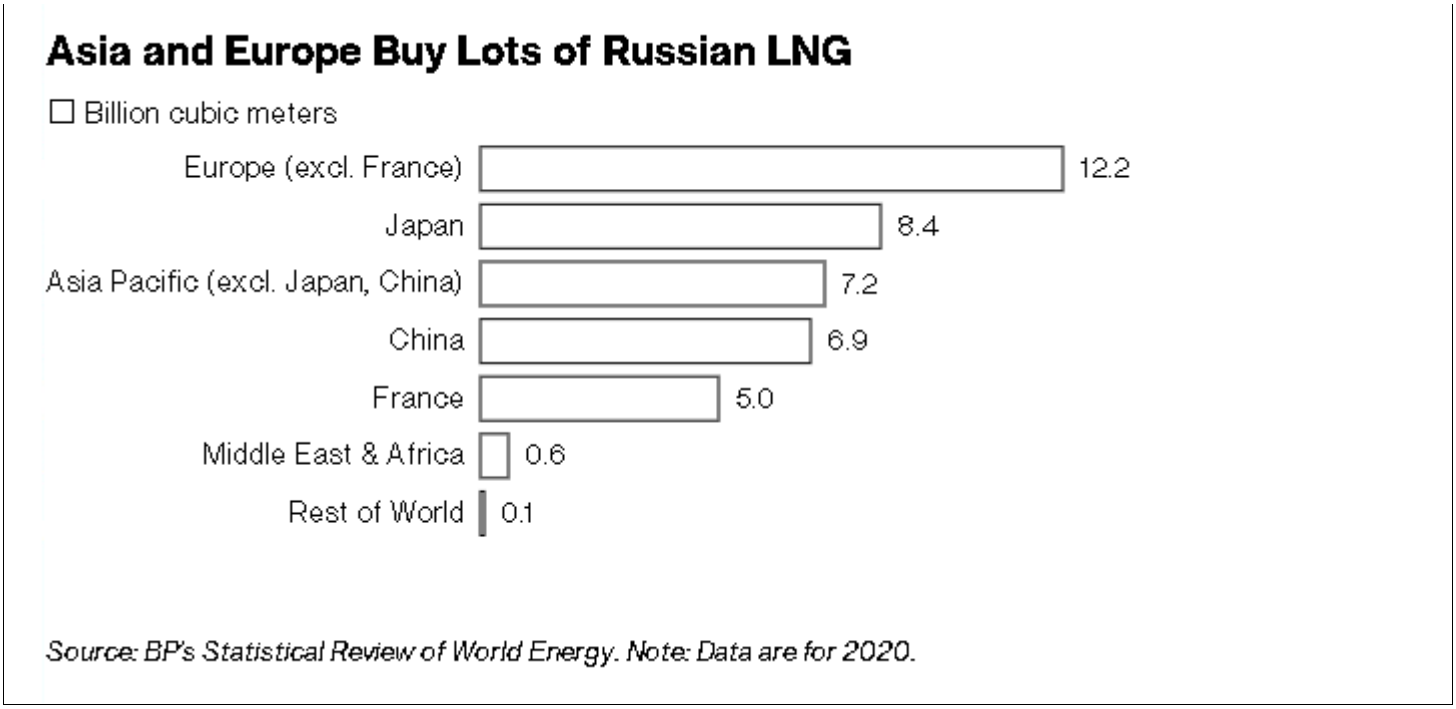
Moscow threatened to cut supply on a key pipeline to Europe in response to sanctions. To reduce the risks to its energy security, the European Union plans to curb the region's import needs from Russia by two-thirds this year.



Today, countries like Germany are particularly dependent on Russian gas. That could be an opportunity for liquefied natural gas exporters like the U.S. and Qatar, who move the fuel on ships.

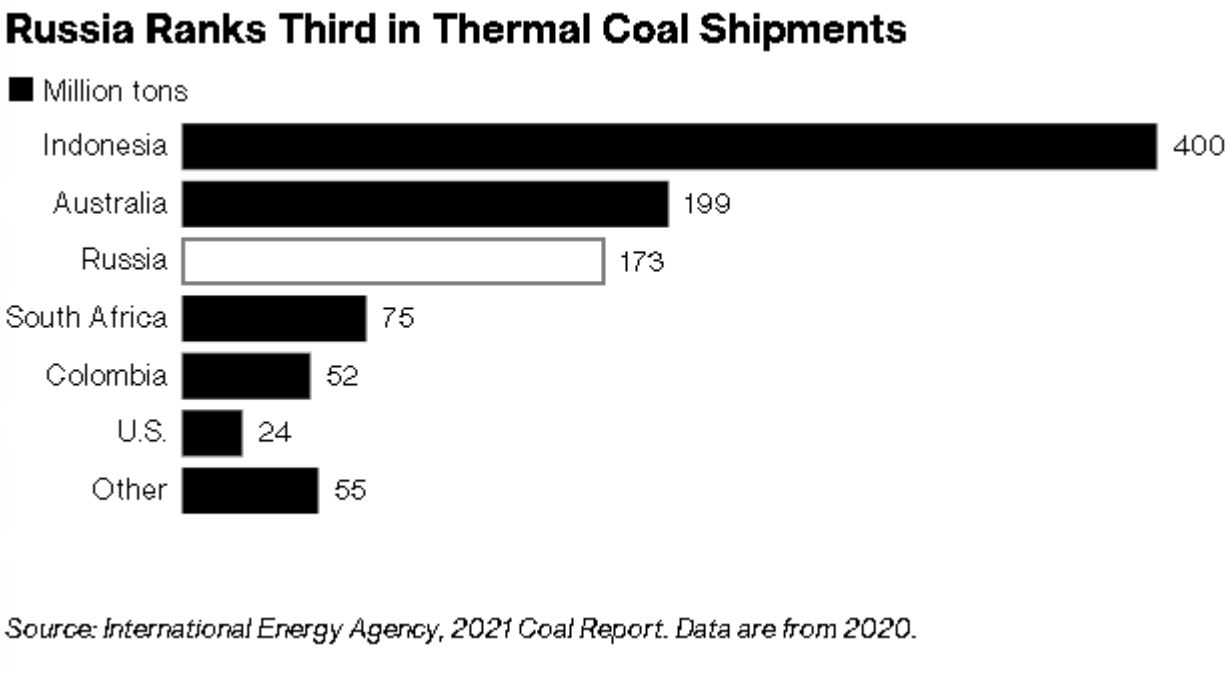


Higher gas prices not only push up household energy bills, but drive broader inflation by boosting production costs of goods. Some nations like Germany and Italy are considering prolonging the usage of coal plants—potentially hindering green goals in the short term.

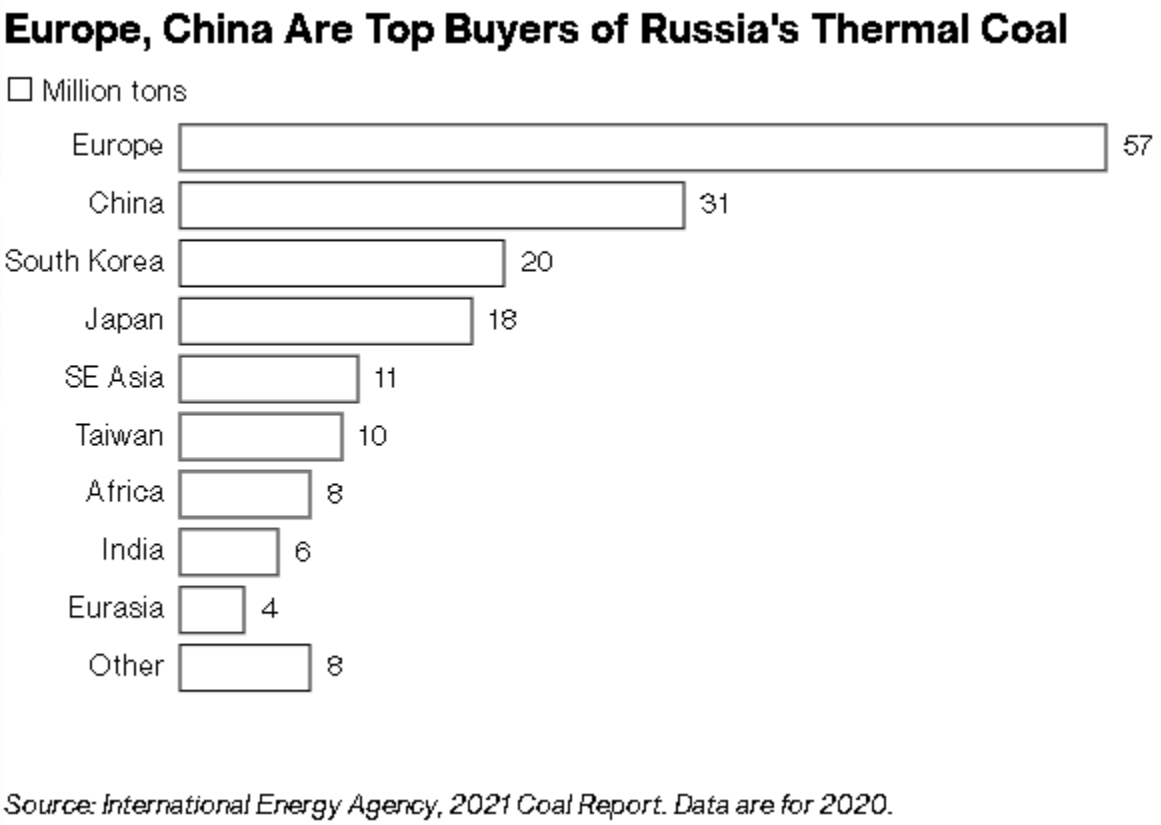


Coal

Europe is Russia's top buyer of thermal coal, used in power stations largely in central and eastern Europe. Colombian, South African and U.S. suppliers are already getting more demand, and Europe could even source as far away as Australia and Indonesia.



Like gas, higher coal prices mean bigger energy bills for households and heavy users such as the steel industry. Coal looks set to be attractive for a while as the cost of burning it is lower than gas.



Source: International Energy Agency, 2021 Coal Report. Data are for 2020.

FOOD

Wheat

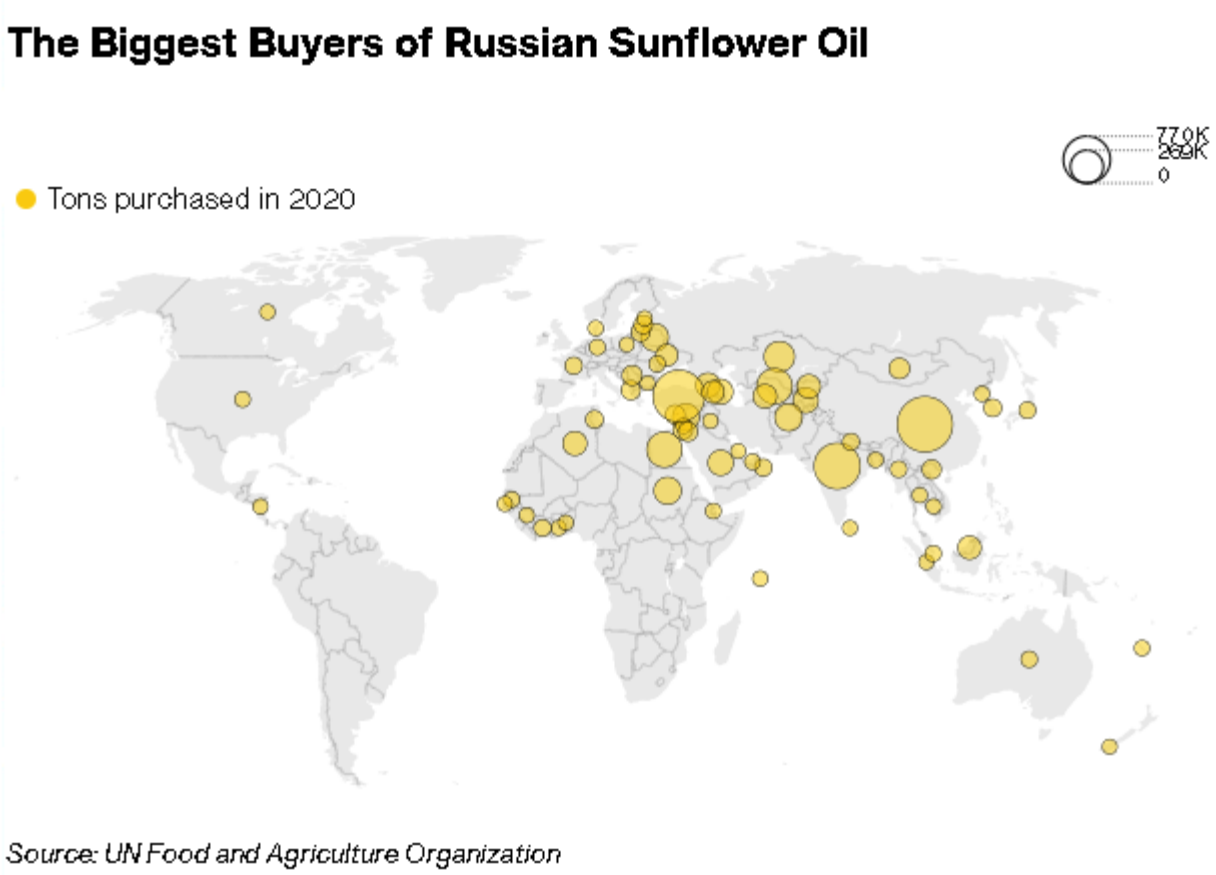
Both Russia and Ukraine are crucial to global wheat flows, and analysts have cut sales outlooks with Ukrainian ports shut and some vessels avoiding the region. African and Asian importers are among the biggest buyers of typically cheap Black Sea wheat and while they can look elsewhere, it may cost more to source supplies from farther afield.

Seeking alternative supply could be good news for sales from the European Union, Australia and North America. Shipments from India, which isn't traditionally a major exporter, are swelling as higher global prices make its grain more competitive.

Costlier wheat and the risk of shortages will further raise bread costs at a time when food has never been so expensive, exacerbating a global hunger crisis. Food is unlikely to come under sanctions, though there's a possibility some buyers could try to reduce their dependence on Russian grain.

Sunflowers

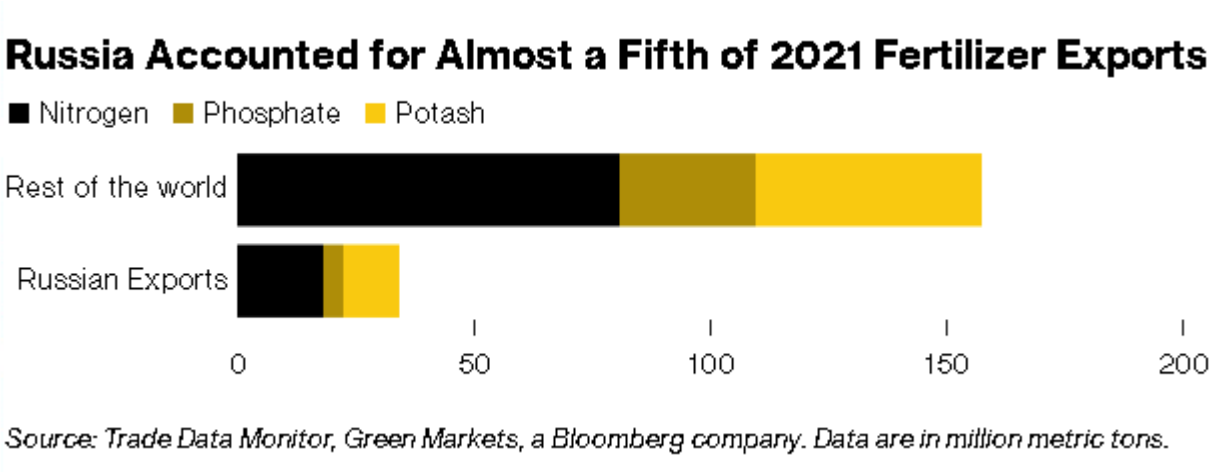
The war is also roiling global supplies of sunflower oil, as the closure of Ukrainian ports cuts off flows from a country that accounts for roughly a half of all exports of the key cooking oil. Russia itself is the second-biggest shipper of the oil. That's already fueled warnings that European grocery stores could soon run out of supplies and helping to keep vegetable oil prices near record highs.



Source: UN Food and Agriculture Organization

Fertilizers

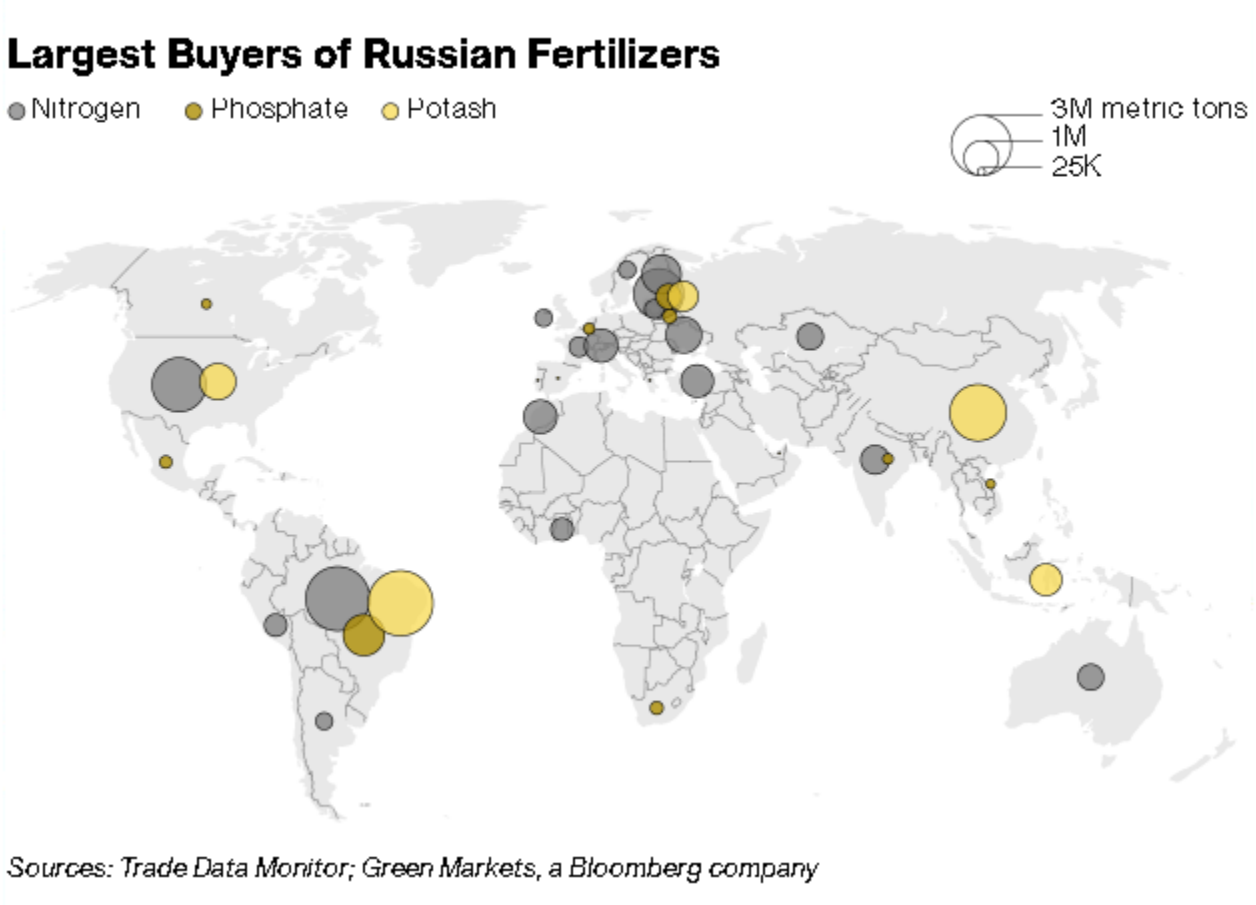
The fertilizer market was already constrained before the war due to plant shutdowns, higher trade tariffs and sanctions on Belarus, and now it's on the brink of chaos. Russia, which accounts for almost a fifth of combined exports of the three main nutrient types, has urged its producers to halt shipments.



Source: Trade Data Monitor, Green Markets, a Bloomberg company. Data are in million metric tons.

That would make it much harder for countries from agricultural giants Brazil and the U.S. to South Africa and India to source fertilizers crucial to growing all types

of crops. Grocery prices could climb even higher if food output falls or farmers pass on the extra costs.

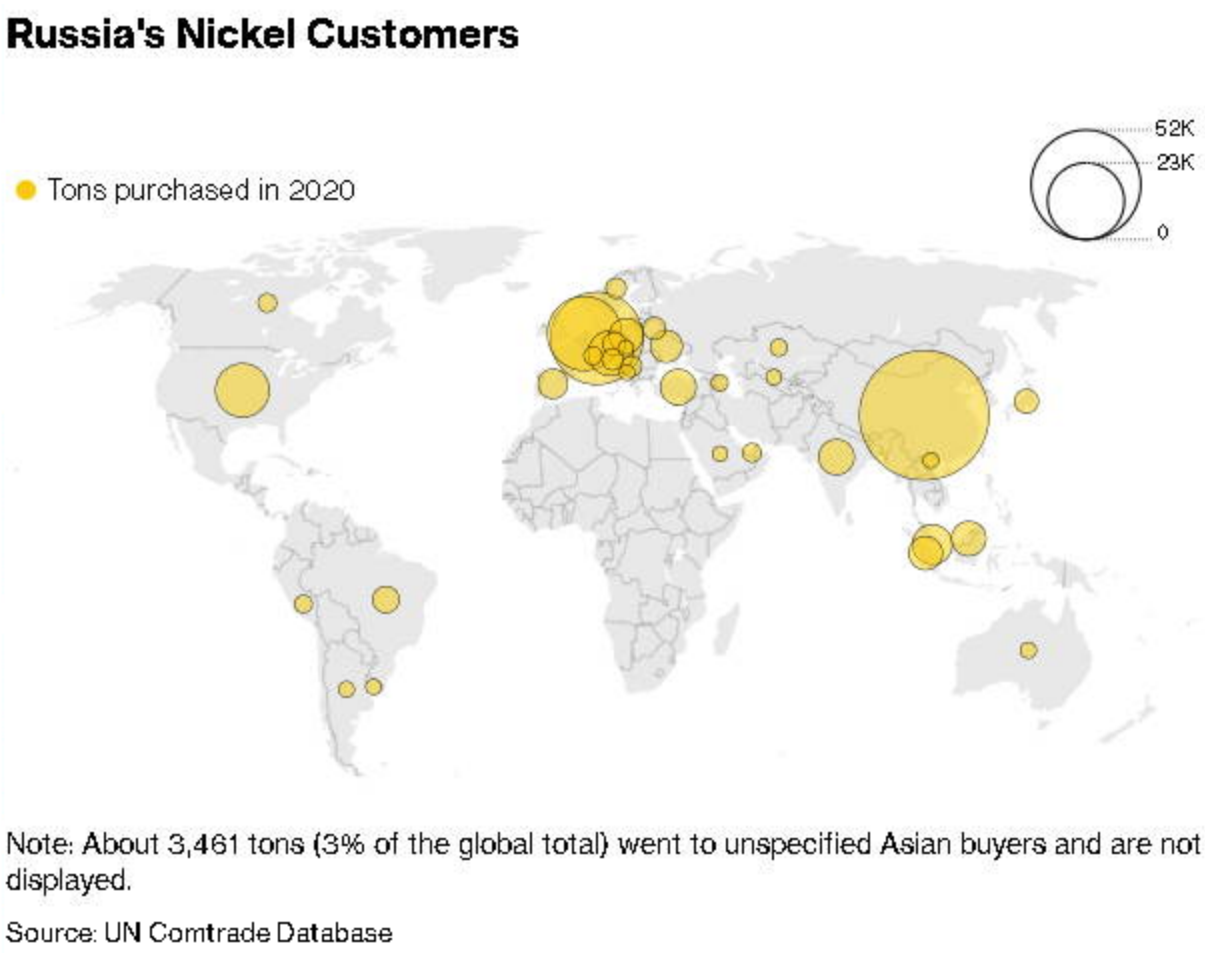


Producers such as CF Industries Holdings Inc. in the U.S., Canada's Nutrien Ltd. and Norway's Yara International ASA could benefit if they fill a gap in Russian supply. With spring arriving, the upcoming U.S. corn planting season will give the first real glimpse at how high fertilizer prices will play out for farmers.

METALS

Nickel

The market was thrown into chaos in early March when worries about Russian supply and short-covering sent prices rocketing, forcing the London Metal Exchange to take the extraordinary step of suspending nickel trading.



Russia is a key supplier of a type of nickel used to make steel and electric-vehicle batteries. Elon Musk has said it's the battery metal that concerns him the most and that he's looking to cut usage in Tesla Inc. batteries.

Aluminum

The world was already running low before disruption at Russian ports exacerbated shortages. That's straining manufacturers in the aerospace, auto and construction sectors—particularly in Europe—and analysts say Russian supplies are crucial to avoid a bigger scarcity. It has created an opportunity for traders to make money shipping aluminum to Europe from places like China.

Turkey, China, Japan Are Among Top Buyers of Russian Aluminum

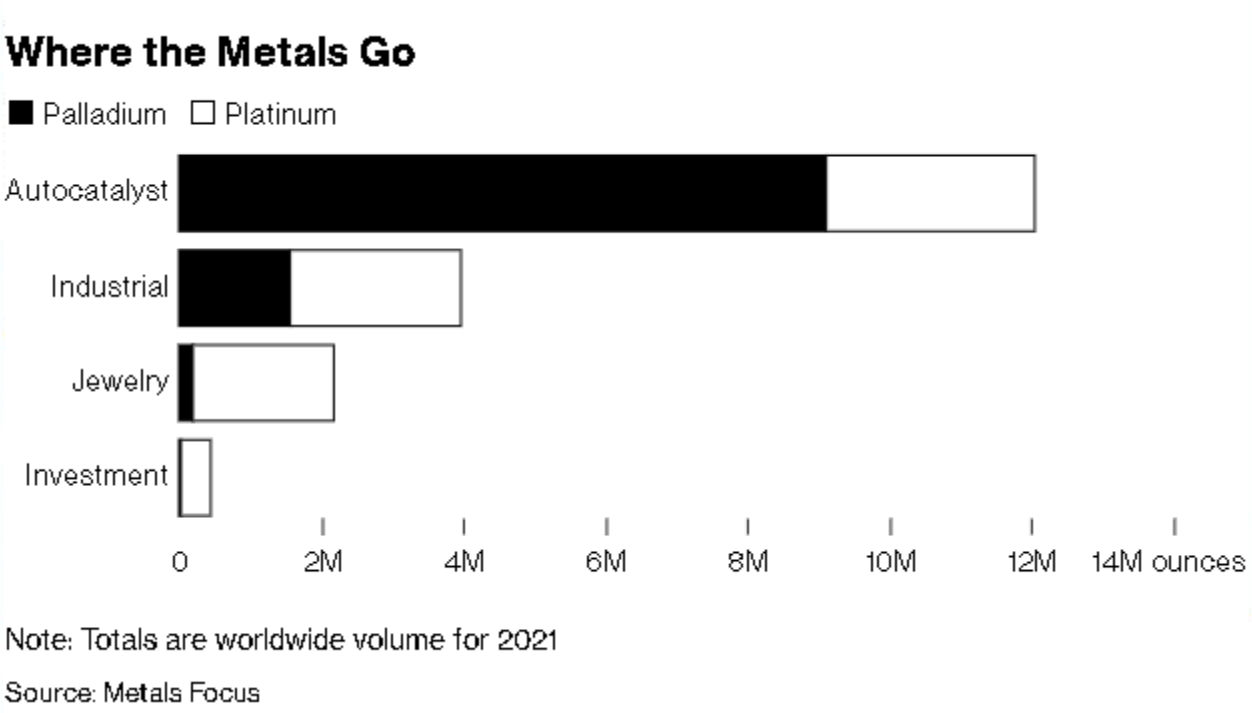
Note: About $194 million in aluminum (3.3% of the global total) was purchased by unspecified Asian buyers and is not displayed.

Source: UN Comtrade Database

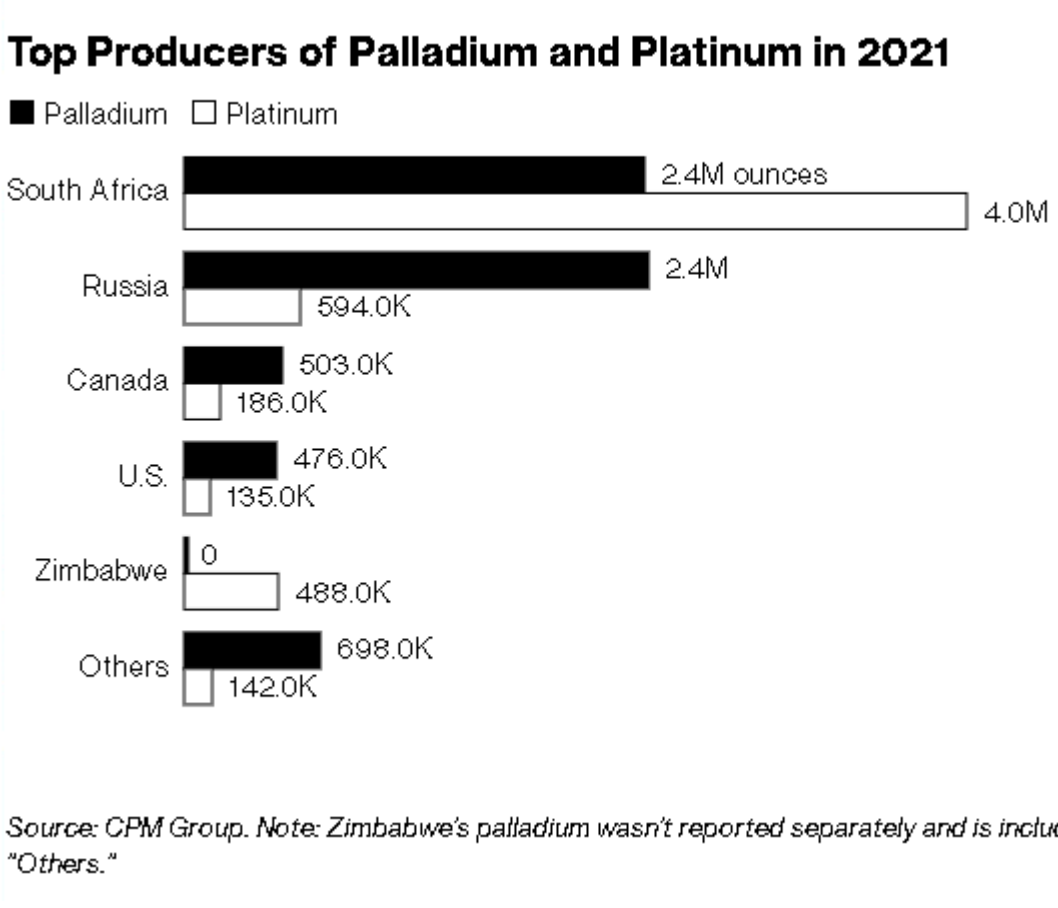
Higher costs could feed into consumer goods like packaging, cars and mobile phones. The worry is that the pressures, including from higher energy prices, will prove too great and lead to reduced aluminum demand.

Palladium and Platinum

It's too early to say if supply has been impacted in Russia, which exports most of its output of the metals that are mainly used in catalytic converters.

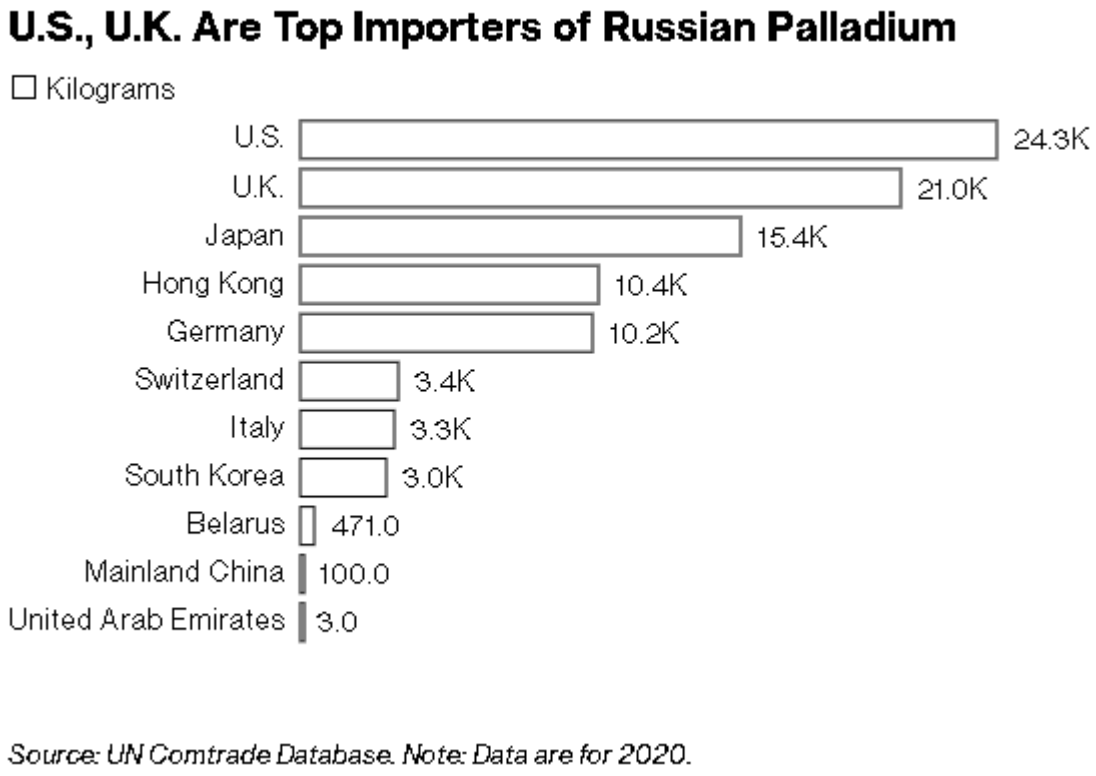


Any disruption would come just as auto demand is poised to improve and would leave North American and European buyers most exposed. It could benefit rival miners in South Africa, Zimbabwe and North America—especially for palladium.



The metals account for a small part of car costs and so showroom prices are unlikely to change much unless prices spike a lot and stay there.

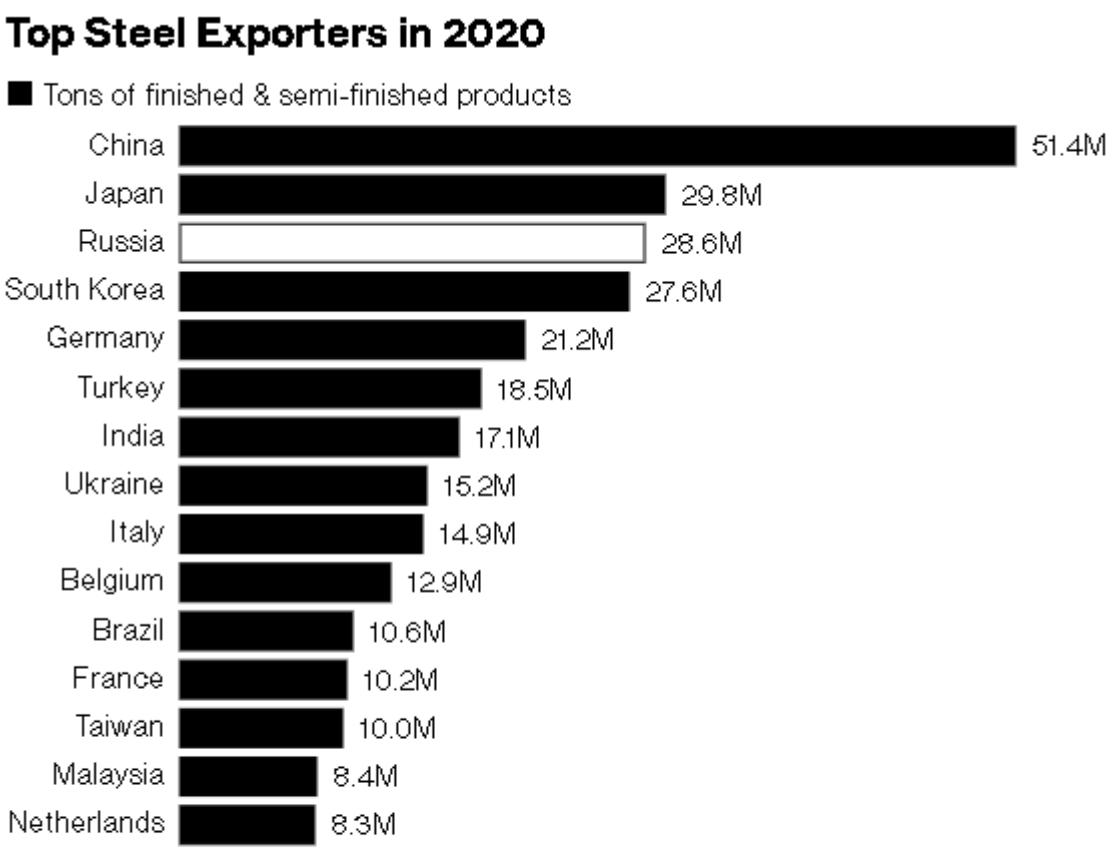
But with Russia more key for palladium, there's a chance buyers could switch toward platinum, which has many similar applications. Jewelry and other industrial sectors could feel the pinch, but are smaller consumers.



Steel

Russia's steelmakers are facing difficulty exporting to Europe as buyers turn away, and the European Union is contemplating banning certain products.

Turkey and Poland are likely to be most affected by disrupted flows. European producers like ArcelorMittal SA and Thyssenkrupp AG are benefiting from higher prices as Russian supply dwindles, though that's partly offset by high energy costs.



The construction sector is hardest hit by high prices, though consumers may not be too affected as steel makes up a small share of the cost of making everything from household appliances to cars.

A key risk is that even with record prices, some European mills may be forced to shut due to a lack of Russian feedstock and higher energy costs.

In the transition to clean energy, critical minerals bring new challenges to energy security

An energy system powered by clean energy technologies differs profoundly from one fuelled by traditional hydrocarbon resources. Building solar photovoltaic (PV) plants, wind farms and electric vehicles (EVs) generally requires more minerals than their fossil fuel-based counterparts. A typical electric car requires six times the mineral inputs of a conventional car, and an onshore wind plant requires nine times more mineral resources than a gas-fired power plant. Since 2010, the average amount of minerals needed for a new unit of power generation capacity has increased by 50% as the share of renewables has risen.

The types of mineral resources used vary by technology. Lithium, nickel, cobalt, manganese and graphite are crucial to battery performance, longevity and energy density. Rare earth elements are essential for permanent magnets that are vital for wind turbines and EV motors. Electricity networks need a huge amount of copper and aluminium, with copper being a cornerstone for all electricity-related technologies.

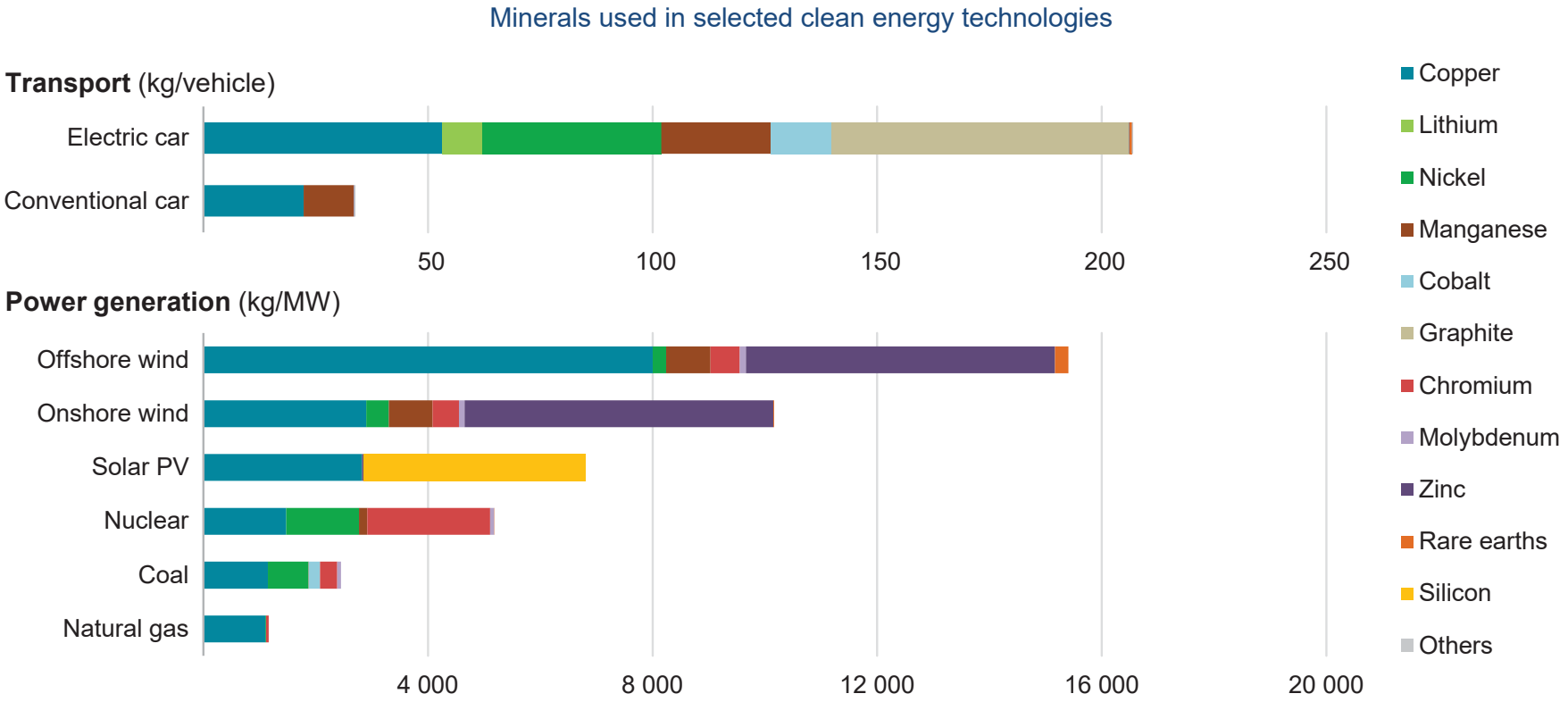
The shift to a clean energy system is set to drive a huge increase in the requirements for these minerals, meaning that the energy sector is emerging as a major force in mineral markets. Until the mid-2010s, the energy sector represented a small part of total demand for most minerals. However, as energy transitions gather pace, clean energy technologies are becoming the fastest-growing segment of demand.

In a scenario that meets the Paris Agreement goals, clean energy technologies' share of total demand rises significantly over the next two decades to over 40% for copper and rare earth elements, 60-70% for nickel and cobalt, and almost 90% for lithium. EVs and battery storage have already displaced consumer electronics to become the largest consumer of lithium and are set to take over from stainless steel as the largest end user of nickel by 2040.

As countries accelerate their efforts to reduce emissions, they also need to make sure their energy systems remain resilient and secure. Today's international energy security mechanisms are designed to provide insurance against the risks of disruptions or price spikes in supplies of hydrocarbons, particularly oil. Minerals offer a different and distinct set of challenges, but their rising importance in a decarbonising energy system requires energy policy makers to expand their horizons and consider potential new vulnerabilities. Concerns about price volatility and security of supply do not disappear in an electrified, renewables-rich energy system.

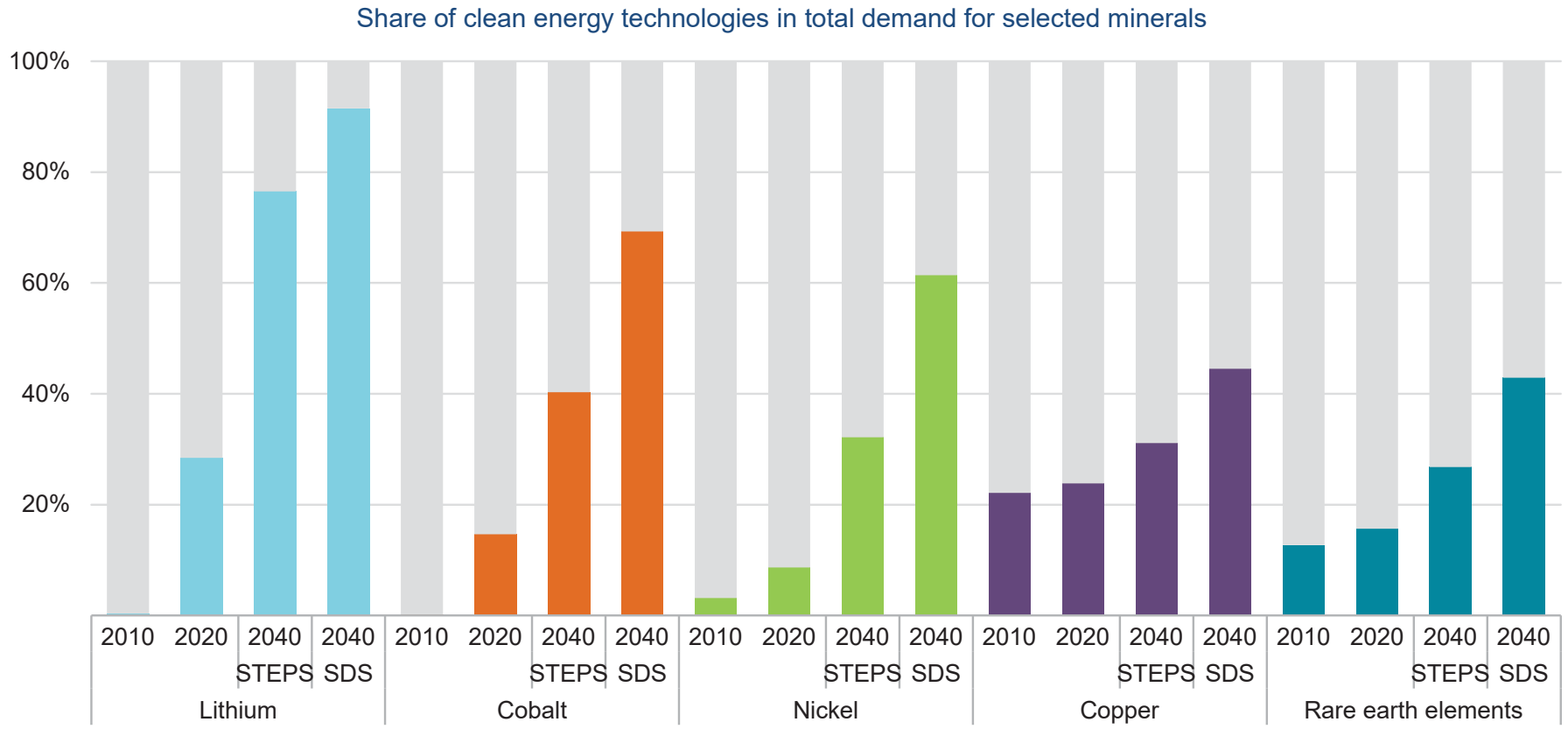
This is why the IEA is paying close attention to the issue of critical minerals and their role in clean energy transitions. This report reflects the IEA's determination to stay ahead of the curve on all aspects of energy security in a fast-evolving energy world.

The rapid deployment of clean energy technologies as part of energy transitions implies a significant increase in demand for minerals



Notes: kg = kilogramme; MW = megawatt. Steel and aluminium not included. See Chapter 1 and Annex for details on the assumptions and methodologies.

The energy sector becomes a leading consumer of minerals as energy transitions accelerate



Notes: Demand from other sectors was assessed using historical consumption, relevant activity drivers and the derived material intensity. Neodymium demand is used as indicative for rare earth elements. STEPS = Stated Policies Scenario, an indication of where the energy system is heading based on a sector-by-sector analysis of today's policies and policy announcements; SDS = Sustainable Development Scenario, indicating what would be required in a trajectory consistent with meeting the Paris Agreement goals.

Clean energy transitions will have far-reaching consequences for metals and mining

Our bottom-up assessment suggests that a concerted effort to reach the goals of the Paris Agreement (climate stabilisation at "well below 2°C global temperature rise", as in the IEA Sustainable Development Scenario [SDS]) would mean a quadrupling of mineral requirements for clean energy technologies by 2040. An even faster transition, to hit net-zero *globally* by 2050, would require six times more mineral inputs in 2040 than today.

Which sectors do these increases come from? In climate-driven scenarios, mineral demand for use in EVs and battery storage is a major force, growing at least thirty times to 2040. Lithium sees the fastest growth, with demand growing by over 40 times in the SDS by 2040, followed by graphite, cobalt and nickel (around 20-25 times). The expansion of electricity networks means that copper demand for power lines more than doubles over the same period.

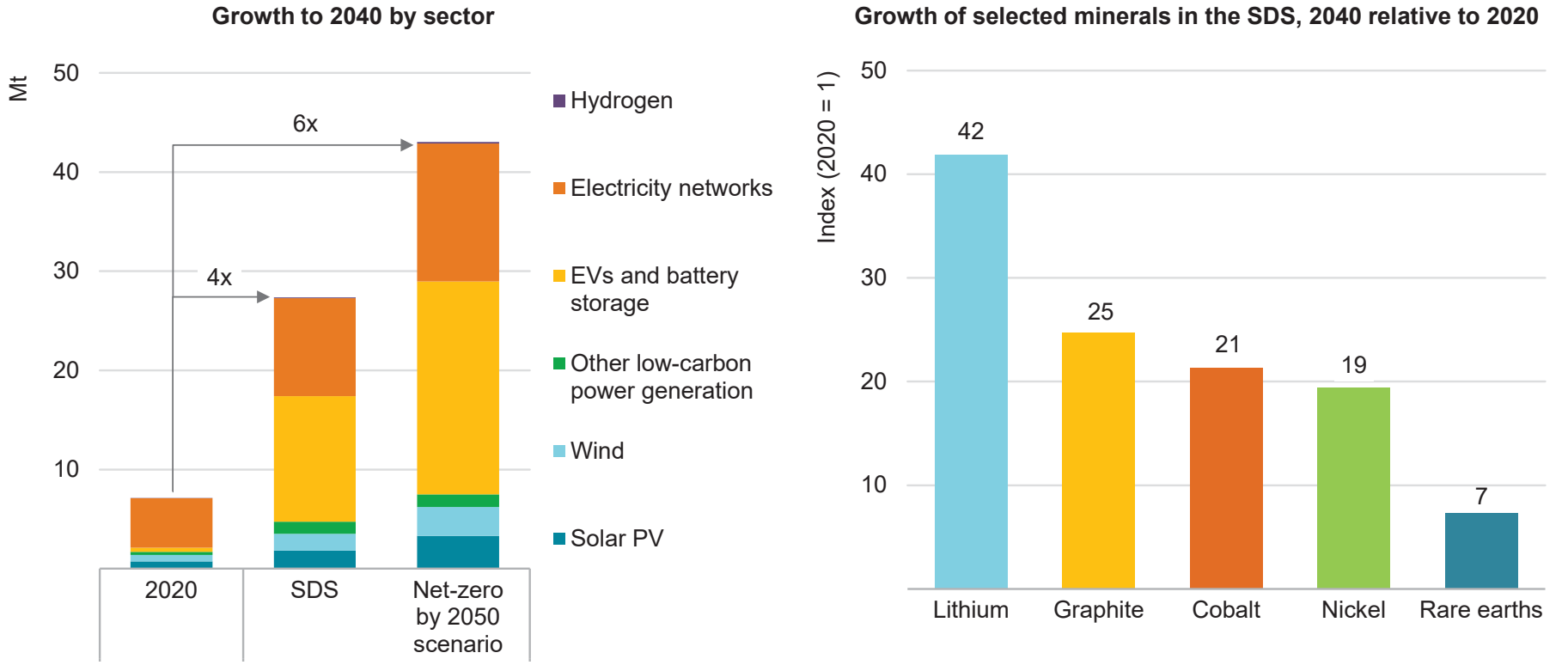
The rise of low-carbon power generation to meet climate goals also means a tripling of mineral demand from this sector by 2040. Wind takes the lead, bolstered by material-intensive offshore wind. Solar PV follows closely, due to the sheer volume of capacity that is added. Hydropower, biomass and nuclear make only minor contributions given their comparatively low mineral requirements. In other sectors, the rapid growth of hydrogen as an energy carrier underpins major growth in demand for nickel and zirconium for electrolysers, and for platinum-group metals for fuel cells.

Demand trajectories are subject to large technology and policy uncertainties. We analysed 11 alternative cases to understand the impacts. For example, cobalt demand could be anything from 6 to 30 times higher than today's levels depending on assumptions about the evolution of battery chemistry and climate policies. Likewise rare earth elements may see three to seven times higher demand in 2040 than today, depending on the choice of wind turbines and the strength of policy support. The largest source of demand variability comes from uncertainty around the stringency of climate policies. The big question for suppliers is whether the world is really heading for a scenario consistent with the Paris Agreement. Policy makers have a crucial role in narrowing this uncertainty by making clear their ambitions and turning targets into actions. This will be vital to reduce investment risks and ensure adequate flow of capital to new projects.

Clean energy transitions offer opportunities and challenges for companies that produce minerals. Today revenue from coal production is ten times larger than those from energy transition minerals. However, there is a rapid reversal of fortunes in a climate-driven scenario, as the combined revenues from energy transition minerals overtake those from coal well before 2040.

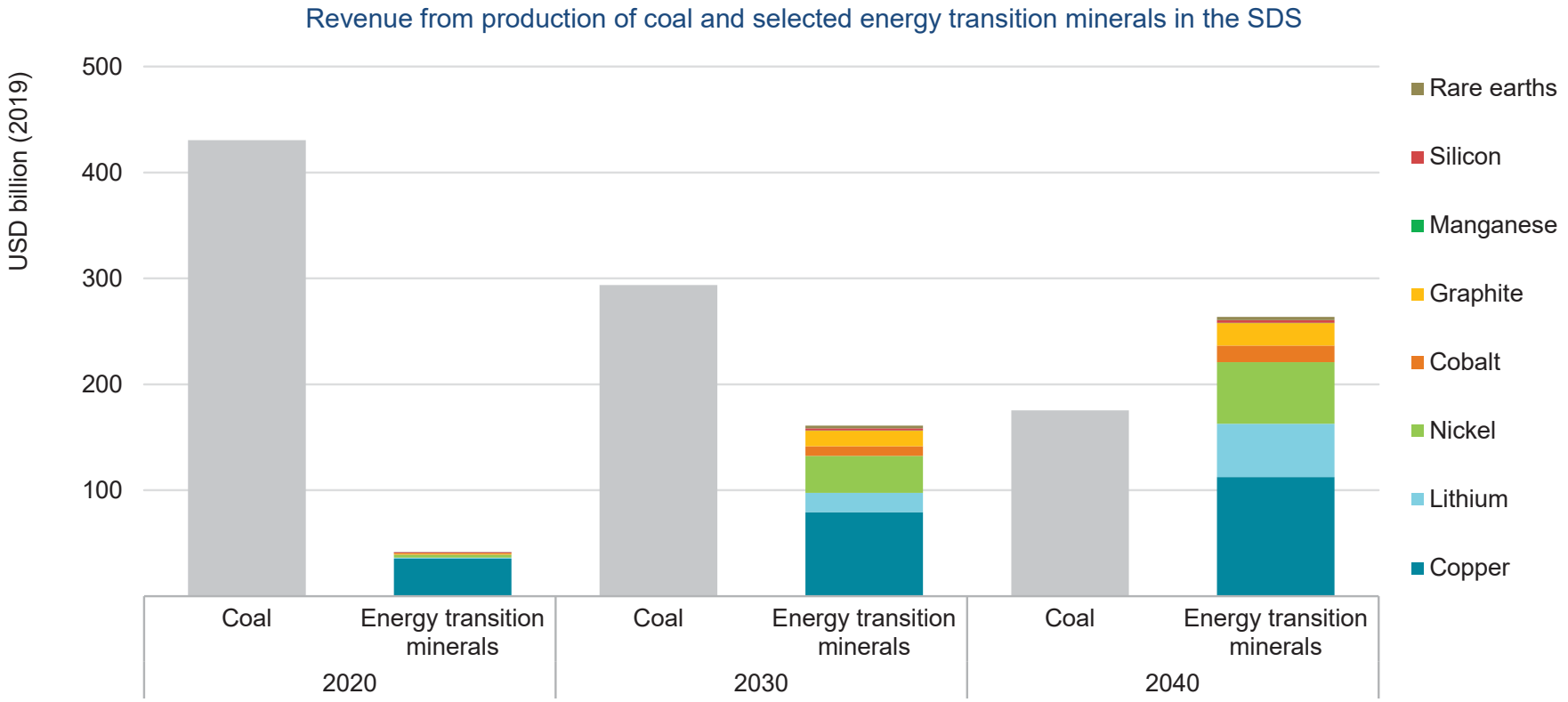
Mineral demand for clean energy technologies would rise by at least four times by 2040 to meet climate goals, with particularly high growth for EV-related minerals

Mineral demand for clean energy technologies by scenario



Notes: Mt = million tonnes. Includes all minerals in the scope of this report, but does not include steel and aluminium. See Annex for a full list of minerals.

Changing fortunes: Coal vs energy transition minerals



Notes: Revenue for energy transition minerals includes only the volume required in clean energy technologies, not total demand. Future prices for coal are projected equilibrium prices in *WEO 2020* SDS. Prices for energy transition minerals are based on conservative assumptions about future price trends (moderate growth of around 10-20% from today's levels).

Today's mineral supply and investment plans fall short of what is needed to transform the energy sector, raising the risk of delayed or more expensive energy transitions

The prospect of a rapid increase in demand for critical minerals – well above anything seen previously in most cases – raises huge questions about the availability and reliability of supply. In the past, strains on the supply-demand balance for different minerals have prompted additional investment and measures to moderate or substitute demand. But these responses have come with time lags and have been accompanied by considerable price volatility. Similar episodes in the future could delay clean energy transitions and push up their cost. Given the urgency of reducing emissions, this is a possibility that the world can ill afford.

Raw materials are a significant element in the cost structure of many technologies required in energy transitions. In the case of lithium-ion batteries, technology learning and economies of scale have pushed down overall costs by 90% over the past decade. However, this also means that raw material costs now loom larger, accounting for some 50-70% of total battery costs, up from 40-50% five years ago. Higher mineral prices could therefore have a significant effect: a doubling of lithium or nickel prices would induce a 6% increase in battery costs. If both lithium and nickel prices were to double at the same time, this would offset all the anticipated unit cost reductions associated with a doubling of battery production capacity. In the case of electricity networks, copper and aluminium currently represent around 20% of total grid investment costs. Higher prices as a result of tight supply could have a major impact on the level of grid investment.

Our analysis of the near-term outlook for supply presents a mixed picture. Some minerals such as mined lithium and cobalt are expected to be in surplus in the near term, while lithium chemical products, battery-grade nickel and key rare earth elements (e.g. neodymium and dysprosium) might face tight supply in the years ahead. However, looking further ahead in a scenario consistent with climate goals, expected supply from existing mines and projects under construction is estimated to meet only half of projected lithium and cobalt requirements and 80% of copper needs by 2030.

Today's supply and investment plans are geared to a world of more gradual, insufficient action on climate change (the STEPS trajectory). They are not ready to support accelerated energy transitions. While there are a host of projects at varying stages of development, there are many vulnerabilities that may increase the possibility of market tightness and greater price volatility:

- **High geographical concentration of production:** Production of many energy transition minerals is more concentrated than that of oil or natural gas. For lithium, cobalt and rare earth elements, the world's top three producing nations control well over three-

quarters of global output. In some cases, a single country is responsible for around half of worldwide production. The Democratic Republic of the Congo (DRC) and People's Republic of China (China) were responsible for some 70% and 60% of global production of cobalt and rare earth elements respectively in 2019. The level of concentration is even higher for processing operations, where China has a strong presence across the board. China's share of refining is around 35% for nickel, 50-70% for lithium and cobalt, and nearly 90% for rare earth elements. Chinese companies have also made substantial investment in overseas assets in Australia, Chile, the DRC and Indonesia. High levels of concentration, compounded by complex supply chains, increase the risks that could arise from physical disruption, trade restrictions or other developments in major producing countries.

- **Long project development lead times:** Our analysis suggests that it has taken on average over 16 years to move mining projects from discovery to first production. These long lead times raise questions about the ability of suppliers to ramp up output if demand were to pick up rapidly. If companies wait for deficits to emerge before committing to new projects, this could lead to a prolonged period of market tightness and price volatility.

- **Declining resource quality:** Concerns about resources relate to quality rather than quantity. In recent years, ore quality has continued to fall across a range of commodities. For example, the average copper ore grade in Chile declined by 30% over the past 15 years. Extracting metal content from lower-grade ores requires more energy, exerting upward pressure on production costs, greenhouse gas emissions and waste volumes.

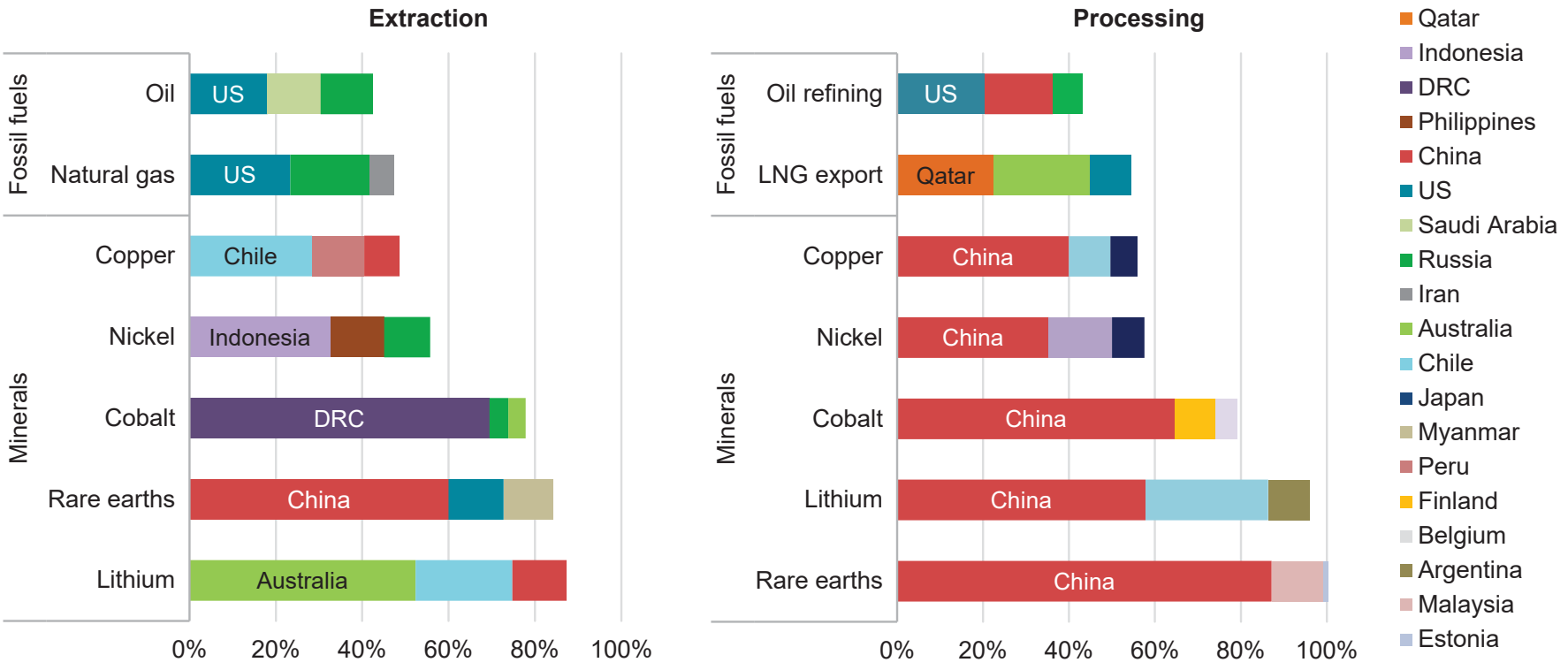
- **Growing scrutiny of environmental and social performance:** Production and processing of mineral resources gives rise to a variety of environmental and social issues that, if poorly managed, can harm local communities and disrupt supply. Consumers and investors are increasingly calling for companies to source minerals that are sustainably and responsibly produced. Without broad and sustained efforts to improve environmental and social performance, it may be challenging for consumers to exclude minerals produced with poor standards as higher-performing supply chains may not be sufficient to meet demand.

- **Higher exposure to climate risks:** Mining assets are exposed to growing climate risks. Copper and lithium are particularly vulnerable to water stress given their high water requirements. Over 50% of today's lithium and copper production is concentrated in areas with high water stress levels. Several major producing regions such as Australia, China, and Africa are also subject to extreme heat or flooding, which pose greater challenges in ensuring reliable and sustainable supplies.

These risks to the reliability, affordability and sustainability of mineral supply are manageable, but they are real. How policy makers and companies respond will determine whether critical minerals are a vital enabler for clean energy transitions, or a bottleneck in the process.

Production of many energy transition minerals today is more geographically concentrated than that of oil or natural gas

Share of top three producing countries in production of selected minerals and fossil fuels, 2019



Notes: LNG = liquefied natural gas; US = United States. The values for copper processing are for refining operations.
Sources: IEA (2020a); USGS (2021), World Bureau of Metal Statistics (2020); Adamas Intelligence (2020).

New and more diversified supply sources will be vital to pave the way to a clean energy future

As energy transitions gather pace, security of mineral supply is gaining prominence in the energy security debate, a realm where oil has traditionally occupied a central role.

There are significant differences between oil security and mineral security, notably in the impacts that any disruption may have. In the event of an oil supply crisis, all consumers driving gasoline cars or diesel trucks are affected by higher prices. By contrast, a shortage or spike in the price of a mineral affects only the supply of *new* EVs or solar plants. Consumers driving existing EVs or using solar-powered electricity are not affected. In addition, the combustion of oil means that new supply is essential to the continuous operation of oil-using assets. However, minerals are a component of infrastructure, with the potential to be recovered and recycled.

Nonetheless, experience from oil markets may offer some valuable lessons for an approach to mineral security, in particular to underscore that supply-side measures need to be accompanied by wide-ranging efforts encompassing demand, technology, supply chain resilience and sustainability.

Rapid, orderly energy transitions require strong growth in investment in mineral supplies to keep up with the pace of demand growth. Policy makers can take a variety of actions to encourage new supply projects: the most important is to provide clear and strong signals about energy transitions. If companies do not have confidence in countries' energy and climate policies, they are likely to make investment decisions based on much more conservative expectations. Given the long lead times for new project developments, this could create bottlenecks when deployment of clean energy technologies starts to grow rapidly. Diversification of supply is also crucial; resource-owning governments can support new project development by reinforcing national geological surveys, streamlining permitting procedures to shorten lead times, providing financing support to de-risk projects, and raising public awareness of the contribution that such projects play in the transformation of the energy sector.

Reducing material intensity and encouraging material substitution via technology innovation can also play major roles in alleviating strains on supply, while also reducing costs. For example, 40-50% reductions in the use of silver and silicon in solar cells over the past decade have enabled a spectacular rise in solar PV deployment. Innovation in production technologies can also unlock sizeable new supplies. Emerging technologies, such as direct lithium extraction or enhanced metal recovery from waste streams or low-grade ores, offer the potential for a step change in future supply volumes.

A strong focus on recycling, supply chain resilience and sustainability will be essential

Recycling relieves the pressure on primary supply. For bulk metals, recycling practices are well established, but this is not yet the case for many energy transition metals such as lithium and rare earth elements. Emerging waste streams from clean energy technologies (e.g. batteries and wind turbines) can change this picture. The amount of spent EV batteries reaching the end of their first life is expected to surge after 2030, at a time when mineral demand is set to still be growing rapidly. Recycling would not eliminate the need for continued investment in new supplies. But we estimate that by 2040, recycled quantities of copper, lithium, nickel and cobalt from spent batteries could reduce combined primary supply requirements for these minerals by around 10%. The security benefits of recycling can be far greater for regions with wider deployment of clean energy technologies due to greater economies of scale.

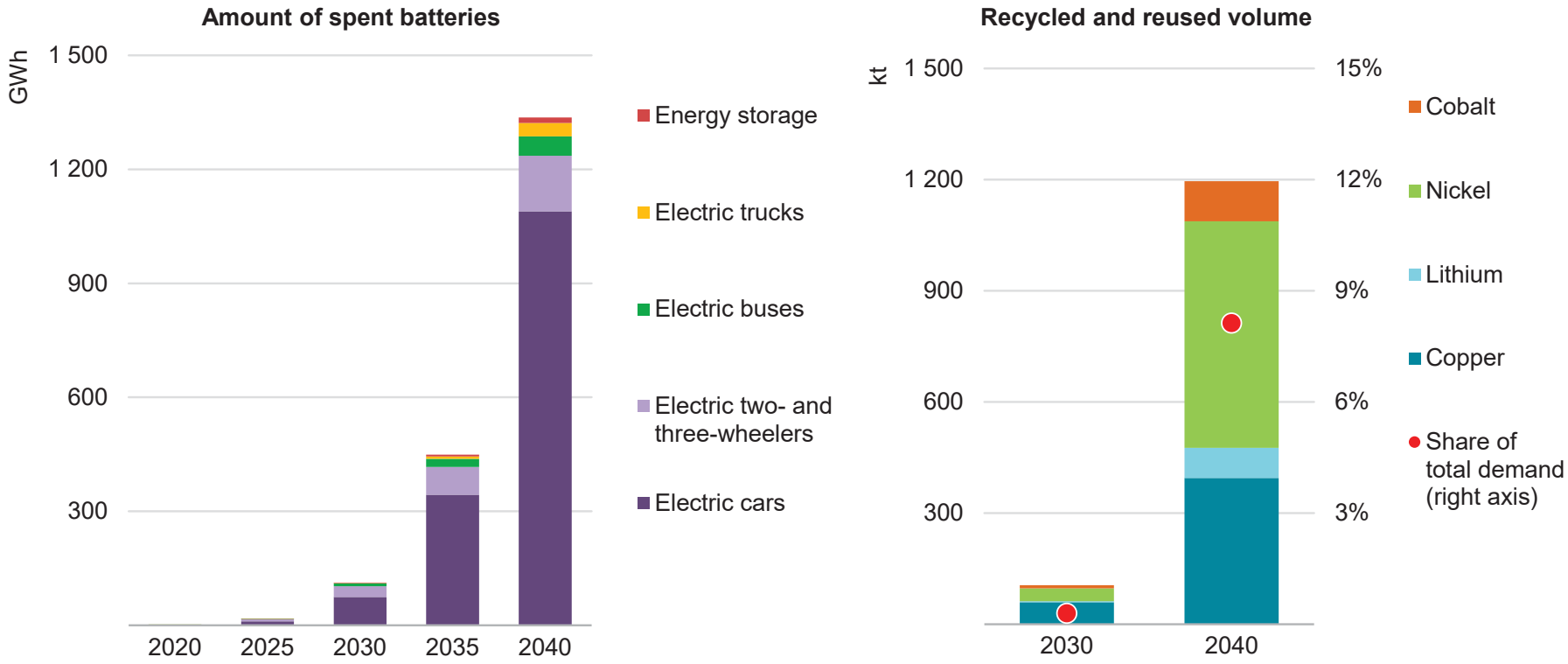
Regular market assessments and periodic stress tests, coupled with emergency response exercises (along the lines of the IEA's existing emergency response programmes), can help policy makers identify possible weak points, evaluate potential impacts and devise necessary actions. Voluntary strategic stockpiling can in some cases help countries weather short-term supply disruptions. Such programmes need to be carefully designed, and based on a detailed review of potential vulnerabilities. Some minerals with smaller markets have low pricing transparency and liquidity, making it difficult to manage price risks and affecting investment decisions. Establishing reliable price benchmarks will be a crucial step towards enhancing transparency and supporting market development.

Tackling the environmental and social impacts of mineral developments will be essential, including the emissions associated with mining and processing, risks arising from inadequate waste and water management, and impacts from inadequate worker safety, human rights abuses (such as child labour) and corruption. Ensuring that mineral wealth brings real gains to local communities is a broad and multi-faceted challenge, particularly in countries where artisanal and small-scale mines are common. Supply chain due diligence, with effective regulatory enforcement, can be a critical tool to identify, assess and mitigate risks, increasing traceability and transparency.

Emissions along the mineral supply chain do not negate the clear climate advantages of clean energy technologies. Total lifecycle greenhouse gas emissions of EVs are around half those of internal combustion engine cars on average, with the potential for a further 25% reduction with low-carbon electricity. While energy transition minerals have relatively high emission intensities, a large variation in the emissions footprint of different producers suggests that there are ways to minimise these emissions through fuel switching, low-carbon electricity and efficiency improvements. Integrating environmental concerns in the early stages of project planning can help ensure sustainable practices throughout the project life cycle.

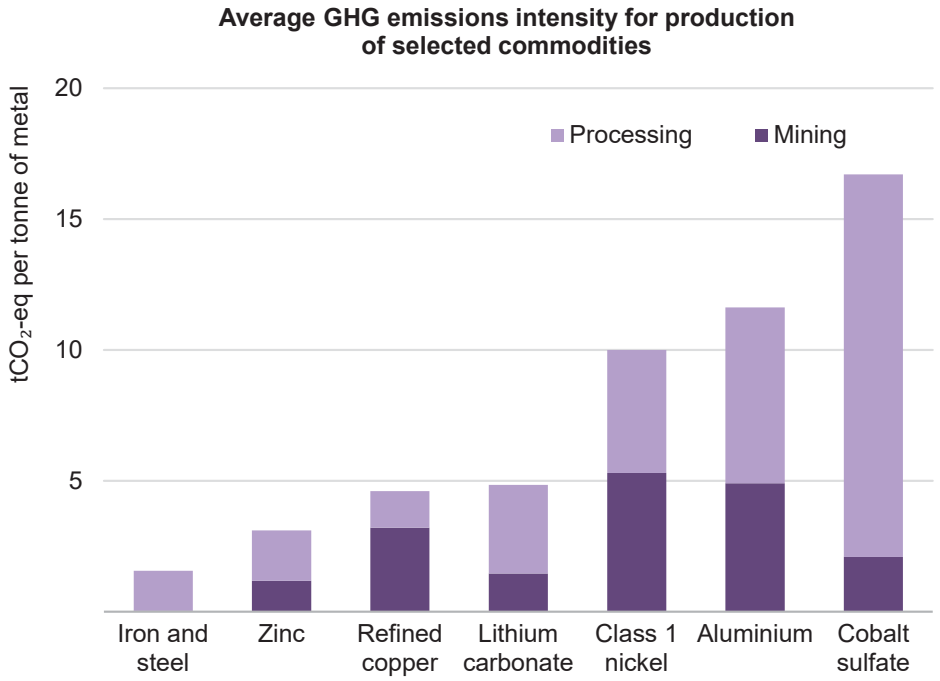
The projected surge in spent battery volumes suggests immense scope for recycling

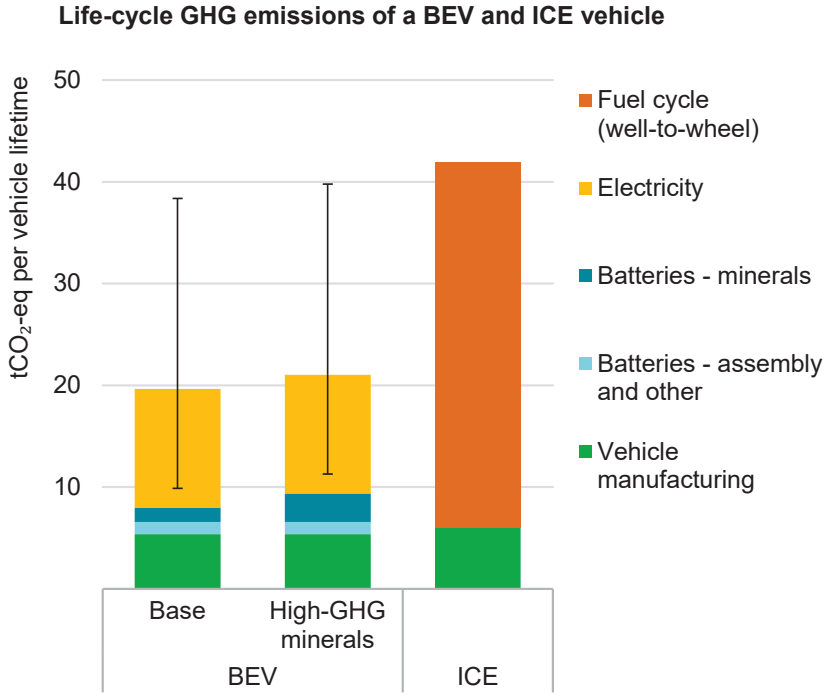
Amount of spent lithium-ion batteries from EVs and storage and recycled and reused minerals from batteries in the SDS



Note: GWh = gigawatt hour.

Stronger actions are required to counter the upward pressure on emissions from mineral production, but the climate advantages of clean energy technologies remain clear





Notes: BEV = battery electric vehicle; ICE = internal combustion engine. The "High-GHG minerals" case assumes double the GHG emissions intensity for battery minerals. Includes both Scope 1 and 2 emissions of all GHG from primary production. See Chapter 4 for more detailed assumptions.

Source: IEA analysis based on IEA (2020a); IEA (2020b); Kelly et al. (2020); Argonne National Laboratory (2020); Argonne National Laboratory (2019); Rio Tinto (2020); S&P Global (2021); Skarn Associates (2021); Marx et al. (2018).

IEA's six key recommendations for a new, comprehensive approach to mineral security

1. **Ensure adequate investment in diversified sources of new supply.** Strong signals from policy makers about the speed of energy transitions and the growth trajectories of key clean energy technologies are critical to bring forward timely investment in new supply. Governments can play a major role in creating conditions conducive to diversified investment in the mineral supply chain.

2. **Promote technology innovation at all points along the value chain.** Stepping up R&D efforts for technology innovation on both the demand and production sides can enable more efficient use of materials, allow material substitution and unlock sizeable new supplies, thereby bringing substantial environmental and security benefits.

3. **Scale up recycling.** Policies can play a pivotal role in preparing for rapid growth of waste volumes by incentivising recycling for products reaching the end of their operating lives, supporting efficient collection and sorting activities and funding R&D into new recycling technologies.

4. **Enhance supply chain resilience and market transparency.** Policy makers need to explore a range of measures to improve the resilience of supply chains for different minerals, develop response capabilities to potential supply disruptions and enhance market transparency. Measures can include regular market assessments and stress tests, as well as voluntary strategic stockpiles in some instances.

5. **Mainstream higher environmental, social and governance standards.** Efforts to incentivise higher environmental and social performance can increase sustainably and responsibly produced volumes and lower the cost of sourcing them. If industry players with strong environmental and social standards are rewarded in the marketplace, this can also bring new suppliers to a more diversified market.

6. **Strengthen international collaboration between producers and consumers**. An overarching international framework for dialogue and policy co-ordination among producers and consumers can play a vital role, an area where the IEA's energy security framework could usefully be leveraged. Such an initiative could include actions to (i) provide reliable and transparent data; (ii) conduct regular assessments of potential vulnerabilities of supply chains and potential collective responses; (iii) promote knowledge transfer and capacity building to spread sustainable and responsible development practices; and (iv) strengthen environmental and social performance standards to ensure a level playing field.

https://www.ing.com/Newsroom/News/ING-steps-up-renewable-energy-efforts-and-restricts-financing-of-new-oil-gas-fields.htm

ING steps up renewable energy efforts and restricts financing of new oil & gas fields

23 March 2022 3 min read Listen

ING has worked hard over the years to build a power generation lending book that's 60% renewables, outperforming by far the most ambitious climate goal of the Paris Agreement. Today we go a step further and announce that we aim to grow new financing of renewable energy by 50% by year-end 2025 and will no longer provide dedicated finance to new oil & gas fields.

These steps are aligned with the 'Net-Zero Emissions by 2050 Roadmap' by the International Energy Agency. Massive investment is needed in clean energy and infrastructure, which will then lead to a decrease in demand for fossil fuels, according to the roadmap. That reduced demand should be met by existing oil and gas fields, which means that in both the IEA's and our view, no new fields should be needed.

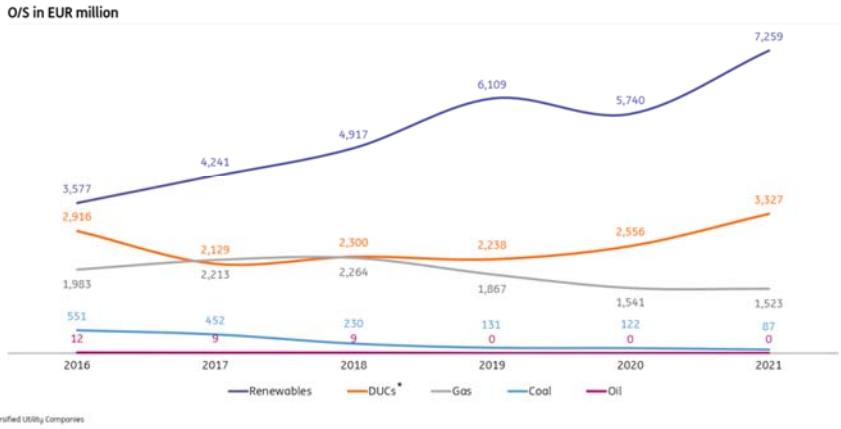
These steps also support the European Union's 'Fit for 55' and 'REPowerEU' plans. Also there, key elements are oil and gas supplies from existing fields, investments in clean energy and infrastructure for the electrified economy, and energy efficiency.

"The best way to reduce dependency on fossil fuels is to make sure there are enough affordable green alternatives available," said Michiel de Haan, head of ING's energy sector. "These steps support that and show we're serious about putting our financing to work to facilitate the energy transition."

In developing ING's energy strategy, we balance three key interests: the need to decarbonise to fight climate change, the need for energy to remain affordable for people and companies, and the need for security of the energy supply.

The steps we announced today follow a path we embarked on years ago. Looking at our power generation portfolio, we pledged in 2017 to exit coal-fired power plants by 2025 and have since then decreased our exposure by 80%. At the same time, we more than doubled our financing of power generation from renewable energy sources such as solar and wind, which now makes up almost 60% of our power generation portfolio.

Total power generation lending



The restriction announced today refers to dedicated upstream finance (lending or capital markets) for oil & gas fields approved for development after 31 December 2021. At the same time, we will continue to provide financing to clients active in keeping oil and gas flowing, in line with efforts to keep energy secure and affordable during the low-carbon transition.

Today's announcement is part of our Terra approach to steer our portfolio towards keeping the rise in global temperatures to 1.5 degrees Celsius to achieve net zero by 2050. For further details please see our integrated climate report.

https://www.washingtonpost.com/us-policy/2022/03/26/billionaire-tax-budget-biden/

President Biden to unveil new minimum tax on billionaires in budget

First White House attempt to target billionaires with tax plan comes amid potential revival of talks with Manchin

By Jeff Stein
Today at 4:00 p.m. EDT

Listen to article
6 min

The White House will unveil a new minimum tax targeting billionaires as part of its 2023 budget Monday, proposing a tax on the richest 700 Americans for the first time, according to five people with knowledge of the matter and an administration document obtained by The Washington Post.

The "Billionaire Minimum Income Tax" plan under President Biden would establish a 20 percent minimum tax rate on all American households worth more than $100 million, the document says. The majority of new revenue raised by the tax would come from billionaires.

Biden has long favored higher taxes on the wealthiest Americans, but the White House has not introduced a tax plan specifically designed to hit billionaires until now. The plan comes amid signs that the administration's negotiations with Sen. Joe Manchin III (D-W.Va.) over stalled White House economic proposal may be reviving. But all previous efforts to tax billionaires have failed amid major political head winds, and it is unclear if Manchin and Sen. Kyrsten Sinema (D-Ariz.) will go along with the plan.

Many billionaires can pay far lower tax rates than average Americans because the federal government does not tax the increase in the value of their stock holdings until those assets are sold.

Billionaires are able to borrow against their accumulated gains without triggering taxes on capital gains, enabling huge accumulations of wealth to go virtually untaxed by the federal government.
Lofty tax agenda of Democrats imperiled by resistance from within

The White House Office of Management and Budget and Council of Economic Advisers estimated this fall that 400 billionaire families paid an average federal tax rate of just over 8 percent of their income between 2010 and 2018. That rate is lower than the rate paid by millions of Americans.

The White House plan would mandate billionaires to pay a tax rate of at least 20 percent on their full income, or the combination of traditional forms of wage income and whatever they may have made in unrealized gains, such as higher stock prices.

Billionaires paying a rate below that will have to pay the difference between what they pay now and the 20 percent rate. Billionaires already paying more than 20 percent would not owe additional taxes. The taxes paid toward the minimum tax would count toward whatever billionaires owe once they have to pay ordinary capital gains taxes.

"The Billionaire Minimum Income Tax will ensure that the very wealthiest Americans pay a tax rate of at least 20 percent on their full income," the White House document says. "This minimum tax would

make sure that the wealthiest Americans no longer pay a tax rate lower than teachers and firefighters."

White House officials estimate the tax would raise roughly $360 billion in new revenue over the next 10 years if enacted, according to the document. The proposal was developed by Biden aides at the Office of Management and Budget, the Treasury Department and the White House National Economic Council.

The White House is expected to release a budget Monday that includes increases in defense and nondefense spending, with a focus on mental health, child care, other social programs, and reducing the deficit, two other people familiar with the matter said. These people, like the others, spoke on the condition of anonymity to reflect planning not yet made public.

Biden's budget proposal will also cut the federal deficit by more than $1 trillion over the next decade, according to a White House document. News of the deficit reduction was first reported by the Associated Press.

The outcry over the low tax rates of the financial elite has emerged as a key flash point in American politics, particularly after liberal Democrats in the 2020 presidential election sought to tackle wealth inequality by targeting billionaires.

Tax experts have long debated how best to turn that aspiration into reality. Sen. Elizabeth Warren (D-Mass.) proposed a wealth tax during that campaign that would have levied an annual 2 percent tax on all assets in excess of $50 million. Senate Finance Chair Ron Wyden (D-Ore.) this fall unveiled a "billionaire income tax" that would have taxed on an annual basis the gains in value of stocks and other "unrealized assets."

The White House approach represents yet another attempt to craft a billionaire tax that can be approved by Congress and administered effectively by the Internal Revenue Service. Wyden's plan would have been assessed on an annual basis, whereas the White House plan gives wealthy households five years to be in compliance with the minimum 20 percent tax. The White House plan also creates an initial period of nine years from enactment for households to pay previously unrealized income.

"Biden's proposal really effectively addresses the practical implementation challenges we've seen to previous proposals to tax very high income households," said Jason Furman, a professor at Harvard Kennedy School who served as an economist in the Obama administration.

Still, some tax experts prefer Biden's prior approach of taxing unrealized capital gains only once those gains are realized at death. Conservatives and other legal scholars have argued it is unclear if the Supreme Court will strike down any measure they view as a wealth tax.

"We still have questions of constitutionality. Can the IRS collect taxes if nothing has been sold based on the wealth, the property, of the taxpayers?" said Steve Rosenthal, a senior fellow at the Tax Policy Center, a nonpartisan think thank. "In my view, Biden's minimum tax adds more complexity to Wyden's original billionaire income tax, which already was complicated."

One of the people familiar with the White House plan rejected the argument that it amounted to a wealth tax that could potentially be viewed as unconstitutional, saying, "This is an income tax, and income taxes are constitutional under the 16th Amendment. There are lots of income tax provisions that apply tax before a realization event. This tax on billionaires would be no different."

It also remains unclear if even the more nuanced approach to taxing billionaires will be approved by Democrats in Congress. House Speaker Nancy Pelosi (D-Calif.) was among the Democrats who privately objected to Wyden's billionaire tax plan, suggesting it amounted to a publicity stunt. Manchin denounced the billionaire tax as divisive last fall, though he later told the White House he could support a version of a billionaire tax.

The White House tax plan would dramatically change what some of the wealthiest Americans pay in taxes. Tesla chief executive Elon Musk would pay an additional $50 billion, while Amazon founder Jeff Bezos would pay an additional $35 billion, according to calculations by Gabriel Zucman, an economist at the University of California Berkeley. (Bezos is the owner of The Washington Post.)

THE INVESTMENT FUNDS INSTITUTE OF CANADA | L'INSTITUT DES FONDS D'INVESTISSEMENT DU CANADA

IFIC Monthly Investment Fund Statistics – February 2022

Mutual Fund and Exchange-Traded Fund Assets and Sales

March 23, 2022 (Toronto) – The Investment Funds Institute of Canada (IFIC) today announced investment fund net sales and net assets for February 2022.

Mutual fund assets totalled $1.997 trillion at the end of February 2022. Assets decreased by $24.6 billion or 1.2% compared to January 2022. Mutual funds recorded net sales of $9.9 billion in February 2022.

ETF assets totalled $317.1 billion at the end of February 2022. Assets increased by $0.2 billion or 0.1% compared to January 2022. ETFs recorded net sales of $4.0 billion in February 2022.

Starting with January 2022 data, ETF data is adjusted to remove double counting arising from Canadian-listed ETFs that invest in units of other Canadian-listed ETFs. Any references to IFIC ETF assets and sales figures prior to 2022 data should indicate that the data has not been adjusted for ETF of ETF double counting.

Mutual Fund Net Sales/Net Redemptions ($ Millions)*

Asset Class	Feb. 2022	Jan. 2022	Feb. 2021	YTD 2022	YTD 2021
Long-term Funds					
Balanced	5,062	3,081	8,745	8,142	13,726
Equity	4,627	2,922	6,490	7,549	10,707
Bond	(155)	366	2,482	211	5,578
Specialty	241	627	840	868	1,608
Total Long-term Funds	9,775	6,995	18,557	16,770	31,618
Total Money Market Funds	112	178	(957)	290	(2,442)
Total	9,887	7,172	17,600	17,060	29,177

Mutual Fund Net Assets ($ Billions)*

Asset Class	Feb. 2022	Jan. 2022	Feb. 2021	Dec. 2021
Long-term Funds				
Balanced	986.5	997.9	889.1	1,022.6
Equity	708.3	719.1	608.7	745.1
Bond	253.3	255.8	245.5	260.9
Specialty	22.2	22.1	36.1	21.9
Total Long-term Funds	1,970.2	1,994.9	1,779.4	2,050.4
Total Money Market Funds	26.8	26.6	31.4	26.4
Total	1,996.9	2,021.5	1,810.8	2,076.8

* Please see below for important information regarding this data.

ETF Net Sales/Net Redemptions ($ Millions)*

Asset Class	Feb. 2022	Jan. 2022	Feb. 2021	YTD 2022	YTD 2021
Long-term Funds					
Balanced	251	301	477	551	972
Equity	3,104	4,297	3,471	7,402	5,648
Bond	(53)	(269)	1,172	(322)	2,481
Specialty	308	88	876	396	934
Total Long-term Funds	3,609	4,417	5,996	8,027	10,035
Total Money Market Funds	411	154	(230)	564	(255)
Total	4,020	4,571	5,766	8,591	9,780

ETF Net Assets ($ Billions)*

Asset Class	Feb. 2022	Jan. 2022	Feb. 2021	Dec. 2021
Long-term Funds				
Balanced	12.2	12.1	8.3	12.1
Equity	206.5	206.4	167.7	225.2
Bond	78.5	79.6	80.2	89.6
Specialty	13.1	12.3	6.0	13.6
Total Long-term Funds	310.2	310.4	262.2	340.5
Total Money Market Funds	6.9	6.5	7.0	6.6
Total	317.1	316.9	269.2	347.1

* Please see below for important information regarding this data.

IFIC direct survey data (which accounts for approximately 91% of total mutual fund industry assets) is complemented by data from Investor Economics to provide comprehensive industry totals.

IFIC makes every effort to verify the accuracy, currency and completeness of the information; however, IFIC does not guarantee, warrant, represent or undertake that the information provided is correct, accurate or current.

*** Important Information Regarding Investment Fund Data:**

1. Mutual fund data is adjusted to remove double counting arising from mutual funds that invest in other mutual funds.
2. Starting with January 2022 data, ETF data is adjusted to remove double counting arising from Canadian-listed ETFs that invest in units of other Canadian-listed ETFs. Any references to IFIC ETF assets and sales figures prior to 2022 data should indicate that the data has not been adjusted for ETF of ETF double counting.
3. The Balanced Funds category includes funds that invest directly in a mix of stocks and bonds or obtain exposure through investing in other funds.
4. Mutual fund data reflects the investment activity of Canadian retail investors.
5. ETF data reflects the investment activity of Canadian retail and institutional investors.

About IFIC

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https://www.globaltimes.cn/page/202203/1256467.shtml

Marriages fall in 2021 leading to lower birth rates in China, despite declining divorce rate

By Du Qiongfang Published: Mar 20, 2022 09:50 PM

The number of Chinese couples tying the knot dropped sharply in 2021 which an expert said would continue to cause a decline in China's birth rate, despite that the number of Chinese couples who got divorced in 2021 also dropped, a temporary effect caused by the cooling-off period stipulated by the newly enacted Civil Code last year.

A total of 7.63 million couples registered to get married across the nation in 2021, a record low for the past 36 years since 1986 when the Ministry of Civil Affairs started to release such statistics.

He Yafu, an independent demographer told the Global Times on Sunday that the decline in the number of marriage registrations will inevitably result in the decline of the birth rate in China, since most children are born within marriages in China.

The number of marriage registrations across the nation has been decreasing sharply over the past three years with the number of couples who got married less than 10 million in 2019, less than 9 million in 2020, and less than 8 million in 2021.

The number of couples who tied the knot in 2021 was only 56.6 percent of the number in 2013 when the number of marriage registrations reached a peak, according to news website yicai.com.

According to He, marriage registration numbers in China have been declining for eight consecutive years due to a declining number of young people, more men than women of marriageable age and the decision to put off marriage until they are older.

Besides, due to Chinese women's rising educational and economic development, their willingness to get married is even lower than that for men.

Meanwhile, statistics from the Ministry of Civil Affairs showed that the number of Chinese couples who got divorced also reduced dramatically last year compared with the number in 2020.

According to the latest statistics from the ministry, a total of 2.14 million couples registered their divorce across the nation in 2021, only accounting for 57.3 percent of the total number of 3.73 million couples in 2020.

Before 2020, the number of couples who got divorced had increased in three consecutive years with 3.69 million in 2017, 3.8 million in 2018 and 4.04 million in 2019, according to The Paper.

Many places which had previously released their marriage statistics for 2021 said the decreasing number of divorced couples was due to the cooling-off period set up for divorce registration in the Civil Code which was enacted on January 1, 2021.

For example, in Hefei, capital city of East China's Anhui Province, 16,851 local couples got divorced in 2021, an unconventional drop of over 51 percent compared with the number of 34,591 couples in 2020, according to Hefei Evening News.

According to local civil affairs workers, as many as 30,107 local couples applied for divorce between January and November in 2021 but only 16,851 couples eventually got divorced, with 44 percent of divorce applicants withdrawing their applications actively or passively after the cool-off period.

However, He pointed out that the decline in the number of divorces is probably a temporary effect resulting from the cool-off period, since China's divorce rates had increased between 2013 and 2020, consistent with the rising trend of divorce globally.

Due to insufficient childbirth encouragement policies, He predicted that China will probably face negative population growth this year.

Dan Tsubouchi @Energy_Tidbits · 3h

#JCPOA. good @BeckyCNN @USEnvoyIran clip. Is he the frontman or decisionmaker? He says no deal unless Iran gives in to his marching orders. But aren't we to the expected reality of reaching any deal, does #Biden decide if he will close any gap? #OOTT
twitter.com/DohaForum/stat...

> **Dan Tsubouchi** @Energy_Tidbits · 3h
>
> #JCPOA "i can't be confident it's imminent""it's one of the requests Iran has made we haven't decided to delist the IRGC""zero sense of now you really need to rush for a deal because of the need to get oil on the market"@USEnvoyIran thx @SimoneFoxman @V_Ratcliffe @RcShahla #OOTT
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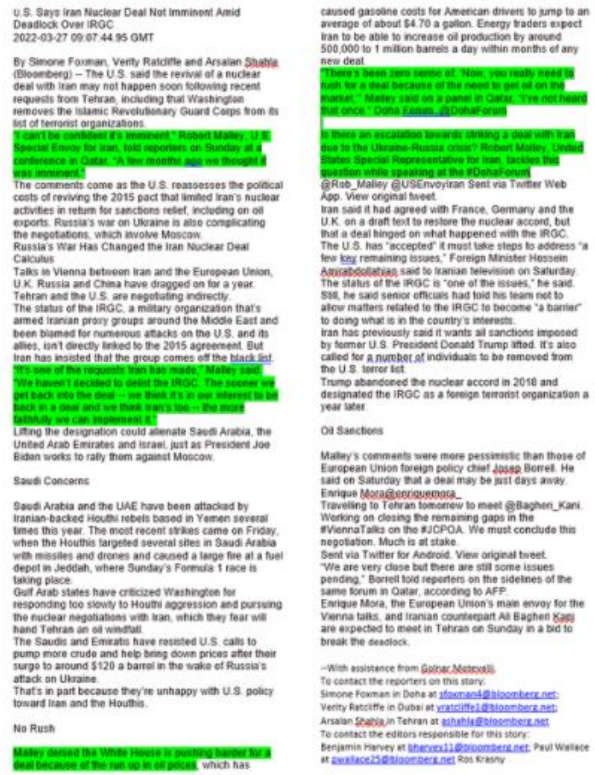
> 
>
> U.S. Says Iran Nuclear Deal Not Imminent Amid Deadlock Over IRGC
> 2022-03-27 09:07:44.95 GMT
>
> By Simone Foxman, Verity Ratcliffe and Arsalan Shahla (Bloomberg) -- The U.S. said the revival of a nuclear deal with Iran may not happen soon following recent requests from Tehran, including that Washington removes the Islamic Revolutionary Guard Corps from its list of terrorist organizations.
> "I can't be confident it's imminent," Robert Malley, U.S. Special Envoy for Iran, told reporters on Sunday at a conference in Qatar. "A few months ago we thought it was imminent."
> The comments come as the U.S. reassesses the political costs of reviving the 2015 pact that limited Iran's nuclear activities in return for sanctions relief, including on oil exports. Russia's war on Ukraine is also complicating the negotiations, which involve Moscow.
> Russia's War Has Changed the Iran Nuclear Deal Calculus
> Talks in Vienna between Iran and the European Union, U.K. Russia and China have dragged on for a year. Tehran and the U.S. are negotiating indirectly.
> The status of the IRGC, a military organization that's armed Iranian proxy groups around the Middle East and been blamed for numerous attacks on the U.S. and its allies, isn't directly linked to the 2015 agreement. But Iran has insisted that the group comes off the black list.
> "It's one of the requests Iran has made," Malley said. "We haven't decided to delist the IRGC. The sooner we get back into the deal -- we think it's in our interest to be back in a deal and we think Iran's too -- the more faithfully are can implement it."
> Lifting the designation could alienate Saudi Arabia, the United Arab Emirates and Israel, just as President Joe Biden works to rally them against Moscow.
>
> Saudi Concerns
>
> Saudi Arabia and the UAE have been attacked by Iranian-backed Houthi rebels based in Yemen several times this year. The most recent strikes came on Friday, when the Houthis targeted several sites in Saudi Arabia with missiles and drones and caused a large fire at a fuel depot in Jeddah, where Sunday's Formula 1 race is taking place.
> Gulf Arab states have criticized Washington for responding too slowly to Houthi aggression and pursuing the nuclear negotiations with Iran, which they fear will hand Tehran an oil windfall.
> The Saudis and Emiratis have resisted U.S. calls to pump more crude and help bring down prices after their surge to around $120 a barrel in the wake of Russia's attack on Ukraine.
> That's in part because they're unhappy with U.S. policy toward Iran and the Houthis.
>
> No Rush
>
> Malley denied the White House is pushing harder for a deal because of the run up in oil prices, which has caused gasoline costs for American drivers to jump to an average of about $4.70 a gallon. Energy traders expect Iran to be able to increase oil production by around 500,000 to 1 million barrels a day within months of any new deal.
> "There's been zero sense of: 'Now, you really need to rush for a deal because of the need to get oil on the market'," Malley said on a panel in Qatar. "I've not heard that once." Doha Forum @DohaForum
>
> Is there an escalation towards striking a deal with Iran due to the Ukraine-Russia crisis? Robert Malley, United States Special Representative for Iran, tackles this question while speaking at the #DohaForum.
> @Rob_Malley @USEnvoyIran Sent via Twitter Web App. View original tweet.
> Iran said it had agreed with France, Germany and the U.K. on a draft text to restore the nuclear accord, but that a deal hinged on what happened with the IRGC.
> The U.S. has "accepted" it must take steps to address "a few key remaining issues," Foreign Minister Hossein Amirabdollahian said to Iranian television on Saturday.
> The status of the IRGC is "one of the issues," he said. Still, he said senior officials had told his team not to allow matters related to the IRGC to become "a barrier" to doing what is in the country's interests.
> Iran has previously said it wants all sanctions imposed by former U.S. President Donald Trump lifted. It's also called for a number of individuals to be removed from the U.S. terror list.
> Trump abandoned the nuclear accord in 2018 and designated the IRGC as a foreign terrorist organization a year later.
>
> Oil Sanctions
>
> Malley's comments were more pessimistic than those of European Union foreign policy chief Josep Borrell. He said on Saturday that a deal may be just days away.
> Enrique Mora@enriquemora_
> Travelling to Tehran tomorrev to meet @Bagheri_Kani. Working on closing the remaining gaps in the #ViennaTalks on the #JCPOA. We must conclude this negotiation. Much is at stake.
> Sent via Twitter for Android. View original tweet.
> "We are very close but there are still some issues pending," Borrell told reporters on the sidelines of the same forum in Qatar, according to AFP.
> Enrique Mora, the European Union's main envoy for the Vienna talks, and Iranian counterpart Ali Bagheri Kani are expected to meet in Tehran on Sunday in a bid to break the deadlock.
>
> --With assistance from Golnar Motevalli.
> To contact the reporters on this story:
> Simone Foxman in Doha at sfoxman4@bloomberg.net;
> Verity Ratcliffe in Dubai at vratcliffe1@bloomberg.net;
> Arsalan Shahla in Tehran at ashahla@bloomberg.net
> To contact the editors responsible for this story:
> Benjamin Harvey at bharvey11@bloomberg.net; Paul Wallace at pwallace25@bloomberg.net; Ros Krasny

Dan Tsubouchi @Energy_Tidbits · 3h

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Saudi Concerns

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Enrique Mora@enriquemora

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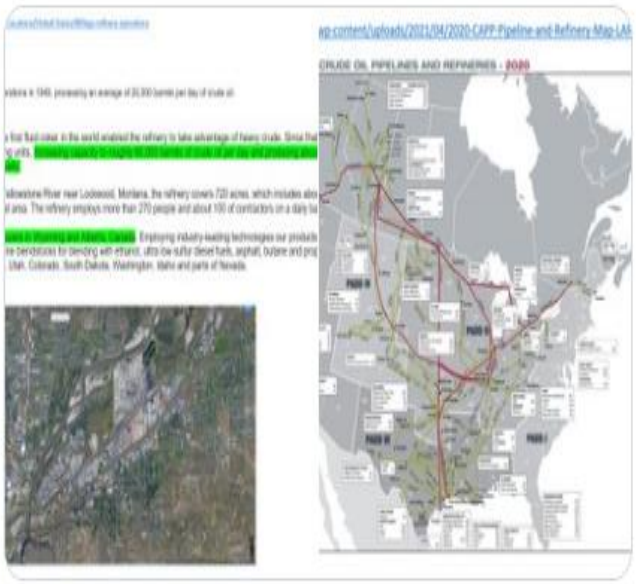
2 1

Dan Tsubouchi @Energy_Tidbits · 4h

Explosion/fire late last night at #Exxon Billings Montana refinery. Capacity is 61,500 b/d, runs on Alberta & Wyoming crude. Note the excellent @OilGasCanada oil and gas pipelines map. #OOTT #Oil #Diesel



> **Billings Gazette** @billingsgazette · 10h
>
> An explosion at the Exxon Mobil oil refinery near Lockwood Saturday night brought a large emergency response from multiple agencies, according to witnesses and Gazette reporters at the scene. The cause of the explosion is still unknown but no one... billingsgazette.com/news/local/bre...

3

Dan Tsubouchi @Energy_Tidbits · 12h

Unintended consequence - pickup in quickie "divorces" if it gets them separately <$100mm wealth mark. ie. household $150mm with $15mm income would save $3mm/yr. That would cover a lot of flying private & much more. Great scoop @JStein_WaPo

> **Jeff Stein** @JStein_WaPo · 19h
>
> Scoop: Biden's budget on Monday to propose "Billionaire Minimum Income Tax"
>
> 1st time WH has so directly targeted billionaire wealth
>
> Would create minimum 20% rate on income above $100M
>
> 400 billionaire families paid "8.2% federal rate" from 2010-18
>
> washingtonpost.com/us-policy/2022...
>
> Show this thread

2

Dan Tsubouchi @Energy_Tidbits · 20h

#Vortexa crude #Oil floating storage for 03/25 est 91.44 mmb, -4.18 mmb WoW vs revised up 95.62 mmb at 03/18. Floating storage has been fairly steady in the ~90-100 mmb range for past few months. Thx @Vortexa @TheTerminal #OOTT

Vortexa Crude Oil Floating Storage Estimated as of 1pm MT on March 26, 2022

Source: Bloomberg, Vortexa

Est as of Mar 26, 1pm MT

Date	Mid Px
Fr 03/25/2022	91443
Fr 03/18/2022	95618
Fr 03/11/2022	89990
Fr 03/04/2022	96966
Fr 02/25/2022	93293
Fr 02/18/2022	85019
Fr 02/11/2022	97292
Fr 02/04/2022	98869
Fr 01/28/2022	94032
Fr 01/21/2022	98387
Fr 01/14/2022	84689

Est as of Mar 19, 1pm MT

Date	Mid Px
Fr 03/18/2022	87894
Fr 03/11/2022	92535
Fr 03/04/2022	98407
Fr 02/25/2022	94289
Fr 02/18/2022	84645
Fr 02/11/2022	98207
Fr 02/04/2022	101.946k
Fr 01/28/2022	95109
Fr 01/21/2022	101.164k
Fr 01/14/2022	86550
Fr 01/07/2022	92922

Est as of Mar 12, 1pm MT

Date	Mid Px
Fr 03/11/2022	79207
Fr 03/04/2022	96290
Fr 02/25/2022	96668
Fr 02/18/2022	88504
Fr 02/11/2022	104.323k
Fr 02/04/2022	105.319k
Fr 01/28/2022	96377
Fr 01/21/2022	98631
Fr 01/14/2022	83624
Fr 01/07/2022	92340
Fr 12/31/2021	93862

Source: Bloomberg, Vortexa


Dan Tsubouchi @Energy_Traders · 2h
In case you weren't listening, #Biden's Warsaw speech "for God's sake, this man cannot remain in power" referring to #Putin. Surely this makes it unlikely/impossible for any areas of cooperation i.e. will this keep #JCPOA in limbo? #OOTT

SAF

Dan Tsubouchi @Energy_Tidbits · Mar 26

Let's all hope that all the action tomorrow is on the track! Recognize Hamilton's Mercedes was behind the 1/2 Ferrari finish, but still have trouble seeing Hamilton 4th in the odds to win.

> **Formula 1** @F1 · Mar 26
>
> Joint statement on the Saudi Arabian Grand Prix

Formula 1 and the FIA can confirm that following discussions with all the teams and drivers, the 2022 FIA Formula 1 Saudi Arabian Grand Prix will continue as scheduled.

Following the widely reported incident that took place in Jeddah on Friday, there has been extensive discussion between all stakeholders, the Saudi government authorities and security agencies who have given full and detailed assurances that the event is secure.

It has been agreed with all stakeholders to maintain a clear and open dialogue throughout the event and for the future.

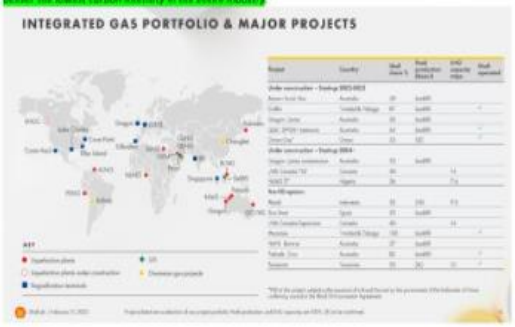
Dan Tsubouchi @Energy_Tidbits · Mar 25

#Biden #LNG deal with #EC says LNG supply growth be consistent with shared #NetZero goals. Who has lowest carbon intensity of any #LNG project in the world? #LNGCanada said Shell on 02/21. Will #Shell FID LNG Canada Phase 2? Still think yes. #NatGas #OOTT twitter.com/Energy_Tidbits...

Shell Integrated Business Deep Dive Feb 21, 2022 Wael Sawan

Items in "Italics" are SAF Group created transcript

S16. Approx 8:36am MT. Sawan "*That brings me to the future. Our current integrated gas business is doing what we said we would do and is on the right trajectory. But we are not yet where we want to be. We have opportunities that we are pursuing to do even better, with our existing assets, but also to position our growth portfolio to one with even stronger returns with lower carbon emissions. Let me expand on that a bit more. For our capital spend, we need to be even more focused with a continued emphasis on value over volume. We have a capital budget of $4 to $5 billion a year in the short to medium term. We are making good progress on our two LNG capacity expansion projects under construction. In Canada, Canada LNG surpassed recently the 50% completion mark last October, after three years of construction. The project remains dedicated to have the first cargo by the middle of this decade.*" He then speaks of Nigeria and that construction there is now firmly underway, and then says "*both these projects are competitively positioned for LNG growth markets in Asia. The same goes for most of our long term project funnel. We have several attractive expansion and backfill projects. A limited number of greenfield LNG projects and several promising low carbon new gaseous projects in early stages of development. For the pre-FID projects, we have an expected average internal rate of return of between 14% and 18%, and a unit technical cost below $5/mmbtu. With most of these projects clearly having lower costs than the average in the industry. These are good numbers, but you will understand that we strive to push the IRR to the higher end and to push the unit costs down even further. But the long term role of gas depends on efforts to abate emissions and develop cleaner pathways for gas. This is why we continually try to reduce the carbon intensity of our new projects. Take LNG Canada currently under construction. It will run on hydropower and is set to deliver the lowest carbon intensity in the entire industry.*"



Prepared by SAF Group https://safgroup.ca/news-insights/

Dan Tsubouchi @Energy_Tidbits · Mar 25

#1 takeaway from #Biden LNG deal with EC. EC admits to get rid of RUS #NatGas, means an abrupt shift to long term LNG supply deals. Basically what Asian LNG buyers started July 2021, see SAF 07/07/21 blog. #LNGSupplyGap is coming, #LNG #NatGas will be ...

2 9 12

Dan Tsubouchi @Energy_Tidbits · Mar 25

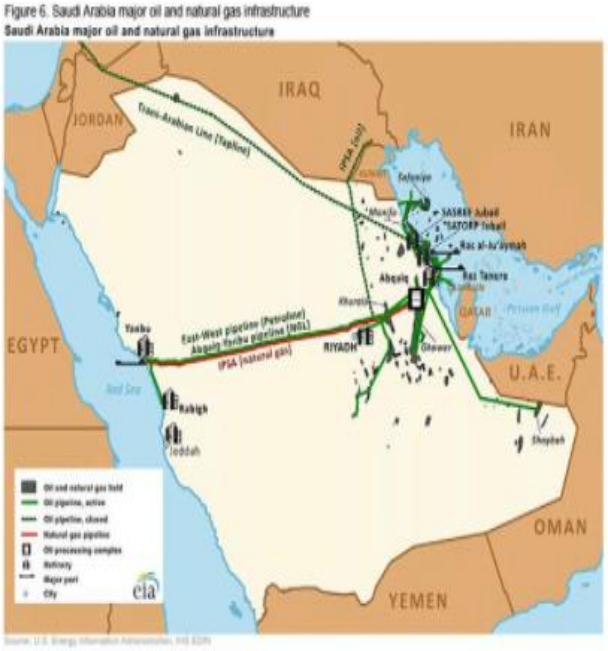
Cutting RUS #Oil means #DE "is rushing to make complex plans to line up deliveries by sea, truck & trains" reports @ArneDelfs. Rail track capacity aside, can't believe there are enough of these lying around to bring oil from ports inland to the #Druzhba pipeline refineries? #OOTT

1 1

Dan Tsubouchi @Energy_Tidbits · Mar 25

#Houthis. KSA "thwarted all hostile attempts to target the southern, central and eastern regions". infers long range drone/missile attempt at #Aramco Persian Gulf facilties & some target in Riyadh. #OOTT

Figure 6. Saudi Arabia major oil and natural gas infrastructure



Source: U.S. Energy Information Administration, IHS EDIN

العربية عاجل @AlArabiya_Brk · Mar 25

التحالف: أحبطنا كافة المحاولات العدائية لاستهداف المنطقة الجنوبية والوسطى والشرقية #العربية_عاجل alarabiya.net

1

Dan Tsubouchi @Energy_Tidbits · Mar 25

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Blog Summary

Buyers Abruptly Change and Lock in Long Term Supp
upply Gap, Provides Support For Brownfield LNG FID

y, July 14, 2021 at 10:00 MT

For Details, Please See The 8 Page Blog
http://www.safgroup.ca/research/trends-in-the-market

5 6 23

Dan Tsubouchi @Energy_Tidbits · Mar 24

Buckle up. #LNGSupplyGap will be sooner & larger. #Novatek Arctic LNG-2 delays. Line1 0.87 bcfd should still be 2023, but timing no longer clear for Line2 0.87 bcfd in 2024 & Line3 0.87 bcf/d in 2025 as #TotalEnergies halted RUS spending. Positive for #LNG #NatGas in 2020s. #OOTT

Google Translate of https://www.kommersant.ru/doc/5272310
03/25/2022, 00:58

NOVATEK liquefies with strength

The company concentrated on the first line of the Arctic LNG-2

NOVATEK, according to Kommersant, has froze work on all its promising projects, except for the first line of the Arctic LNG-2 liquefaction plant. And although, according to Kommersant's sources, work on it is behind schedule, the company still retains plans to begin transporting the first floating platform from Murmansk to the Gulf of Ob by the end of August. The fate of the second and third lines is less clear due to TotalEnergies' refusal to continue investing in the project, as well as possible difficulties in obtaining equipment.

NOVATEK has paused all processes for the implementation of its promising projects, with the exception of the first stage of Arctic LNG-2, according to Kommersant sources familiar with the situation. The project's liquefaction lines are assembled in Murmansk and installed on gravity platforms, which will then be towed to Yamal.

According to Kommersant's interlocutors, there are some delays on the first platform, but NOVATEK expects to send it from Murmansk to the Gulf of Ob at the end of August. The platform is almost complete, with major equipment being commissioned, but delivery of seven Baker Hughes gas turbines is still pending. If, however, the company does not have time to tow the platform during this year's navigation, the launch will be postponed. The head of TotalEnergies, Patrick Pouyanne, said in an interview with Bloomberg on March 24 that the readiness of the first line is 94%.

The first line of the Arctic LNG-2 plant is to be launched in 2023, the second was planned for 2024, and the third for 2025. Each of the three stages should have a production capacity of 6.6 million tons per year. In April 2021 all project partners entered into twenty-year contracts for the purchase of LNG from the plant in proportion to their share. NOVATEK owns 60% in Arctic LNG-2, while other shareholders, including French TotalEnergies, Chinese CNPC and CNOOC, and a consortium of Japanese Mitsui and JOGMEC, each own 10%.

Formally, the US and EU restrictions did not affect equipment for the production of LNG, and NOVATEK itself did not fall under new sanctions. The company has already contracted major equipment for the second and third lines of Arctic LNG-2, including Siemens compressors, Baker Hughes turbines and Linde heat exchangers. But, as the interlocutors of Kommersant note, in the current conditions it is impossible to be completely sure that the equipment will be shipped, moreover, delays are possible due to the tightening of export controls in the EU and failures in supply chains for deliveries to the Russian Federation.

Arctic LNG-2 is NOVATEK's second major LNG export project after the Yamal LNG plant with a capacity of 16.5 million tons per year, launched in 2017. They were to be followed by Ob GCC and Ob LNG (see Kommersant dated February 21) - now, according to Kommersant, these projects have been put on hold.

NOVATEK, due to sanctions, has already encountered difficulties in attracting external financing for Arctic LNG-2, since VEB.RF, Otkritie and Sberbank, which fell under the sanctions, actively participated in it (see Kommersant on March 3). Also, tankers with NOVATEK's spot cargo could not enter European ports, and buyers in the EU refuse to buy them, although formally no sanctions have been imposed on the purchase of Russian gas.

TotalEnergies said on March 22 that it was halting new investment in Arctic LNG-2 as EU sanctions ban investments in the Russian fuel and energy complex. The Japanese consortium has not yet made its position clear. The entire project was valued at $21 billion, and the shareholders had to provide half, the rest would be external financing. Thus, the total contribution of Total as a shareholder should have been about $1 billion.

As of the end of 2021, Arctic LNG-2 was 57% funded. It is not yet clear what will happen to the TotalEnergies stake and who will cover the missing funding. In theory, TotalEnergies may agree to reduce its share in proportion to the investments already made in favor of other shareholders. Otherwise, TotalEnergies may be left without the opportunity to receive dividends and without its representative in the governing bodies of Arctic LNG-2.

Liability measures against a participant who does not fulfill his investment obligations, says adviser to JSB S&K Vertical, lawyer Alena Gazbinskaya, may consist in the forced collection of funds due, the collection of a penalty, as well as losses incurred - in the form of both actual damage and lost profits.

Tatyana Gorin,

Dan Tsubouchi @Energy_Tidbits · Mar 10

Prior to this, #Shell fcast #LNGSupplyGap in mid-2020s. EU wants +4.9 bcfd this yr, so more in 2023. Approx equal to KOR #LNG imports, approaching @qatar_energy massive 6.4 bcf/d expansion. As @SStapczynski notes, a global #NatGas fight, EU will...

5 18

Dan Tsubouchi @Energy_Tidbits · Mar 24

Another sign any #JCPOA is next week at the earliest. Is this the final US consultation with Israel before they try to get one of key election priorities, getting a return to #JCPOA compliance, over the goal line? #Biden doesn't give up easily on his election promises. #OOTT

> **Jacob Magid** @JacobMagid · Mar 24
>
> Blinken will meet w/ Prime Minister Naftali Bennett, Foreign Minister Yair Lapid, Defense Minister Benny Gantz, and President Isaac Herzog in Israel and with Palestinian Authority President Mahmoud Abbas along with representatives from Palestinian civil society in Ramallah (2/3)
>
> Show this thread

3 2

Dan Tsubouchi @Energy_Tidbits · Mar 24

#Chicago joins the movement of we don't want anything to tie us to capital to #Oil #NatGas #Coal producers, but we won't/can't say we don't want/need supply thereof because we need to have secure and affordable energy. #OOTT

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CHICAGO:

SECTION 1. Section 2-32-515 of the Municipal Code of Chicago is hereby amended by adding the underscored language, as follows:

2-32-515 Investment Policy.

The Treasurer shall adopt a written investment policy which shall address the safety of the principal, liquidity of funds and return on investment. The policy shall be consistent with the provisions of this Code pertaining to investments. Subject to the requirements of this section, the Treasurer may amend the written policy from time to time. Copies of the written policy and any amendments thereto shall be kept on file with the City Clerk and the Comptroller, and shall be submitted annually, or if amended, no later than 30 days after such amendment, to the Chairman of the City Council Committee on Finance and the Chief Financial Officer.

The written investment policy shall include material, relevant, and decision-useful sustainability factors to be considered by the Treasurer in evaluating investment decisions, including, but not limited to: (1) corporate governance and leadership factors; (2) environmental factors; (3) social capital factors; (4) human capital factors; and (5) business model and innovation factors, as provided under the Illinois Sustainable Investing Act, 30 ILCS 238/1, et seq.

The written investment policy shall include a list of the top companies that are coal, oil, and gas reserve owners, ranked by the potential carbon emissions embedded in their reserves, which shall be updated by the Treasurer, at least annually. The Treasurer shall annually report to the Committee on Finance any changes, or whether there have been no changes, to the list. The Treasurer shall not invest any City funds in securities or other obligations of the companies on the list and shall divest from all securities or other obligations of the companies on the list, as soon as practicable or in accordance with the written investment policy.

Dan Tsubouchi @Energy_Tidbits · Mar 23

Translating ING's new financing approach. We don't want Europeans mad at us for supporting dirty drilling. But want to make sure EU can take more #Oil #NatGas #LNG so Europeans see we are doing all we can to "keep energy secure & affordable during the low-...

1 1 3

Dan Tsubouchi @Energy_Tidbits · Mar 23

For those not near their laptop, @EIAgov weekly #Oil #Gasoline #Distillates inventory data as of March 18 just out. Prior to release, WTI was $113.69. #OOTT
ir.eia.gov/wpsr/overview....

s Inventory March 18: EIA, Bloomberg Survey Expectation		
ls)	EIA	Expectations
	-2.51	-0.75
	-2.95	-1.85
	-2.07	-1.05
	-7.53	-3.65

ommercial so builds in impact of 4.2 mmb draw from SPR for M
d in the oil data, Cushing had a build of 1.24 mmb for Mar 18 v
Bloomberg
SAF Group https://safgroup.ca/news-insights/

1 1 5

Dan Tsubouchi @Energy_Tidbits · Mar 23

Reinforces #Oil #NatGas #LNG will be needed for longer and stronger thru the 2020s. #OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Mar 23
>
> Translating ING's new financing approach. We don't want Europeans mad at us for supporting dirty drilling. But want to make sure EU can take more #Oil #NatGas #LNG so Europeans see we are doing all we can to "keep energy secure & affordable during the low-carbon transition" #OOTT
>
> 
> ING steps up renewable energy efforts and restricts financing of new oil & gas fields

2 1

Dan Tsubouchi @Energy_Tidbits · Mar 23

Translating ING's new financing approach. We don't want Europeans mad at us for supporting dirty drilling. But want to make sure EU can take more #Oil #NatGas #LNG so Europeans see we are doing all we can to "keep energy secure & affordable during the low-carbon transition" #OOTT

ING steps up renewable energy efforts and restricts financing of new oil & gas fields

23 March 2022 3 min read Listen

ING has worked hard over the years to build a power generation lending book that's 60% renewables, outperforming by far the most ambitious climate goal of the Paris Agreement. Today we go a step further and announce that we aim to grow new financing of renewable energy by 50% by year-end 2025 and will no longer provide dedicated finance to new oil & gas fields.

These steps are aligned with the 'Net Zero Emissions by 2050 Roadmap' by the International Energy Agency. Massive investment is needed in clean energy and infrastructure, which will then lead to a decrease in demand for fossil fuels, according to the roadmap. That reduced demand should be met by existing oil and gas fields, which means that in both the IEA's and our view, no new fields should be needed.

These steps also support the European Union's 'Fit for 55' and 'REPowerEU' plans. Also there, key elements are oil and gas supplies from existing fields, investments in clean energy and infrastructure for the electrified economy, and energy efficiency.

"The best way to reduce dependency on fossil fuels is to make sure there are enough affordable green alternatives available," said Michiel de Haan, head of ING's energy sector. "These steps support that and show we're serious about putting our financing to work to facilitate the energy transition."

In developing ING's energy strategy, we balance three key interests: the need to decarbonise to fight climate change, the need for energy to remain affordable for people and companies, and the need for security of the energy supply.

The steps we announced today follow a path we embarked on years ago. Looking at our power generation portfolio, we pledged in 2017 to exit coal-fired power plants by 2025 and have since then decreased our exposure by 60%. At the same time, we more than doubled our financing of power generation from renewable energy sources such as solar and wind, which now makes up almost 60% of our power generation portfolio.

Total power generation lending

The restriction announced today refers to dedicated upstream finance (lending or capital markets) for oil & gas fields approved for development after 31 December 2021. At the same time, we will continue to provide financing to clients active in keeping oil and gas flowing, in line with efforts to keep energy secure and affordable during the low-carbon transition.

Today's announcement is part of our Terra approach to steer our portfolio towards keeping the rise in global temperatures to 1.5 degrees Celsius to achieve net zero by 2050. For further details please see our integrated climate report.

6

Dan Tsubouchi @Energy_Tidbits · Mar 23

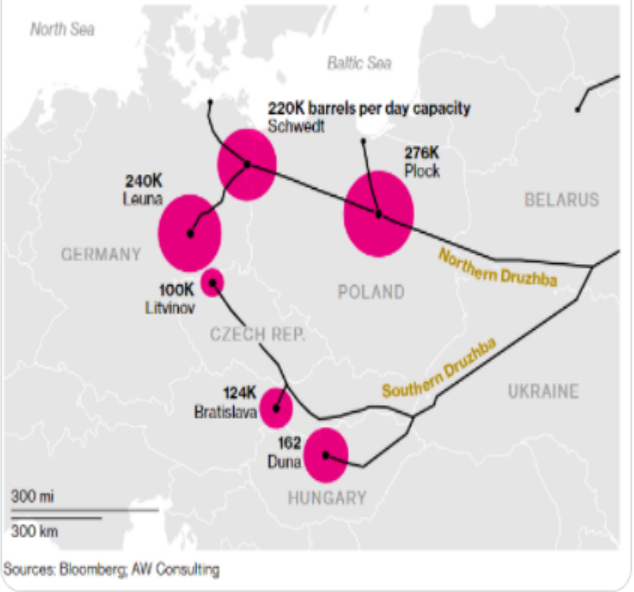
hi @FerroTV @lisaabramowicz1. re your watch on earnings season for the big oil on russia. don't forget the supermajors "profits" in q1 will surely be reduced by provisions for russian assets. but cash flow should be huge. great show. #OOTT

1

Dan Tsubouchi @Energy_Tidbits · Mar 22

EU may be able to work around (with added cost) RUS #Oil that lands via tankers, but this map reminds why EU won't be able to ban RUS oil imports via #Druzhba pipeline. another good map courtesy of @business @JLeeEnergy. #OOTT

> **Helen Robertson** @HelenCRobertson · Mar 22
>
> Why might Germany be reluctant to join a ban on Russian oil imports?
>
> Well... bloomberg.com/news/articles/...
>
> #OOTT
>
> Show this thread



5 5

Dan Tsubouchi @Energy_Tidbits · Mar 22

Positive to #Oil. RUS says CPC terminal could be down for 1.5 to 2 mths for "repairs". Deputy Energy Minister Sorokin says 1 mmb/d exports could be hit, but CPC data shows record 1.55 mmb/d in Feb. As expected, KZ #Oil production gets impacted. #OOTT

Repair of CPC terminal facilities may lead to loss of export of 1 million b/d of oil

Repair of facilities at the marine terminal of the Caspian Pipeline Consortium near Novorossiysk may take 1.5-2 months, said Russian Deputy Energy Minister Pavel Sorokin

MOSCOW, March 22. /TASS/. Repairs to facilities at the Caspian Pipeline Consortium's (CPC) offshore terminal near Novorossiysk could take 1.5-2 months, which could lead to a drop in exports of about 1 million barrels per day of oil, Russian Deputy Energy Minister Pavel Sorokin said. His words were reported to TASS by the press service of the Ministry of Energy.

"If the damage is confirmed, then it could be 1.5-2 months. These are quite serious terms, and we see the risk that about 1 million barrels per day may fall. Naturally, we would like the recovery to happen as quickly as possible and the consequences were eliminated because it affects Russian companies, it affects, among other things, the production of Russian companies in the region. Therefore, of course, we will do everything possible here to eliminate these potentially serious consequences," he stressed.

According to the deputy minister, the facilities were damaged due to a strong storm. He noted that there are three oil loading terminals at the facility, one was damaged, the other is under examination. "This is an extremely dangerous situation from the point of view of ecology, no spills, no damage to the water area should be allowed," Sorokin said.

The day before, CPC reported that after the end of the period of adverse weather conditions, the company conducted an inspection of the equipment complex of remote mooring devices, as a result of which damage was revealed in the form of a displacement of the load-bearing frame of one of the VPU-3 floating hoses. After that, CPC decided to temporarily decommission the specified TLU for flushing and repair.

Later, the head of the company, Nikolay Gorban, told reporters that CPC could decommission one more offshore mooring device for repairs.

https://www.cpc.ru/EN/press/releases/2022/Pages/20220321.aspx

The CPC Pipeline System is one of CIS largest energy investment projects that involves foreign capital. The length of the Tengiz – Novorossiysk pipeline is 1,511 kms. This route moves over two thirds of all Kazakhstan export oil along with crude from Russian fields including those in the Caspian region. CPC Marine Terminal is equipped with three Single Point Moorings (SPM), allowing tankers to be loaded safely at significant distance offshore, including in poor weather conditions.

CPC Shareholders: Federal Agency for State Property Management represented by Transneft (trustee) – 24%, CPC Company – 7%, KazMunayGas – 19%, Kazakhstan Pipeline Ventures LLC – 1.75%, Chevron Caspian Pipeline Consortium Company – 15%, LUKARCO B.V. - 12.5%, Mobil Caspian Pipeline Company - 7.5%, Rosneft-Shell Caspian Ventures Limited - 7.5%, BG Overseas Holding Limited - 2%, Eni International N.A. N.V. - 2%, and Oryx Caspian Pipeline LLC – 1.75%.

https://www.cpc.ru/en/about/Pages/default.aspx

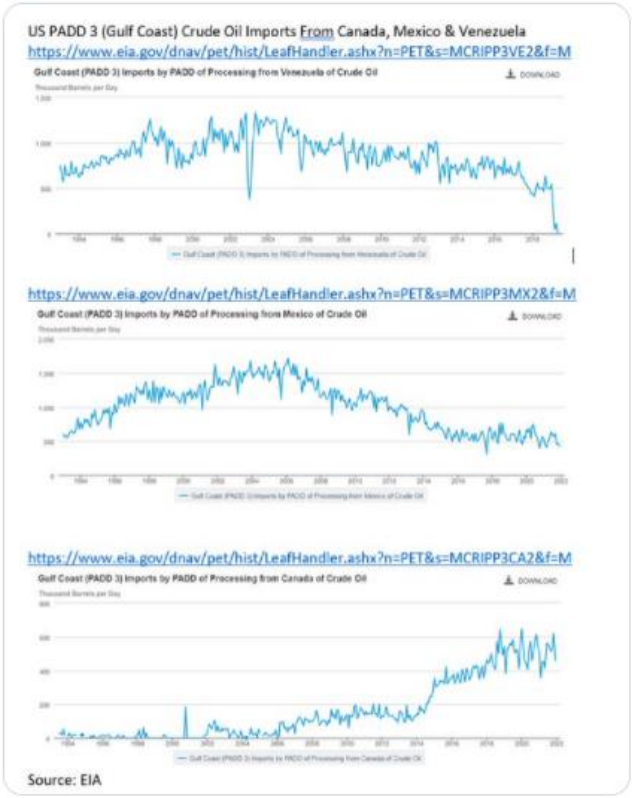
https://www.cpc.ru/EN/operations/Pages/loading.aspx

Shipment

1 6 14

Dan Tsubouchi @Energy_Tidbits · Mar 22

#Biden admin listening to #Chevron who can help double #Venezuela 800 kbd #Oil production "within momths". Negative to Cdn heavy as b/d to PADD3 was due to VEN MEX decline. $CHV has 479,000 b/d PADD3 refining capacity. Thx @cmatthews9 @Jose_deCordoba #OOTT wsj.com/articles/chevr...



1 4 5

Dan Tsubouchi @Energy_Tidbits · Mar 22

Buckle up! note #4 below. liberals are to announce hard emissions reduction 2025 target for #Oil #NatGas #OilSands sector by Mar 31. just announced #LiberalsNDP support agreement gives #Trudeau cover to be as tough as he really wants on the sector. #OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Mar 20
>
> Our weekly SAF Mar 20, 2022 Energy Tidbits memo is posted on our SAF Group website. This 60-pg energy research memo expands upon & covers more items than tweeted this week. See news/insights section of SAF website #Oil #OOTT #LNG #NatGas #EnergyTransition safgroup.ca/news-insights/

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Energy Tidbits

March 20, 2022

Produced by: Dan Tsubouchi

Will There Be a JCPOA Deal Post Biden's Face-to-Face Meetings With Key NATO Leaders on March 24?

Welcome to new Energy Tidbits memo readers. We are continuing to add new readers to our Energy Tidbits memo, energy blogs and tweets. The focus and concept for the memo was set in 1999 with input from PMs, who were looking for research (both positive and negative items) that helped them shape their investment thesis to the energy space, and not just focusing on daily trading. Our priority was and still is to not just report on events, but also try to interpret and point out implications therefrom. The best example is our review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector and not just a specific company results. Our target is to write on 48 to 50 weekends per year and to post by noon mountain time on Sunday.

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2. Will Biden use his face-to-face meetings with key partners at the March 24 NATO summit to tell them he is ready to sign a JCPOA deal? (Click Here)
3. Saudi Aramco 430,000 refinery at Yanbu was hit by drone last night. (Click Here)
4. Liberals are to issue, by March 31, their hard 2025 targets for emissions reductions for oil and gas sector (Click Here)
5. Boris Johnson "*it also vital to recognize that, in this transition, there will be a continuing and vital role, important role, for oil and gas.*" (Click Here)
6. Please follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK].

6 | 16 | 19

Dan Tsubouchi @Energy_Tidbits · Mar 22

Support for shoulder season #LNG. Should see some extra Japan LNG cargos. Six thermal coal plants still down from March 16 earthquake and "the damage could leave some of them idle for weeks or even months, Hagiuda said." Thx @KantaroKomiya #NatGas #OOTT

> **Kantaro Komiya** @KantaroKomiya · Mar 22
>
> Neon signs were turned off, lights dimmed and thermostats dialled down in Japan on Tuesday after the government issued an urgent call to save energy, warning of blackouts after an earthquake last week caused a serious power shortage. reuters.com/world/asia-pac...

1 1

Dan Tsubouchi @Energy_Tidbits · Mar 22

#CPRail work stoppage over as "Teamsters Canada Rail Conference (TCRC) and Canadian Pacific (CP) have agreed to final and binding arbitration. In such a process, both parties agree to accept the arbitrator's decision as final." #CrudeByRail #OOTT

teamstersrail.ca/Work_Stoppage_...

1 4 5

Dan Tsubouchi @Energy_Tidbits · Mar 22

"About 3/4 of China's 11,800 scheduled flights on
Tues have been canceled, according to aviation data company VariFlight, but it remains unclear at this stage how long some services will be halted" report @elizabethlow @saketsundria #JetFuel #OOTT

2 1

Dan Tsubouchi @Energy_Tidbits · Mar 21

1,400 b/d is approx enough sustainable aviation fuel for three 1-way flights from London to NYC every day. #JetFuel will be hard to decarbonize is an understatement. #OOTT

flightdeckfriend.com/ask-a-pilot/ho....

> **Dan Tsubouchi** @Energy_Tidbits · Mar 21
>
> "one of the largest ever sustainable aviation fuel deals" is only 1,400 b/d. reinforces challenge for hard to decarbonize #JetFuel. It's not just nowhere near cost competitive, @PPouyanne warned there isn't capacity for any big volume of #Biofuels. twitter.com/Energy_Tidbits... #OOTT

2 2

Dan Tsubouchi @Energy_Tidbits · Mar 21

Recognize today's Saudi warning on supply has a big Houthi element, but it's hard not to wonder what happened at Riyadh refinery. And with the new "temporary" reduction in YASREF refinery production at Yanbu. It may well be a warning supply of products has been impacted. #OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Mar 11
>
> Recognize "supply" isn't impacted but have to wonder if #Aramco refinery "operations" were impacted by the drone. Or it was just coincidence that an unusually large amount of diesel but also for immediate delivery just after the drone attack. #OOTT twitter.com/Energy_Tidbits...

5 9

Dan Tsubouchi @Energy_Tidbits · Mar 21

"one of the largest ever sustainable aviation fuel deals" is only 1,400 b/d. reinforces challenge for hard to decarbonize #JetFuel. It's not just nowhere near cost competitive, @PPouyanne warned there isn't capacity for any big volume of #Biofuels. twitter.com/Energy_Tidbits… #OOTT

> **Neste** @NesteGlobal · Mar 21
>
> We're proud of this milestone agreement with DHL to supply them with approximately 320,000 tons of Neste MY Sustainable Aviation Fuel™. #SAF is widely recognized as a crucial solution in mitigating the climate impact of aviation. ✨Read more: bit.ly/3wkyOxW #renewables

1 2 1

Dan Tsubouchi @Energy_Tidbits · Mar 21

Must read. Not the typical post #Houthi missile attack statement ie. doesn't impact #Aramco ability to be reliable supplier. So Why? Is Saudi warning on what could happen or inferring something did happen to abiltiy to deliver #Oil or #PetroleumProducts? Anyone know? #OOTT


ory.php?lang=en&newsid=2339207#2339207

it will not incur responsibility regarding any shortage of oil supply as its oil facilities are attacked

An official source in the Ministry of Foreign Affairs stated that the Kingdom of Saudi Arabia declares that it in oil supplies to global markets in light of the attacks on its oil facilities from the Iranian-backed terrorist H ortance of the international community realizing the gravity of Iran's continued behavior of equiping the ter iles, and advanced UAVs with which they target the Kingdom's production sites of oil, gas and refined prod d downstream sectors affecting the Kingdom's production capability and it's ability to fulfill its commitment ability of energy supplies to global markets.

the importance of the International community undertaking its responsibility to preserve the energy supplie t militias, deterring their malicious attacks that represents direct threat to the security of oil supplies in the e global energy markets.

4 4 16

Dan Tsubouchi @Energy_Tidbits · Mar 20

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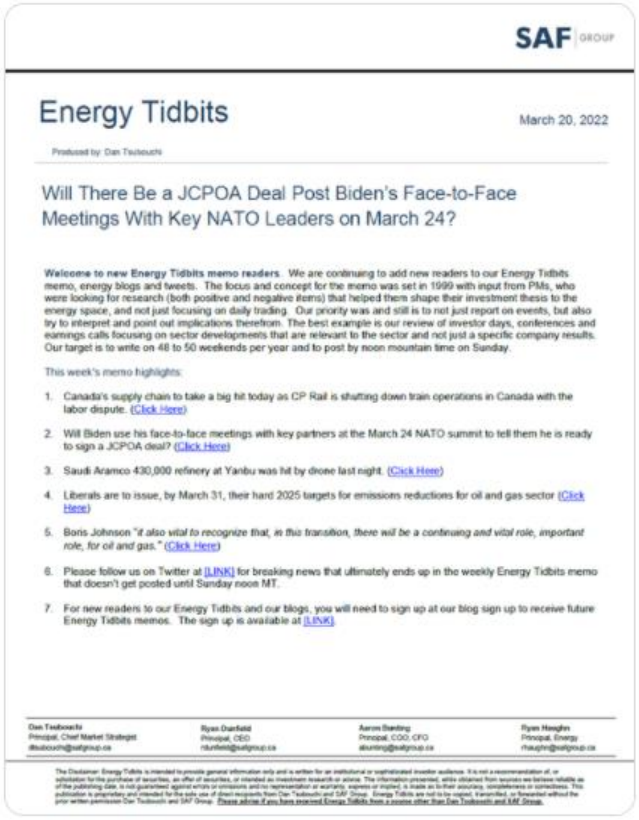

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