Energy Tidbits

Surely, It’s a Question of When, Not If, Shell FIDs What CEO Sawan Says is a “Very Attractive” LNG Canada Phase 2

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July 30, 2023

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bp and OMV sign a 10-year LNG supply agreement
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July 28, 2023

bp and OMV today announced the signing of a long-term sale and purchase agreement (SPA). Covering supply of up to 1 million tonnes of liquefied natural gas (LNG) per year for 10 years from 2026.

Under the terms of the agreement, bp will provide OMV with LNG from its diverse and global portfolio of LNG, which will be received and re-gasified through the Gate LNG Terminal in Rotterdam, the Netherlands, where OMV holds regasification capacity, or other terminals in Europe.

Alfred Stern, Chairman of the Executive Board and CEO of OMV AG, said “It is one of OMV’s key priorities to drive forward our ongoing diversification of supply sources that encompasses gas from our own production and external sources from Norway, as well as additional LNG volumes. In tandem with the recent news regarding our additional gas transport capacities until 2028, our agreement with bp reflects our significant contribution to the security of supply to our customers in Austria and Europe. Our partnership with bp, spanning a 10-year period from 2026 is an important strategic step towards diversifying and safeguarding our supply sources in the long-term.”

Jonty Shepard, VP Global LNG Trading & Origination at bp, said “At bp, we see LNG as an essential part of the energy transition and essential for our own pivot to becoming an integrated energy company. We are pleased to conclude this LNG sale and purchase agreement with OMV, with whom we have a longstanding relationship. Europe is a significant LNG market and this agreement with OMV further demonstrates our LNG supply capability in the region, supporting security of supply for our European customers.”

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About bp
bp’s purpose is to reimagine energy for people and our planet. It has set out an ambition to be a net zero company by 2050, or sooner and help the world get to net zero, and a strategy for delivering on that ambition. For more information visit bp.com.

Cautionary statement:
In order to utilize the 'safe harbor' provisions of the United States Private Securities Litigation Reform Act of 1995 (the 'PSLRA'), bp is providing the following cautionary statement. This press release contains

certain forward-looking statements – that is, statements related to future, not past events and circumstances – which may relate to one or more of the financial condition, results of operations and businesses of bp and certain of the plans and objectives of bp with respect to these items. These statements are generally, but not always, identified by the use of words such as 'will', 'expects', 'is expected to', 'aims', 'should', 'may', 'objective', 'is likely to', 'intends', 'believes', 'anticipates', 'plans', 'we see' or similar expressions. Actual results may differ from those expressed in such statements, depending on a variety of factors including the risk factors set forth in our most recent Annual Report and Form 20-F under "Risk factors" and in any of our more recent public reports.

Our most recent Annual Report and Form 20-F and other period filings are available on our website at www.bp.com, or can be obtained from the SEC by calling 1-800-SEC-0330 or on its website at www.sec.gov.

About OMV Aktiengesellschaft
With Group sales revenues of EUR 62 bn and a workforce of around 22,300 employees in 2022, OMV is amongst Austria's largest listed industrial companies.
In Chemicals & Materials, OMV through its subsidiary Borealis, is one of the world's leading providers of advanced and circular polyolefin solutions and a European market leader in base chemicals and plastics recycling. Together with its two major joint ventures – Borouge (with ADNOC, in the UAE and Singapore) and Baystar™ (with TotalEnergies, in the USA) – Borealis supplies products and services to customers across the globe. OMV's Fuels & Feedstock business produces and markets fuels as well as feedstock for the chemical industry, operates three refineries in Europe, and holds a 15% stake in a refining joint venture in the UAE. OMV operates around 1,700 filling stations in eight European countries. In the Energy segment, OMV explores and produces oil and gas in the four core regions of Central and Eastern Europe, Middle East and Africa, North Sea, and Asia-Pacific. Average daily production in 2022 amounted to 392 kboe/d. Its activities also include the Low Carbon Business as well as the entire gas business.

OMV intends to transition from an integrated oil, gas, and chemicals company to become a leading provider of innovative and sustainable fuels, chemicals, and materials, while taking a leading global role in the circular economy. By switching over to a low-carbon business, OMV is striving to achieve net zero in all three Scopes by 2050 at the latest.

OMV shares are traded on the Vienna Stock Exchange (OMV) and as American Depository Receipts (OMVKY) in the U.S.

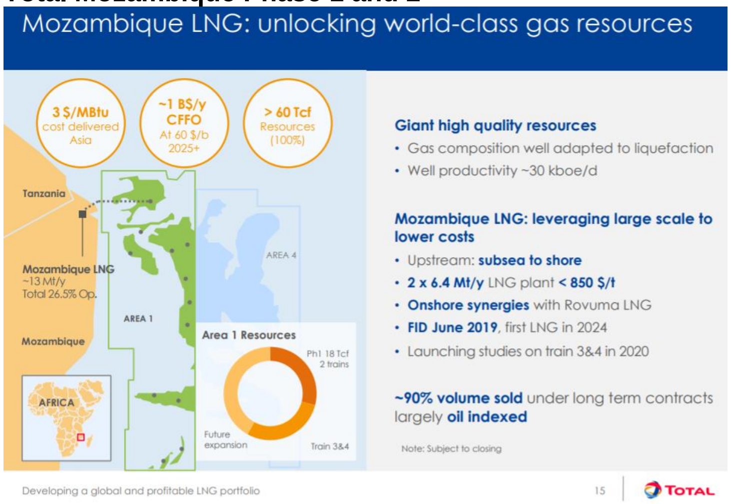
Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?

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



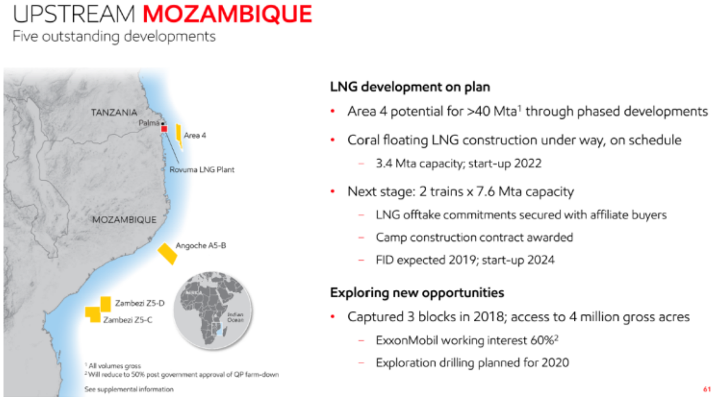
Source: Total Investor Day September 24, 2019

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

<u>We expect the IEA's blunt message that the gap is getting wider will be reinforced on May 18</u>. 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

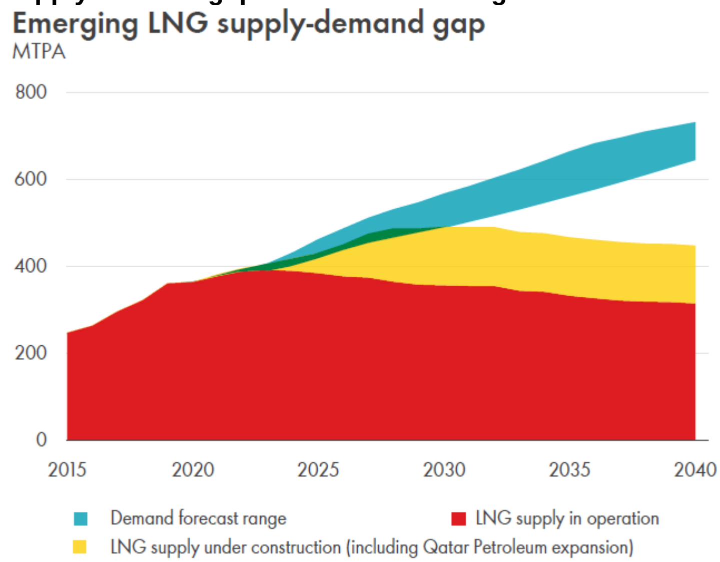
Source: IEA Tracking Clean Energy Progress, June 2020

<u>We are referencing Shell's long term outlook for LNG</u> 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.

<u>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</u> 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

<u>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..</u> 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.

<u>And does this bigger, nearer supply gap force LNG players to look at what brownfield LNG projects they could advance?</u> 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.

<u>Sea change in Asian LNG buyers is also the best validation of the LNG supply gap and big to LNG supply FIDs.</u> 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.

<u>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.</u> 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".*

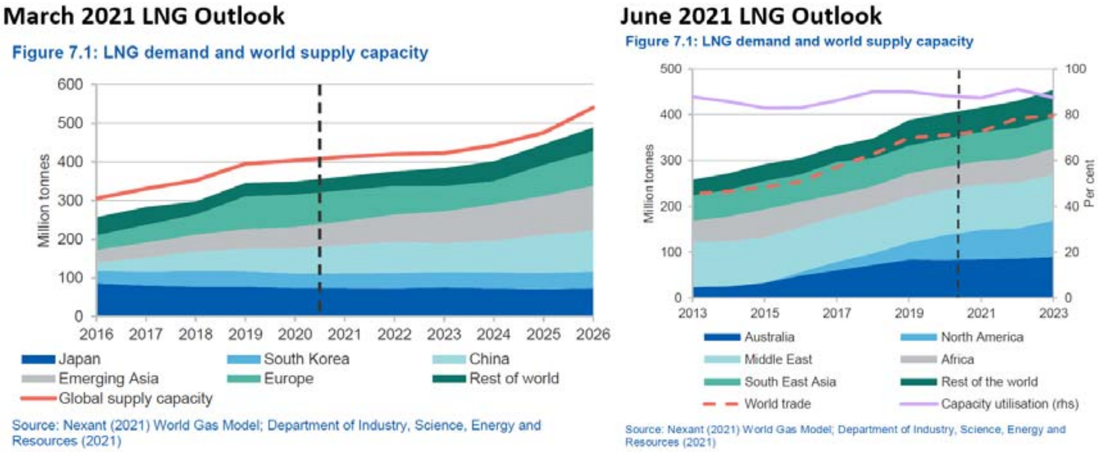
<u>There are other LNG supply delays/interruptions beyond Mozambique.</u> There have been a number of other smaller LNG delay or existing supply interruptions that add to Asian LNG buyers feeling less secure about the reliability of mid to long term LNG supply. Here are just a few examples. (i) Total 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

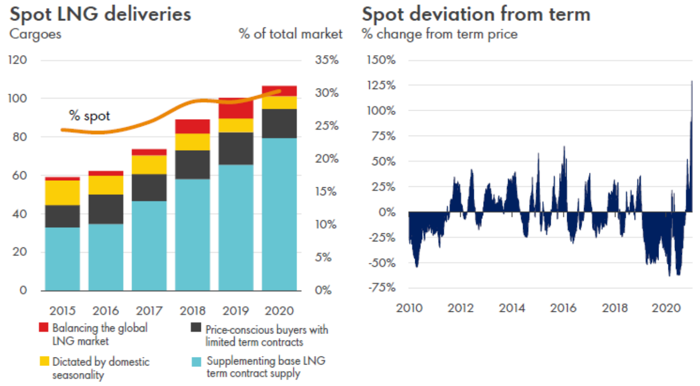


Source: Australia Resources and Energy Quarterly

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.

https://www.whitehouse.gov/briefing-room/statements-releases/2023/07/27/readout-of-national-security-advisor-jake-sullivans-trip-to-saudi-arabia/

JULY 27, 2023

Readout of National Security Advisor Jake Sullivan's Trip to Saudi Arabia

National Security Advisor Jake Sullivan traveled to Jeddah, Saudi Arabia on July 27, 2023 to meet with Prime Minister and Crown Prince Mohammed bin Salman and senior Saudi officials to discuss bilateral and regional matters, including initiatives to advance a common vision for a more peaceful, secure, prosperous, and stable Middle East region interconnected with the world. Mr. Sullivan also reviewed significant progress to build on the benefits of the truce in Yemen that have endured over the past 16 months and welcomed ongoing UN-led efforts to bring the war to a close. Both delegations agreed to maintain regular consultations and follow up on matters discussed throughout the day.

https://www.spa.gov.sa/en/b5e0c829cem

HRH Crown Prince Receives US National Security Advisor

Thursday 09/01/1445

Jeddah, July 27, 2023, SPA – His Royal Highness Prince Mohammed bin Salman bin Abdulaziz Al Saud, Crown Prince and Prime Minister, received in Jeddah today the US National Security Advisor, Jake Sullivan.

During the meeting, the two sides discussed the Saudi-US strategic relations and ways to enhance them in various fields, in addition to the latest regional and international developments of mutual concern.

The meeting was attended by Minister of Energy Prince Abdulaziz bin Salman, Minister of Defense Prince Khalid bin Salman, Saudi Arabia's Ambassador to the United States Princess Reema bint Bandar bin Sultan bin Abdulaziz, Minister of State, Member of the Cabinet and National Security Adviser Dr. Musaed bin Mohammed Al-Aiban, Minister of State and Cabinet Member Mohammad bin Abdulmalik Al Al-Sheikh and Governor of the Public Investment Fund (PIF) Yasir bin Othman Al-

Rumayyan.

The meeting was also attended by the US Ambassador to Saudi Arabia, Michael Ratney, National Security Council's (NSC) Middle East and North Africa Coordinator Brett McGurk, US Special Presidential Coordinator for Global Infrastructure and Energy Security Amos J. Hochstein, Legal Adviser to the National Security Council Jake Phillips and Senior Advisor to the National Security Ariana Berengaut.

-SPA

23:42 LOCAL TIME 20:42 GMT

0047

https://www.theatlantic.com/magazine/archive/2022/04/mohammed-bin-salman-saudi-arabia-palace-interview/622822/

GLOBAL

ABSOLUTE POWER

Asked about the murder of Jamal Khashoggi, Mohammed bin Salman said, “If that’s the way we did things, Khashoggi would not even be among the top 1,000 people on the list.”

By Graeme Wood

Photographs by Lynsey Addario

A woman walks past a poster showing Crown Prince Mohammed bin Salman (*left*) with his father (*right*) and grandfather (*top*), at the old market in Taif, Saudi Arabia. (Lynsey Addario for The Atlantic)

MARCH 3, 2022, 6 AM ET

SHARE

MOHAMMED BIN SALMAN, the crown prince of Saudi Arabia, is 36 years old and has led his country for almost five years. His father, the 86-year-old King Salman, has rarely been seen in public since 2019, and even MBS—as he is universally known—has faced the world only a few times since the pandemic began. Once, he was ubiquitous, on a never-ending publicity tour to promote his plan to modernize his father’s kingdom. But soon after the murder of the *Washington Post* columnist Jamal Khashoggi in 2018, MBS curtailed his travel. His last interview with non-Saudi press was more than two years ago. The CIA concluded that he had ordered Khashoggi’s murder, and Saudi Arabia’s own prosecutors found that it had been conducted by some of the crown prince’s closest aides. They are thought to have dismembered Khashoggi and disintegrated his corpse.

MBS had already developed a reputation for ruthlessness. In 2017, he rounded up hundreds of members of his own family and other wealthy Saudis and imprisoned them in Riyadh’s Ritz-Carlton hotel on informal charges of corruption. The Khashoggi murder fixed a view of the crown prince as brutish, thin-skinned, and psychopathic. Among those who share a dark appraisal of MBS is President Joe Biden, who has so far refused to speak with him. Many in Washington and other Western capitals hope his rise to the throne might still be averted.

But within the kingdom, MBS's succession is understood as inevitable. "Ask any Saudi, anyone at all, whether MBS will be king," a senior Saudi diplomat told me. "If there are people in Washington who think he will not be, then I cannot help them. I am not a psychiatrist."

His father's eventual death will leave him as the absolute monarch of the birthplace of Islam and the owner of the world's largest accessible oil reserves. He will also be the leader of one of America's closest allies and the source of many of its headaches.

I've been traveling to Saudi Arabia over the past three years, trying to understand if the crown prince is a killer, a reformer, or both—and if both, whether he can be one without the other.

Even MBS's critics concede that he has roused the country from an economic and social slumber. In 2016, he unveiled a plan, known as Vision 2030, to convert Saudi Arabia from—allow me to be blunt—one of the world's weirdest countries into a place that could plausibly be called normal. It is now open to visitors and investment, and lets its citizens partake in ordinary acts of recreation and even certain vices. The crown prince has legalized cinemas and concerts, and invited notably raw hip-hop artists to perform. He has allowed women to drive and to dress as freely as they can in dens of sin like Dubai and Bahrain. He has curtailed the role of reactionary clergy and all but abolished the religious police. He has explored relations with Israel.

He has also created a climate of fear unprecedented in Saudi history. Saudi Arabia has never been a free country. But even the most oppressive of MBS's predecessors, his uncle King Faisal, never presided over an atmosphere like that of the present day, when it is widely believed that you place yourself in danger if you criticize the ruler or pay even a mild compliment to his enemies. MBS's critics—not regicidal zealots or al-Qaeda sympathizers, just ordinary people with independent thoughts about his reforms—have gone into exile. Some fear that if he keeps getting his way, the modernized Saudi Arabia will oppress in ways the old Saudi Arabia never imagined. Khalid al-Jabri, the exiled son of one of MBS's most prominent critics, warned me that worse was yet to come: "When he's King Mohammed, Crown Prince MBS is going to be remembered as an angel."

For about two years, MBS hid from public view, as if hoping the Khashoggi murder would be forgotten. It hasn't been. But the crown prince still wants to convince the world that he is saving his country, not holding it hostage—which is why he met twice in recent months with me and the editor in chief of this magazine, Jeffrey Goldberg.

In our meetings, the crown prince was charming, warm, informal, and intelligent. But even at its most affable, absolute monarchy cannot escape weirdness. For our first meeting, MBS summoned us to a remote palace by the Red Sea, his family's COVID bunker. The protocols were multilayered: a succession of PCR tests by nurses from the Royal Clinics; a Gulfstream jet in the middle of the night from Riyadh; a convoy from a deserted airstrip; a surrender of electronic devices; a stopover at a mysterious guesthouse visible in satellite photos but unmarked on Google Maps. He invited us to his palace at about 1:30 a.m., and we spoke for nearly two hours.

For the second meeting, in his palace in Riyadh, we were told to be ready by 10 a.m. It also began after midnight. The halls were astir. The crown prince had just returned after nearly two years of remote work, and aides and ministers padded red carpets seeking meetings, their first in months, with the boss. Neglected packages and documents had piled up on the desks and tables in his office, which was large but hardly opulent. The most obvious concession to high taste was an old-fashioned telescope on a tripod, its altitude set shallow enough that it appeared to be pointed not at the heavens but at Riyadh, the sprawling and unsightly desert metropolis from which the Saud family has ruled for most of the past three centuries.

At the outset of both conversations, MBS said he was saddened that the pandemic precluded giving us hugs. He apologized that we all had to wear masks. (Each meeting was attended by multiple, mainly silent princes wearing identical white robes and masks, leaving us unsure, to this day, who exactly was present.) The crown prince left his tunic unbuttoned at the collar, in a casual style now favored by young Saudi men, and he gave relaxed, nonpsychopathic answers to questions about his personal habits. He tries to limit his Twitter use. He eats breakfast every day with his kids. For fun, he watches TV, avoiding shows, like *House of Cards*, that remind him of work. Instead, he said without apparent irony, he prefers to watch series that help him escape the reality of his job, such as *Game of Thrones*.

Before the meetings, I asked one of MBS's advisers if there were any questions I could ask his boss that he himself could not. "None," he answered, without pausing—"and that is what makes him different from every crown prince who has come before him." I was told he derives energy from being challenged.

MBS said it was "obvious" he had not ordered the killing of Khashoggi. "It hurt me a lot," he said. "It hurt me and it hurt Saudi Arabia, from a feelings perspective."

During our Riyadh encounter, Jeff asked MBS if he was capable of handling criticism. "Thank you very much for this question," the prince said. "If I couldn't, I would not be sitting with you today listening to that question."

"I'd be in the Ritz-Carlton," Jeff suggested.

"Well," he said, "at least it's a five-star hotel."

Difficult questions caused the crown prince to move about jumpily, his voice vibrating at a higher frequency. Every minute or two he performed a complex motor tic: a quick backward tilt of the head, followed by a gulp, like a pelican downing a fish. He complained that he had endured injustice, and he evinced a level of victimhood and grandiosity unusual even by the standards of Middle Eastern rulers.

When we asked if he had ordered the killing of Khashoggi, he said it was "obvious" that he had not. "It hurt me a lot," he said. "It hurt me and it hurt Saudi Arabia, from a feelings perspective."

"From a feelings perspective?"

"I understand the anger, especially among journalists. I respect their feelings. But we also have feelings here, pain here."

The crown prince has told two people close to him that "the Khashoggi incident was the worst thing ever to happen to me, because it could have ruined all of my plans" to reform the country.

In our Riyadh interview, the crown prince said that his *own* rights had been violated in the Khashoggi affair. "I feel that human-rights law wasn't applied to me," he said. "Article XI of the Universal Declaration of Human Rights states that any person is innocent until proven guilty." Saudi Arabia had punished those responsible for the murder, he said—yet comparable atrocities, such as bombings of wedding parties in Afghanistan and the torture of prisoners in Guantánamo Bay, have gone unpunished.

The CIA concluded that Mohammed bin Salman ordered the murder of the *Washington Post* columnist Jamal Khashoggi. Saudi Arabia's own prosecutors found that it had been conducted by some of the crown prince's closest aides. (Moises Saman / Magnum)

The crown prince defended himself in part by asserting that Khashoggi was not important enough to kill. "I never read a Khashoggi article in my life," he said. To our astonishment, he added that if he *were* to send a kill squad, he'd choose a more valuable target, and more competent assassins. "If that's the way we did things"—murdering authors of critical op-eds—"Khashoggi would not even be among the top 1,000 people on the list. If you're going to go for another operation like that, for another person, it's got to be professional and it's got to be one of the top 1,000." Apparently, he had a hypothetical hit list, ready to go. Nevertheless, he maintained that the Khashoggi killing was a "huge mistake."

"Hopefully," he said, no more hit squads would be found. "I'm trying to do my best."

If his best is not good enough for Joe Biden, MBS said, then the consequences of running a moralistic foreign policy would be the president's to discover. "We have a long, historical relationship with America," he said. "Our aim is to keep it and strengthen it." Biden and Vice President Kamala Harris have called for "accountability" for Khashoggi's murder, as well as the humanitarian disaster in Yemen, due to war between Saudi Arabia and Iranian-backed Houthi rebels. The Americans also refuse to treat him as Biden's counterpart—Biden's peer is the king, they insist—even though the crown prince rules the country with his father's blessing. This stings. MBS has lines open to the Chinese. "Where is the potential in the world today?" he said. "It's in Saudi Arabia. And if you want to miss it, I believe other people in the East are going to be super happy."

We asked whether Biden misunderstands something about him. "Simply, I do not care," he replied. Alienating the Saudi monarchy, he suggested, would harm Biden's position. "It's up to him to think about the interests of America." He gave a shrug. "Go for it."

Also risible to the crown prince was the notion that his citizens fear speaking out against him. We need dissent, he said, "if it's objective writing, without any ideological agenda." In practice, I noted, dissent seemed to be nonexistent. In September 2017, MBS ordered a boycott of Qatar, citing the country's support for the Iranian government, the Muslim Brotherhood, al-Qaeda, and other Islamist organizations in the region. His tiny neighbor suddenly transformed from official friend into official villain, and those expressing a kind word toward it disappeared into prison.

These sentiments, apparently, did not count as objective or nonideological. Qatar, MBS said, was comparable to Nazi Germany. "What do you think [would have happened] if someone was praising and trying to push for Hitler in World War II?" he asked. "How would America take that?" Of course Saudis would react strongly to Nazi sympathizers in their midst. Three years later, however, the countries reconciled, and the Saudi government tweeted out a photo of MBS and Hitler—that is, Qatari Emir Tamim Al Thani—wearing board shorts and smiling at MBS's Red Sea palace. "Sheikh Tamim's an amazing person," MBS said. The fight between them had been no big deal, "a fight between brothers." The relationship is now "better than ever in history." The dissenters remain in prison, however, and I do not mean the Ritz-Carlton.

As for the actual Ritz-Carlton prisoners: They had it coming, the crown prince said. Overnight he'd rounded up hundreds of the most prominent Saudis, delivered them to Riyadh's most lavish hotel, and refused to let them go until they confessed and paid up. I said that sounded like he was eliminating rivals. MBS looked incredulous. "How can you eliminate people who don't have any power to begin with?" If they had power, he would not have been able to force them into the Ritz.

Does Joe Biden misunderstand something about him? “Simply, I do not care,” MBS replied. “It’s up to him to think about the interests of America.” He gave a shrug. “Go for it.”

The Ritz operation, MBS said, was a blitzkrieg against corruption, and wildly successful and popular because it started at the top and did not stop there. “Some people thought Saudi Arabia was, you know, just trying to get the big whales,” MBS said. They assumed that after the government extracted settlements from the likes of Alwaleed bin Talal, the kingdom’s richest man, corruption at lower levels would resume. MBS noted, proudly, that even the minnows had been hooked. By 2019, everyone “understood that even if you steal $100, you’re going to pay for it.” In just a few months, he claims to have recovered $100 billion directly, and says that he will recover much more indirectly, as dividends of deterrence.

MBS acknowledged that to outsiders the Ritz operation may have looked thuggish. But to him it was an elegant, and by the way nonviolent, solution to the problem of vampires feasting on the kingdom’s annual budget. (An adviser to MBS told me that one alternative his aides had suggested was executing a few prominent corrupt officials.) During the months that the Ritz served as a prison, the kingdom’s financial regulator was essentially made king pro tempore, to devote the full power of the government to bleeding the vampires dry. But the Ritz guests had not, MBS said, been placed under arrest. That would imply that they had entered the court system and faced charges. Instead, he said, they had been invited to “negotiate”—and to his pleasure, 95 percent did so. “That was a strong signal,” he said. I’m sure it was.

THE SAUDI THRONE does not, like the British throne once did, just pass to the next male heir. The king chooses his successor, and ever since the founding king of the modern Saudi state, Abdulaziz, chose his son Saud as crown prince in 1933, each king has chosen another son of Abdulaziz. (He had 36 sons—with multiple wives and concubines—who survived to adulthood.) All were old enough to remember the camels-and-tents days, before extreme wealth, and they ruled conservatively, as if to lock in their gains. Even the shrewdest and most ambitious kings accomplished little. Abdullah, who took power in 2005, began as a reformer, but much of the momentum of the first half of his reign was lost as he doddered in the second, and the royal treasury was looted. (One notorious alleged thief in the Ritz, a major figure in the Royal Court, was said to have stolen tens of billions of dollars during His Majesty’s decline.)

Salman, the current king and at 86 one of the youngest of Abdulaziz’s brood, saw the perils of unchecked gerontocracy and anointed a successor from the next generation. His choice of Mohammed was not obvious. King Salman’s sons include Faisal, 51, who has a doctorate in international relations from Oxford; and Sultan, 65, a former Royal Saudi Air Force pilot who in 1985 spent a week on the space shuttle Discovery as a payload specialist. Either of these competent and educated men, citizens of the world, might have been a natural successor. But Salman had an inkling that the next king would need a certain grit and fluency with power that cannot be acquired in a seminar or a flight simulator. The new generation, born into luxury, tended to be soft, and the next king would need to be a modern version of a desert warlord like his grandfather.

Outside the immediate family, Salman considered his nephew Mohammad bin Nayef, who is known as MBN, appointing him crown prince in 2015, when he was 55. As a spymaster and security official in the 2000s, MBN had led the country’s domestic war against al-Qaeda, and in the process had become well connected with counterparts in Washington and London. In 2009, MBN was injured when an al-Qaeda bomber packed his underpants with explosives and approached him at an event.

Foreign governments considered MBN a safe pick: old enough but not too old, a proven fighter, respected overseas. But for Salman he was merely a throne-warmer for his son. (MBS had held no high office prior to his father’s coronation and needed a couple of years as defense minister to burnish his CV.) In 2017, Salman fired MBN. When you fire a prince, you fire all those who staked their fortunes on his rise; among the opponents of MBS are foreign governments who had planned for the reign of King MBN, and Saudis whose wealth and influence flowed from him. MBN’s chief adviser, Saad al-Jabri, fled to Canada. He alleges that MBS sent a team there to kill him. MBS's government alleges that al-Jabri stole a massive fortune and is bankrolling efforts to defame the crown prince. (Both parties deny the claims.) "MBN survived al-Qaeda," al-Jabri's son Khalid told me. "But he couldn't survive his own cousin."

Others have suggested Salman's younger brother Ahmed, a well-liked former deputy interior minister, as a throne-worthy alternative to MBS. Ahmed reportedly opposed MBS's appointment as crown prince. In 2020, he was arrested on suspicion of treason.

HAVING CONSOLIDATED POWER, MBS focused on Vision 2030. He is exasperated by the rest of the world's failure to acknowledge how well it has gone. "Saudi Arabia is a G20 country," he said. "You can see our position five years ago: It was almost 20. Today, we are almost 17." He noted strong non-oil GDP growth, and reeled off statistics about foreign direct investment, Saudi overseas investment, and the share of world trade that passes through Saudi waters. The economic success, the concerts, the social reform—these are all done deals, he said. "If we were having this interview in 2016, you would say I'm making assumptions," he said. "But we did it. You can see it now with your eyes."

He was not lying. Between my first visit to Saudi Arabia, in 2019, and this conversation two years later, I had gone to the movies in Riyadh and sat next to a Saudi woman I had never met. She wore jeans and canvas sneakers, and she bounced her bare ankle while we watched *Zombieland: Double Tap*. When I first visited, I ate at restaurants that had cinder-block walls dividing single men on one side from women and families on the other. These were sledgehammered down—a little Berlin 1989 in every restaurant—and now men and women can eat together without eliciting so much as a sideways glance from fellow diners.

Many of the crown prince's most persistent critics approve of these changes, and wish only that they had come sooner. (Khashoggi was such a critic. When I met him in London for brunch, shortly before his death, I asked him to list MBS's failings. He said "90 percent" of the reforms were prudent and overdue.) The most famous Saudi women's-rights activist, Loujain al-Hathloul, campaigned for women's right to drive, and against the Saudi "guardianship law," which prevented women from traveling or going out in public without a male relative. Al-Hathloul was thrown in prison on terrorism charges in 2018—*after* MBS and his father had announced the imminent end of both policies. In prison, her family says, she was electrocuted, beaten, and—this was just a few months before Khashoggi's murder—threatened with being chopped up and thrown in a sewer, never to be found. (The Saudi government has previously denied allegations of torturing prisoners.)

Left: Saudi Crown Prince Mohammed bin Salman is greeted by Qatar's Emir Sheikh Tamim Al Thani in Doha, Qatar, in 2021. *Center:* The Saudi activist Loujain al-Hathloul in 2021. *Right:* MBS and his father, King Salman, in 2017. (Saudi Press Agency / Reuters; Ahmed Yosri / Reuters; Saudi Press Agency / AP)

Al-Hathloul and other activists had demanded rights, and the ruler had granted them. Their error was in thinking those rights were theirs to take, rather than coming from the monarch, who deserved credit for having bestowed them. Al-Hathloul was released in February 2021, but her family says she is forbidden from traveling abroad or speaking publicly.

Another dissident, Salman al-Awda, is a preacher with a massive following. His original crime, too, was to utter publicly a thought that would later be shared by the crown prince himself. When MBS began squabbling with his counterpart in Qatar, al-Awda tweeted, “May God harmonize between their hearts, for the good of their people.” He was imprisoned, and actual harmony between the two leaders has not freed him. His son Abdullah, now in the United States, claims that his father, who is 65, is being held in solitary confinement and has been tortured.

The crown prince, one of his admirers told me, “put the Wahhabis in a cage, then he reached in with gardening shears and he cut their balls off.”

Saudi authorities say al-Awda is a terrorist and a member of the Muslim Brotherhood, which is supported by Qatar and intent on overthrowing the monarchy and replacing it with a theocracy. (The Muslim Brotherhood plays a bogeyman role in the Saudi imagination similar to the role of Communists in America during the Red Scare. Also like Communists, the Muslim Brotherhood really has worked covertly to undermine state rule, just not to the extent imagined.) Al-Awda’s defenders say he is being punished for daring to speak with a moral voice independent of the monarchy’s. He faces death by beheading.

Would MBS consider pardoning those who’d spoken out in favor of women driving and normalization with Qatar—both now the policy of the country? “That’s not my power. That’s His Majesty’s power,” MBS said. But, he added, “no king has ever used” the pardon power, and his father does not intend to be the first.

The issue, he said, is not a lack of mercy. It is a problem of balance. Yes, there are liberals and kumbaya types who have run afoul of state security—and perhaps some could be candidates for a royal pardon. But some of the others in his jails are bad hombres indeed, and pardons cannot be meted out selectively. “You have, let’s say, extreme left and extreme right,” he said. “If you give forgiveness in one area, you have to give it to some very bad people. And that will take everything backward in Saudi Arabia.”

Left: Saudi women attend a live music performance in Riyadh in January. The crown prince has legalized cinemas and concerts and permitted women to dress as freely as they can in places like Dubai and Bahrain. *Bottom:* A tenth-grade girls’ basketball team in Jeddah. Until recently, a man would have been forbidden to coach a girls’ team. (Lynsey Addario for *The Atlantic*)

On one side are liberals, tugging on the sympathies of Westerners; on the other, Islamists who are also opposed to the monarchy. Letting this latter group out would not just mean the end of rock concerts and coed dining. They would not stop until they brought down the House of Saud, seized the country’s estimated 268 billion barrels of oil and the holy cities of Mecca and Medina, and established a terrorist state. In private conversations with others, MBS has likened Saudi Arabia before the Saud family’s conquest in the 18th century to the anarchic wasteland of the *Mad Max* films. His family unified the peninsula and slowly developed a system of law and order. Without them, it would be *Mad Max* all over again—or Afghanistan.

Still, the crown prince's argument—that if he extended forgiveness to good people who deserved it, he would have to extend it equally to bad people who did not—struck me as bizarre. Why would one require the other? Then I realized that MBS was not saying that the failure of his plan to remake the kingdom *might* lead to catastrophe. He was saying that he'd guarantee it would. Many secular Arab leaders before him have made the same dark implication: Support everything I do, or I will let slip the dogs of jihad. This was not an argument. It was a threat.

ALI SHIHABI, A Saudi financier and pro-MBS commentator, told me that the changes in Saudi Arabia could be compared to those in revolutionary France. An old order had been overturned, a priestly class crushed; a new order was struggling to be born.

The priestly class in particular interested me. The brand of conservative Islam practiced in Saudi Arabia—called Wahhabism, after the sect's 18th-century founder, Muhammad ibn Abd al-Wahhab—once wielded great power and enjoys at least some popular support. I asked Shihabi if MBS really had diminished the Wahhabis' role. "Diminished their role?" Shihabi asked me. "He put the Wahhabis in a cage, then he reached in with gardening shears"—here he made the universal *snip snip* gesture with his fingers—"and he cut their balls off."

My flight into Riyadh was packed with foreigners attending Stan Lee's Super Con. Ahead of me in the passport line I saw Lou Ferrigno, the Incredible Hulk.

In France, revolution worked out just as badly for the House of Bourbon as it did for the clergy. (Diderot famously wrote that the entrails of the priests would be woven into ropes to strangle kings.) The House of Saud wanted the anticlerical revolution while conveniently omitting the antiroyalist one. I wanted to see how that alliance between monarch and sansculottes was working.

Vision 2030 made modernization easier to observe now than it would have been just a few years ago. Until October 2019, tourist visas to Saudi Arabia did not exist. Then the Saudis realized that to attract crowds to the concerts they had legalized, they'd need to let in visitors. Overnight, a visa to Saudi Arabia went from one of the hardest in the world to get to one of the easiest. In minutes I had one valid for a whole year. My flight into Riyadh was packed with foreigners attending Stan Lee's Super Con. Ahead of me in the passport line I saw Lou Ferrigno, the Incredible Hulk, on his way to an autograph signing.

The new system arrived so fast that the first visitors were like an invasive species, an unnatural fit in the rigid social order of the kingdom. For years, almost every non-Saudi in the country had needed a document called an *iqama*. It was a sort of license to exist: Your *iqama* identified your Saudi patron, the local national whom you were visiting or working for, and who controlled your fate. Every Saudi patron had his own patron, too—sometimes a tribal leader, sometimes a regional one. Even those bigwigs paid obeisance to someone and, eventually, by the transitive property of Saudi deference, to the king himself. Saudi Arabia, MBS explained, "is not one monarchy. You have beneath it more than 1,000 monarchies—town monarchies, tribal monarchies, semitribal monarchies." The *iqama* guaranteed that every sentient creature fit into this scheme of Saudi society.

MBS batted away my suggestion that this system is antiquated and might be replaced with a constitutional monarchy—one where citizens have freestanding rights not granted by a monarch or a demi-monarch. "No," he said. "Saudi Arabia is based on pure monarchy," and he, as crown prince, would preserve the system. To remove himself from it would amount to a betrayal of all the monarchies and Saudis beneath him. "I can't stage a coup d'état against 14 million citizens."

But he has already forced that system to adapt. Nearly every day someone asked for my *iqama*, and I had to explain that I had none. They reacted as if I'd told them that I had no name. Renting a car, buying a train ticket, checking into a hotel—all of these interactions left some poor clerk baffled. But in the new Saudi Arabia I was free to wander, to listen, to overhear.

Left: Men talk over coffee in Riyadh. *Right:* Young women at a Formula E racing event. (Lynsey Addario for *The Atlantic*)

In Riyadh I found, effortlessly, young people thrilled by the reforms. Like the other major Saudi cities, Dammam and Jeddah, Riyadh has specialty coffee shops in abundance—little outposts of air-conditioning and caffeine, in an environment otherwise characterized by heat and boredom. Many of the Saudis I met professed a deep love for America. "I spent seven years at Cal State Northridge," one told me, before rattling off a list of cities he had visited. He was one of several hundred thousand Saudi students who'd attended U.S. universities on government scholarships in the 2000s. "I studied finance," he said. "But I never graduated. I had a wonderful time." He listed his American friends, who had names like Mike and Emilio. "I drank and did too much meth, and my grades weren't good."

"Is it possible to do just the right amount of meth?" I asked.

"When I came back, I stopped." He looked out the window of the coffee shop at the parched cityscape. "This country is the best rehab center on the planet."

Now he was studying again, at a Saudi university, and planning to open his own business. He had already attended concerts, and he said his fondest wish was to listen to music in the open air and smoke a joint—just one, he promised. He asked if I thought that would happen. I said I did not think that was explicitly part of Vision 2030, but he'd probably get his wish. Later, with him in mind, I asked the crown prince whether alcohol would soon be sold in the kingdom. It was the only policy question that he refused to answer.

In another café, in the northern city of Ha'il, a man pointed to a mural, freshly painted, of the Lebanese singer Fairouz, her hair flowing beautifully over her shoulders. Next to her were her lyrics (in Arabic): "Bring me the flute and sing, for song is the secret to eternity."

"One year ago," he said, "that would not be possible." By "that," he meant pretty much everything: a woman's hair; a celebration of song; a celebration of a song about singing; and, on top of all this, the music playing in the café as we spoke. Before the rise of MBS, every component of this scene would have violated long-standing canons of Saudi morality enforcement. The religious police, known in Arabic as the *hay'a* or *mutawwi'in*, would have busted the joint. They used to show up in ankle-length white *thobes*, their beards curly and unkempt. They yelled at people for dressing immodestly, or thwacked at them with sticks to goad them to the mosque for one of the five daily prayers. For the flagrancy of the Fairouz sins, the café's managers would have been detained, questioned, and punished. "Screw those guys," the man said, in a succinct expression of the most common sentiment I heard about the religious police.

Encounters with the *hay'a* have provided many an appalling story for foreign visitors. When Maureen Dowd of *The New York Times* went to Riyadh in 2002, the *hay'a* spotted her in a shopping mall and objected to being able to see the outline of her body. Her host, the future foreign minister Adel al-Jubeir, pleaded with them, but they were unimpressed by his status as a prominent diplomat, and she fled to her hotel room. "I fretted that I was in one of those movies where an American makes one mistake in a repressive country and ends up rotting in a dungeon," Dowd wrote.

"Saudi Arabia is based on pure monarchy," MBS said. To remove himself from that system would amount to a betrayal of all the Saudis beneath him. "I can't stage a coup d'état against 14 million citizens."

I told one of MBS's advisers that the religious police had been an international PR problem. "May I be impolite?" he asked me. "I don't give a fuck about the *foreigners*. They terrorized *us*." He likened the religious police to J. Edgar Hoover's FBI, operating with unchecked authority. (The religious police's official Arabic name dates back hundreds of years, but still sounds Orwellian in English: the Committee for the Prevention of Vice and Promotion of Virtue.) Anyone who wished to drag down a professional or political rival could scrutinize him for sins, then call the religious police to set up a sting. Or the *hay'a* could flex its authority on its own, either for political reasons—toppling a prince they disliked—or for recreation.

"The religious police were the losers in school," Ali Shihabi told me. "Then they got these jobs and were empowered to go and stop the cute girls, break into the parties no one wanted them at, and shut them down. It attracted a very nasty group of people." The Saudi diplomat told me that he did not miss them, and that Saudi Arabia had needed someone with the crown prince's mettle to get rid of them. "When someone hits you because he does not like what you are wearing," he said, "that is not just a form of harassment. It is abuse."



Left: Golf at the Boulevard in Riyadh. *Right:* A couple, newly engaged, dine at a restaurant in Jeddah in January. In the recent past, many restaurants had cinder-block walls dividing single men on one side from women and families on the other. (Lynsey Addario for *The Atlantic*)

MBS ordered the religious police to stand down, and one of the enduring mysteries of contemporary Saudi Arabia is what these thwackers do, now that they are invisible on the streets. Fuad al-Amri, who runs the *hay'a* in Mecca province, confessed to me that since the reforms, one of his main activities has been vetting his own employees, to ensure that they aren't fanatics loyal to the Muslim Brotherhood.

MBS'S GRANDFATHER KING Abdulaziz founded the modern Saudi state with the support of the clergy. But he also cracked down on them, hard, when they outlived their usefulness. MBS has recounted a famous anecdote about his grandfather. In 1921, Abdulaziz attended the funeral of the most senior religious scholar in the kingdom. The king told the assembled clerics that they were dear to his heart—in the Arabic idiom, "on my *iqal*," the black cord that holds a Najd headdress in place. But then he warned them: "I can always shake my *iqal*," he said, "and you will fall."

For the past 50 years, Abdulaziz's successors have taken a softer line with the Wahhabis. The Saudi clerical class's power grew, and their imprimatur mattered. In 1964, they sealed the fate of the inept King Saud when his brothers Faisal and Mohammed sought and received religious approval for ousting him. To oppose the religious conservatives was risky. Peter Theroux, a former National Security Council director who worked on the Saudi portfolio during the 2000s, recalls being aghast at the vicious sermons still being preached by government-paid imams years after September 11. Theroux told me he confronted a senior Saudi official about the sermons. "You know," the official apologized, "the big beards are kind of our constituency." The rulers of Saudi Arabia put almost no limits on the speech or behavior of conservative clerics, and in return those clerics exempted the rulers from criticism. "That was the drug deal that the Saudi state was based upon for many years," Theroux told me. "Until Mohammed bin Salman."

Who could resist cheering on MBS as he renegotiated this relationship? One of MBS's most persistent critics in Washington, Senator Chris Murphy, a Democrat from Connecticut, told me the concerts and Comic-Cons in Riyadh have not yet translated into defunding Wahhabi intolerance overseas. "When I'm traveling the world, I still hear story after story of Gulf money and Saudi money fueling very conservative, intolerant Wahhabist mosques," he said. A hallmark of traditional Wahhabism is hatred for non-Wahhabi Muslims, whom the Wahhabis view as even worse than unbelievers for perverting the faith. With little modification, Wahhabi teachings can lead to Osama bin Laden–style jihadism. Murphy said he thinks that isn't over. "The money that flows from Saudi Arabia into conservative Islam isn't as transparent as it was 10 years ago—much of it has been driven underground—but it still exists."

Yet after spending hours in MBS's company, and in the company of his allies and enemies, I was convinced that neutering the clergy was not just symbolic. He was fighting them avidly, and personally. "The kings have historically stayed away from religion," Bernard Haykel, a scholar of Islamic law at Princeton and an acquaintance of MBS's, told me. Outsourcing theology and religious law to the big beards was both an expedient and a necessity, because no ruler had any training in religious law, or indeed a beard of any significant size.

By contrast, MBS has a law degree from King Saud University and flaunts his knowledge and dominance over the clerics. "He's probably the only leader in the Arab world who knows anything about Islamic epistemology and jurisprudence," Haykel told me.

“In Islamic law, the head of the Islamic establishment is *wali al-amr*, the ruler,” MBS explained. He was right: As the ruler, he is in charge of implementing Islam. Typically, Saudi rulers have sought opinions from clerics, occasionally leaning on them to justify a policy the king has selected in advance. MBS does not subcontract his religion out at all.

He explained that Islamic law is based on two textual sources: the Quran and the Sunna, or the example of the Prophet Muhammad, gathered in many tens of thousands of fragments from the Prophet’s life and sayings. Certain rules—not many—come from the unambiguous legislative content of the Quran, he said, and he cannot do anything about them even if he wants to. But those sayings of the Prophet (called Hadith), he explained, do not all have equal value as sources of law, and he said he is bound by only a very small number whose reliability, 1,400 years later, is unimpeachable. Every other source of Islamic law, he said, is open to interpretation—and he is therefore entitled to interpret them as he sees fit.

The effect of this maneuver is to chuck about 95 percent of Islamic law into the sandpit of Saudi history and leave MBS free to do whatever he wants. “He’s short-circuiting the tradition,” Haykel said. “But he’s doing it in an Islamic way. He’s saying that there are very few things that are fixed beyond dispute in Islam. That leaves him to determine what is in the interest of the Muslim community. If that means opening movie theaters, allowing tourists, or women on the beaches on the Red Sea, then so be it.”

MBS rebuked me when I called this attitude “moderate Islam,” though his own government champions the concept on its websites. “That term would make terrorists and extremists happy.” It suggests that “we in Saudi Arabia and other Muslim countries are changing Islam into something new, which is not true,” he said. “We are going back to the core, back to pure Islam” as practiced by Muhammad and his four successors. “These teachings of the Prophet and the four caliphs—they were amazing. They were perfect.”

Even the Islamic law that he is bound to implement will be implemented sparingly. MBS told me a story, reported in Hadith, about a woman who commits fornication, confesses her crime to the Prophet, and begs to be executed. The Prophet repeatedly tells her to go away—implying, the crown prince said, that the Prophet preferred to give sinners every chance at lenience. (MBS did not relate the end of the tale: The woman returns with indisputable evidence of her sin—a bastard son—and the Prophet acquiesces. She is buried to her chest and stoned to death.)

Instead of hunting for sin and punishing it as a matter of course, MBS has curtailed the investigative function of the religious police, and encourages sinners to keep their transgressions between themselves and God. “We should not try to seek out people and prove charges against them,” he said. “You have to do it the way that the Prophet taught us how to do it.” The law will be enforced only against those so flagrant that they are practically demanding to take their lumps.

He also stressed that none of these laws applies to non-Muslims in the kingdom. “If you are a foreign person who’s living or traveling in Saudi Arabia, you have all the right to do whatever you want, based on your beliefs,” he said. “That’s what happened in the Prophet’s time.”

It is hard to exaggerate how drastically this sidelining of Islamic law will change Saudi Arabia. Before MBS, influential clerics issued fatwas exhibiting what might charitably be called a pre-industrial view of the world. They declared that the sun orbited the Earth. They forbade women from riding bikes (“the devil’s horses”) and from watching TV without veiling, just in case the presenters could see them through the screen. Salih al-Fawzan, the most senior cleric in the kingdom today, once issued a chillingly anti-American fatwa forbidding all-you-can-eat buffets, because paying for a meal without knowing what you’ll be eating is akin to gambling.

Some of the clerics may have given in because they were convinced by the crown prince's legal interpretations. Others appear to have succumbed to good old-fashioned intimidation. Formerly conservative clerics will look you in the eye and without hesitation or scruple speak in Stepfordlike coordination with the government's program. The minister of Islamic affairs and guidance, normally an unsmiling type, now cheerily defended the opening of cinemas and mass layoffs of Wahhabi imams. I liked him immediately. His name, Abdullatif Al Asheikh, indicates that he is descended from a long line of stern moralists going back to Muhammad ibn Abd al-Wahhab himself. I told him I had seen the *Zombieland* sequel in his country, and if Woody Harrelson reprised his role in *Zombieland 3*, I would return to Riyadh so we could go to a theater and watch it together. "Why not?" he replied.

Mohammad al-Arefe, a preacher known for his good looks and conservative views, mysteriously began promoting Vision 2030 after a meeting with MBS in 2016. Previously, he had preached that Mada'in Saleh, a spectacular pre-Islamic archaeological site in northwest Saudi Arabia, was forbidden to Muslim tourists. God had struck down the civilization that once lived there, and the place was forever to remain a reminder of his wrath. The conventional view held that Muslims should follow the Prophet's warning to stay away from Mada'in Saleh, but if they absolutely must pass through, they should cast their gaze downward and maintain a fearful demeanor toward the Almighty. Then, in 2019, al-Arefe appeared in what seemed, to me, like some sort of hostage video, filmed by the Saudi tourism authority, lecturing about the site's history and inviting all to enjoy it. If he was displaying a fearful demeanor, it was not toward the Almighty.

IN THE SMALLER CITIES it isn't clear how quickly modernization is catching on. I visited Buraydah, the capital of Qassim, the most conservative part of the country. In two days, every woman I saw wore a black, flowing abaya. I attended the opening of a new shopping mall and showed up early to watch the crowds arrive. The sexes separated themselves without discussion: women in the front, all in black, near the stage where children recited poems and sang; men, in white *thobes*, in the back of the audience and on the sides. The process was unconscious and organic, but to an outsider remarkable, as if salt and pepper were shaken out onto a plate, and the grains slowly and perfectly segregated themselves. Cultural practices decades or centuries old do not yield suddenly.

Taif, a city an hour outside Mecca, was once the summer residence of the king and his family. The Prophet is thought to have visited there, and many Muslims supplement their pilgrimages to Mecca with side trips to other sites from the Prophet's life. The Wahhabis have, historically, treated these visits as un-Islamic and reprehensible. Whenever pilgrimage sites have fallen into Wahhabi hands, they have methodically and remorselessly destroyed them by leveling monuments, grave markers, and other structures sacred to Muslims in other traditions.

One morning I took a long walk to a mosque where the Prophet is said to have prayed. On arrival I found a building in disrepair, fenced off by rusty wire, with parts of it reduced to rubble. A sign at this site, posted by the Ministry of Islamic Affairs, noted in Arabic, Urdu, Indonesian, and English that the historical evidence for the Prophet's visit was uncertain. It suggested, further, that "to feel an adoring reverence or regard toward these places is a kind of heresy and fabrication in religion," an innovation not sanctioned by God that "leads to polytheism."

Later, I met Mohammad al-Issa, formerly the minister of justice under King Abdullah and now, as secretary-general of the Muslim World League, an all-purpose interfaith emissary for his country. In the past, Saudi clerics inveighed against infidels of all types. Now al-Issa spends his time meeting Buddhists, Christians, and Jews, and trying to stay ahead of the occasional surfacing of comments he made in less conciliatory times. I asked him about the site, and whether Saudi Arabia's new tolerance—which he emphasizes so energetically overseas, with non-Muslims—would apply domestically. He assured me that it already did. "If in the past there were some mistakes, now there is correction," al-Issa said. "Everyone has the right to visit the historic places, and there is a lot of care given to them."

"But the signs are still up," I said.

"Maybe they are there to remind people to be respectful," he suggested. "You see signs like that at sites all over the world: 'Don't touch or take the stones.'"

But these signs are not meant to preserve the ruins. They are there to remind you that you are wicked for visiting at all.

A mosque in Taif where the Prophet Muhammad is said to have prayed. A sign posted by the Ministry of Islamic Affairs notes that the historical evidence for the Prophet's visit is uncertain, and warns that "to feel an adoring reverence or regard toward these places is a kind of heresy." (Lynsey Addario for *The Atlantic*)

The day after my trip to the mosque, I stopped by a Starbucks in Taif. It was early afternoon. When I pulled the door handle, it clunked—the shop was closed for prayer, just as it would have been if the religious police had been enforcing prayer times.

As I waited outside alone, a small police truck pulled up behind me. The police officer salaamed me, and I responded in Arabic. Only after a short interrogation ("What are you doing here? Why are you here?") did he discover that I was American—not, as I think he suspected, Filipino—and apologize awkwardly and leave. It took me a minute to realize what had happened: The religious police have stood down, and the ordinary police have stood up in their place. The conservatism in society has not gone away. In some places, it has just undergone a costume change.

THESE LINGERING MANIFESTATIONS of intolerance illustrate what MBS's critics say is his ultimate error: Even a crown prince can't change a culture by fiat.

Belated realization of this error might be behind the grandest and most improbable of his projects. If existing cities resist your orders, just build a new one programmed to do your bidding from the start. In October 2017, MBS decreed a city in a mostly uninhabited area on the Gulf of Aqaba, adjacent to Egypt's Sinai Peninsula, the southwestern edge of Jordan, and the Israeli resort town Eilat. The city is called Neom, from a violent collision between the Greek word *neos* ("new") and the Arabic *mustaqbal* ("future").

At present, little exists but an encampment for the employees of the Neom project, a small area of tract housing. Regular buses take them to shop in the nearest city, Tabuk, which is itself a city only by the standards of the vacant, rock-strewn desert nearby. (If you recall the early scenes of *Lawrence of Arabia*, when a lonely camel-borne Peter O'Toole sings "The Man Who Broke the Bank at Monte Carlo" to the echoes of a sandstone canyon, then you know the spot.) The ambitions for this settlement are vast. Neom's administrators say they expect it to attract billions of dollars in investment and millions of residents, both Saudi and foreign, within 10 to 20 years. Dubai grew at a similar pace in the 1990s and 2000s. MBS said Neom is "not a copy of anything elsewhere," not a xerox of Dubai. But it has more in common with the great globalized mainstream than with anything in the history of a country that, until recently, was remarkably successful at walling off its traditional culture from the blandishments of modernity.

For a few hours, the Neom team showed me around and made grandiose promises about the future. Neom would lure its investors, I gathered, by creating the ideal regulatory environment, stitched together from best practices elsewhere. The city would profit from central planning. When New York or Delhi want to grow, they choke on their own traffic and decrepit infrastructure. Neom has no inherited infrastructure at all. The centerpiece of the project will be "The Line"—a 106-mile-long, very skinny urban strip connected by a single bullet train that will travel from end to end in 20 minutes. (No train capable of this speed currently exists.) The Line is intended to be walkable—the train will run underground—and a short hike perpendicular to its main axis will take you into pristine desert. Water will be desalinated; energy, renewable.

So far, Neom is less a city than an urbanist cargo cult. The practicalities can come later, or not at all. (The projected cost is in the hundreds of billions of dollars, a huge sum even for Saudi Arabia.) But many good ideas look crazy at first. What struck me was that Neom's vision is really an anti-vision. It is the opposite of the old Saudi Arabia. In the old Saudi Arabia, and even to an extent today, corruption and bureaucracy layered on each other to make an entrepreneur's nightmare. Riyadh has almost no public transportation. No matter where you are, you cannot walk anywhere, except perhaps to your local mosque. No one in Neom mentioned religion at all. Even Neom's location is suggestive. It is far from where Saudis actually live. Instead it is huddled in a mostly empty corner, as if seeking sustenance and inspiration from Jordan and Israel.

Seen this way, Neom is MBS's declaration of intellectual and cultural bankruptcy on behalf of his country. Few nations have as many carried costs as Saudi Arabia, and Neom zeroes them out and starts afresh with a plan unburdened by the past. To any parts of the kingdom that cling to their old ways, it promises that the future is everything they are not. And the future will wait only so long.

DURING THE 1990S AND 2000S, Saudi Arabia was a net exporter of vision, but it was a jihadist vision. The standard narrative, now accepted by the Saudi state itself, is that the kingdom was seduced by conservative Islam, and eventually the jihadists it sent overseas (most famously Osama bin Laden) redirected their efforts toward the Saudi monarchy and its allies. Fifteen of the 19 hijackers on 9/11 were Saudi citizens.

"A series of things happened that made the Saudis realize they couldn't keep playing the game they had been playing," Philip Zelikow, a State Department official under George W. Bush and the executive director of the 9/11 Commission, told me. The years of violence that followed 9/11 shocked the Saudis into realizing that they had a reckoning coming, though only after jihadists began attacking in the kingdom itself did the government move to crush them. What the Saudis did not have was a plan to redirect the jihadists' energy. "They needed to have some story of what kind of country they were going to be when they grew up," Zelikow said. Jihadism would not be that story. But there was no immediate alternative, either for society or for the individuals attracted to jihadism. Saudi Arabia was left to do what most other countries, including the United States, have done, which is to imprison terrorists until they grow too old to fight.



Left: The aftermath of an al-Qaeda bombing in Riyadh in 2003. Only after jihadists began attacking in the kingdom did the government move to crush them. *Right:* Saudi Special Security Forces at the Counterterrorism Training School in Riyadh in 2013. (Lynsey Addario)

Last year, Saudi officials informed me that the crown prince had a new plan to deprogram jihadists. One morning they sent a convoy of state-security SUVs to my hotel, and with lights flashing, we left behind the glassy skyscrapers of the capital and continued along one of the straight, hypnotic roads radiating from Riyadh to nowhere. An hour later, we turned off at an area called al-Ha'ir and went through a security checkpoint.

Ha'ir is a state-security prison, run by the Saudi secret police, which means that its prisoners are not car thieves and check forgers but offenders against the state. They include jihadists from al-Qaeda and the Islamic State—I met at least a dozen of each—as well as softer Islamists, like Salman al-Awda, the cleric.

We drove past the checkpoint and through the gates, into a windswept compound coated in a film of light-brown dust, like tiramisu. We were met by the director of state-security prisons, Muhammad bin Salman al-Sarrah, and what appeared to be a television crew of at least half a dozen men, each bearing a microphone or a camera. I worried about what would happen next. Newsworthy events inside the walls of terrorist prisons tend not to be good. Lurking in the background were several bearded men in identical gray business suits.

During the 1990s and 2000s, Saudi Arabia was a net exporter of vision, but it was a jihadist vision. Fifteen of the 19 hijackers on 9/11 were Saudi citizens.

Al-Sarrah, it turned out, was a real jihadism nerd, and over tea we reminisced about various luminaries in the history of Saudi terror. After this small talk, he invited me to join him in an auditorium that could have been a lecture hall on a small college campus. Shutters clicked as the cameramen followed.

In the auditorium, the men in suits took the stage. Their leader, a man named Abdullah al-Qahtani, explained that he and most of the others in the room were prisoners, and that they had a PowerPoint presentation they wished to show me about the enterprise they were running in the prison. The camera crew was made up of prisoners too, and they were documenting my visit for imprisoned members of jihadist sects.

What followed was the most surreal slide deck I have ever seen: a corporate org chart and plans for a set of businesses run from within the prison by jihadists and other enemies of the state. Al-Qahtani spoke in Arabic, translated by an excitable counterpart nearby.

The org chart showed CEO al-Qahtani at the top, with direct reports from seven offices beneath him, among them financial, business development, and "programs' affairs." Under the last of these was another sub-office, "social responsibility."

Al-Qahtani explained that 89 percent of the prison population had taken part in the program so far. In a way, it was like any other prison-industry program; in the United States, prisoners staff call centers, raise tilapia, or just push brooms in the prison corridor for a dollar an hour. But the Ha'ir group, doing business as a company called, simply, Power, was aggressively corporate and entrepreneurial.

Al-Qahtani and the interpreter took me to a small garden, where prisoners cultivated peppers under plastic sheeting and raised bees and harvested their honey to sell at the prison shop, in little jars with the Power logo. They operated a laundromat and presented me with a price list. The prison will clean your clothes for free, they said, but staff and inmates alike could bring clothes here for special services, such as tailoring, for a fee. I could see shirts, freshly laundered and pressed, with prisoner numbers inked into the collars. Each number started with the year of entry on the Islamic calendar. I saw one that started in 1431, about 12 years ago.

Almost all the men wore thick beards, and many had a *zabiba* (literally "raisin"), the discolored, wrinkly spot one gets from pressing the head to the ground in prayer. Some of their products were artisanal and religious-themed. They led me into a tiny room, a factory for the production of perfumes for sale outside the prison, and to another room where they made prayer beads from olive pits.

"Here, smell this," a former member of al-Qaeda commanded me, sticking under my nose a paper strip blotted with a chemical I could not identify. I think the scent was lavender. Another prisoner, at the Power-run prison canteen, offered me free frozen yogurt. As I walked around the prison, the yogurt began to melt, and my interpreter held it so I could take notes.

Strangest of all, I found, was Power's corporate nerve center—a warren of drab, cubicle-filled offices. The employees wore uniforms: suits for the C-suite executives and blue Power-branded polo shirts for the mid-levels puttering on their computers. They had a conference room with a whiteboard (at the top, "In the name of God, the most gracious, most merciful" was written in Arabic, and partially erased; the rest was the remains of a sales brainstorming session), a reception desk, and portraits of the king and the crown prince overseeing it all.

Nothing is stranger than normalcy where one least expects it. These jihadists—people who recently would have sacrificed their life to take mine—had apparently been converted into office drones. Fifteen years ago, Saudi Arabia tried to deprogram them by sending them to debate clerics loyal to the government, who told the prisoners that they had misinterpreted Islam and needed to repent. But if this scene was to be believed, it turned out that terrorists didn't need a learned debate about the will of God. They needed their spirits broken by corporate drudgery. They needed Dunder Mifflin.

My hyperactive interpreter, who had been gesticulating and yapping throughout the tour, was no ordinary jihadist. He was an American-born Saudi member of al-Qaeda named Yaser Esam Hamdi. Hamdi, now 41, emerged from a pile of rubble in northern Afghanistan in December 2001. His dear friend, pulled from the same rubble, was John Walker Lindh, the so-called American Taliban. Hamdi spent months in Guantánamo Bay before being transferred to the U.S.; he was released after his father, a prominent Saudi petrochemical executive, helped take Hamdi's case to the Supreme Court, and won (*Hamdi v. Rumsfeld*). Hamdi was sent back to Saudi Arabia on the condition that he renounce his U.S. citizenship (he was born in Louisiana and left as a small child), but the Saudis decided he needed more time in prison and locked him up for eight years in a facility in Dammam, and for another seven in Ha'ir. He is due for release this year.

Hamdi guided me like a kid showing his parents around his sleepaway camp. He explained that Power is part of a larger entity at the prison, known as the "Management of Time" (*Idarat al-Waqt*)—a comprehensive but amorphous program meant to beguile the inmates out of bad ideas and replace them with good ones. It involves corporate training, but also gathering the inmates together for song and music, for poetry readings, for the publishing of newspapers (I snagged a copy of the *Management of Time News*), and for the production of TV shows. I watched a room full of men sing a song they had written, “O My Country!,” and show videos in which they extolled the government and the crown prince. Al-Qaeda and ISIS forbid most music and revile the monarchy. Like so many other Saudis, these men seemed to have swapped their religious fanaticism for nationalist fanaticism. One wondered what they really believed.

Al-Sarrah followed close behind us, and I shot him a look when I heard the name of the program. One of the most famous jihadist texts, a playbook for ISIS, is “The Management of Savagery” (*Idarat al-Tawahhush*). It is a deranged manual for destroying the world and replacing it with a new one. That was what this program was doing in reverse: replacing the jihadists’ savage appetite for an imagined future with an appetite for the real, the now, and the ordinary.

A bookish man who had been with Osama bin Laden at Tora Bora looked me steadily in the eye, like he was trying to convince me and not himself. “Vision 2030 is real,” he said.

I told Hamdi that I had corresponded with his friend Lindh, who served 17 years in federal prison in the United States before his release in 2019. Our correspondence had led me to believe that he was just as radical as ever, and that his stay in prison—spent in solitary study of Islamic texts—had confirmed his violent streak and converted him from an al-Qaeda supporter to an ISIS supporter.

Graeme Wood: I wrote to John Walker Lindh. He wrote back.

“Really?” Hamdi asked, before venturing a guess as to why. “The United States doesn’t know how to deal with Muslims. When I was in Afghanistan, I had extreme thinking.” Going to a Saudi prison helped. “The difference is that in jail [here] we have a program. You want to explode the thinking we have in our brain. For 17 years he was alone.” The Saudis filled Hamdi’s time. They managed it. “We didn’t have time to read the Islamic books … We didn’t have time to do anything but work to improve ourselves.” He was a specialist in Power’s media department, and could now produce videos of passable quality.

“I didn’t know what a montage was,” he said. “I didn’t know what a design was.” We were driving to another part of the prison with al-Sarrah in the front seat and Hamdi and me in the back. “Now I am professional!” he said. “I am a complete montage expert!” He pointed at al-Sarrah, who smiled but did not speak or even look back. “All thanks to this man! The government opened this for us! Now I am in a car! Talking to you! Normally! Peacefully! No kind of problems!” Upon release, he said, he might work for his father’s company, or even (this was his dream) go into film and television production. I wondered what it might be like to have a co-worker like Hamdi, with, shall we say, an unconventional work history, and a penchant for extremism and Osama bin Laden that he swore up and down had been thoroughly replaced with a love for film and video production and the crown prince of Saudi Arabia. I was pretty sure Hamdi would be a better colleague than John Walker Lindh.


Top left: A camel market about an hour outside Riyadh, in January. *Top right:* A sign on the highway from Jeddah to Taif marking the turnoff for Mecca. *Bottom:* Women in Asir province. Outside Saudi Arabia's major cities, it isn't clear how quickly modernization is catching on. (Lynsey Addario for *The Atlantic*)

At the prison I asked many inmates how they could trade jihadism for these worldly things, which surely amounted to frippery compared with the chance to die in the path of God. They laughed, nervously, as if to ask what I was trying to do—get them to leave the prison and kill again? They were mostly still young, and they yearned for freedom. That they no longer wanted something thrilling and extraordinary was exactly the point. It is possible to have too much vision, or the wrong kind—some of them had gone to Syria, barely survived, and had had enough vision, thank you very much. "We don't want anything but a normal life," one told me. "I would be happy just to go outside, to walk on the Boulevard in Riyadh, to go to McDonald's."

"I went to Syria because I was offered to take part in a dream, the dream of a caliphate," said another. Ali al-Faqasi al-Ghamdi, a bookish man who had been with bin Laden at Tora Bora, told me he now recognized such dreams as counterfeit. What, he asked, is the point of a big, exciting dream when it is a false one? A small ambition that can actually be fulfilled is preferable to a big one that cannot. He looked me steadily in the eye, like he was trying to convince me and not himself. "Vision 2030 is real."

AMERICA MUST NOW decide whether that vision is worth encouraging. Twenty years ago, if you had told me that in 2022 the future king of Saudi Arabia would be pursuing a relationship with Israel; treating women as full members of society; punishing corruption, even in his own family; stanching the flow of jihadists; diversifying and liberalizing his economy and society; and encouraging the world to see his country and his country to see the world—Wahhabism be damned—I would have told you that your time machine was malfunctioning and you had visited 2052 at the earliest. Now that MBS is in power, all of these things are happening. But the effect is not as pleasing as I had hoped.

In 1804, another modernizing autocrat, Napoleon Bonaparte, arrested Louis Antoine, the duke of Enghien, on suspicion of sedition. The duke was young and foolish, and no great threat to Napoleon. But the future emperor executed him. Around Europe, monarchs were shocked: If this was how Napoleon treated a harmless naif like the duke, what could they expect from him as his power grew, and his domestic opposition dissolved in fear? The execution of Enghien alerted the most perceptive among them that Napoleon could not be managed or appeased. It took a decade of carnage to figure out how to stop him.

Enghien's schemes wouldn't have stopped Napoleon, and Khashoggi's columns wouldn't have stopped MBS. But his murder was a warning about the personality of the man who will be running Saudi Arabia for the next half century, and it is reasonable to worry about that man even when most of what he does is good and long overdue.

For now, MBS's main request to the outside world, and especially the United States, is the usual request of misbehaving autocrats—namely, to stay out of his internal affairs. "We don't have the right to lecture you in America," he said. "The same goes the other way." Saudi affairs are for Saudis. "You don't have the right to interfere in our interior issues."

But he acknowledges that the fates of the two countries remain linked. In Washington, many see MBS's rise as abetted, perhaps even made inevitable, by American support. "There was a moment in time where the international community could have made it clear that the Khashoggi murder was the straw that broke the camel's back, and that we weren't willing to deal with MBS," Senator Murphy told me. The Trump administration's support, when MBS was at his most vulnerable, saved him. "If MBS ultimately becomes king," Murphy said, "he owes no one bigger than Jared Kushner," Trump's personal envoy to the crown prince. ("You Americans think there is something strange about a ruler who sends his unqualified son-in-law to conduct international relations," one Saudi analyst told me. "For us this is completely normal.")

Some still hope that MBS will not accede to the throne. "Only one of the last five crown princes has eventually become king," Khalid al-Jabri noted to me, optimistically. But everything I see suggests that his ascent is certain, and that the search for alternatives is forlorn. Two of those four also-ran crown princes were sidelined or replaced by MBS himself. The other two died of old age.

The United States needs its partners in isolating Iran, and MBS is a stalwart there. And even domestically, he remains in some ways the right man for the job. He is at least, as Philip Zelikow reminded me, not a ruler in denial. "We wanted Saudi leadership who would face their problems, and embark on an ambitious and incredibly challenging generational struggle to remake Saudi society for the modern world," he told me. Now we have such a leader, and he is presenting a binary choice: support me, or prepare for the jihadist deluge.

"We don't have the right to lecture you in America," MBS said. "The same goes the other way."

MBS is correct when he suggests that the Biden administration's posture toward him is basically recriminatory. *Stop bombing civilians in Yemen. Stop jailing and dismembering dissidents.* The U.S. might, on the margins, be able to persuade MBS to use a softer touch—but only by first persuading him that he will be rewarded for his good behavior. And no persuasion will be possible at all without acknowledging that the game of thrones has concluded and he has won.

Many of the exiles I spoke with said their best hope now is that the crown prince will mellow, and that elder Saudi wise men will keep him from destroying the country with rash decisions, like the fight with Qatar, or the murder of Khashoggi. MBS does have a sense that being capricious and impulsive can be costly. "If we run the country randomly," he told me, "then the whole economy is going to collapse." Others had tried that strategy: "That's the Qaddafi way."

King Salman has instituted measures ostensibly intended to force his son to govern more inclusively after Salman's death. He changed the law of succession to prevent the next king from naming his own children, or indeed anyone from his own branch of the family, as his crown prince. I asked MBS if he understood that to be the rule, and he said yes. I asked if he had anyone in mind for the job. "This is one of the forbidden subjects," he said. "You will be the last to know."

WHEN HE IS KING, however, the rules will belong to him, and to ask him to abide by them against his wishes will be about as easy as negotiating from your suite at the Ritz-Carlton.

A crown prince with a subtler mind and a gentler soul might have implemented MBS's reforms without resorting to his brutal methods. But it is pointless to consider policy in a state of childlike fantasy, as if it were possible to conjure some new Saudi monarch by closing your eyes and wishing him into existence. Open your eyes, and MBS will still be there. If he is not, then the man ruling in his place will not be an Arab Dalai Lama. He will be, at best, a member of the unsustainable Saudi old guard, and at worst one of the big beards of jihadism, now richer than Croesus and ready to fight. As MBS told me, to justify the Ritz operation, "It's sometimes a decision between bad and worse."

Since reality has handed us MBS, the question for America is how to influence him. This question is practical rather than moral: If your moralism drives him into a partnership with China, what good will it have been? A fundamental principle of Chinese foreign relations is butting out of other countries' internal affairs and expecting the same from them. Certainly Beijing will not reprimand him for his treatment of dissidents.

In effect, both the Saudis and the Americans are now in the Ritz-Carlton, forced to bargain with a jailer who promises us prosperity if we submit to his demands, and *Mad Max* if we do not. The predicament is familiar, because it is the same barrel over which every secular Arab autocrat has positioned America since the 1950s. Egypt, Iraq, and Syria all traded semitribal societies for modern ones, and they all became squalid dictatorships that justified themselves as bulwarks against chaos.

Twenty years ago, Syria watchers praised Bashar al-Assad for his modernizing tendencies—his openness to Western influence as well as his Western tastes. He liked Phil Collins; how evil could he be? By now most everyone outside Damascus, Tehran, and Moscow recognizes him as Saddam Hussein's only rival in the dubious competition for most evil Arab leader.

MBS has completed about three-quarters of the transition from tribal king with theocratic characteristics to plain old secular-nationalist autocrat. The rest of that transition need not be as ruthless as the beginning, but MBS shows no sign of letting up. The United States can, and should, make the case that Saudi Arabia's security and development will demand different tools going forward. It might even suggest what those tools should be. But it probably cannot make MBS use them.

A more pragmatic approach is to make sure that the reforms he has instituted stick, and that the changes in Saudi culture become irreversible. The opening of the country and the forcible sidelining of a crooked royal class—these are hard changes to undo, and they bind even the absolute monarch who decreed them. Granting women driver’s licenses was ultimately a smooth process. Taking them back would disrupt millions of lives and sow protest across the kingdom. American influence can acknowledge and encourage such changes.

Sometimes this is how absolute power relaxes its grip: slowly, without anyone noticing. In England, the transition from absolute monarchy to a fully constitutional one took 200 years, not all of them superintended by the most stable kings. MBS is still young and hoarding power, and everyone who has predicted that he would ease up on dissent has so far been proved optimistic. But 50 years is a long reign. The madness of King Mohammed could give way to something else: a slow and graceful renunciation of power—or, as with Assad, an ever more violent exercise of it.

This article appears in the April 2022 print edition with the headline “Absolute Power.”

Graeme Wood is a staff writer at *The Atlantic* and the author of *The Way of the Strangers: Encounters With the Islamic State*.

07/28/2023 04:53:42 [BN] Bloomberg News

OIL DEMAND MONITOR: China Woes Cloud Outlook Despite Tightness

- **Asian nation's stuttering recovery remains source of concern**
- **India's fuels sales drop on monsoon; US gasoline gauge dips**

By John Deane

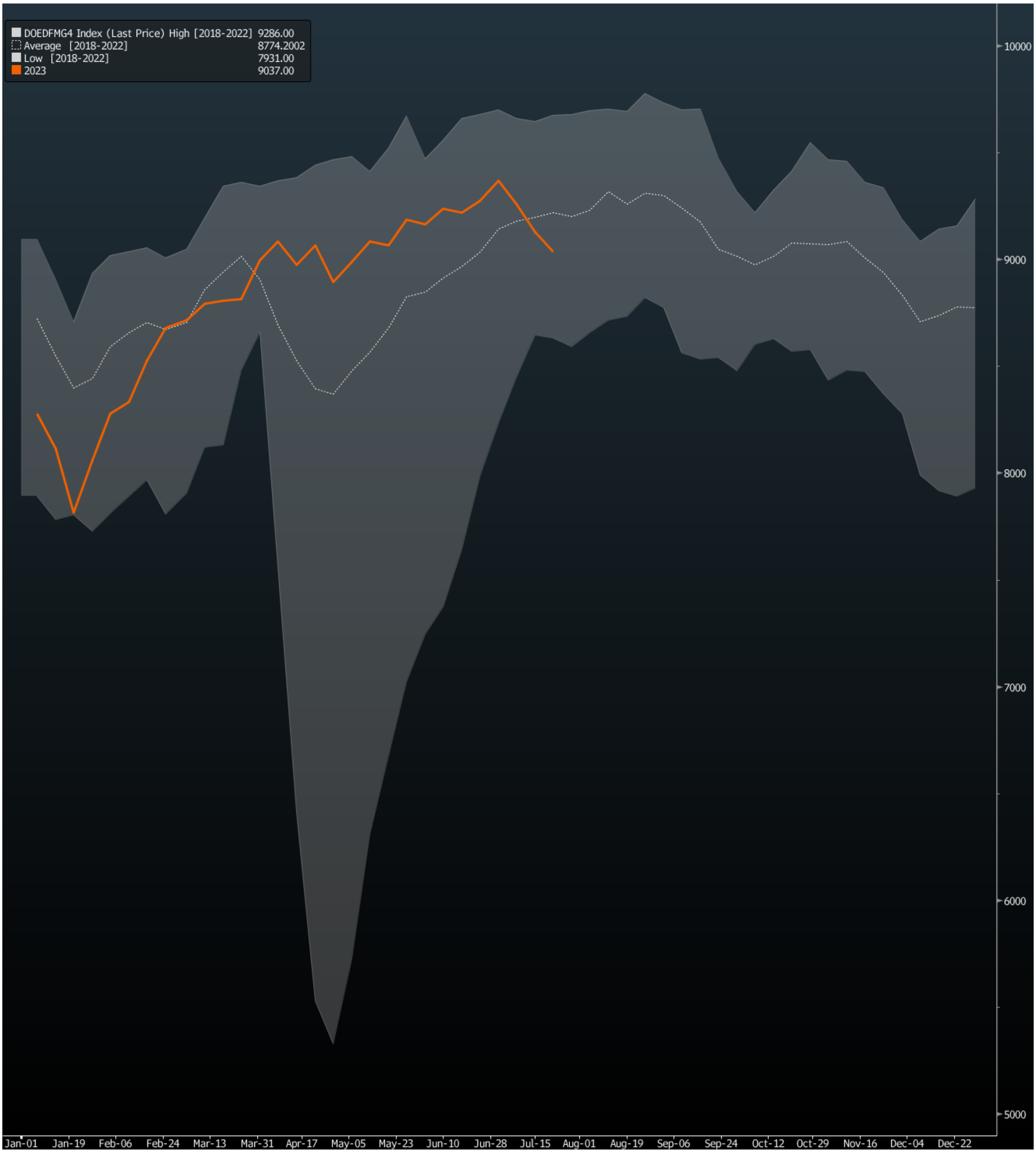
(Bloomberg) -- Constrained production is set to tighten oil markets in the second half of the year, buttressing recent price gains — but concerns over China's economic trajectory continue to cloud the outlook for demand.

The recovery in the Asian nation — the world's biggest oil importer — has lost steam, with GDP growing more slowly than expected last quarter and other data flashing warning signs. That has prompted economists to downgrade growth projections. Earlier this week, the country's top leaders signaled more support for the troubled real estate sector alongside pledges to boost consumption — but fell short of announcing large-scale stimulus.

Output curbs by Saudi Arabia and its partners are camouflaging the absence of a solid demand recovery in China, according to Citigroup Inc. "The bulls got it all wrong," said Ed Morse, the bank's veteran head of commodities research. A "real" Chinese upsurge remains elusive, while Europe stutters and "we still don't know if the US will have a hard landing," he cautioned.

There are warning signs too in India, where sales of road transport fuels from state-owned refiners plunged in the first half of July — on both a monthly and annual basis — though refinery officials pegged that mostly on the impact of monsoon rains and flooding.

In the US, implied gasoline demand measured on a four-week rolling basis fell for the third week in a row in the latest data as consumption continued to retreat from its late-June peak. Surging pump prices may be a contributory factor.



US implied gasoline demand declines on a four-week rolling basisDoE

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In the skies, passenger numbers may hit the high-point for the year soon. The peak is expected in two weeks' time, with weekly seat capacity reaching almost 117 million, data provider OAG Aviation said in an update. That would still be 1.6%

below the same period in 2019.

Growth continues in Europe, with travellers seemingly undeterred by the heat wave in the south. More than 80% of the 144,000 seats added globally this week are operating to, from or within Western Europe, according to OAG.

London's Heathrow Airport reported 37 million passengers in the first half of 2023, compared with 26 million in the same period last year. Still, departing Chief Executive Officer John Holland-Kaye struck a cautious tone about strength of air travel in the latter part of the year, as the cost-of-living crisis weighs on more leisure customers and corporate travel continues to linger below pre-pandemic levels.

While "demand has defied gravity" this summer, the question is whether it will continue to do so for the rest of 2023, said the CEO.

Flight numbers in the region may plateau across the remainder of July and fall in August, in line with seasonal norms, according to a report by BNEF.

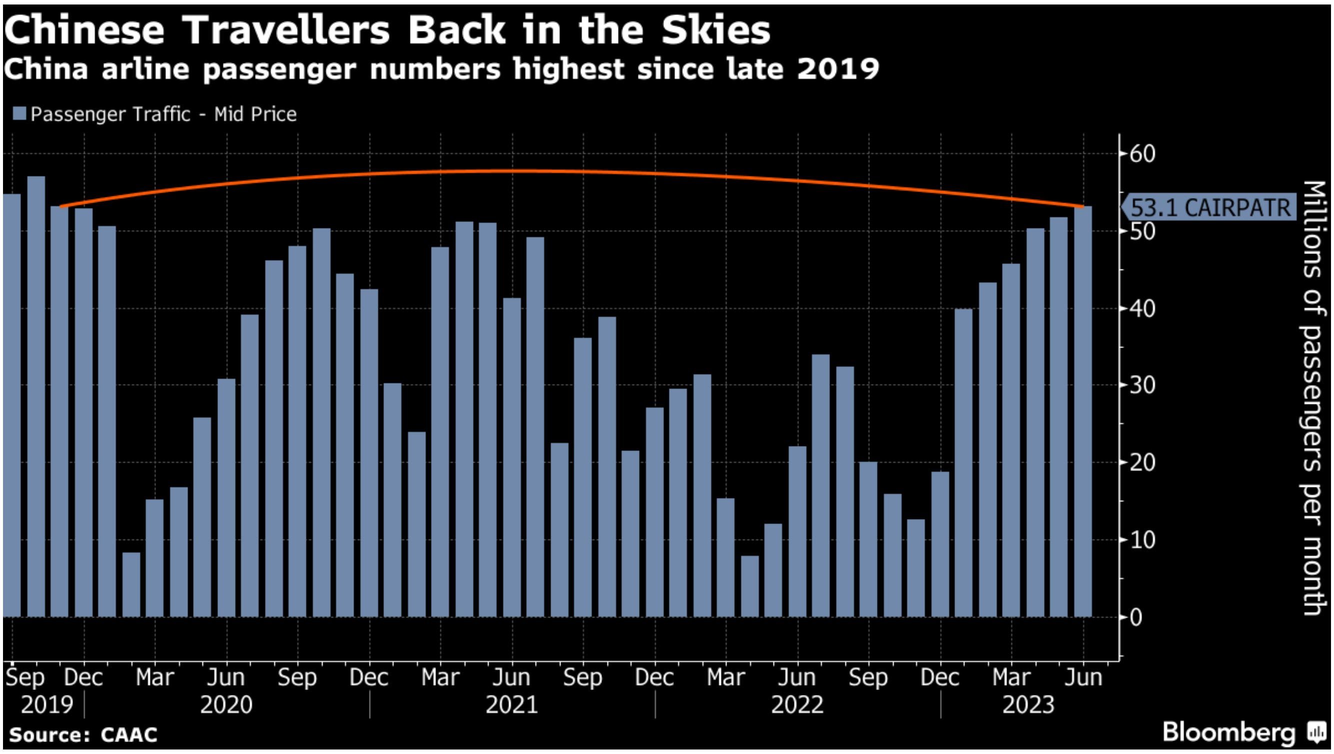
Read More: Global Jet Fuel Demand Grows at Slowest Pace in 2023: JPMorgan

On the roads, Europe's summer holiday season has started to make an impact. Among 13 major world cities tracked by this monitor, congestion eased back below pre-pandemic levels in London, Paris and Berlin, according to BNEF seven-day moving average calculations based on TomTom data. Traffic levels in most of the major Chinese cities dipped in the latest figures.

Still, the global demand outlook is complex, with wide variations in individual countries' economic prospects and in usage of different fuels. Individual data sets often provide contradictory indications of where demand is headed.

China's apparent oil demand rose 14% year-on-year in June, and gained 10% in the first six months, according to data compiled by Bloomberg. In its monthly oil market report for July, the Organization of Petroleum Exporting Countries saw the country's oil demand growing by 0.7 million barrels a day year-on-year in the third quarter, and 0.6 million in the fourth quarter, followed by about 0.6 million in the first quarter of next year. The Paris-based International Energy Agency sees China's oil demand growth averaging 1.6 million barrels a day this year, despite the country's economic headwinds, though slowing to 560,000 barrels a day in 2024.

Passengers using the country's airlines jumped to the highest since November 2019 in June, according to data from the country's civil aviation administration.



The recent uptick in oil futures prices reflects the prospects for a tighter market in the coming months, in which demand as well as constrained supplies will play a part, according to Standard Chartered Plc.

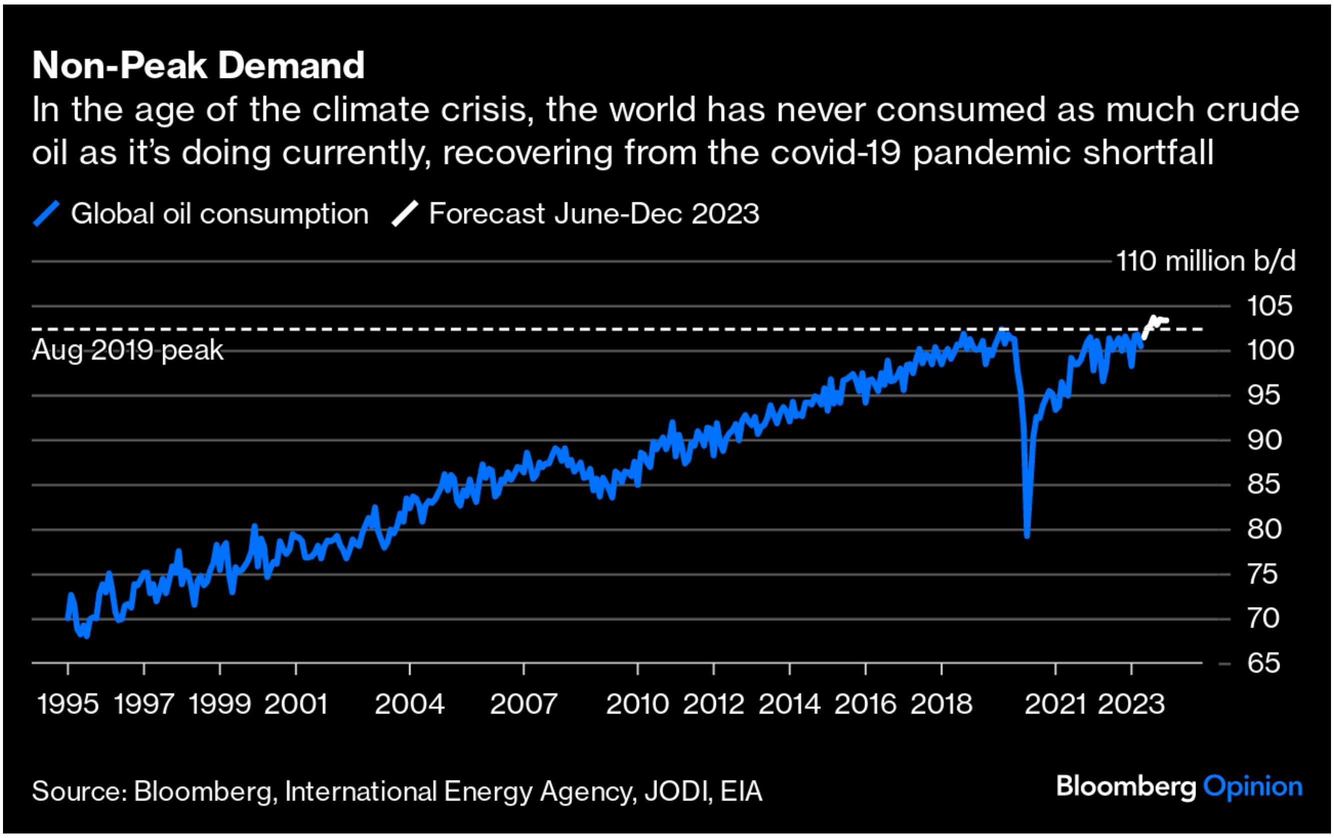
"We expect a seasonal increase in demand to combine with producer output restraint to create large supply deficits over the next two months," analysts including Emily Ashford and Suki Cooper said in a note. The bank projects global inventories to shrink by 310 million barrels by year-end and by a further 94 million in the first quarter of next year, "keeping oil markets backwardated and pulling prices higher."

"Oil demand growth is solid, but heterogenous," UBS AG analysts including Giovanni Staunovo said in a report. It continues to be driven principally by China and India, while for refined products, manufacturing woes have translated into weak diesel demand, with growth led by jet fuel and gasoline.

"Despite the recession concerns, oil demand remains solid at above 102 million barrels per day and set to breach 103 million barrels per day in August for the first time," he added.

Looking at the longer term, it seems like the world may be some way from peak oil demand, with major forecasters still seeing new consumption records coming down the road.

Read More: The Harsh Truth Is We're Using More Oil Than Ever: Javier Blas



The Bloomberg oil-demand monitor uses a range of high-frequency data to help identify emerging trends. Following are the latest indicators. The first two tables shows fuel demand and road congestion, the next shows air travel globally and the last is refinery activity:

Demand Measure	Location	%vs 2022	% vs 2021	% vs 2020	% vs 2019	% m/m	Freq	Latest Date	Latest Value	Source
Gasoline product supplied	US	-3.3	-4.1	+1.5	-7.6	-3.9	w	July 21	8.94m b/d	EIA
Distillates product supplied	US	-0.9	-15	+2.3	-13	+12	w	July 21	3.72m b/d	EIA
Jet fuel product supplied	US	+2.3	+9.6	+77	-1.4	-6.7	w	July 21	1.81m b/d	EIA
Total oil products supplied	US	+6.5	+0.7	+11	-1.3	+4.8	w	July 21	21.3m b/d	EIA
Car use	UK	+2.1	+7.7	+23	-2	-1	m	July 10	98	DfT
Heavy goods vehicle use	UK	+1.9	+3.9	+9.2	+7	-1.8	m	July 10	107	DfT
All motor vehicle use index	UK	+2	+9.6	+23	+3	-1	m	July 10	103	DfT
Gasoline (petrol) avg sales per filling station	UK	+9.1	+5.3	+36	+0.5	+1.3	m	Week to July 2	7,225 liters/d	BEIS
Diesel avg sales per station	UK	-0.4	-6.3	+10	-13	+6.3	m	Week to July 2	9,088 liters/d	BEIS
Total road fuels sales per station	UK	+3.6	-1.5	+21	-7.3	+4	m	Week to July 2	16,313 liters/d	BEIS

Diesel sales	India	−15				−20	m	July 1−16	2.96m tons TK	Blbg
Gasoline sales	India	−11				−11	m	July 1−16	1.3m tons TK	Blbg
Jet fuel sales	India	+6.1				−6.7	m	July 1−16	302k tons TK	Blbg
LPG sales	India	−6.3				+3.8	m	July 1−16	1.3m tons TK	Blbg
Gasoline deliveries	Spain	+7.7				+6.6	m	June	565.7k m3	Exolum
Diesel (and heating oil) deliveries	Spain	+1.7				+1.3	m	June	2,271k m3	Exolum
Jet fuel deliveries	Spain	+8				+3.6	m	June	633k m3	Exolum
Total oil products deliveries	Spain	+3.6				+2.6	m	June	3,470k m3	Exolum
Road fuel sales	France	+1.8				+7.4	m	June	4.36m m3	UFIP
Gasoline sales	France	+8.3					m	June	n/a	UFIP
Road diesel sales	France	−0.6					m	June	n/a	UFIP
Jet fuel sales	France	+14				+6.2	m	June	699k m3	UFIP
All petroleum products sales	France	+4.9				+7	m	June	4.86m tons	UFIP
All vehicles traffic	Italy	unch.				+5	m	June	n/a	Anas
Heavy vehicle traffic	Italy	−1				−2	m	June	n/a	Anas
Gasoline sales	Italy	+4.4			+10	+2.7	m	June	729k tons	Energy Ministry
Transport diesel sales	Italy	+0.2			+2.5	−1	m	June	2.04m tons	Energy Ministry
Diesel/gasoil sales	Italy	+0.6			unch.	+0.4	m	June	2.29m tons	Energy Ministry
LPG sales	Itay	+3.6			+5.5	−4.5	m	June	232k tons	Energy Ministry
Jet fuel sales	Italy	+13			−10	+10	m	June	419k tons	Energy Ministry
Total oil product sales	Italy	+1.8			−4.1	−1.8	m	June	4.45m tons	Energy Ministry
Gasoline consumption	Portugal	+8.8	+15	+26	+15	−13	m	June	96.3k tons	ENSE
Diesel consumption	Portugal	+6.4	+11	+14	+5.7	−13	m	June	417k tons	ENSE
Jet fuel consumption	Portugal	+11	+143	+906	+5.8	+2.4	m	June	158k tons	ENSE
% change in toll roads kms travelled	France	+4.1			−0.1		m	June	n/a	Mundys
% change in toll roads kms travelled	Italy	+1.3			+1.8		m	June	n/a	Mundys
% change in toll roads kms travelled	Spain	+0.6			−3.2		m	June	n/a	Mundys
% change in toll roads kms travelled	Brazil	+5.7			+9.3		m	June	n/a	Mundys
% change in toll roads kms travelled	Chile	−3.7			+4.4		m	June	n/a	Mundys
% change in toll roads kms travelled	Mexico	+4.6			+15.3		m	June	n/a	Mundys

Notes: Click here for a PDF with more information on sources, methods. The frequency column shows w for data updated weekly, 2/m for twice a month and m for monthly.

City congestion:

Measure	Location	July 24	July 19	July 10	July 3	June 26	June 19	June 12	June 5	May 29	May 22	May 15	May 8
Congestion	Tokyo	95	92	89	88	86	91	89	88	90	85	85	67

Congestion	Taipei	93	88	86	93	77	94	90	94	87	86	86	89
Congestion	Jakarta	58	67	74	47	66	69	67	57	69	60	69	69
Congestion	Mumbai	63	56	64	58	53	49	47	44	44	42	43	45
Congestion	New York	88	87	72	80	97	99	92	104	86	109	111	98
Congestion	Los Angeles	86	87	69	81	87	86	86	88	77	93	98	90
Congestion	London	86	103	109	114	118	121	120	103	115	115	122	100
Congestion	Rome	85	96	107	76	105	121	114	99	124	121	122	123
Congestion	Madrid	52	60	65	72	79	83	90	88	90	84	81	77
Congestion	Paris	82	78	103	109	121	122	121	126	98	85	113	74
Congestion	Berlin	81	104	111	108	114	108	106	110	96	99	118	111
Congestion	Mexico City	60	67	67	69	67	70	75	75	76	81	74	73
Congestion	Sao Paulo	63	63	65	73	76	93	67	84	80	80	87	79

Source: TomTom. Click here for a PDF with more information on sources, methods

NOTE: TomTom changed its methodology for calculating traffic delays with data for Feb. 20 and no longer publishes comparisons with pre−Covid levels. We have therefore switched to using figures calculated by BNEF, which show 7−day moving average congestion indexed to average 2019 levels. See the linked PDF for more details.

NOTE: City traffic congestion in London fell in the most recent week following the start of school summer vacations.

Air Travel:

Measure	**Location**	**vs 2022**	**vs 2021**	vs 2020	**vs 2019**	**m/m**	**w/w**	**Freq.**	Latest Date	Latest Value	**Source**
		changes shown as %									
All flights	Worldwide	+11	+19	+67	+15	+6.6	−2.3	d	July 24	244,945	Flightradar24
Commercial flights	Worldwide	+24	+40	+110	+6.6	+4.8	+0.4	d	July 24	133,597	Flightradar24
Seat capacity per week	Worldwide	+14	+42	+102	−2.5		+0.2	w	July 24 week	116.1m seats	OAG
Air traffic (flights)	Europe				−6.7	−1.6	−1.8	d	July 24	32,933	Eurocontrol
Airline passenger throughput (7−day avg)	US	+13	+28	+300	+1	+1	+2	w	July 23	2.64m	TSA
Air passenger traffic per month	China	+141	+29	+73	−0.6	+2.7		m	June	53.1m	CAAC
Heathrow airport passengers	UK	+18	+633	+1,911	−2.9	+4.6		m	June	7.04m	Heathrow
Rome % change in passengers carried	Italy	+26			−11			m	June	n/a	Mundys

NOTE: Comparisons versus 2019 are a better measure of a return to normal for most nations, rather than y/y comparisons.

FlightRadar24 data shown above, and comparisons thereof, all use 7−day moving averages, except for w/w which uses single day data.

Refineries:

Measure	Location	vs 2022	vs 2021	vs 2019	m/m chg	Latest as of Date	Latest Value	Source
			Changes are in ppt unless noted					
Crude intake	US	+2.8%	+3.8%	−3.3%	+1.4%	July 21	16.48m b/d	EIA
Utilization	US	+1.2	+2.3	+0.3	+1.2	July 21	93.4%	EIA
Utilization	US Gulf	−3.7	+0.7	+2.2	+2.2	July 21	93.3%	EIA
Utilization	US East	−16	−6.2	+4.3	+4.5	July 21	81.7%	EIA
Utilization	US Midwest	+13	+5.8	−1.8	+0.6	July 21	97.7%	EIA
Utilization (indep. refs)	Shandong, China	−5.4	−1	−0.4	+1.2	July 28	62.29%	Oilchem

NOTE: US refinery data is weekly. Changes are shown in percentages for the row on crude intake, while refinery utilization changes are shown in percentage points.

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Gasoline Is Surging All Over World in Fresh Inflation Blow

--With assistance from Julian Lee, Prejula Prem, Rakesh Sharma and Grant Smith.

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achieve better asset efficiencies. Rig is also seeing high-interest in its automated robotics products having sold packages for six rigs with the first offshore system installed and commissioned in the second-quarter. Operators are pressing for reduce greenhouse gas emissions, leading to-high interest in our Power blade product, which significantly reduces power consumption and diesel costs for offshore drillers. Looking ahead in the near-term, we believe North-America land operations will continue to slow in the 3rd-quarter pending higher commodity prices. But our drilling contractor customers are keeping rigs ready for a resumption of higher activity in 2024, importantly, we expect international and offshore markets to overcome these near-term North American headwinds as most and offshore focused IOCs are pressing forward with aggressive campaigns. Specifically, we are pleased to see growing activity in West Africa, Asia, the North Sea and offshore Mexico and continued strength in the Middle-East, Guyana, Brazil and North Africa. As major project FIDs grow, we see a strong sales pipeline emerging for our gas processing and FPSO products, which typically lag FIDs by 18 months, having delivered our 4th new land rig in the Saudi market and with lots of interest in digital technologies across the region, we are ready to drive substantially improved drilling efficiencies for around the golf. As a leading independent provider of essential technologies and equipment for what is probably the world's most essential industry is positioned to benefit from years of under-investment as the industry equips itself to meet the challenges of providing energy security. Before I turn it over to Jose for those Innovia employees listening today. I want to thank you for all that you need to take care of our customers and keep their programs on-track, you're simply the best-in our customers appreciate you and I want you to know that. I do to. With that, I'll turn it over to Jose.

Jose. {BIO 4619131 <GO>}

Thank you Clay. NOV consolidated revenue totaled $2.09 billion, a 7% sequential increase and a 21% increase compared to the second-quarter of 2022.

Unidentified Speaker

Revenue-related to offshore activity grew 18% sequentially and revenue from international markets grew 9%. Despite industry activity levels, the decline in the US and a tougher than average Canadian spring breakup, revenues from North-America improved 4% during the second-quarter. Adjusted EBITDA for the second-quarter totalled $245 million or 11.7% of sales, representing an incremental flow-through of 38% sequentially.

While our margins are moving in the right direction and the later cycle nature of our business is starting to gain momentum from the significant growth in offshore and international markets, we're not content with our performance. As Clay mentioned, we are focusing on improving the margins in our business and have begun implementing strategic actions, which will lead to approximately $75 million of annualized savings within the next 12 months.

These initiatives coupled with a strong outlook for the fourth quarter should lift our consolidated EBITDA margins into the low teens In the fourth quarter and set us up for stronger results in 2024. Clay covered the primary reasons for increase in working capital, which resulted in a $70 million use of cash from operations during the quarter. This increase is transitory and should begin to unwind later this year. While working capital

We see rapidly-growing demand for flexible pipe at a time when excess industry capacity has been absorbed, operators are struggling to understand the rapid change in pricing dynamics, which resulted in multiple large tenders not being awarded after bids came in at pricing that was well-above operators budgets.

We do not believe this reflects loss work and these projects are expected to move forward. However, there are likely to be slight delays in the award process as operators adjust their budgets for a flexible pipe market has quickly gone from having ample excess capacity to industry demand exceeding capacity.

We're increasingly confident that our deliberate approach and which projects we sign-up, will allow us to realize meaningful improvements in this operations margins as we transition from projects that originated during the depth of the downturn. Two projects that are now being signed in a much healthier market environment.

Our Process and Flow Technologies business posted a mid-single-digit sequential increase in revenue with improved progress on our well stream processing projects, partially offset by small declines in the business unit's APL and production and midstream operations. Orders for the business unit increased more than threefold sequentially, representing the best bookings quarter for this business in two years.

Our well stream processing operation booked an order for a sizable monoethylene glycol regeneration reclamation unit for the North Sea and our APL operation received an order for a submerged swivel and destined for our project in West Africa. While operators remain somewhat cautious due to global economic uncertainties, the pipeline of potential offshore projects continues to grow.

Similar to our Subsea business, we expect the rapidly improving market environment for this business to result in meaningful margin expansion during 2024. Our Intervention and Stimulation Equipment business realized a slight sequential decrease in revenue with lower deliveries of pressure pumping equipment, mostly offset by higher aftermarket sales and strong deliveries of coiled tubing equipment.

This more favorable business mix drove a modest sequential increase in EBITDA. Decline in completions related activity in North-America broke the business units streak of six straight quarters with a book-to-bill of greater than one while quoting activity declined only 4% and the average size of opportunities increased orders for new equipment pushed out as service companies focused on their existing asset-base driving incremental demand for aftermarket spare parts and services.

Demand from international and offshore markets remain healthy, which led to solid orders for our coiled tubing wireline and pressure control equipment. Our fiber glass systems business posted a high-single-digit increase in revenue was strong incrementals. Softening demand in the North American oil and gas market was more than offset by robust sales into chemical and industrial markets, which included the businesses initial shipments of FM 4922 compliant fuel and smoking exhaust composite ducks for a major semiconductor manufacturers chip foundry.

The first of several large projects, we believe. Our Fiber Glass Systems business will support. Additionally, the operation realized higher demand for scrubber systems in Asia. While the North American oil and gas markets have softened demand remains robust in the Middle-East and North Africa, which we expect will drive strong results in the second-half of 2023 for the business units.

For our completions and production solutions segment, we expect growing demand from improving offshore markets will offset softer conditions in North-America, resulting in 3rd-quarter results that are in-line with the second-quarter. However, building momentum in offshore markets are giving us growing confidence in the segment's ability to achieve low-double-digit EBITDA margins by year end.

Our Rig Technology segment generated revenues of 606 million in the second-quarter, an increase of 56 million or 10% compared to the first-quarter, an increase of 144 million or 31% compared to the second-quarter of 2022. The sequential increase in revenue was driven by greater levels of service and repair work-in our aftermarket business and higher revenue conversion from our backlog of capital equipment projects.

Adjusted EBITDA increased $2 million sequentially and $30 million year-over-year to $71 million or 11.7% of revenue. As Clay mentioned incremental EBITDA flow-through was limited due in-part to a less favorable sales mix and higher start-up costs related to our new wind tower venture.

New orders totaled 222 million, representing a book-to-bill of 108% and total backlog for the segment at quarter-end was 2.89 billion. Bookings declined $29 million sequentially due to a sizable order for wind installation vessel equipment in the first-quarter that did not repeat.

However, orders for our Rig equipment were solid and we booked 11 top drives and ten iron roughnecks for land rigs in the Middle-East. Several automation packages for offshore rigs and eight of our new electric lattice boom cranes for multiple operators. We're capturing a strong market position in this growing zero-emission market niche for all-electric based on our unmatched reliability.

The early phase of a robust recovery in offshore exploration and development is underway, driving an increasing pace of offshore drilling tendering activity. After numerous bankruptcies and 38 drillships a number equal to over half the ships working today that were scrapped over the past eight years available rigs are increasingly hard to come by.

Consequently, we have seen offshore drilling day rates continued to inflect higher with some of our key customers announcing drillship contracts north of $500,000 per day-in recent weeks. Expectations are for rates to continue to rise in order to incentivize additional rig reactivations as the low-hanging fruit has mostly been pulled out-of-the stack.

Additionally, confidence the long-term sustainability of the cycle combined with concerns related to rig availability is also causing the length of contract terms inflect with a recent contract extending out to 2029. There are a limited number of remaining drill ships that are not spoken for and are either warm-stacked or in yards waiting to be completed and cold stack rigs will require significantly more capital to get back into proper working condition and to outfit with the latest technologies that operator's desire.

As we help our customers dig deeper into the stack of rigs to reactivate. We expect to see an increasing number of opportunities with larger scopes and expect projects to include a growing amount of associated capital equipment orders. While the outlook is promising, or aftermarket business is already benefiting from growing rig reactivations and the continued normalization of maintenance capital spending by drilling contractors.

Spare part bookings increased for the sixth consecutive quarter, and revenues from both our service and repair operations grew approximately 17% sequentially. With increasing manufacturing throughput, we expect to realize a greater pace of higher-margin spare part deliveries in the second-half of the year.

While orders for our marine construction business were down sequentially due to the lack of a wind installation vessels during the quarter, we're actively engaged in a number of tenders and are optimistic about the order outlook for this piece of the business in the second-half of 2023 and beyond.

Looking out to latter part of this decade, there still a projected shortfall in vessel capacity for the number of projects that have been sanctioned developers continue to list the inability to contract adequate wind construction vessel supply as one of their Chief operational concerns.

A fear we are more than happy to help alleviate. Looking-forward, we believe, accelerating production and an improved mix in both our aftermarket and our capital equipment operations will translate into improved results for our Rig Technology segment in the coming quarters.

For the third-quarter, we expect revenue for the segment to grow approximately 5% with incremental margins in the 30% range. We expect this segment to have an additional 5% to 10% sequential growth into the fourth-quarter and end the year with low-teen EBITDA margins.

While the midpoint of our segment level guidance implies a very modest improvement in our consolidated company results during the 3rd-quarter, we believe the combination of improving international and offshore markets and the proactive measures we are taking to improve our profitability.

We will drive meaningful improvements in the fourthth-quarter resulting in EBITDA in the CAD300 million range and setting us up for even better performance and stronger cash flows in 2024. With that, we'll open the call to questions.

Questions And Answers

Operator

Thank you. (Operator Instructions). First question is going to come from the line of Marc Bianchi with TD Cowen. Your line is open. Please go-ahead.

Q - Marc Bianchi {BIO 18339369 <GO>}

Yes, thanks. I wanted to first ask about the supply-chain challenges that you guys have had, there have been a few different ones. I think they're probably very unique in their description, but just broadly speaking, why do you think NRV is has struggled so much with this over the past several quarters and what gives you confidence that we won't see that going-forward.

A - Unidentified Speaker

Well, first Marc. As we noted in our prepared remarks, we made good headway, particularly since the last two quarters on accessing in particular castings and forgings, which has been a particular supplies supply-chain challenge the pandemic. As I noted, drove a lot of foundries out of business and so e is out there with other industrial manufacturers trying to reposition supply change, qualify new foundries appended castings that we need. These are all very specialized custom parts that these foundries

Cash for all of us. But stepping back and looking at we're. I think the largest manufacturer in oilfield services with a very broad portfolio of products. And so, for instance, within Rig Technologies alone we have something like 250,000 different discrete things that we buy to support our our product lines out there. And included in that are very exotic steels that maybe only one mill in the world. Producers included in that are very-high performance polymers. Bipin for instance in gaskets in rings and. Items like that. We're also a major purchaser of fiber glass for instance. I think we buy one million. We buy a lot of fiber capacity annually.

And so when the world shuts down, it's economies as it did. And more disruptive to our business model within the oilfield than just about anybody else out there. But if you look more broadly at other industrials, I know, many are still pointing to reverberations coming out of that shutdown affecting their businesses in aircraft supply and automobiles in land crane manufacturer that I'm aware of, there's a lot going on out there, but the good news is, our teams are getting better at managing it. We're making progress there. We're starting to see the logjam break and that gave rise to higher inventory levels, our balance sheet this quarter and last quarter, but also gave rise to stronger incrementals in margins out of our businesses as we battle through this turmoil.

Q - Unidentified Participant

Okay, great that's helpful context. Maybe switching over to orders, you expressed some optimism for the second-half, particularly as it relates to international and offshore. I was hopefully you could maybe help quantify what that might look like, either on a book-to-bill basis or Year-over-Year growth. Just sort of help with the quantification would be great.

A - Unidentified Speaker

A - Unidentified Speaker

Thanks a lot.

Operator

Thank you. And one moment for our next question. Our next question is going to come from the line of Jim Rollyson with Raymond James, your line is open. Please go-ahead.

Q - Jim Rollyson {BIO 1796082 <GO>}

Good morning, guys. There's been a lot of talk this quarter offshore and internet theme has obviously been kind of moving up into the right for the last handful of quarters. But there's kind of been more discussion around this quarter from a shrinked and particularly a duration standpoint and since you fly all over the world and talk to a lot of folks who would love to kind of get your thoughts and what you're seeing from customers.

Maybe that supports this kind of duration comment and maybe just what out of all of that, what's what are you seeing that gets you the most excited about this.

A - Unidentified Speaker

That's a great question Jim. First. I don't think I'm going to provide any different view. Then you've heard from the big three and others in the space we're all pretty excited, we're seeing rising demand for offshore drilling assets broadly and deepwater drilling assets specifically and I think that's generating a lot of excitement. What's behind that.

Our IOCs and both that are they see the need to develop their offshore fields and move forward with very aggressive drilling campaigns. And notably the offshore has been pretty absent frankly since about 2014 and so we feel like we are moving through an inflection point.

What's interesting about that and there's been a lot of cost rationalization not just but elsewhere around the world. And and activity levels today, we're still not quite back to where we weren't even in 2019 and so a lot of room to run. And with rising demand for E&P customers. I think that points to cycle that's going to have a lot of longevity to it.

I'm going to also add a little more color. I think there's sort of two-parts to this wave early part. I think is going to be a little more brownfield, tie-back focused and following that though, I think you're going to see a lot more FIDs, I've seen estimates of 500 billion in offshore FIDs through 2026 which point the more greenfield developments and both brownfield as well as greenfield fit sort of our product offering.

And so one of he is prepared to really meet that demand. But looking at our situation. I feel like we're on the cost of really kind of three things that are going to help improve results. First is I think the resumption of offshore activity and the continued building of international land activity is going to bring pricing leverage back to, we've raised prices, but it's been hard to carve-out margin expansion based on that.

I think with rising demand that's going to help on pricing leverage.

Secondly, some of these lower-margin contracts. I mentioned earlier, we're continuing to burn those off in high-grade our backlog with higher-margin contracts and that's going to continue to proceed in 2024 and then thirdly, and this is probably the biggest thing is just getting all supply-chain turmoil behind us this normalization of supply-chain and kind of getting back to more normal sort of lead times on our products when we get more normal lead times from our vendors.

I think is going to to help a wide but if you kind of round out the picture, we spent a lot of the last decade investing in technologies and we've talked on the call today about wired drill pipe and its continued adoption for offshore operators in the North Sea for Middle-East operators on land investments in technology, which is driving better performance, new downhole tools with zero pressure drop agitators and on-demand agitators and better-performing drilling motors, low emissions fracking equipment with our ideal refrac.

Our rig automation offering, which has mechanical robot arms tripping pipe on the rig floor. And then all of our digital products, our Edge to Cloud MAX platform condition-based monitoring, these are all things that improve the efficiency and safety drilling operations and their most impactful in the offshore, because it's a high-cost environment and are most impactful in low efficiency land drilling operations and which is still occurring lots of places outside of North-America which really didn't upgrade to AC rigs.

And so, operators are looking at that. They're looking at this as a way to drive better efficiency and drilling programs and looking at portfolio of technologies that we can bring and they are pulling those through their oilfield service customers. So even though our oilfield service customers are pledging capital discipline and not spending.

I think operators are going to force the issue historically they've they've sponsored and promoted new entrants and they come in with these new technologies and they've pushed on the comments to bring these two technologies. So I think that's a good setup for NOV for the next several years.

And that's what I'm excited about.

Q - Jim Rollyson {BIO 1796082 <GO>}

Excellent. And from a margin perspective, obviously margins have been creeping higher, certainly a better improved quarter versus versus last with some of those issues kind of unwinding. But as we think about this going-forward between your kind of additional cost, savings opportunity over the next four quarters, the pricing push that you guys are working towards and just kind of building momentum from an order uptake perspective, how do we where do margins or do you think normalized margins should be on a consolidated basis and if you kind of bucket it into the different categories that would get you there. How do you get there.

A - Unidentified Speaker

service capacity. And with higher earnings and improved working capital, our sequential cash flow from operation grew considerably, and we generated free cash flow of nearly $1 billion during the quarter. I want to thank the entire SLB team for their hard work and exceptional performance delivering value for our customers and our shareholders throughout the quarter.

Now, let me take a moment to touch on the macro environment. As we have projected for the past few quarters, the International and Offshore markets continue to exhibit strong growth as North America has moderated. This is playing to the strengths of our business as international revenue represents nearly 80% of our global portfolio, and offshore comprises nearly half of that. As the growth rate shifts further towards international, these market conditions are driving the breadth, resilience, and durability of this upcycle and creating new opportunities for our business.

Let me describe where this is taking place. In the international markets, the investment momentum of the past few years is accelerating. This is supported by resilient long cycle developments in Guyana, Brazil, Norway, and Turkey. Production capacity expansion in the Middle East, notably in Saudi Arabia, UAE, and Qatar, the return of exploration appraisal across Africa and the Eastern Mediterranean, and the recognition of gas as a critical fuel source for energy security and the energy transition.

In the Middle East, this is resulting in record levels of upstream investment. From 2023 to 2025, Saudi Arabia is expected to allocate nearly $100 billion to upstream oil and gas capital expenditure expenditure, a 60% increase compared to the previous three years, as they invest to attain a maximum sustained production capacity of 13 million miles per day by 2027. Several other countries in the region have also announced mature increases in capital expenditure that extend beyond 2025. Furthermore, we continue to witness a broad resurgence in offshore driven by energy security and regionalization.

Operators all over the world are making large scale commitments to ascend discovery, accelerate development times, and increase the productivity of their assets. This is resulting in increased infill and tieback activity in metro basins, new development projects both in oil and gas, and support for new exploration. With this backdrop, we anticipate more than $500 billion in global FID between 2022 and 2025, with more than $200 billion billion attributable to deepwater. This reflects an increase of nearly 90% when compared to 2016-2019.

These FID investments are global, taking place in more than 30 countries, and we are seeing the results with new projects in offshore basins across the world. This is reflected in the many contract awards highlighted in the earnings press release, notably in Mexico, Brazil, and Turkey. These contracts, in addition to many others, are building a strong foundation of activity outlook decoupled from short-term community price volatility. Moving forward, we expect further growth to be led by accelerating activity in well construction, new opportunities for reservoir performance in exploration appraisal, expansion for production system in subsea, and digital will enhance it all.

return $2 billion to our shareholders this year between dividends and stock buybacks. I will now turn turn the conference call back to Olivier.

Olivier Le Peuch {BIO 16885975 <GO>}

Thank you, Stephane. Ladies and gentlemen, I believe we are ready to open the floor to your questions.

Questions And Answers

Operator

Question And Answer

Thank you. (Operator Instructions) Our first question will come from the line of James West with Evercore ISI Please go ahead.

Q - James C West {BIO 19758684 <GO>}

Hey, good morning, Olivier, Stephane.

A - Unidentified Speaker

Good morning, James.

Q - James C West {BIO 19758684 <GO>}

Olivier, you and I and Stephane have spent a lot of time together in the last 18 months. If we go back to Lausanne and then to the Ann Arbor in New York City and recent events, we've become increasingly, I think, all three of us, bullish on the cycle and the cycle's duration, especially.

I wonder if you could comment on the duration aspect you see now as you travel around the world? Do you meet with your customers? What are they saying about their drilling programs over the next several years? You made some pretty bullish comments around Saudi, but more broadly, with your major customers, what are their expectations and how are they thinking about duration of their upstream spinning cycle?

A - Unidentified Speaker

A very good question, James. I think you may have realized that recently we characterized the cycle as breath, resilience, and durability. Let me comment a bit further on durability. There are two or three elements to this.

I think, obviously, we did comment on the return of offshore where the first to flag it and to call for the return of offshore. I think we have seen this international offshore resurgence resurgence materializing in the last 12 months and accelerating, and in the second half actually, the offshore rig count will be higher than the land rig count increase. So this momentum is driven by the economics of offshore assets, where the FID now, the

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vast majority of the FID are below $50, hence a favorably position for FID Also the geologic and the low carbon nature of most of the assets, accessibility to this resource and is both oil and gas. So offshore is having an assurance that is translating into very significant pipeline of FID and we see it across not only the IOCs and independent that are capturing this opportunity, but also the NOC that have placed a bet on offshore as you can see from the east or the North Sea.

So we see this happening at scale. we see also the emergence of a second leg of FID and future offshore expansion driven by exploration appraisal. Exploration appraisal is happening in many countries. There are many, many rounds of licensing rounds happening.

A lot of exploration and appraisal is happening to find this next reserve and develop. So offshore is there to stay and not only in 24 or 25, but beyond as we can see and with the second leg materializing. Beyond that obviously Middle East has made a significant commitment of capacity expansion both in oil of 4 million barrel or so and in gas for regional consumption displacing oil for energy or for generating some blue ammonia or blue halogen products, as well as further expanding their export in Qatar particularly. So the Middle East capacity expansion is is leading to, as we have been quoting, a record level of investment from this year onward, and is not set to again stop in 2024, as the vast majority of this capital expansion are towards the second half of the decade 2027 or 2030 for some of the targets.

So what we have seen lately, and the feedback through the visits we have had, is that the duration of the cycle as we were characterizing a year ago is actually extending and is, to be believed, prolonging to the right, and with a combination of offshore resurgence being very solid, and Middle East being a capital expansion beyond the next three years.

Q - James C West {BIO 19758684 <GO>}

Okay, that makes a lot of sense. And then the maybe a follow-up, as we think about, or as you think about, I guess, revenue quality as we go through through what looks to be and appears to be, and I think we agree on, a long-duration cycle, you can upgrade to revenue quality either by choosing offshore over onshore or customers by customer. How are you thinking about that quality of the revenue base that you're putting in place now, and what are the main kind of drivers of that? I'm assuming that you're looking for the highest return and highest margin, but what are the key metrics or key assumptions you have there?

A - Unidentified Speaker

No, absolutely.

I think we have been initiating the returns-focused strategy a few years back, and I think we are getting the characteristics of the cycle that is favoring and accelerating our strategy as we get the opportunity to not only get a five-hour mix, that includes a bit that include a bit more offshore Middle East exploration appraisal, but also higher technology adoption, including digital, including FID technology, or including transition technology, all combining to give a premium to the higher origin equality. But I will not forget also the capital discipline that we have initiated as part of this strategy that is pushing us to high-grade to the higher returns, higher margins contract as you move forward, and make sure that we get the best return for the capital we deployed, and also to put a clear threshold on capital investment and capital stewardship going forward. So the combination, as I said, of the Fababra mix, the technology adoption at scale with some secular trends in digital, and the capital discipline that we have used to execute our strategy are allowing us to create the revenue quality improvement and the high grading on every portfolio and every business plan we have to drive a margin expansion. And we have seen margin expansion increasing, and we will continue to pursue this as we move forward.

Q - James C West {BIO 19758684 <GO>}

Thanks so much, Olivier.

A - Olivier Le Peuch {BIO 16885975 <GO>}

Thank you, James.

Operator

Our next question is from David Anderson with Barclays. Please go ahead.

Q - J David Anderson {BIO 6875231 <GO>}

Great, thank you. Good morning, Olivier. How are you?

A - Olivier Le Peuch {BIO 16885975 <GO>}

Good Morning, Dave.

Q - J David Anderson {BIO 6875231 <GO>}

So I was curious on the Middle East-Asia showed really impressive sequential growth during the quarter.

I was wondering if you could talk a bit about what drove that. Was that just a reflection of the steady ramp-up of projects in Saudi and other Middle East markets? And also, you mentioned a directional growing contract in the release. Was that a discrete contract? And are you starting to see higher prices on those types of contracts now?

A - Olivier Le Peuch {BIO 16885975 <GO>}

No, I think to stay very broad term, I think it's Middle East and Asia and several geo-units, as we call them, that have been benefiting from very significant growth, sequential and year-on-year. As we commented, many of them are in the 30% basket, more than 30% basket growth year-on-year in that region, that area across.

But indeed, in the GCC and the Middle East, particularly, we are benefiting, and we say from three things, we are benefiting from the capacity expansion program that have been initiated, that have turned into an inflection into reactivity and spend activity, that benefit from considering our market exposure. We have been renewing several contracts, and capability. capability. And that's, again, we are speaking about growing at above 50% for that sub-segment of our digital offering.

And last, and maybe the one that has the most growth potential, that is untapped across the industry, is digital operation. That's everywhere from well construction to producing assets. And that's why we deploy either some element of our cloud offering in drilling automation, or in surveillance of assets, or we deploy at the edge, on the asset, at the pump, some device, and we call it the Agora Edge solution, which have embedded AI at the edge that do not need to round-trip to the cloud to optimize these assets. And we use it and consume it in our APS asset to enhance the performance.

So we are seeing the benefit of all these at the same time. They're all going at a different pace, different adoption across the NOC, the independent, all the IOCs, and it will be a long tail of growth that will clearly have a long durability, and will continue to be a factor of secular trend in our industry to extract efficiency, low carbon, productivity, using this trend. So that's what we see. Multiple engine of growth across multiple horizons, and with different technology where we have leadership on most and a footprint that allows us to tap into 1,500 customers for the long run.

Operator

And we will move on to the line of Arun. Go ahead, Mr.Gruber. We will go ahead and move on to the line of Arun Jayaram with JPMorgan Chase. Please go ahead.

Q - Arun Jayaram {BIO 5817622 <GO>}

Yeah, good morning, Olivier. My first question is on offshore. You've highlighted how 85% of global offshore FIDs are now underpinned by oil prices at $50 or below, which is quite a bit below what we saw in the prior cycle where we thought that you needed, call it mid-60 oil price, to kind of justify offshore developments, particularly deep water. I was wondering if you could give some thoughts on what is driving, call it the lower breakevens than we saw in the prior cycle?

A - Olivier Le Peuch {BIO 16885975 <GO>}

I would think that there are several aspects to that.

One, obviously, is the progress the industry at large has made in efficiency, integration, technology, performance at large. That is getting the curve shifting to the left, underlining the cycle compressing on subsea, and the overall development cycle to be more at derisk to digital. So technology, integration performance at large has helped the operator and the service industry to deliver faster and to deliver at a lower total cost the development of those assets. The second element I would think is that exploration has been creating a portfolio of assets that can then be high graded and then the quality of the resource, the high quality of the geological play and lower carbon and better place that have a better production and recovery potential have also emerged and have been more favorably primed and or we say prioritized by our customers.

So these customers have choice and they focus on the best and the most advantageous assets and the most advantageous advantageous geological basins. We have seen it from Brazil to Guyana, and we are seeing it in the Middle East for some of the gas assets as well. So the third, I think, dimension that is, I think, accelerating, in my opinion, is what is called infrastructure-led development or infrastructure-led exploration and development, which make the returns on incremental oil, incremental gas from existing hubs, from existing platform, lower cost than in the past because the capability to infill, tieback, and expand from an existing platform, getting a better return on existing infrastructure. Hence we have seen a significant improvement and a significant increase in investment into this infill and tieback, and IEDX, as it is called, infrastructure-led development, infrastructure-led exploration.

And that's, these are, this is another trend that is lowering the average cost of FID for increment of oil pool or additional gas. So you combine all of this and you are getting better economics, and better and sustained and higher durability for the long-term offshore play.

Q - Analyst

Great. Thanks for that.

And just to follow up, Olivier, we've been getting a few by-side questions on the update on your website regarding Russia. So I was wondering if you could just expand on what this means on a go-forward basis for SLB

A - Olivier Le Peuch {BIO 16885975 <GO>}

Well, simply said, I think Russia's revenue represented approximately 5% of our consolidated revenue in the second quarter. And the decision that we have made last Friday to halt remaining shipment to Russia from all SLB facilities will not impact our financial guarantees. So this decision extends what you have seen as our previous ban on shipment from the location that we had in the United States, UK, EU, Canada into Russia, and we will continue to ensure that our remaining presence in Russia meets and exceeds all international sanctions.

Q - Analyst

Great. Thanks a lot.

A - Olivier Le Peuch {BIO 16885975 <GO>}

Thank you.

Operator

And I apologize.

We will go back to the line of Scott Gruber with Citi Group. Please go ahead.

I think the general sentiment is that, first and foremost, energy security and capacity expansion still dominates the decision. And the economics are seen as very favorable. And the outlook of the industry at large is seen as resilient. And you have seen it for many many major reaffirming their 2030 production volume and adjusting their strategy to make sure they maximize the opportunity to either accelerate the gas transition or sustain their oil production.

And this will mean investment. And we see that in all the engagement we have. And then the NOCs, be it in the Americas, in Africa, Middle East or Asia, are pursuing there two things, either their pollution enhancement to make sure they continue to lift their production performance, and then addressing energy security through their gas development typically. We see this everywhere, particularly in Asia.

So the customers are fairly focused on developing their gas assets, expanding and reverting some of the trends of declining oil production, and to make sure to make sure they maximize the cycle, their participation to the cycle and the participation to the international pool, supply pool that is happening. So it's broad, and as I commented during our time together, I think, I commented that we are seeing also many newcomers that are expanding into deepwater, into exploration rounds that are across the globe in new territories or new countries, and this will attract more investment. This will attract, if the geology are right, future FID So, it's in general driven by energy security, pool and international supply and IOC's commitment to sustain their pollution towards the end of the decade.

Q - Analyst

Thank you.

Operator

And next, we go to a question from Luke Lemoine. Please go ahead.

Q - Luke Lemoine {BIO 15190258 <GO>}

Hey, good morning.

A - Unidentified Speaker

Good morning.

Q - Luke Lemoine {BIO 15190258 <GO>}

Olivier, impressive award with a five-year contract with PETRONAS for Delphi deployment across the organization. Seeing if you can maybe talk about the opportunity for additional contracts with other NOCs or majors for enterprise-wide Delphi and kind of the level of interest there.

A - Olivier Le Peuch {BIO 16885975 <GO>}

Country Analysis Brief: Kuwait

Last Updated: July 20, 2023
Next update: July 2025

Independent Statistics and Analysis
U.S. Energy Information Administration

www.eia.gov
U.S. Department of Energy
Washington, DC 20585

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Overview

Table 1. Kuwait's energy overview, 2021

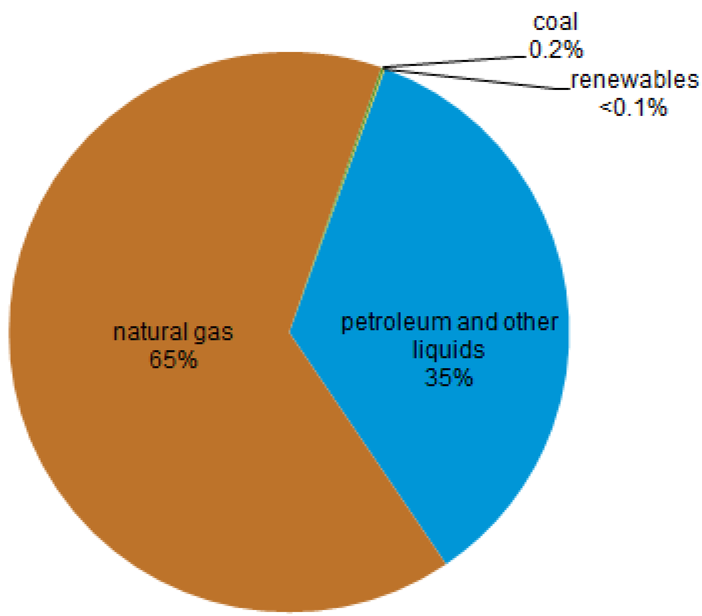
	Crude oil and other petroleum liquids	Natural gas	Coal	Nuclear	Hydro	Other renewables	Total
Primary energy consumption (quads) 2021	0.6	1.1	<0.1	--	--	<0.1	1.6
Primary energy consumption (percentage)	35.0%	64.8%	<0.2%	--	--	<0.1%	100.0%
Primary energy production (quads) 2021	5.8	0.8	--	--	--	<0.1	6.5
Primary energy production (percentage)	88.0%	12.0%	--	--	--	<0.1%	100.0%
Electricity generation (terawatthours)[a] 2021	27.4	43.8	--	--	--	<0.1	71.2
Electricity generation (percentage)	38.5%	61.5%	--	--	--	<0.1%	100.0%

Data source: U.S. Energy Information Administration, Fitch Solutions
Note: Quads=quadrillion British thermal units
Note: Numbers may not add up because of independent rounding.
[a] Crude oil and other petroleum liquids, natural gas, and coal generation proportions from Fitch Solutions, *Kuwait Power Report, Q3 2023*, were used to breakout aggregate fossil fuel generation from EIA's *International Energy Statistics*.

- Kuwait, a long-standing member of OPEC, held 6% of the world's proved oil reserves, including half of the reserves in the Neutral Zone that is shared with Saudi Arabia, in 2022.[1] Kuwait was the third-largest crude oil producer in OPEC and the 10th largest total petroleum liquids producer in the world.[2]
- Internal political disputes and frequent government turnovers create a high level of uncertainty in energy project investment, which has led to delayed or canceled energy projects over the past decade.[3] The ongoing political disputes have prevented reforms necessary for Kuwait to become more energy efficient and to diversify its economy.[4] The executive branch, which has experienced frequent turnover, has dissolved the legislature several times since Kuwait's parliament was elected in 2020. The most recent suspension occurred in April 2023, less than two months after the legislature was reinstated.[5] In addition to political stalemates, Kuwait's limits on foreign investment and regulatory hurdles in the oil and natural gas sectors hinder upstream development and limit production increases.[6]
- Crude oil export revenues account for a large part of Kuwait's economy. According to International Monetary Fund estimates, oil and natural gas revenues accounted for an estimated 57% of the government's total revenues in fiscal year 2021 (April 2020–March 2021).[7] Total petroleum exports accounted for an estimated 78% of the country's total export revenues in 2021.[8] Much like other OPEC producers, Kuwait saw the value of its net oil exports rise in 2022 after crude oil prices and production rose. In 2022, Kuwait's real value of oil exports totaled $98 billion, up from $68 billion (in 2022 dollars) in 2021. However, we expect that oil price decreases and production cuts in 2023 will lower Kuwait's net oil export revenues.[9]
- Kuwait's economy consumed an estimated 1.6 quadrillion British thermal units (quads) of primary energy in 2021, up from 1.5 quads in 2020, after the country began to recover from the

effects of the COVID-19 pandemic (Table 1). We expect energy consumption to continue growing in 2022 as the economy strengthens and as higher oil production requires more energy consumption in the oil industry.[10] Natural gas and oil accounted for virtually all of Kuwait's total primary energy consumption, and coal and renewable energy made up a fraction of consumption (Figure 1). The share of natural gas in Kuwait's energy consumption rose from 32% in 2009 to 65% in 2021 because natural gas displaced some oil in the electric power and industrial sectors.[11]

Figure 1. Kuwait's primary energy consumption by fuel, 2021



Data source: U.S. Energy Information Administration, International Energy Statistics

Petroleum and Other Liquids

- With proved reserves of crude oil estimated at 102 billion barrels at the end of 2022, Kuwait held the fifth-largest reserves in the Middle East and seventh-largest reserves in the world (Figure 3).[12] Kuwait was the fourth-largest crude oil producer in OPEC, and its crude oil and lease condensate production ranked 10th in the world. Kuwait exported most of its crude oil and condensate production in 2022.[13]
- Kuwait, one of the key members of the OPEC+ agreement, raised its crude oil output in 2022 by nearly 300,000 barrels per day (b/d) to 2.7 million b/d, similar to its 2019 average, after the OPEC+ members reversed the significant production cuts made in 2020. Kuwait produced, on average, more than 3.0 million b/d of total petroleum liquids in 2022, of which 2.7 million b/d was crude oil and about 320,000 b/d was non-crude oil liquids (Figure 4).[14]
- Saudi Arabia and Kuwait agreed at the end of 2019 to restart production in the Neutral Zone after a five-year shutdown, and as a result, production began in early 2020 at the Wafra and Al-

Khafji fields. In 2022, PNZ oil production rose to an average of 300,000 b/d, and Kuwait and Saudi Arabia equally shared the production and revenues.[15]

- Nine of the OPEC+ participants, including Kuwait, volunteered to cut crude oil production by nearly 1.7 million b/d from May through December 2023. Kuwait pledged to cut its production by 128,000 b/d during this time, which lowered its monthly production target to below 2.6 million b/d.[16] We forecast that Kuwait's overall 2023 oil production will decline slightly compared with the 2022 averages because of this voluntary reduction.[17] In June 2023, OPEC+ agreed to extend crude oil production cuts through 2024, and Kuwait will continue its voluntary production cuts through 2024 which would leave production estimates at below 2.6 million b/d.[18]
- The fields in the southeast, mainly from the legacy Burgan field (Figure 2), account for most of Kuwait's oil production and exports, which consist of a medium, sour crude oil grade (higher sulfur content). Kuwait added two grades from the northern region to its portfolio of crude oil export grades starting in 2018. Kuwait began exporting its super light oil grade from the Jurassic oil and natural gas field in mid-2018 and its heavy crude oil grade from the south Ratqa and Umm Naqa fields in early 2020.[19]
- Kuwait's crude oil production capacity, including the Neutral Zone, declined after 2017 from nearly 3.2 million b/d to below 2.8 million b/d in 2020 because of insufficient investment, cost increases, regulatory hurdles, and political challenges to project approvals.[20] Most of the declines occurred in the large, mature Burgan field in the southeastern region of Kuwait.[21] To counteract some of the high declines in oil production from its aging fields, Kuwait Oil Company is using enhanced oil recovery (EOR) and constructing gathering centers.[22] Despite its technical and financial challenges in the upstream oil sector, Kuwait targets 4 million b/d of crude oil production capacity by 2035.[23]
- Kuwait has launched almost 300,000 b/d in additional oil projects since 2018 and has announced several new oil and natural gas projects to bolster its oil production by 2040 (Table 2). Key projects, located in northern Kuwait, include associated light oil from the Jurassic natural gas field projects coming online by 2024 and heavy oil additions at the Lower Fars phase 2 project slated to be online before 2040.
- After reaching a high of more than 520,000 b/d in 2009, Kuwait's oil consumption has gradually declined since then as natural gas has displaced some oil use. Kuwait's oil consumption reached 365,000 b/d in 2022, up from nearly 290,000 in 2020 (Figure 4).[24] Kuwait uses a significant amount of fuel oil in its electric power sector, although the higher supply of natural gas over the past decade has replaced some of the fuel oil and direct crude oil burn for electricity generation.[25]
- As of May 2023, Kuwait had the capacity to process 1.2 million b/d of crude oil from its three refineries (Table 3).[26] In late 2021, Kuwait's national oil company (KPC) completed its Clean Fuels Project, which upgraded the Mina Al-Ahmadi and Mina Abdullah refineries to be able to process petroleum products with low levels of sulfur and nitrogen oxide and to reduce overall carbon emissions.[27] Kuwait commissioned the sizeable Al Zour refinery, one of the Middle East's largest refineries, in November 2022 and brought online the plant's second crude oil distillation unit in March 2023.[28] KPC expects to make the last unit operational in the second half of 2023, which will raise Kuwait's total refining capacity to 1.4 million b/d.[29] Kuwait's higher refining capacity is likely to divert some of its crude oil cargo exports to domestic use and result in higher oil product exports in 2023 and beyond. The Al Zour refinery produces significant amounts of low

sulfur fuel oil, which Kuwait plans to use for its power plants when international natural gas prices are high.[30]

Table 2. Kuwait's oil and natural gas projects

Project name	Additional oil production capacity (thousand b/d)	Additional natural gas production capacity (Bcf)	Announced start date	Notes
Jurassic natural gas field Phase 2	120	114	2018	Installation of three early production facilities (EPFs)
Jurassic EPF-50 expansion	N/A	13	2018	Expansion of the original facility supporting the 2010 Jurassic Gas Project
Lower Fars heavy oil project Phase 1	60	N/A	2020	South Ratqa field in northern Kuwait
GC-31 gathering facility	100	23	2021	Gathering center located in northern Kuwait
Khafji oil field in the Neutral Zone	N/A	9	2021	Natural gas pipeline from the offshore field installed
Khafji oil field in the Neutral Zone Phase 2	N/A	6	2023	Second phase of the pipeline completed
Wafra oil field in the Neutral Zone	N/A	15	2022	Natural gas first captured from Wafra to be used for field operations and Kuwait's power grid
Jurassic natural gas field—EPF 3 expansion	10	38	2024	
Jurassic natural gas field Phase 3—EPF 4 and 5	100	110	2024	
Burgan GC-32 gathering facility	120	30	TBA	Project to increase Burgan oil field capacity; operated by Petrofac; under construction
Umm Niqa heavy oil field expansion	30	N/A	2030	
Lower Fars heavy oil project Phase 2	210	N/A	2040	South Ratqa field in northern Kuwait; project not yet sanctioned

Durra natural gas field	42	183	TBA	Kuwait and Saudi Arabia agreed to co-develop the field in 2022. Oil and natural gas production are Kuwait's shares only
Total	**792**	**541**		

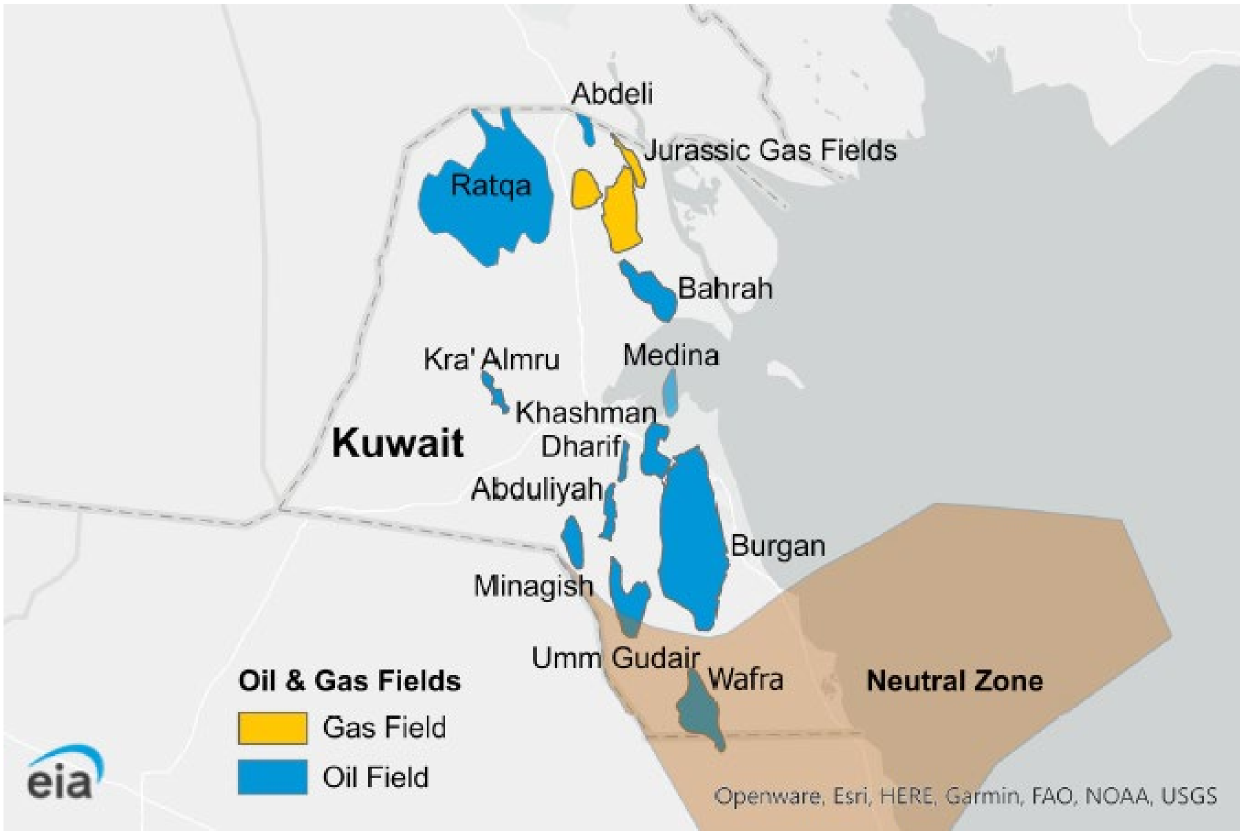
Data source: *Middle East Economic Survey*, Fitch Solutions, Rystad Energy, Reuters, Kuwait Oil Company.
Note: b/d=barrels per day, Bcf=billion cubic feet, N/A=not applicable, TBA=to be announced.

Table 3. Kuwait's oil refining capacity, 2023

Refinery	Owners	Capacity (thousand barrels per day [b/d])	Notes
Crude oil and condensate refineries			
Mina Abdullah	Kuwait National Petroleum Corporation	454	Clean Fuels Project upgrade for refinery completed September 2021
Mina Al-Ahmadi	Kuwait National Petroleum Corporation	346	Clean Fuels Project upgrade for refinery completed August 2020
Al Zour Unit 1	Kuwait Integrated Petroleum Industries Company	205	Became operational in November 2022 with 205,000 b/d of capacity
Al Zour Unit 2	Kuwait Integrated Petroleum Industries Company	205	Became operational in March 2023 with 205,000 b/d of capacity
Al Zour Unit 3	Kuwait Integrated Petroleum Industries Company	205	Expected online in the second half of 2023
Total		**1,415**	

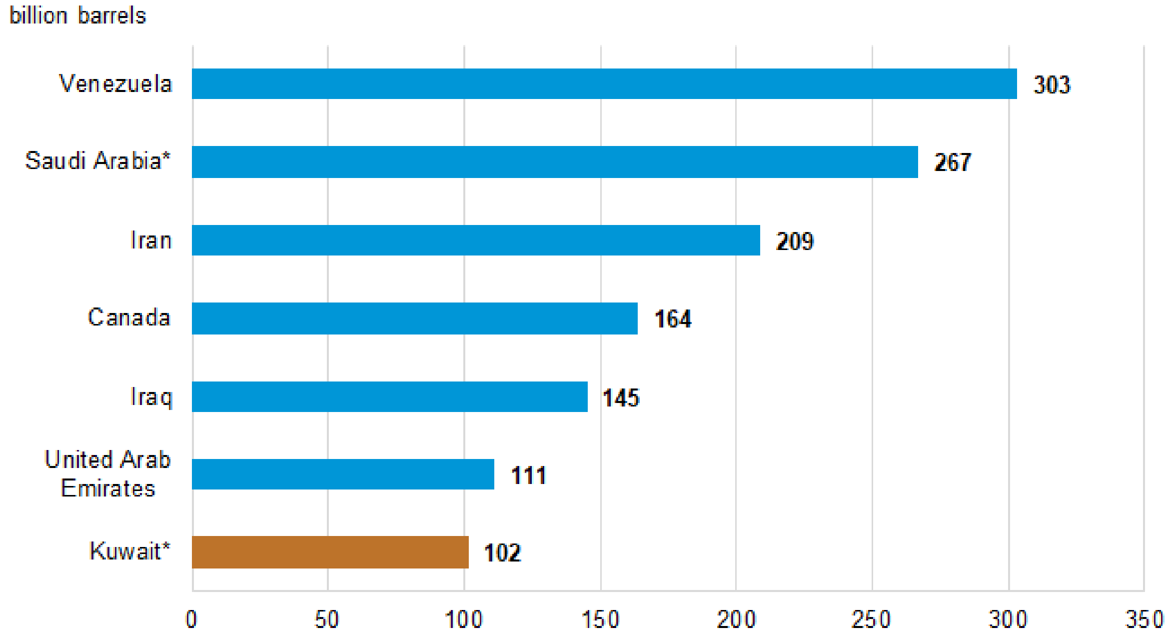
Data source: *Oil and Gas Journal*, FACTS Global Energy, and *Middle East Economic Survey*

Figure 1. Kuwait's key oil and natural gas fields



Data source: U.S. Department of Energy, National Energy Technology Laboratory and U.S. Energy Information Administration

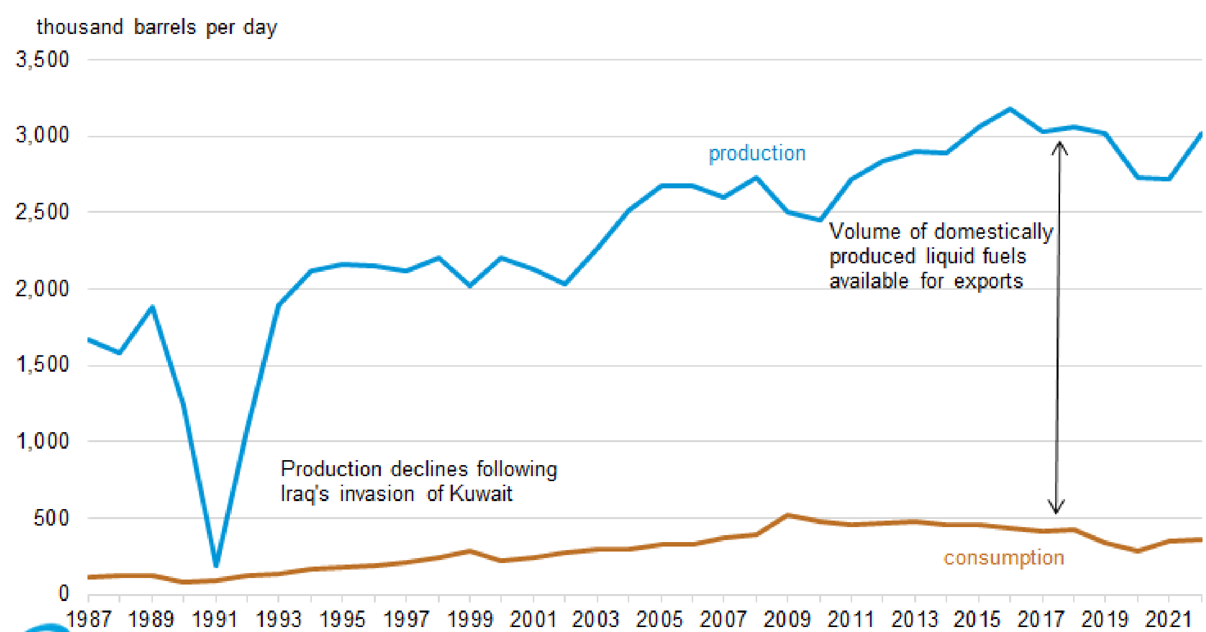
Figure 3. Top proved world oil reserves, 2022



Data source: *Oil & Gas Journal*, December 2022

Note: *Reserve volumes include those from the Neutral Zone

Figure 4. Kuwait's petroleum and other liquids production and consumption, 1987-2022



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook* June 2023

Natural Gas

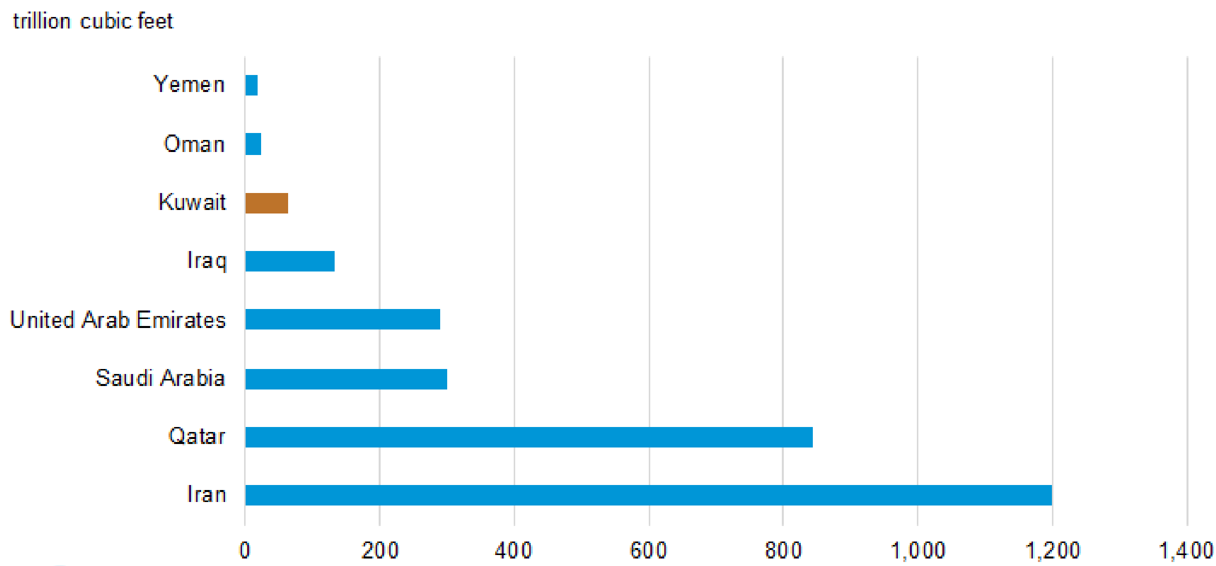
- Although Kuwait's estimated proved natural gas reserves were low compared with its neighbors in the Middle East, it ranked in the top 20 countries in the world. Kuwait held 63 trillion cubic feet (Tcf) of proved natural gas reserves as of December 2022 (Figure 5).[31] About 70% of Kuwait's natural gas production was from fields associated with oil production in 2021.[32]
- Even though Kuwait's natural gas production rose significantly after 2010, its domestic demand growth outpaced production during the same time frame. Kuwait became the leading liquefied natural gas (LNG) importer in the Middle East.[33] Kuwait's natural gas production fell from 691 billion cubic feet (Bcf) in 2019 to 664 Bcf in 2021 because the OPEC+ member had to reduce its associated gas output in line with its oil production cuts (Figure 6). In 2022, production rose back to the 2019 averages as oil production and therefore associated gas cuts were reversed during most of 2022. We expect natural gas production to remain tempered in 2023 because of Kuwait's oil cuts made in late 2022 and early 2023.
- Kuwait intends to increase its natural gas production through the development of natural gas fields not associated with crude oil production.[34] As part of this goal, Kuwait is expanding the Jurassic natural gas field production in the northern region by 110 Bcf in 2024 (Table 2).
- Kuwait and Saudi Arabia signed an agreement in 2022 to develop the large Durra natural gas field located offshore near the Neutral Zone. The countries aim to produce 365 Bcf/y of natural gas and 84,000 b/d of condensate, which would be split between them. Development of the Durra field could face delays because Iran also claims the field is in its territorial waters.[35]
- Kuwait's natural gas consumption increased by 52% between 2014 and 2022 after the most recent fossil-fuel-fired power plant, the Az Zour natural gas-fired power plant, came online in 2015.[36] The domestic power plants, water desalination plants, petrochemical and other industries, and the oil sector heavily use natural gas for fuel.[37] Kuwait plans to replace some of its oil-fired power generation with natural gas-fired generation to reduce its carbon dioxide emissions and to free up more crude oil and oil products for exports.[38]
- Because the demand for natural gas outpaced its production, Kuwait began to import LNG in 2009 at a floating and regasification vessel docked at Mina Al-Ahmadi.[39] The Kuwait Integrated Petroleum Industries Company, a state-owned firm, commissioned the large-scale, onshore Al-Zour regasification terminal in mid-2021, which replaced the floating vessel at Mina Al-Ahmadi.[40] The Al-Zour import terminal can help the electric power sector pivot even more away from oil and toward natural gas for fuel. A second phase came online in early 2022, which raised Kuwait's total LNG importing capacity to more than 1.1 Tcf (Table 4).[41]

Table 4. Kuwait's existing regasification terminals

Project name	Owners	Nameplate capacity (billion cubic feet per year)	Operational start year
Existing LNG import terminals			
Al-Zour LNG Phase 1	Kuwait Petroleum Corporation	528	July 2021
Al-Zour LNG Phase 2	Kuwait Petroleum Corporation	528	February 2022
Total		**1,056**	

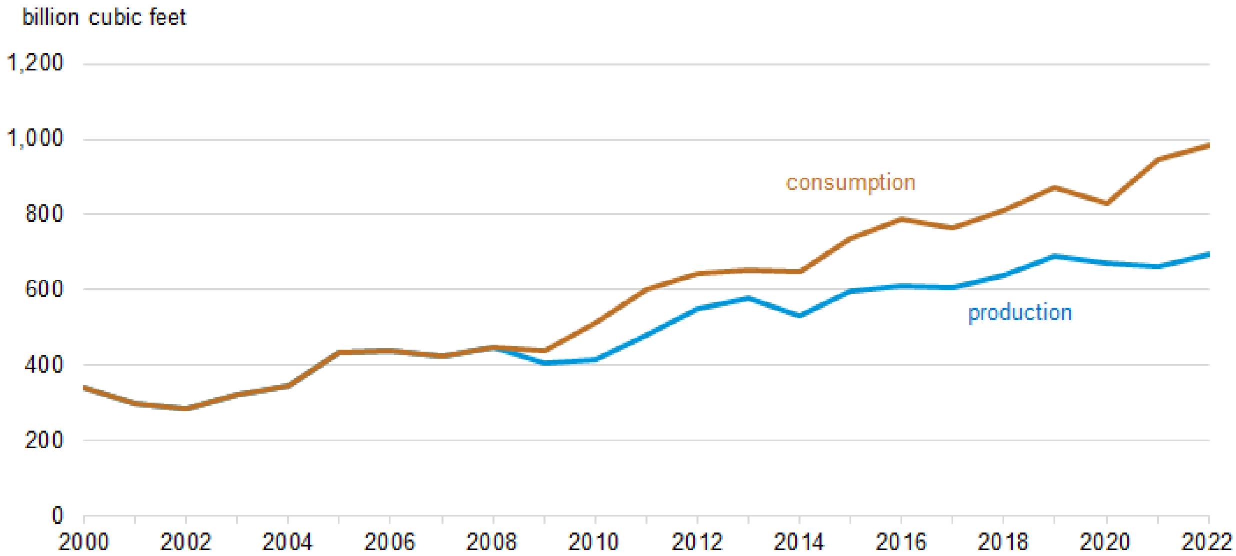
Data source: International Gas Union, *2022 World LNG Report, Middle East Economic Survey,* Rigzone, Arab Times
Note: LNG=liquefied natural gas

Figure 5. Largest proved reserve holders of natural gas in the Middle East, 2022



Data source: *Oil & Gas Journal*, December 2022

Figure 6. Kuwait natural gas production and consumption, 2000-2022



eia Data source: U.S. Energy Information Administration

Electricity

- Kuwait's electric power generation capacity was 20 gigawatts (GW) in 2021 and rose 7% between 2016 and 2021. The country's net electricity generation rose at a similar pace, about 8%, in the same period (Figure 7).[42] Population growth, increasing water desalination, and high summer temperatures raised electricity consumption.[43] The Kuwaiti government heavily subsidizes electricity rates for consumers.[44] Because of its high electricity subsidies, which make electricity cheaper for consumers, Kuwait had the fifth-highest electricity generation per capita in the world and the third-highest in the Middle East in 2021.[45]
- Kuwait generated more than 71 terawatthours (TWh) of net electricity in 2021 (Figure 7), and virtually all of it came from natural gas, fuel oil, and (to a smaller degree) direct burn crude oil.[46] Although Kuwait's electricity demand fell in 2020 because of the effects of the COVID-19 pandemic on mobility, the economy, and oil production, demand resumed growth in 2021.[47] We assess that the rise in oil production[48] and economic growth[49] in 2022 led to higher annual electricity output.
- Although Kuwait currently has sufficient electricity capacity, its peak demand in the summer is rising close to the country's available capacity and could soon strain the power system. Kuwait proposed expanding its power production capacity by nearly 13 GW through several projects to meet the growing demand.[50] Most of these projects are highly efficient combined-cycle natural gas-fired units, and one project uses solar energy for fuel. The political stalemate and regulatory issues have delayed all of these projects over the past decade.[51]
- Kuwait produces a negligible amount of electricity from renewable energy, mainly from solar energy. However, the Kuwaiti government's goal is to diversify its energy sources and to produce 15% of its power supply, which it estimates to be around 4.5 GW, from renewable energy by 2030.[52] Bolstering its renewable energy, reducing electricity demand through higher efficiencies, switching from oil to more natural gas use, and using carbon capture technology are

part of Kuwait's plan to reduce its carbon emissions by 7.4% by 2035 (in a business-as-usual scenario) and to become carbon neutral by 2060.[53]

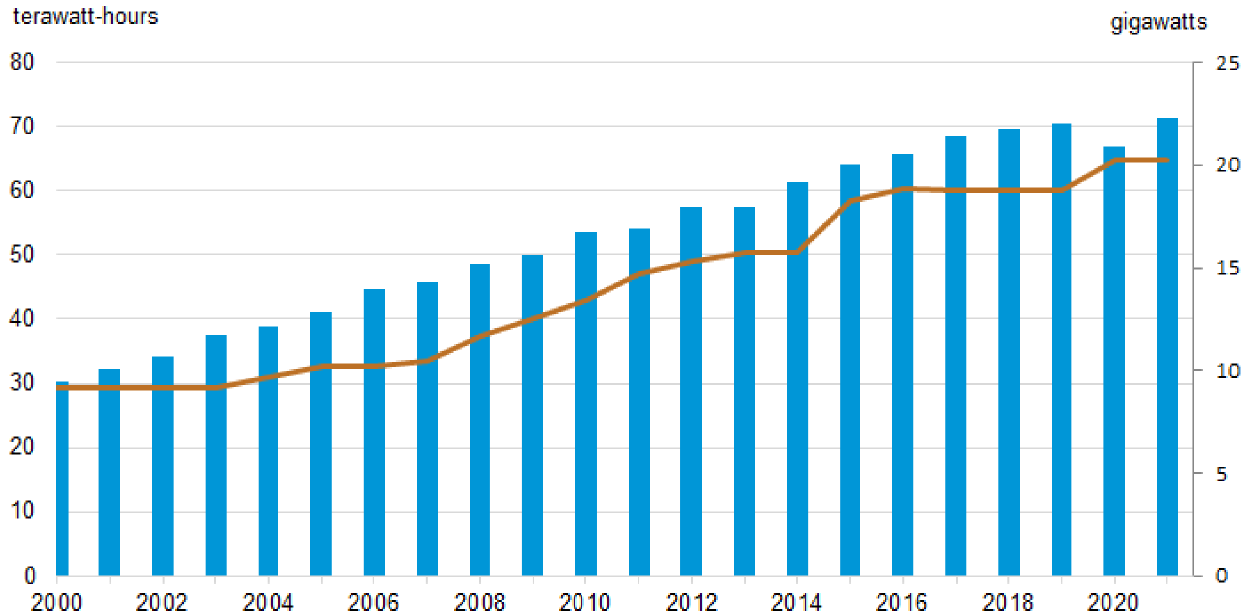
- In 2019, Kuwait opened its first utility-scale solar and wind powered project, the 70-megawatt first phase of the Al-Shygayah power project.[54] The next phases of this project are slated to bring online at least 3.5 GW of solar capacity (Table 5), and it will displace some of the oil-fired electricity.

Table 5. Kuwait's planned power plants

Project name	Fuel	Capacity (megawatts)	Notes
Az-Zour North Phases 2 and 3	Natural gas	2,700	CCGT plant
Al-Khiran Phase 1	Natural gas and oil	1,800	Gas turbine
Al Sabiya Phases 2 and 4	Natural gas	1,150	CCGT plant
Nowaiseeb Phase 1	Natural gas	3,600	CCGT plant
Al-Shygaya Renewable Energy Phases 2 and 3	Solar	3,500	
Kabd project	Waste to energy	80	
Total		**12,830**	

Data source: Kuwait's Ministry of Electricity & Water & Renewable Energy, Saudi Gulf Projects, *Middle East Economic Survey, Times Kuwait,* Power Technology
Note: CCGT=combined-cycle gas turbine

Figure 7. Kuwait's electricity generation and capacity, 2000-2021



Data source: U.S. Energy Information Administration, International Energy Statistics

Energy Trade

Petroleum and other liquids

- Kuwait only occasionally imports crude oil and petroleum products because the country's oil production and refining sectors more than meet domestic demand.[55]
- Kuwait's crude oil and condensate exports have hovered around 1.9 million b/d since 2020; the vast majority are sent to Asia, and small amounts are sent to Egypt and the United States (Figure 8).[56] The share of Kuwait's crude oil travelling to China rose significantly in the past decade from around 9% in 2013 to 31% in 2022. Vietnam began importing crude oil from Kuwait in 2017 when Vietnam's largest refinery (35.1% owned by Kuwait Petroleum Corporation) began operations.[57] The share of exports headed to the United States, which accounted for 16% of Kuwait's crude oil exports in 2013, fell to 1% in 2022 because U.S. crude oil and condensate production rose substantially during this period.[58]
- Kuwait's crude oil exports are likely to decline in 2023 because of the higher domestic demand for crude oil by the new Al-Zour refinery. Kuwait is slated to produce and export more petroleum products, particularly diesel, fuel oil, and naphtha.[59]
- In 2022, Kuwait's oil product exports rose to around 650,000 b/d from 530,000 b/d the year before.[60] The additional refinery capacity from refurbishments at original refineries and commissioning of the Al-Zour facility allowed Kuwait to produce and export more petroleum products. Europe and East Africa increased their imports of oil products from Kuwait (Figure

9).[61] Europe is looking to replace diesel and other products that it used to receive from Russia before Europe sanctioned Russia's oil product cargoes.

- More than 90% of Kuwait's oil product exports were liquefied petroleum gas (LPG), diesel, jet fuel, and naphtha. Exports of relatively cleaner products such as jet fuel and diesel have increased since 2019, and fuel oil exports have declined.[62] Kuwait can produce more middle distillates after its Clean Fuels Project refinery upgrade project, and it uses fuel oil domestically for its power plants.

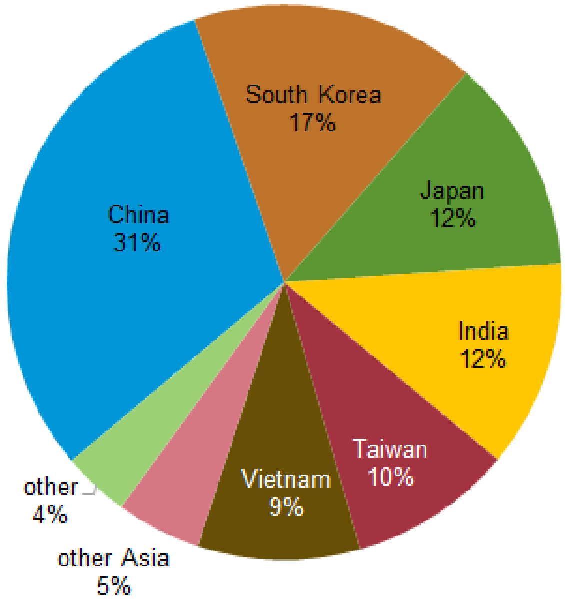
Natural gas

- Kuwait's natural gas production growth has not kept pace with its demand, and it began to import natural gas in 2009. In 2021, Kuwait was the largest importer of LNG in the Middle East,[63] and the third-largest importer of total natural gas (including LNG and pipeline natural gas) in the Middle East behind the UAE and Iraq.[64] Kuwait's natural gas imports rose substantially after 2018 because of escalating demand for natural gas-fired power generation (especially during summer months), reduced associated natural gas production because of OPEC+ oil production cuts in 2020, and the inauguration of the Al-Zour LNG import terminal in mid-2021.[65]
- In 2022, Kuwait received about half of its LNG from regional suppliers, primarily Qatar (Figure 10). The UAE began to send Kuwait LNG cargoes in 2021.[66] After the United States began exporting LNG in 2016, it quickly became a significant natural gas exporter to Kuwait.[67]
- Kuwait signed its first long-term LNG contracts with QatarEnergy and Shell for up to 288 Bcf/y to supply the Al-Zour terminal for 15 years.[68]

Electricity

- As a member of the Gulf Cooperation Council Interconnection Authority (GCCIA), Kuwait trades small amounts of electricity with its neighbors. The main transmission line connecting Al Zour in Kuwait to Saudi Arabia has a capacity of 1.2 GW.[69] The GCCIA also intends to extend the transmission line north from Kuwait to Iraq. The additional 1.8 GW of capacity to Iraq is slated to be completed by 2025.[70]

Figure 8. Kuwait's crude oil and condensate exports by destination, 2022

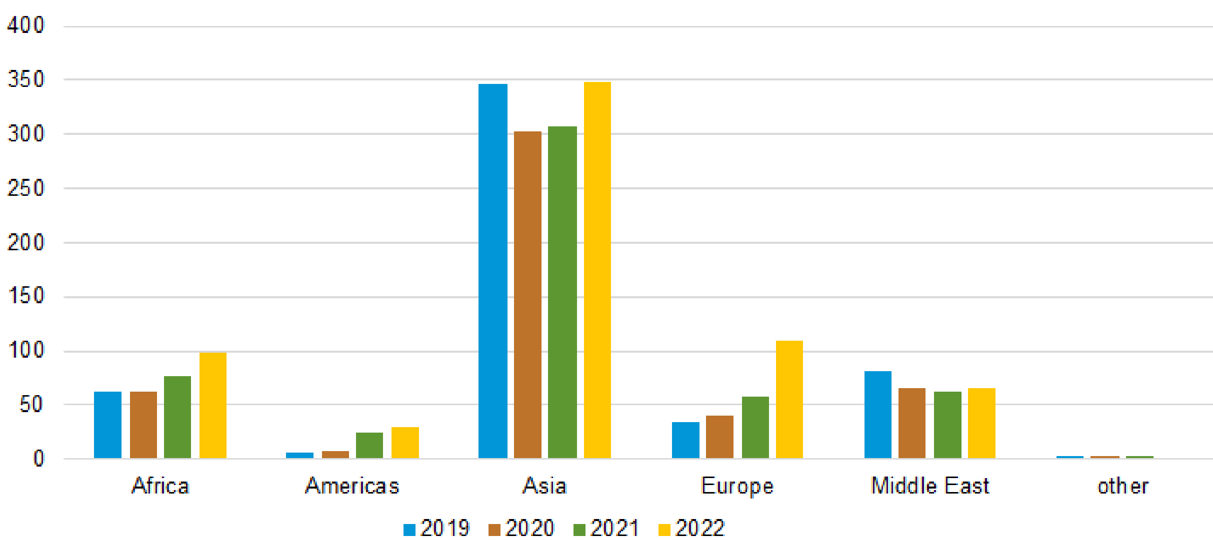


Data source: Kpler (accessed March 2023)

Numbers may not add to 100% because of independent rounding.

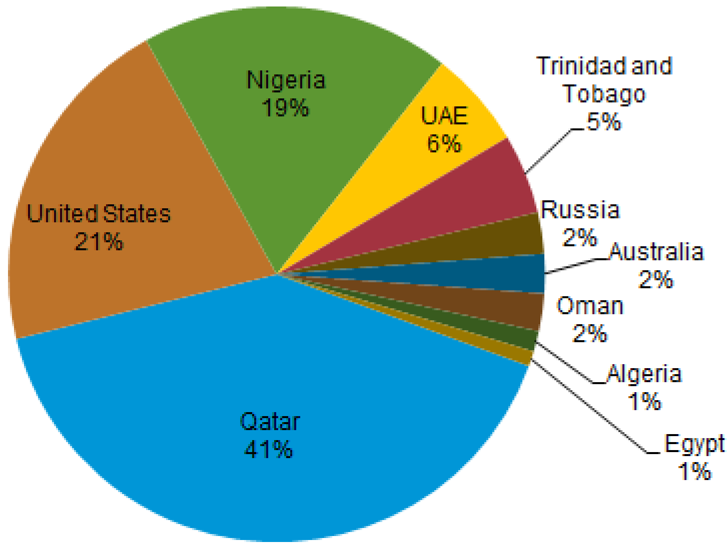
Figure 9. Kuwait's oil product exports by destination, 2019-2022

thousand barrels per day



Data source: Kpler (accessed April 2023)

Figure 10. Kuwait's LNG imports by source, 2022



Data source: U.S. Energy Information Administration and Kpler

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[1] *Oil & Gas Journal*, Worldwide look at reserves and production (December 2022).
[2] U.S. Energy Information Administration, *Short-Term Energy Outlook*, June 2023.
[3] *Middle East Economic Survey*, "Kuwait Hopes For New Political Dawn. Again," October 21, 2022.
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Texas Energy Sector Employment Growth Continues

*21 Jul 2023 10:00 AM***Anonymous**

Austin, Texas - Citing the latest Current Employment Statistics (CES) report from the U.S. Bureau of Labor Statistics (BLS), the Texas Independent Producers and Royalty Owners Association (TIPRO) today highlighted new employment figures showing an increase in Texas upstream employment last month. According to TIPRO's analysis, direct Texas upstream employment for June 2023 totaled 208,000, an increase of 2,500 jobs from adjusted May employment numbers. Texas upstream employment in June 2023 represented the addition of 24,800 positions compared to June 2022, including an increase of 3,900 jobs in oil and natural gas extraction and 20,900 jobs in the services sector.

TIPRO's new employment data yet again indicated strong job postings for the Texas oil and natural gas industry during the month of June. According to the association, there were 13,696 active unique jobs postings for the Texas oil and natural gas industry in June, including 4,692 new job postings added during the month by companies. In comparison, the state of California had 4,655 unique job postings last month, followed by Louisiana (2,328), Oklahoma (1,982) and Pennsylvania (1,666). TIPRO reported a total of 62,700 unique job postings nationwide last month within the oil and natural gas sector.

Among the updated 17 specific industry sectors TIPRO uses to define the Texas oil and natural gas industry, Support Activities for Oil and Gas Operations led in the rankings for unique job listings in June with 3,299 postings, followed by Gasoline Stations with Convenience Stores (1,658) and Crude Petroleum Extraction (1,633). The leading three cities by total unique oil and natural gas job postings were Houston (5,065), Midland (1,234) and Odessa (666), said TIPRO.

The leading three companies ranked by unique job postings in June were John Wood Group (751), Love's (549) and KBR (492), according to TIPRO. Of the top ten companies listed by unique job postings last month, four companies were in the services sector, followed by two midstream companies, two in the gasoline stations category with convenience stores, and two in oil and natural gas extraction. Top posted industry occupations for June included maintenance and repair workers (432), heavy tractor-trailer truck drivers (431) and managers (342). The top posted job titles for June included field service technicians (106), lease operators (94) and process engineers (70).

Top qualifications for unique job postings included valid driver's license (2,416), commercial driver's license (CDL) (372), and Master of Business Administration (MBA) (245). TIPRO reports that 43 percent of unique job postings required a bachelor's degree, 30 percent required a high school diploma or GED, and 28 percent had no education requirement listed. There are 1,370 advertised salary observations (10 percent of the 13,696 matching postings) with a median salary of $50,600.

Additional TIPRO workforce trends data:

- A sample of 500 industry job postings in Texas for June 2023 can be viewed here.
- The top three posting sources in June included indeed.com (5,345), simplyhired.com (3,238) and dejobs.org (2,286).
- Average annual wages for the Texas oil and natural gas industry can be viewed here.
- Leading industry positions in Texas with median hourly earnings, education, work experience and typical on-the-job training is available here.

TIPRO also highlights recent data released from the Texas comptroller's office showing large tax contributions this summer by the Texas oil and natural gas industry. In June, Texas energy producers paid $456 million in oil production taxes and also contributed $184 million in natural gas production taxes. Oil and natural gas severance taxes are an extremely important source of revenue for state and local governments and are used help to support and pay for road and infrastructure investments, water conservation projects, schools and education, first responders and other essential public services across the Lone Star State.

Furthermore, TIPRO reports that oil and natural gas output from Texas and the United States will continue to remain strong in the coming months, though is forecasted to fall in August for the first time this year. New data from the U.S. Energy Information Administration (EIA) projects that after peaking in July, U.S. crude oil production in the Lower 48 will total 9.397 million barrels per day (b/d) next month, a decline of 18,000 b/d from July. After a long-running streak of production gains in the Permian Basin, the most nation's most prolific shale oil basin, regional oil output is expected to drop by around 11,000 b/d to 5.764 million b/d in August, forecasts EIA experts, after reaching 5.775 million b/d in July. Domestic natural gas production in the United States also will slow in August and is expected to decrease by around 100 million cubic feet per day to 97.972 billion cubic feet per day (bcf/d) in August, according to the latest EIA estimates. Despite the overall reduction in natural gas production in the United States, the Permian Basin is still slated to see natural gas output increase to 23.389 bcf/d, with the highest growth in production of natural gas anywhere in the country.

"Oil and gas employment in Texas is strong and our state remains the undisputed leader for oil and gas production by a significant margin, generating economic prosperity and fortifying our energy security," said Ed Longanecker, president of TIPRO. "TIPRO and our members will continue to advocate for sound, science-based energy policies at all levels of government to support continued expansion of domestic production and energy infrastructure."

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https://www.thesun.co.uk/news/politics/23246629/grant-shapps-labour-eco-plans-could-cause-blackouts/

Labour’s eco plans could plunge Britain into blackouts, Energy Secretary Grant Shapps warns

- **Kate Ferguson**, Political Editor Sun on Sunday

- Published: 20:30, 29 Jul 2023
- Updated: 21:13, 29 Jul 2023

LABOUR’S eco plans risk plunging Britain into 1970s-style blackouts, Energy Secretary Grant Shapps warned last night.

Sir Keir Starmer wants to end new licences for drilling for oil and gas in the North Sea and make the electricity system carbon neutral by 2030.

Sir Keir Starmer's eco plans could plunge Britain into blackouts, Energy Secretary Grant Shapps warnsCredit: PA

But Mr Shapps said the “insane” policy would put 213,000 jobs across Britain at risk and cost the country £87 billion in lost revenues.

It will also leave the UK dependent on foreign leaders like Vladimir Putin for our energy, he warned.

He said: “Keir Starmer’s plan threatens the lights going out.

“They will put the security of our energy supply in danger.”

Mr Shapps said Labour’s green targets are impossible to achieve without clobbering families with higher bills.

“Their plan is so extreme and done at such speed, it is in danger of putting us completely in hoc to Putin or whoever the next dictator is”, he fumed.

“Basically that plan - reading between the lines - says just import a lot more oil and gas.

“And if you're going to do that and prices spike, we could be looking at the danger of blackouts.

“So Labour's plan threatens not only jobs and livelihoods, but also blackouts in people's homes.

"It is mission impossible."

He accused Labour of "buying" their green policy from eco mob Just Stop Oil. Labour have taken £1.5m in donations from JSO donor Dale Vince.

The minister said: "What do they [Just Stop Oil] demand? Stop giving oil and gas licences.

"What does Labour's Keir Starmer deliver? They won't provide any more oil and gas licences. It is crazy.

"How did they get all of these things? They paid £1.5m and they bought the policy."

His fiery putdown is the most ferocious attack on Labour's green mission by a Cabinet minister yet.

In stark contrast, Mr Shapps says he wants to "max out" the amount of oil and gas drilling we do in the North Sea - suggesting more licences will be doled out soon.

Sun on Sunday political editor with Energy Secretary Grant ShappsCredit: Louis Wood

His words come as No10 kickstarts energy week.

Mr Shapps and PM Rishi Sunak are meeting leaders from the UK oil, gas and green energy sector all week to help power up the sector.

A Labour spokeswoman hit back at Mr Shapps.

She said: "Every family and business is paying the price in higher energy bills of 13 years of failed Tory energy policy.

"Labour will take no lessons from the party that banned onshore wind, crashed the market for solar, stalled energy efficiency, haven't got any new nuclear plants started, and left us at the mercy of tyrants across the world."

Government of Canada delivers on key climate commitment to phase out inefficient fossil fuel subsidies

From: Environment and Climate Change Canada

News release

July 24, 2023 – Montréal, Quebec

The Government of Canada is committed to investing in a strong, sustainable economic future that will deliver good, middle-class jobs, clean air, and energy security for generations to come.

Today, the Honourable Steven Guilbeault, Minister of Environment and Climate Change, released the *Inefficient Fossil Fuel Subsidies Government of Canada Self-Review Assessment Framework* and the *Inefficient Fossil Fuel Subsidies Government of Canada Guidelines*, which were jointly developed by Environment and Climate Change Canada and the Department of Finance Canada. Eliminating inefficient fossil fuel subsidies and redoubling our focus on clean energy is a key step in building Canada's net-zero economy by 2050 and supporting good-paying jobs for Canadians for generations to come.

The Assessment Framework and Guidelines support the decarbonization of Canada's oil and gas sector and support a strong future for workers in the industry while making real progress to fight climate change. The Government of Canada's commitment to eliminating inefficient fossil fuel subsidies signals both greater support for clean technology as well as emission reductions across the economy from traditional sectors. This will help create and secure middle-class jobs from coast to coast to coast while protecting the environment. From support for the Come By Chance biodiesel refinery in Newfoundland and Labrador, to the Enerkem biomethanization plant in Varennes, Quebec, to the Oneida battery storage project in Ontario and Indigenous-led solar projects in Alberta, clean energy investments mean good jobs and clean air.

The Assessment Framework builds on Canada's commitment under the 2021 Glasgow statement to end new direct public support for the international unabated fossil fuel energy sector. Putting the Assessment Framework and Guidelines into force will ensure any government supports for the sector will not delay the transition to renewables, are in compliance with the goals of the Paris Agreement to limit warming to 1.5 °C, and account for the availability of credible alternative energy sources.

The Assessment Framework—the first transparently published methodology worldwide—will be used to determine which tax and non-tax measures constitute an inefficient fossil fuel subsidy. Subsidies will be considered inefficient unless they meet one or more of the following six criteria:

1. Enable significant net greenhouse gas emissions reductions in Canada or internationally in alignment with article 6 of the Paris Agreement.
2. Support clean energy, clean technology, or renewable energy.
3. Provide essential energy service to a remote community.
4. Provide short-term support for emergency response.
5. Support Indigenous economic participation in fossil fuel activities.
6. Support abated production processes, such as carbon capture, utilization, and storage (CCUS), or projects that have a credible plan to achieve net-zero emissions by 2030.

The Guidelines become effective today and apply to all federal departments and agencies.

Canada is also committed to phasing out public financing of the fossil fuel sector. This refers to financing beyond the scope of today's fossil fuel subsidies commitment. The Government's work will identify current public financing by 2024 and announce by fall 2024 the implementation plan to phase out public financing of the fossil fuel sector.

Canada is the only G20 country to phase out inefficient fossil fuel subsidies ahead of the 2025 deadline. We are the first country to release a rigorous analytical guide that both fulfills our commitment and transparently supports action. By eliminating inefficient fossil fuel subsidies, the Government of Canada is enabling greater support for clean technology, clean growth, and accelerated efforts to decarbonize important Canadian industries, including the oil and gas sector, which continues to play an important role in the Canadian economy.

Quotes

“The Government of Canada is committed to supporting energy innovation and environmental improvements to ensure that Canadians, communities and businesses can thrive in a net-zero world with a reliable, affordable supply of clean power. By eliminating inefficient fossil fuel subsidies, we are encouraging smart and efficient government investment decisions that can increase Canada’s competitiveness in a decarbonizing global economy, while avoiding creation of stranded assets. Phasing out fossil fuel subsidies in Canada will ensure government programs and spending support an energy sector that is aligned with our ambitious climate goals.”
– The Honourable Steven Guilbeault, Minister of Environment and Climate Change
“With the $120 billion clean economy plan detailed in our 2023 budget, our government is building Canada’s clean economy and creating great careers for workers across Canada. Investing in building a thriving, clean economy is essential to helping us achieve our climate goals, bringing investment to our communities, and ensuring Canada remains competitive as the global economy moves at speed towards net zero.”
– The Honourable Chrystia Freeland, Deputy Prime Minister and Minister of Finance

Quick facts

- Cutting pollution in our communities is good for our climate, economy, health, and well-being. It will also help Canadians reduce the impacts of climate change that are already costing the Canadian economy billions of dollars every year.
- The Guidelines can be updated at any point to better reflect new policy developments and enable increased stringency and may be formally reviewed periodically.
    - Canada’s Assessment Framework uses the World Trade Organization Agreement on Subsidies and Countervailing Measures (PDF) Article 1.1 definition of subsidies as a reference.
- The Guidelines will provide a standardized methodology to ensure future government support is aligned with Canada’s climate and energy priorities and would preclude project funding within discretionary programs that do not align with the Assessment Framework.
- As Ministers Guilbeault and Wilkinson announced at the April 2023 G7 Ministers’ Meeting on Climate, Energy, and Environment in Japan, Canada, along with other G7 members, committed to accelerate the phase-out of unabated fossil fuels in combustion applications and called on other non-G7 countries to do the same, consistent with Canada’s 2030 Emissions Reduction Plan and the need to apply large-scale decarbonizing technologies and practices to achieve net zero. Canada also secured an agreement among partner nations to report back by the end of the year on the progress to phase out fossil fuel subsidies and international fossil fuel finance
- In Budget 2023, the government announced new investments in jobs and growth as part of its $120 billion clean economy plan, including new investment tax credits to support clean electricity, clean technology manufacturing, clean hydrogen, and carbon capture, utilization, and storage.

Associated links

- Inefficient Fossil Fuel Subsidies Government of Canada Self Review Assessment Framework
- Inefficient Fossil Fuel Subsidies Government of Canada Guidelines
- Government of Canada delivers on key international climate commitment to end new public support for the international unabated fossil fuel energy sector
- Statement on International Public Support for the Clean Energy Transition
- 2030 Emissions Reduction Plan: Clean Air, Strong Economy
- Ministers Guilbeault and Wilkinson wrap up G7 Ministers’ Meeting in Japan focused on climate action, clean energy, and nature protection

Contacts

https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/inefficient-fossil-fuel-subsidies/guidelines.html

Inefficient Fossil Fuel Subsidies Government of Canada – Guidelines

On this page

Inefficient Fossil Fuel Subsidies Government of Canada – Guidelines[PDF - 357 KB]

Overview

The Government of Canada has delivered on its G20 commitment to phase out inefficient fossil fuel subsidies, including through the application, in 2023, of an Assessment Framework to existing tax Measures and 129 non-tax Measures.

These Guidelines, which were jointly developed by the Minister of the Environment and Climate Change and the Minister of Finance, are the government's tool to achieve two objectives that are related to the G20 commitment:

1. avoid creating new Measures that would be considered Inefficient Fossil Fuel Subsidies as per the Assessment Framework
2. help ensure all support for the fossil fuel sector that meet the definition of a fossil fuel subsidy, as per the Assessment Framework, are aligned with one of the six inefficiency criteria below

Scope and Application

There are two Parts to these Guidelines. **Part A** refers to the creation of a Measure, and **Part B** refers to spending decisions within a Measure.

Part A of these Guidelines outlines how the Government of Canada will avoid creating new Measures that would be considered Inefficient Fossil Fuel Subsidies as per the Assessment Framework. This Part applies to all Ministers when developing a proposal for consideration by Cabinet (e.g., for policy, funding, expenditure or legislative authority) for the creation of a new Measure (i.e., an "Initiative") or to the Minister of Finance when developing a new tax Measure.

Part B of these Guidelines outlines how the Government of Canada will ensure non-tax Measures do not provide inefficient Support to the Fossil Fuel Sector, Fossil Fuel Activities or Fossil Fuel Consumption. This Part applies to all federal departments, and agencies responsible for administering Measures. Federal Crown corporations with similar responsibilities would also be expected to adhere to these Guidelines.

Direct public support for operations in the fossil fuel energy sector outside of Canada's jurisdiction are assessed separately under Canada's Glasgow Statement Guidelines. Public financing support for operations within the fossil fuel energy sector within Canada are outside the scope of these Guidelines, and will proceed on a separate track of work.

Defined terms (bold and italicized) are found in Annex B.

Review

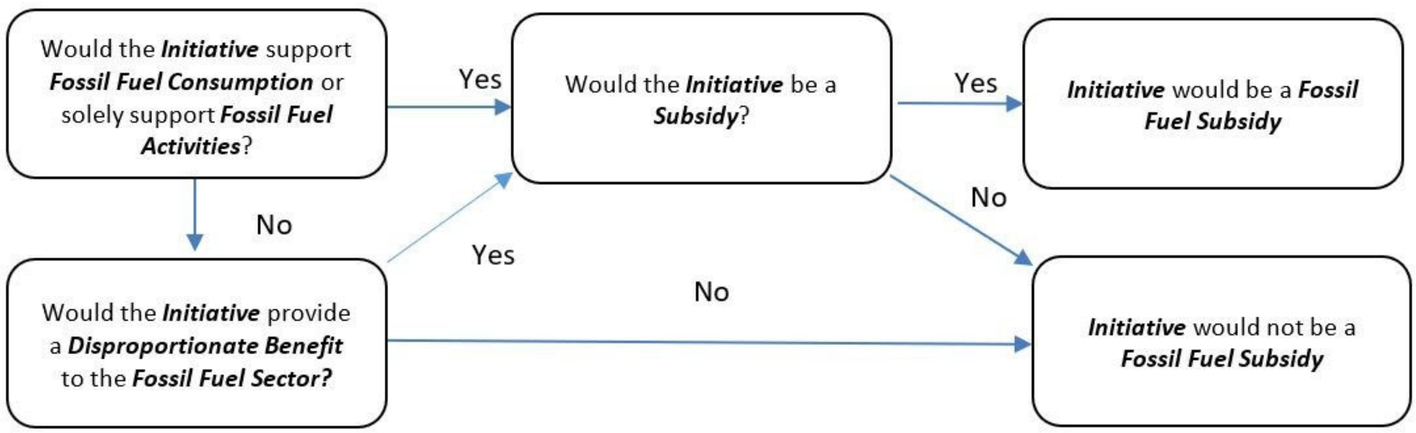
The Ministers of Finance and of the Environment and Climate Change, in consultation with the Minister of Natural Resources will initiate review of the Guidelines at regular intervalsto ensure that they remain aligned with future government commitments and technological developments. The Ministers may also update the Guidelines at any time if issues arise that require immediate consideration.

Part A – Requirements

Ministers who are developing any ***Initiative*** will undertake two steps prior to submitting them.

Step 1 – Identifying a *Fossil Fuel Subsidy*

The first step will assess whether the ***Initiative*** would be a ***Fossil Fuel Subsidy***, if created.



Long description

Step 2: Identifying an Inefficient *Fossil Fuel Subsidy*

All ***Initiatives*** identified as ***Fossil Fuel Subsidies*** in Step 1 of the assessment framework will be considered as potential ***Inefficient Fossil Fuel Subsidies*** **unless** they meet one or more of the following criteria:

1. ***Subsidies*** that enable significant net GHG emissions reductions in Canada or internationally **In Alignment with Article 6 of the Paris Agreement**
2. ***Subsidies*** that support ***Clean Energy***, ***Clean Technology*** or ***Renewable Energy***
3. ***Subsidies*** that provide an ***Essential Energy Service*** to a ***Remote Community***
4. ***Subsidies*** that provide short-term support for ***Emergency Response***

5. ***Subsidies*** that support ***Indigenous Economic Participation*** in ***Fossil Fuel Activities***
6. ***Subsidies*** that support ***Abated*** production processes,or projects that have a credible plan to achieve net-zero emissions by 2030

If any Minister determines that an ***Initiative*** would be an ***Inefficient Fossil Fuel Subsidy***, they should not submit the ***Initiative*** for consideration and instead undertake efforts to refine the ***Initiative*** to avoid the creation of an ***Inefficient Fossil Fuel Subsidy***.

Part B – Requirements

Federal departments and agencies who are responsible for administering non-tax ***Measures*** will not provide ***Fossil Fuel Support*** from those ***Measures*** **unless** that ***Fossil Fuel Support*** meets one or more of the following criteria listed below. Federal Crown corporations, with responsibilities for administering not-tax Measures would also be expected to align their activities with the criteria:

1. enables significant net GHG emissions reductions in Canada or internationally **In Alignment with Article 6 of the Paris Agreement**
2. supports ***Clean Energy***, ***Clean Technology*** or ***Renewable Energy***
3. provides an ***Essential Energy Service*** to a ***Remote Community***
4. provides short-term support for ***Emergency Response***
5. supports ***Indigenous Economic Participation*** in ***Fossil Fuel Activities***
6. supports ***Abated*** production processes, or projects that have a credible plan to achieve net-zero emissions by 2030

Annex A: G20 Commitment

In 2009, Canada and other G20 countries committed to **phase out and rationalize over the medium-term inefficient fossil fuel subsidies while providing targeted support for the poorest.**

Inefficient fossil fuel subsidies encourage wasteful consumption, reduce our energy security, impede investment in clean energy sources and undermine efforts to deal with the threat of climate change.

As we do that, we recognize the importance of providing those in need with essential energy services, including through the use of targeted cash transfers and other appropriate mechanisms. This reform will not apply to our support for clean energy, renewables, and technologies that dramatically reduce greenhouse gas emissions.

Annex B: Defined Terms

"Abated" refers to effective (leading to significant elimination of emissions), operational carbon capture and storage (CCS)/carbon capture, utilization and storage (CCUS) or equivalent technologies. **Note:** This excludes carbon capture for the purposes of enhanced oil recovery.

"Benefit" refers to any financial contribution that provides an advantage (benefit) to the recipient.

"**Clean Energy**" refers to energy produced without the release of greenhouse gases.

"**Clean Technology**" refers to any process, product or service that reduces negative environmental impacts relative to prevailing technology.

"**Disproportionate Benefit**" refers to a Measure for which:

1. more than 10% of the ***Measure's*** expenditures or foregone revenues is received by the ***Fossil Fuel Sector***; or
2. the ***Fossil Fuel Sector*** is specifically targeted to benefit from the ***Measure***.

"**Emergency Response**" refers to a response to a public health, humanitarian, or economic crisis.

"**Essential Energy Services**" refers to energy used for electricity, transportation, or space or water heating.

"**Fossil Fuels**" refers to non-renewable resources that were formed from biomass in the geological past (e.g., coal, natural gas, crude oil, bitumen), and any secondary product manufactured from those natural resources (e.g., pentanes, butane, propane, gasoline, diesel fuel).

"**Fossil Fuel Activities**" refers to activities directly related to ***Fossil Fuel*** production (i.e., exploration, extraction, and processing including refining]) or ***Fossil Fuel*** use (i.e., storage, transportation, sale and production of electricity and/or heat). For greater certainty, activities undertaken by the ***Fossil Fuel Sector*** that are unrelated to ***Fossil Fuel*** production or use are not considered ***Fossil Fuel Activities***.

"**Fossil Fuel Consumption**" refers to industrial, commercial, public sector, and individual consumers of Fossil Fuels. For greater clarity, subsidies that support ***Fossil Fuel*** consumption refer solely to those that reduce the price paid by consumers in the purchase of a ***Fossil Fuel***.

"**Fossil Fuel Sector**" refers to those firms whose business primarily involves activities related to ***Fossil Fuel*** production (i.e., exploration, extraction, and processing including refining) and ***Fossil Fuel*** use (i.e., storage, transportation, sale). The term also refers to those firms that produce electricity and/or heat from ***Fossil Fuels***.

"Fossil Fuel Support" refers to any transfer (e.g., grants, contributions) to another party or expenditure on intramural research and development that occurs within a ***Measure*** and confers a **Benefit** to the ***Fossil Fuel Sector***, or supports ***Fossil Fuel Consumption.***

"In Alignment with Article 6 of the Paris Agreement" refers to any GHG reduction occurring outside of Canada caused by an activity inside Canada for which the reduction can be verified through an Internationally Transferred Mitigation Outcome (ITMO) established pursuant to Article 6 of the Paris Agreement.

"**Indigenous Economic Participation**" refers to ***Measures*** that promote increased Indigenous economic participation in projects and firms. These ***Measures*** should ensure that the main beneficiary of the funding or ***Measure*** are Indigenous peoples.

"**Initiative**" means a potential new ***Measure*** under development by a Minister to seek potential Cabinet and/or funding authorities (e.g., for policy, funding, expenditure or legislative authority).

"**Measure**" refers to the following types of federal programs and expenditure:

- expenditure programs (i.e., grants, contributions, transfers);
- intramural research and development;
- tariff and duty reliefs; and,
- tax expenditures that support ***Fossil Fuel Consumption*** or that can be claimed by the ***Fossil Fuel Sector*** and that represent alternatives to expenditure programs (i.e., tax credits, accelerated capital cost allowances, flow-through shares).

"**Normal Treatment**" refers to the treatment of a ***Measure*** that is a tariff or duty, where the Government has a standard way that it treats all businesses and industries.

"**Phase Out**" refers to gradually eliminating, up to and including complete repeal, an inefficient ***Fossil Fuel Subsidy***.

"**Rationalize**" refers to adjusting the design of an inefficient ***Fossil Fuel Subsidy*** with the objective of ensuring that it is no longer an inefficient ***Fossil Fuel Subsidy***.

"Remote Community" refers to communities that a) not currently connected to the North American electrical grid nor to the piped natural gas network; and, b) a permanent or long-term (five years or more) settlement with at least 10 dwellings.

"**Renewable Energy**" refers to energy derived from natural processes that are replenished at a rate that is equal to or faster than the rate at which they are consumed.

"**Subsidy**" is defined by reference to the World Trade Organization's (WTO) definition of a "Subsidy" as set out in Article 1.1 of the Agreement on Subsidies and Countervailing Measures (ASCM)[Footnote1] :
"[A] subsidy shall be deemed to exist if:

a. (1) there is a financial contribution by a government or any public body within the territory of a Member (referred to in this Agreement as "government"), i.e. where:
    i. a government practice involves a direct transfer of funds (e.g. grants, loans, and equity infusion), potential direct transfers of funds or liabilities (e.g. loan guarantees);
    ii. government revenue that is otherwise due is foregone or not collected (e.g. fiscal incentives such as tax credits)[Footnote2] ;
    iii. a government provides goods or services other than general infrastructure, or purchases goods;
    iv. a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments;

   or

b. (2) there is any form of income or price support in the sense of Article XVI of GATT 1994; and
c. a benefit is thereby conferred."

While the above WTO definition applies to "a government or any public body within the territory of a Member", only ***Measures*** within the scope of Canada's

2009 G20 commitment (i.e., ***Measures*** enacted by the federal government or entities wholly controlled by the federal government) will be assessed.

For the purpose of this Framework, ***Measures*** that are subject to ***Normal Treatment*** shall not be considered ***Subsidies***.

Footnote 1

The definition of a "Subsidy" in Article 1.1 of the ASCM is used as reference to determine what Measures may fall within the scope of Canada's international commitments. The application of this Framework to a Measure does not prejudge the Measure's legal status, nature or effects under GATT 1994 and the ASCM. In particular, such Measures may not be considered a "financial contribution" that confers a benefit or be considered as "specific" within the meaning of the Agreement.

Return to footnote1Referrer

Footnote 2

"*In accordance with the provisions of Article XVI of GATT 1994 (Note to Article XVI) and the provisions of Annexes I through III of the ASCM, the exemption of an exported product from duties or taxes borne by the like product when destined for domestic consumption, or the remission of such duties of taxes in amounts not in excess of those which have accrued, shall not be deemed to be a subsidy.*"

https://www.alberta.ca/release.cfm?xID=72998DCF71AB1-B09A-B25B-F0EB62BA02A0EFC8

Exploring safe, small-scale nuclear technology

Alberta will enter into an agreement with three other provinces to explore emerging, small-scale nuclear technology that could lower emissions and help diversify the energy sector.

Premier Jason Kenney has signalled the intent for Alberta to enter into a memorandum of understanding with Ontario, Saskatchewan and New Brunswick to support the development of versatile and scalable small modular reactors (SMRs).

SMRs are smaller than traditional nuclear reactors and scalable to suit local needs, with lower upfront capital costs and enhanced safety features. This new and versatile technology could supply non-emitting, low-cost energy for on-grid and off-grid communities in Alberta, including remote and rural areas of the province, as well as industries with a significant need for steam, such as Alberta's oil sands.

"Our government is exploring all opportunities that could help diversify our economy and create jobs for Albertans. We are building on our track record of responsible and innovative energy production by exploring the potential for small modular reactors, which have the potential to generate reliable and affordable energy, while also strengthening our traditional resource sectors and reducing emissions. We are excited to collaborate with our provincial partners to stay ahead of the game in the development of this promising technology."
Jason Kenney, Premier

"Alberta's rich uranium deposits, respected innovation and research sector, and technically skilled and educated workforce could make us an attractive destination to develop and deploy SMRs. By signing on to this agreement, our government is taking another step to attract investment and job creators to our province by ensuring we have the appropriate regulatory framework in place should private industry decide to pursue this emerging technology."
Sonya Savage, Minister of Energy

Alberta's Recovery Plan is a bold, ambitious long-term strategy to build, diversify, and create tens of thousands of jobs now. By building schools, roads and other core infrastructure we are benefiting our communities. By diversifying our economy and attracting investment with Canada's most competitive tax environment, we are putting Alberta on a path for a generation of growth.

Alberta came together to save lives by flattening the curve and now we must do the same to save livelihoods, grow and thrive.

Quick facts

- SMRs are nuclear reactors that are smaller and more flexible than conventional nuclear reactors. SMRs would be small enough to be built in a factory and shipped by truck, rail or ship.
- A typical SMR would generate between two and 300 megawatts of electricity, which could provide power for a village or small city. In comparison, a conventional nuclear reactor can generate 600 to 1,000 megawatts, which can provide power for a large city.
- SMRs could operate independently or be linked to multiple units, depending on the required amount of power.
- In November 2018, the federal government released the Canadian Small Modular Reactor Roadmap that outlines recommendations for collaboration among federal, provincial and territorial governments, Indigenous communities and other stakeholders to support SMR development in Canada.
  - In February 2020, the federal government announced plans for a fall 2020 launch of Canada's SMR Action Plan, which will outline progress and ongoing efforts across Canada.
- In December 2019, New Brunswick, Ontario and Saskatchewan signed a memorandum of understanding to work together to support the development and deployment of SMRs.
- Canada is the second largest uranium producer in the world, with about 15 per cent of total world production.
- The Athabasca Basin, which straddles the northern Alberta-Saskatchewan border, contains some of the greatest uranium resources in the world.

Multimedia

- Video message: Premier Kenney and Minister Savage https://www.forbes.com/sites/ellenrwald/2020/06/25/the-small-canadian-province-that-could-lead-the-future-of-energy/?utm_source=TWITTER&utm_medium=social&utm_content=3449040634&utm_campaign=sprinklrForbesMainTwitter#502268eceba7

EDITORS' PICK|8,789 views|Jun 25, 2020,01:39pm EDT

The Small Canadian Province That Could Lead The Future Of Energy

Ellen R. Wald Senior Contributor
Markets

Saskatchewan, which is a province in Canada, has jumped to the forefront of new energy technology. It is not doing this with loan guarantees for solar power companies or massive land grants for wind power businesses. Rather, it is looking into what may prove to be the biggest change in energy technology in this century: the adoption of small modular nuclear power plants.

A sunset over the city of Saskatoon located in Central Canada.

GETTY

The Saskatchewan government is creating an office within its Ministry of Environment to plan the adoption of nuclear power. The policy fits for the province in part because Saskatchewan is a source of uranium. This program would allow the province to keep its energy production local. Also, Saskatchewan is large geographically but small in population, so it could benefit greatly from the flexibility of these plants.

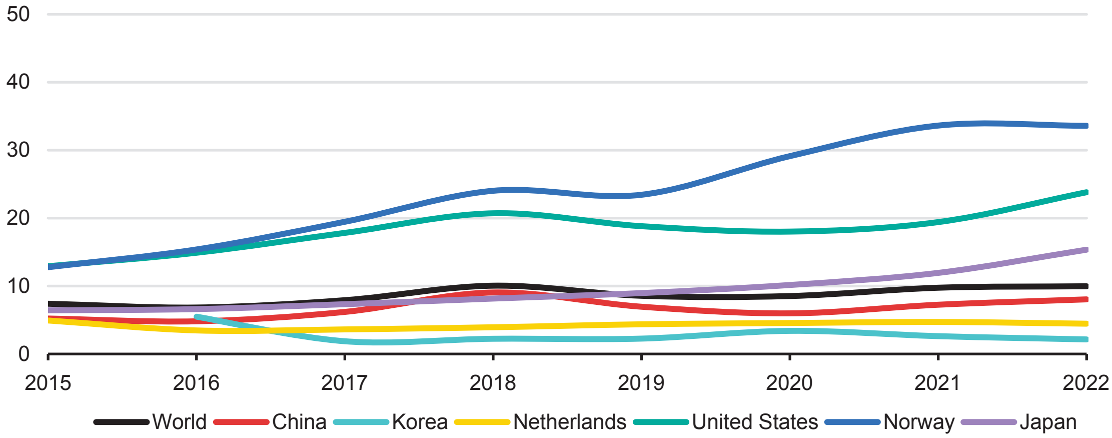
The Sue C open pit uranium mine at Areva Resources 16 July 2007 in McClean Lake, Saskatchewan, ... [+]

The small modular reactors (SMRs) Saskatchewan is looking at can produce between 50 and 300 megawatts of power. They are aiming for small plants that could even be transportable. We have written about small modular nuclear reactors before, including its benefits for businesses and small municipalities. For a full province of 251,700 square miles and almost 1.2 million people, these SMRs would provide flexibility and cost efficiency, with the added benefit of providing electricity without pollution.

It is often cost prohibitive to build large, traditional nuclear power plants. Utilities and governments just don't want to build them anymore. According to the Energy Information Administration, the average age of a nuclear plant in the United States is 39 years old. SMRs can be commissioned for much less. They are also ideal for smaller population centers, and the largest city in the province, Saskatoon, has fewer than 300,000 people. SMRs could also be great power sources for factories and server farms.

Saskatchewan is still committed to solar and wind projects to operate in conjunction with traditional power generation like natural gas-powered plants. However, if Saskatchewan does proceed with its nuclear ambitions, it could be a great example and guide for governments across the world.

Figure 1.15 Electric light-duty vehicle per public charging point, 2010-2022



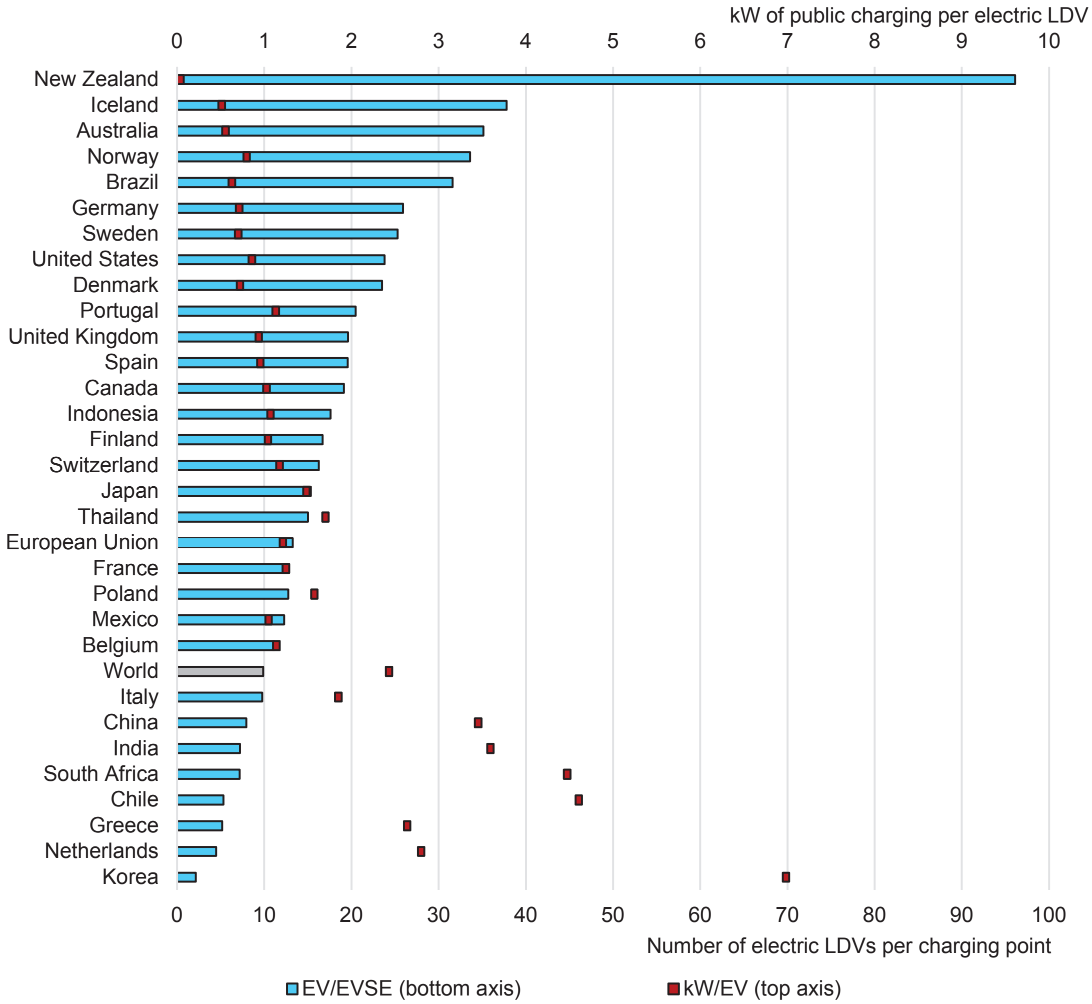
Note: Charging points include only publicly available chargers, both fast and slow.
Source: IEA analysis based on country submissions.

Countries show different speeds in public charging deployment as the number of EVs on the road increases.

Perhaps more important than the number of public chargers available is the total public charging power capacity per EV, given that fast chargers can serve more EVs than slow chargers. During the early stages of EV adoption, it makes sense for available charging power per EV to be high, assuming that charger utilisation will be relatively low until the market matures and the utilisation of infrastructure becomes more efficient. In line with this, the European Union's provisional agreement on the AFIR includes requirements for the total power capacity to be provided based on the size of the registered fleet.

Globally, the average public charging power capacity per electric LDV is around 2.4 kW per EV. In the European Union, the ratio is lower, with an average around 1.2 kW per EV. Korea has the highest ratio at 7 kW per EV, even with most public chargers (90%) being slow chargers.

Figure 1.16 Number of electric light-duty vehicles per public charging point and kW per electric light-duty vehicle, 2022



Notes: EV = electric vehicle; EVSE = electric vehicle supply equipment; LDV = light-duty vehicle. Kilowatts per EV are estimated assuming 11 kW for slow and 50 kW for fast chargers. Official national metrics might differ from these values as they can rely on more granular data.
Source: IEA analysis based on country submissions.

The number of electric light-duty vehicles per public EV charging point varies dramatically between countries, ranging from about 2 vehicles per charging point in Korea to almost 100 in New Zealand.

Charging needs for heavy-duty vehicles

In the regions where electric trucks are becoming commercially available, battery electric trucks can compete on a TCO basis with conventional diesel trucks for a growing range of operations, not only urban and regional, but also in the heavy-duty tractor-trailer regional and long-haul segments. Three parameters that determine the time at which TCO parity is reached are tolls; fuel and operations costs (e.g. the difference between diesel and electricity prices faced by truck operators, and reduced maintenance costs); and CAPEX subsidies to reduce the gap in the upfront vehicle purchase price. Since electric trucks can provide the same operations with lower lifetime costs (including if a discounted rate is applied), the time horizon in which vehicle owners expect to recuperate upfront costs is a key factor in determining whether to purchase an electric or conventional truck.

The economics for electric trucks in long-distance applications can be substantially improved if charging costs can be reduced by maximising “off-shift” (e.g. night-time or other longer periods of downtime) slow charging, securing bulk purchase contracts with grid operators for “mid-shift” (e.g. during breaks), fast (up to 350 kW), or ultra-fast (>350 kW) charging, and exploring smart charging and vehicle-to-grid opportunities for extra income.

Electric trucks and buses will rely on off-shift charging for the majority of their energy. This will be largely achieved at private or semi-private charging depots or at public stations on highways, and often overnight. Depots to service growing demand for heavy-duty electrification will need to be developed, and in many cases may require distribution and transmission grid upgrades. Depending on vehicle range requirements, depot charging will be sufficient to cover most operations in urban bus as well as urban and regional truck operations.

The major constraint to rapid commercial adoption of electric trucks in regional and long-haul operations is the availability of “mid-shift” fast charging. Although the majority of energy requirements for these operations could come from “off-shift” charging, fast and ultra-fast charging will be needed to extend range such that operations currently covered by diesel can be performed by battery electric trucks with little to no additional dwell time (i.e. waiting). Regulations that mandate rest periods can also provide a time window for mid-shift charging if fast or ultra-fast charging options are available en route: the European Union requires 45 minutes of break after every 4.5 hours of driving; the United States mandates 30 minutes after 8 hours.

Most commercially available direct current (DC) fast charging stations currently enable power levels ranging from 250-350 kW. The European Union’s Alternative Fuels Infrastructure Regulation (AFIR) aims to enable mid-shift charging across the EU’s core TEN-T network, which covers 88% of total long-haul freight activity, and along other key freight corridors. The provisional agreement reached by the European Council and Parliament includes a gradual process of infrastructure deployment for electric heavy-duty vehicles starting in 2025. Recent studies of power requirements for regional and long-haul truck operations in the United States and Europe find that charging power higher than 350 kW, and as high as 1 MW, may be required to fully recharge electric trucks during a 30- to 45-minute break.

https://www.worcesternews.co.uk/news/national/23675305.rishi-sunak-says-not-want-hassle-families-net-zero-targets/

Rishi Sunak says he does not want to ‘hassle’ families with net zero targets

5 hrs ago
By PA News Agency
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5

Rishi Sunak is considering watering down policies to tackle the climate emergency as he seeks to take a “proportionate and pragmatic” approach to achieving net zero amid cost-of-living pressures.

The Prime Minister said he does not want to heap “hassle” or extra costs on to families as Conservatives on the right of the party pressure him to weaken commitments to possibly win back voters.

Downing Street insisted Mr Sunak is committed to the ban on selling new petrol and diesel cars from 2030 after he declined to give the same assurance himself.

The Tories’ campaigning against the expansion of London’s Ulez scheme has been widely credited for them retaining the Uxbridge and South Ruislip seat (Lucy North/PA)

But No 10 made clear that ministers are scrutinising existing net zero pledges “in light of some of the cost-of-living challenges”, citing the potential for technological advances.

Some Tories have been calling for Mr Sunak to delay climate pledges after the party narrowly held on to Uxbridge and South Ruislip in last week’s by-election, with Labour’s failure to win being attributed to the expansion of London’s Ultra Low Emission Zone (Ulez) scheme.

Mr Sunak said he does not want to add to the pressure households are experiencing from high inflation amid a challenge to get the UK to net zero on carbon emissions by 2050.

“Actually I’m standing up for the British people because I’m also cognisant that we’re living through a time at the moment where inflation is high,” he told broadcasters who asked about the Conservative pressure during a visit to Worcestershire.

“We’re going to make progress towards net zero, but we’re going to do that in a proportionate and pragmatic way that doesn’t unnecessarily give people more hassle and more costs in their lives” *Prime Minister Rishi Sunak*

“So, yes, we’re going to make progress towards net zero, but we’re going to do that in a proportionate and pragmatic way that doesn’t unnecessarily give people more hassle and more costs in their lives – that’s not what I’m interested in and prepared to do.”

Asked whether he is continuing with the target for banning new fossil fuel car sales, Mr Sunak insisted “We’re going to keep making progress towards our net zero ambitions”, but did not explicitly back it.

The Prime Minister’s official spokesman later said it “remains our commitment”, but added: “It is right that, if the situation changes and new technology evolves, we keep our approach under review and make sure that it is the right one.

“Equally, at a time of global high inflation, which is hitting the public hard, we need to make sure that we’re getting the balance right.”

The Times has reported that an “Aston Martin exemption” could be added to give smaller car manufacturers more time to switch to electric vehicles.

No 10 said the commitment to phase out gas boilers from 2035 remains but that “how technology evolves” is being considered ahead of the deadline.

After Housing Secretary Michael Gove indicated that a deadline to improve the energy efficiency of private rented homes could be relaxed, Mr Sunak’s spokesman said “wider developments in energy efficiency and the private rental sector” have to be considered.

“That’s to ensure that the cost and circumstances relating to energy efficiency improvement are fair and proportionate to landlords and tenants,” he added.

The official stressed that low-traffic neighbourhoods must “work for local people” and involve “extensive consultation”, in response to suggestions that they could be restricted.

Former business secretary Sir Jacob Rees-Mogg and Danny Kruger, co-leader of the New Conservatives group of Tory MPs elected since the Brexit referendum, have been urging the Prime Minister to reconsider the deadlines for green initiatives.

Sir Jacob said that scrapping “unpopular, expensive” policies would be a “real opportunity” and proposed getting rid of the 2030 ban announced during Boris Johnson’s premiership.


Sir Jacob Rees-Mogg has proposed the scrapping of the ban on sales of new petrol and diesel cars after 2030 (Stefan Rousseau/PA)

But Mr Sunak has also faced accusations from some quarters of the Conservative Party of environmental apathy, with Tory peer Lord Zac Goldsmith resigning and accusing the Prime Minister of being “uninterested” in the environment.

Friends of the Earth said ministers should provide financial support to individuals so they can make greener switches, arguing that people on lower incomes are most affected by climate breakdown.

Science head at the climate group Mike Childs said: “Treating climate action as a political fault line is inexcusable, but even more so when deadly heatwaves and wildfires are tearing across Europe, America, and Asia.”

Batting for the Government with a round of morning broadcast interviews, Foreign Office minister Andrew Mitchell was initially unclear about the 2030 ban until he insisted, after coming under pressure, that it “will remain in place”.

But asked on BBC Radio 4’s Today programme if it will remain that way, he said: “Well, all I can tell you is it is in place”, but when challenged again said: “Well, I’m afraid I can’t prophesise for the future.”

He denied the suggestion that it may not stay for the rest of the term of this Government, saying: “That is not what I am saying. I am saying that it is in place and it remains in place.”

Meanwhile, London Mayor Sadiq Khan was sticking by his policy of expanding the £12.50 daily charge for vehicles that fall short of emissions standards to the capital’s suburbs.

Labour leader Sir Keir Starmer had urged him to “reflect” on the policy designed to cut air pollution after the party failed to seize the Uxbridge and South Ruislip seat by 495 votes.

https://www.spglobal.com/commodityinsights/en/market-insights/blogs/energy-transition/072423-renewable-natural-gas-and-hydrogen-fuels-of-the-future-for-transportation-decarbonization

- 24 Jul 2023 | 13:05 UTC

- Insight Blog

Renewable natural gas and hydrogen: fuels of the future for transportation decarbonization

As a mounting number of companies commit to various decarbonization solutions, renewable natural gas could play an increasingly important role in the transportation sector – both as an outright replacement for diesel and gasoline and as the feedstock for bioproducts used in high-emissions, difficult to abate sectors.

Use as a feedstock in the development of bioproducts such as biohydrogen represents an emerging source of demand for RNG. Bioproducts will play a critical role in enabling the transportation industries' transition to a low-carbon future, yet challenges such as high costs, limited supply and regulatory uncertainty must be addressed for widespread adoption.

Renewable natural gas in the transport sector

Renewable natural gas – also referred to as biomethane – is biogas that is captured from decomposing organic waste from landfills, wastewater treatment facilities and livestock manure. RNG is considered a "drop-in" fuel, meaning it can be used interchangeably with fossil gas in a conventional natural gas transmission system when upgraded to pipeline specifications.

Currently in the US, the majority of RNG goes into the transport fuels sector where it is compressed or liquified and used to fuel natural gas vehicles. The concentration of RNG use in this sector has been driven by state and federal incentive programs, namely the California Low Carbon Fuel Standard and the US EPA's Renewable Fuel Standard.

RNG accounted for around 69% of on-road fuel used in natural gas vehicles in the US in 2022, according to a joint report from Natural Gas Vehicles for America and the Coalition for Renewable Natural Gas released in April.

RNG is often touted as a "fuel of the future" due to its low-to-negative carbon intensity and its interchangeability with fossil natural gas. For example, the average annual carbon intensity of bio-CNG under the California Low Carbon Fuel Standard in 2022 was -92.26 gCO2e/MJ. In comparison, the average carbon intensity of fossil CNG under the most recent LCFS current pathway data from the California Air Resources Board was 82.84 gCO2e/MJ.

RNG production capacity in 2022 saw a 218% increase over 2018 levels, with over 280 facilities currently under operation and nearly 500 more under construction or in development, according to the report.

Although **production capacity is ramping up**, RNG production is still only a small fraction of total US natural gas production, and the cost of RNG far exceeds that of conventional natural gas. Platts, a part of S&P Global Commodity Insights, assessed the value of the North America Renewable Natural Gas Premiums (California and Excl. California) at $30.45/MMBtu and $27.70/MMBtu, respectively, on July 18. In comparison, spot physical Henry Hub has averaged $2.41/MMBtu year to date on July 18, according to data from S&P Global Commodity Insights.

Moreover, there are questions about regulatory uncertainty surrounding RNG that could influence production levels and prices, including whether more states would implement Clean Fuel Standards and if Public Utility Commissions would grant approval on rate cases, the regulatory process that sets the rates a utility is allowed to charge customers, for the use of RNG by utilities.

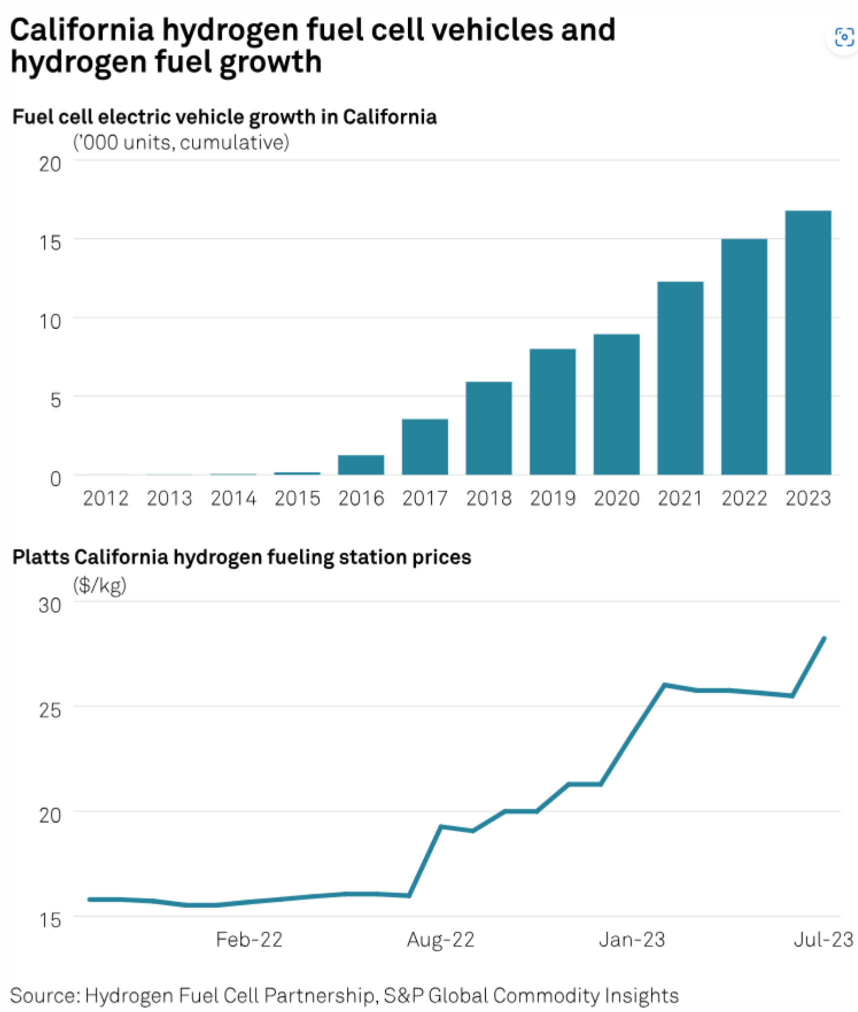
Bioproducts for transport and shipping

Bioproducts, such as biohydrogen, are rising as innovative means to decarbonize the transportation and shipping sectors with these industries beginning to invest in and commit to sourcing "greener" fuels and feedstocks.

Biohydrogen is hydrogen produced through either the conventional production method of steam methane reforming or autothermal reforming with RNG or biogas from biomass as its feedstock rather than conventional natural gas.

Hydrogen is currently used as an alternative transport fuel in hydrogen fuel cell vehicles in the US, primarily seeing growth in California. This application of hydrogen has garnered popularity recently due to the fact that it only produces water when consumed in a fuel cell. In comparison with conventional gasoline vehicles, the use of hydrogen can reduce CO_2 emissions by up to 90% depending on how the hydrogen is produced, according to the US Department of Energy.

Platts last assessed hydrogen prices at California fueling stations on July 5 at $28.23/kg, the highest value since the assessment's launch in September 2021.



Incentives for hydrogen production

A key incentive in the Inflation Reduction Act of 2022 targeted the scaling up of production of low-carbon hydrogen by making available a hefty hydrogen tax credit: the 45v clean hydrogen production tax credit.

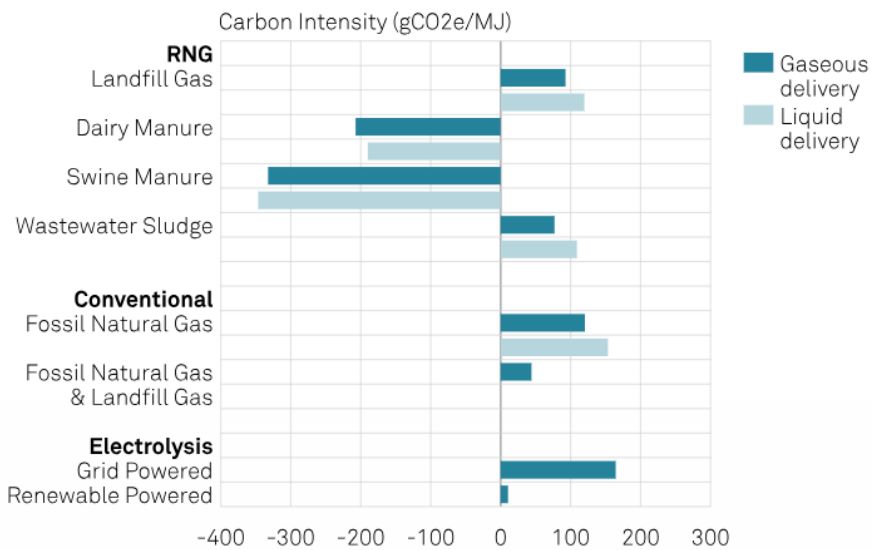
The clean hydrogen tax credit amount is determined by the lifecycle greenhouse gases emitted during hydrogen production, with the potential to receive up to $3/kg of hydrogen if the lifecycle emissions are below 0.45 kg CO2e as well as following certain prevailing wage and apprenticeship requirements.

Market players have begun to consider various approaches to reducing their emissions enough to qualify for these tax savings. One approach, the use of RNG as a partial or total replacement feedstock, has been floated by the market as a potential way to lower lifecycle emissions due to its low-to-negative carbon intensity.

The feedstock of the RNG or biogas must be considered as carbon intensities can range significantly.

"One needs to be very careful about the feedstock used. Our analysis shows that the carbon intensity looks totally different depending on whether one is using woody biomass or waste biomass," said Anne-Sophie Corbeau, global research scholar at the Center on Global Energy Policy at Columbia University.

Carbon intensity of hydrogen under California low carbon fuel standard



Source: California Air Resources Board LCFS current fuel pathway

As a result, the exact blend rate of RNG and natural gas that would qualify for the 45v tax credit would depend on the carbon intensity of the RNG used.

The use of RNG for biohydrogen production in the US is still a gray area under the statute of the 45v tax credit, but it is currently recognized under the US Department of Energy's National Clean Hydrogen Strategy and Roadmap, which was released in June.

Regulatory uncertainty

A remaining uncertainty about the regulatory implementation of the 45v tax credit is the approval of book-and-claim accounting for RNG, said Gabriel Olson, director of carbon strategy and policy at BayoTech, a leading producer of biohydrogen. Book-and-claim is a commonly used accounting mechanism where the end user can claim the carbon reductions of the RNG without receiving the physical molecules as long as it is injected into the interstate pipeline system.

"If this [book and claim] were to not be available, or if it's extremely restricted to specific gas distribution localities like in a particular state or county, it would fragment the market, reducing flexibility, and thus make it expensive and challenging to contract for a reliable source," Olson added.

Whether book-and-claim accounting is permitted will determine the practicality of using RNG as a feedstock to reduce emissions during the production of biohydrogen in an effort to qualify for the clean hydrogen tax credit.

Ultimately, the details of the regulatory implementation of the clean hydrogen tax credit will determine whether biohydrogen production makes sense economically, according to Alex Klaessig, S&P Global Commodity Insights senior director of the Hydrogen and Renewable Gas Forum.

"If the chips fall correctly regarding carbon accounting, the H2 PTC could make biohydrogen a bonanza," Klaessig said.

https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/010623-us-rng-approaches-maturity-as-lenders-eye-50-production-growth-by-2024

- 06 Jan 2023 | 21:20 UTC

US RNG approaches maturity as lenders eye 50% production growth by 2024

HIGHLIGHTS

Lender praises 'circular' story for long-haul RNG

Fuel, investment tax credits fan tailwinds

Author: Dylan Chase

Renewable natural gas is sparking new interest from lenders and financiers close to Wall Street, with expanding subsidies for RNG production expected to support massive growth and investment in coming years.

US RNG was a lead beneficiary of widespread support for lower-carbon investing in 2022, as large energy companies such as BP and Kinder Morgan, as well as large private equity firms, piled money into the sector. Another example of growing support for the industry came Jan. 5, when Clean Energy, a transportation-focused RNG marketer with over 550 fueling stations across North America, announced a four-year, $150 million term loan with a unit of New York-based asset manager Riverstone Holdings.

While sums involved in the transaction are relatively modest by energy industry standards, the transaction speaks to RNG's possible status as the decarbonization method of choice for many transport providers, according to the group underwriting the loan.

"We looked at a bunch of opportunities for renewable diesel and for renewable natural gas," Daniel Flannery, managing director of Riverstone Holdings, told S&P Global Commodity Insights in an interview Jan. 5. "But of all the deals that we've looked at ... we felt like this was the most sizeable, most mature, and was not just a speculative bet on regulatory policy."

RNG is made from biogas sourced from landfills, dairy farms and municipal waste centers that, after processing, can be placed on a traditional natural gas pipeline or used in an RNG-compatible vehicle. The industry has **experienced tremendous growth** in recent years as facilities have rolled out across the US and Canada, although production volumes remain tiny compared with traditional generation or transport fuels.

But Flannery expects that could soon change, considering new subsidies offered under the Inflation Reduction Act signed into law by US President Joe Biden last year. That $370 billion green energy salvo included an investment tax credit promising to reimburse up to 40% of a qualified biogas project's development costs, as well as a renewed $0.50/gal fuel tax credit for RNG used as a transportation fuel.

"Especially for a credit provider like our like us whose focus is to lend money, collect the return and get paid back, we felt the passage of the IRA [created] a lot of tailwinds and a very constructive underwriting environment for a company like this," Flannery said.

RNG Feedstock by Volume, North America

Source: The Coalition for Renewable Natural Gas

Circular story

Setting aside subsidies for RNG -- which already include credits offered under the federal Renewable Fuel Standard and Low-Carbon Fuel Standard programs in certain states -- Riverstone also viewed RNG as a superior option to other low-carbon avenues transport operators might explore when looking to cut emissions in the next few years. For one, RNG sidesteps certain issues associated with other biofuels looking for market share in the long-haul trucking space, including food vs. fuel arguments linked to biofuels made from soybean oil, canola oil or other bio-feedstocks.

"There's definitely a more circular decarbonization story here that resonates," Flannery said. "To us [RNG] makes perfect sense as a bridge fuel that accomplishes customer sustainability objectives and has a place while we figure out a larger transition to carbon-neutral alternatives that will likely be hydrogen or battery-driven longer term."

Riverstone is not the only financier placing a bet on RNG's maturation. Last year, a unit of asset management giant Blackrock bought RNG producer Vanguard Renewables for $700 million, while New York private equity house Warburg Pincus extended a $320 million line of equity to fledgling RNG producer Viridi Energy as part of an expected $1 billion investment in US RNG opportunities.

Growth phase

While ESG- and sustainability-linked investing has come into vogue in recent years, these bets are about more than environmental credentials, in Flannery's view. His group is forecasting tenfold growth for US RNG production capacity in the long-term, from current levels around 220 MMcf/d to an ultimate potential around 2.2 Bcf/d, while near-term growth could explode following the IRA's passage.

"We think production capacity will grow 50%-ish by 2024 with the passing of the investment tax credit and the growth in new development projects," he said. "We think there's an opportunity to make a lot of money in the near term and medium term."

While financial support for RNG grows, it's not hard to find examples of the industry's acceleration, including new infrastructure. Opal Fuels, which touts a vertically integrated business model based around both RNG production and marketing, on Jan. 5 announced it reached full production rates at the first landfill gas to RNG facility in Florida, at the New River Solid Waste Association landfill in Raiford, Florida.

Companies like Opal Fuels and Clean Energy are taking different routes into RNG production, due largely to economics: last year Kinder Morgan CFO David Michels told S&P Global his company was valuing more "bite-sized" **opportunities in landfill RNG**, which typically require around $20 million-$50 million in development costs, instead of dairies, which he said can cost "well above around $100 million" to get off the ground.

Clean Energy, which focuses on dairy farm production rather than landfills, plans to use proceeds from Riverstone's recent sustainability-linked loan to fund "rapid expansion" of RNG projects at dairies it is developing alongside joint venture partners Total Energies and BP. The companies have set a goal to produce 105 million gallons of RNG by 2026.

IFIC Monthly Investment Fund Statistics – June 2023
Mutual Fund and Exchange-Traded Fund Assets and Sales

July 24, 2023 (Toronto) – The Investment Funds Institute of Canada (IFIC) today announced investment fund net sales and net assets for June 2023.

Mutual fund assets totalled $1.894 trillion at the end of June 2023. Assets increased by $29.0 billion or 1.6% compared to May 2023. Mutual funds recorded net redemptions of $4.2 billion in June 2023.

ETF assets totalled $348.4 billion at the end of June 2023. Assets increased by $9.6 billion or 2.8% compared to May 2023. ETFs recorded net sales of $3.5 billion in June 2023.

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

Asset Class	Jun. 2023	May 2023	Jun. 2022	YTD 2023	YTD 2022
Long-term Funds					
Balanced	(4,439)	(3,807)	(4,639)	(21,699)	(3,622)
Equity	(2,354)	(2,170)	(3,303)	(9,534)	4,200
Bond	910	639	(3,217)	8,726	(6,167)
Specialty	97	287	299	1,798	1,203
Total Long-term Funds	(5,786)	(5,051)	(10,860)	(20,709)	(4,386)
Total Money Market Funds	1,537	1,252	1,399	7,898	2,370
Total	(4,249)	(3,799)	(9,461)	(12,811)	(2,016)

Mutual Fund Net Assets ($ Billions)*

Asset Class	Jun. 2023	May 2023	Jun. 2022	Dec. 2022
Long-term Funds				
Balanced	898.1	889.5	882.6	880.6
Equity	693.6	675.7	627.1	649.6
Bond	235.1	234.2	228.6	222.7
Specialty	24.3	24.2	21.8	22.2
Total Long-term Funds	1,851.1	1,823.7	1,760.0	1,775.1
Total Money Market Funds	43.1	41.5	29.0	34.5
Total	1,894.1	1,865.1	1,789.1	1,809.6

* Please see below for important information regarding this data.

ETF Net Sales/Net Redemptions ($ Millions)*

Asset Class	Jun. 2023	May 2023	Jun. 2022	YTD 2023	YTD 2022
Long-term Funds					
Balanced	151	150	23	829	1,165
Equity	1,066	565	(2,248)	5,740	9,543
Bond	1,177	838	1,499	5,461	2,776
Specialty	443	(19)	(609)	1,291	764
Total Long-term Funds	2,837	1,535	(1,336)	13,321	14,249
Total Money Market Funds	649	868	666	5,111	1,792
Total	3,485	2,403	(670)	18,432	16,040

ETF Net Assets ($ Billions)*

Asset Class	Jun. 2023	May 2023	Jun. 2022	Dec. 2022
Long-term Funds				
Balanced	13.6	13.2	11.3	12.0
Equity	215.6	208.8	184.6	194.9
Bond	85.9	84.8	75.2	80.4
Specialty	12.2	11.5	9.7	10.2
Total Long-term Funds	327.2	318.2	280.8	297.5
Total Money Market Funds	21.2	20.6	8.1	16.3
Total	348.4	338.8	288.9	313.7

* Please see below for important information regarding this data.

IFIC direct survey data (which accounts for approximately 85% of total mutual fund industry assets and approximately 83% of total ETF industry assets) is complemented by estimated data 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

The Investment Funds Institute of Canada is the voice of Canada's investment funds industry. IFIC brings together 150 organizations, including fund managers, distributors and industry service organizations, to foster a strong, stable investment sector where investors can realize their financial goals. By connecting Canada's savers to Canada's economy, our industry contributes significantly to Canadian economic growth and job creation. To learn more about IFIC, please visit www.ific.ca.

For more information please contact:

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pkumarasamy@ific.ca
416-309-2317

Dan Tsubouchi @Energy_Tidbits · 4h

Reality of UK PM Sunak's "proportionate and pragmatic" path to #NetZero will include new #Oil#NatGas licensing in North Sea.

@grantsshapps on Labour's plan to stop #Oil#NatGas licensing

*"Basically that plan - reading between the lines - says just import a lot more oil and...*Show more

> **Rt Hon Grant Shapps MP** @grantshapps · 7h
>
> Labour's surrender to Just Stop Oil is an existential threat to our national energy security
>
> Their dangerous plans, apparently written by members of the eco-mob, are so extreme and so rapid they could literally plunge Britain into darkness
>
> Read how 👇
>
> thesun.co.uk/news/politics/...

1 2 1,993

Dan Tsubouchi @Energy_Tidbits · 4h

#Vortexa crude #Oil floating storage at 07/28 est 104.13 mmb, -3.57 WoW vs revised up by +9.05 07/21 of 107.70 mmb.

Last 7-wk average of 115.57 mmb is highest since late 2020.

Thx @Vortexa @business.
#OOTT

2 10 1,492

SAF

Dan Tsubouchi @Energy_Tidbits · 16h

Here's why a Shell FID on #LNGCanada 1.8 bcfd Phase 2 should drive M&A in Cdn #NatGas.

See 👇 02/21/22 tweet, Shell CEO Sawan wants to have enough #NatGas supply to match their LNG offtake share.

In Q2/23 call, Phase 1 supply seems in good shape based on CFO Gorman comments.... Show more

Bloomberg Transcript

A - Sinead Gorman {BIO 22375931 <GO>}

Yeah, absolutely. Thank you. In terms of -- let me start with the second one first, so LNG Canada. So what occurred there, it is largely LNG Canada, as you say, Biraj. And as you know, when we look at impairments, we look at it from the point of view typically of its around price, any portfolio change and effectively the third one is typically about accounting mechanics.

This one was an accounting mechanics one, pure and simple discount rates. So as you saw risk free rates changing of course, that played into the whack and that's where we went up 1%. That's where it played in on this asset. And of course, when you look at this asset, you look at it across three elements again.

Again, it's your upstream, which we have good confidence in as you know, a large part of the gas that's coming from this is coming for us from our own assets, Groundbirch and otherwise. It's the midstream, which is an infrastructure play. Not surprising that you would see on an infrastructure play with rising interest rates that you would have an impact and the third one is trading and optimization of course, under IFRS, we don't put trading and optimization in when we do the impairment.

So that's the thinking around that. Its 40 years assets. This was accounting mechanics that came across. I don't think, I have too much concern around that. It'll change every time as we play through. And of course, we're continuing to derisk it. The other one I think, Biraj, I find quite useful when I look at it as well, it is sizable as you say, but we've got depreciation of some 5 billion to 6 billion, typically a quarter in Shell, and this is the

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Company Name: Shell PLC
Company Ticker: SHEL LN Equity
Date: 2023-07-27

equivalent of about one month of that. So it just helps me put it into context as we run through an asset of that long, of 40 years.

SAF **Dan Tsubouchi** @Energy_Tidbits · Feb 21, 2022

Buckle up, could be huge for Cdn #NatGas M&A. @Shell just said like to align equity #NatGas supply and offtake obligations, used #LNGCanada, Shell has 40% interest so would be 1.44 bcf/d if it FIDs #LNGCanada phase 2. It's why #LNGCanada Phase ...

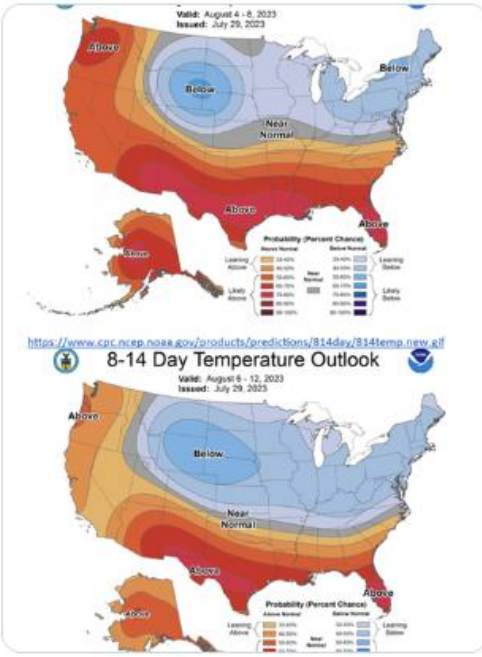
1 · 7 · 21 · 10.7K

Dan Tsubouchi @Energy_Tidbits · 17h

Continued temperature support for US #NatGas.

Today's @NOAA 6-10 & 8-14 day temperature outlook covering Aug 4-12: continued above normal temps expected for most of the US.

Note colder than normal for NE US, but for NYC that is forecast ~80F for daytime highs early Aug.... Show more



1 8 2,131

Dan Tsubouchi @Energy_Tidbits · Jul 29

No regular Saturday morning tweet on @Vortexa crude oil floating storage estimates.

Normally their data for Friday are posted on @business by 9am MT on Saturdays. But nothing yet posted.

#OOTT

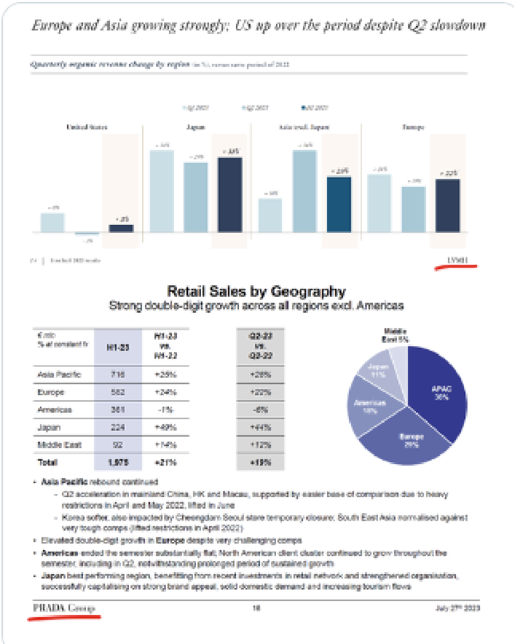
1 7 1,457

Dan Tsubouchi @Energy_Tidbits · Jul 29

Recovering China consumer, at least higher income consumers. #Prada Q2/23 also highlighted return of Chinese consumers, albeit from a low Q2/22.

Note both #LVMH and #Prada weakest region for YoY comps is US higher income consumer, who returned from Covid the quickest.

#OOTT



Dan Tsubouchi @Energy_Tidbits · Jul 25

Recovering China consumer spending within China, at least the higher income consumers.

#LVMH H1 call today.

...

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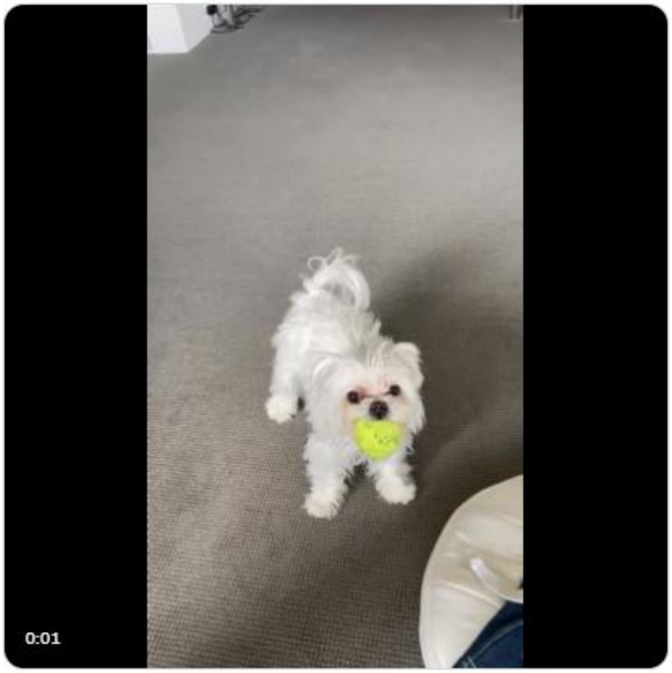
SAF

Dan Tsubouchi @Energy_Tidbits · 1h

our 3.5 lb maltese Chai could do this all day!



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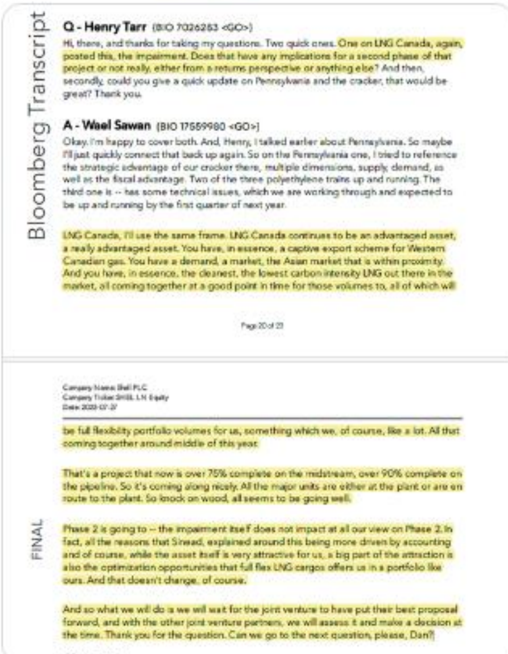
Dan Tsubouchi @Energy_Tidbits · 4h

Feels like FID is when, not if.

#Shell CEO Sawan on #LNGCanada 1.8 bcfd Phase 2. "*while the asset itself is very attractive for us, a big part of the attraction is also the optimization opportunities that full flex #LNG cargos offer us in a portfolio like ours*"

LNG Canada 1.8...Show more



Bloomberg Transcript

Q - Henry Tarr (BIO 7026263 <GO>)

Hi, there, and thanks for taking my questions. Two quick ones. One on LNG Canada, again, posted this, the impairment. Does that have any implications for a second phase of that project or not really, either from a returns perspective or anything else? And then, secondly, could you give a quick update on Pennsylvania and the cracker, that would be great? Thank you.

A - Wael Sawan (BIO 17569980 <GO>)

Okay. I'm happy to cover both. And, Henry, I talked earlier about Pennsylvania. So maybe I'll just quickly connect that back up again. So on the Pennsylvania one, I tried to reference the strategic advantage of our cracker there, multiple dimensions, supply, demand, as well as the fiscal advantage. Two of the three polyethylene trains up and running. The third one is -- has some technical issues, which we are working through and expected to be up and running by the first quarter of next year.

LNG Canada, I'll use the same frame. LNG Canada continues to be an advantaged asset, a really advantaged asset. You have, in essence, a captive export scheme for Western Canadian gas. You have a demand, a market, the Asian market that is within proximity. And you have, in essence, the cleanest, the lowest carbon intensity LNG out there in the market, all coming together at a good point in time for those volumes to, all of which will

Page 20 of 23

Company Name: Shell PLC
Company Ticker: SHEL LN Equity
Date: 2023-07-27

FINAL

be full flexibility portfolio volumes for us, something which we, of course, like a lot. All that coming together around middle of this year.

That's a project that now is over 75% complete on the midstream, over 90% complete on the pipeline. So it's coming along nicely. All the major units are either at the plant or are en route to the plant. So knock on wood, all seems to be going well.

Phase 2 is going to -- the impairment itself does not impact at all our view on Phase 2. In fact, all the reasons that Sinead, explained around this being more driven by accounting and of course, while the asset itself is very attractive for us, a big part of the attraction is also the optimization opportunities that full flex LNG cargos offers us in a portfolio like ours. And that doesn't change, of course.

And so what we will do is we will wait for the joint venture to have put their best proposal forward, and with the other joint venture partners, we will assess it and make a decision at the time. Thank you for the question. Can we go to the next question, please, Dan?

Operator

2 6 16 3,818

Dan Tsubouchi @Energy_Tidbits · 8h

Likely news on Kurdistan/Iraq #Oil resuming exports via Turkey next week.

Surely #Erdogan wouldn't be going to Iraq unless there is some sort of package of economic items to announce including resumption of oil exports?

#OOTT

Prime Minister discusses with Turkish Ambassador Erdogan's upcoming visit to Iraq

Baghdad - Prime Minister Muhammad Shia Al-Sudani
received, on Tuesday morning, the Ambassador of the Republic of Turkey to Iraq, Alireza Konae.

To receive more news, subscribe to our Telegram channel

A statement by the Prime Minister's Information Office received by the Iraqi News Agency (INA) said that "during the meeting, aspects of cooperation between Iraq and Turkey and ways to strengthen and develop bilateral relations were reviewed, in the interest of the two friendly peoples."
The statement added that "the meeting discussed the upcoming visit of Turkish President Recep Tayyip Erdogan to Iraq, the establishment of the joint economic action forum between the two countries in Basra, as well as deliberating on Turkey's contribution to the development road project along with the rest of the neighboring countries, the shared water file and plans to establish a joint measurement center on the Iraq-Turkish border."
During the meeting, Al-Sudani stressed "his support for the economic and trade orientation between the two countries, in a way that develops the level of partnership, economic interdependence and investment, and the need to activate joint committees to follow up on the implementation of memorandums of understanding and bilateral agreements between the two neighboring countries."

1 1 5 1,293

Dan Tsubouchi @Energy_Tidbits · 10h

Oil Sands likely at top of list!

#Exxon CEO Woods " ... *I think some of the small reactors* [mini nukes] *also have broad applicability even in our industry. In fact, we are looking at potential options to engage and employ those to reduce our emissions"*

See 👇 08/08/20 tweet &...Show more

Dan Tsubouchi @Energy_Tidbits · Aug 8, 2020

Alberta to look at mini-nukes. Specifically notes potential for #OilSands, exactly what @Kim_Goheen said Cameco pitched in early 2000s. Think this will have traction especially as world realizes mini nukes can help speed up transition to #CleanEnergy ...

3 4 24 9,014

SAF

Dan Tsubouchi @Energy_Tidbits · 11h

ICYMI.

Still not clear what caused the fire.

But fire is going to last a long time as there are ~500 #EVs, not 25, onboard the burning ship off Dutch coast.

Thx @cagankoc.

#OOTT

coast has almost 500 electric cars on board, according to its operator, more than was previously reported.

The cause of the blaze on the Fremantle Highway is still unknown, according to the Dutch coast guard, which previously said the initial cargo list they received suggested just 25 EVs were on the ship. The coast guard has denied reports that it had been confirmed the fire broke out in a section of the carrier where electric cars were stored.

Whether EVs had anything to do with precipitating the blaze, the number on board is relevant to what's likely to be a days-long effort to put it out. Lithium-ion battery fires burn hotter and last longer than gasoline. They can also be difficult to extinguish, sometimes reigniting hours or days after seemingly having been put out.

The ship is carrying a total of 3,783 vehicles, including 498 electric cars, according to its charterer Kawasaki Kisen Kaisha Ltd. The fire was still ablaze with the situation stable as of Friday. Dutch authorities have established a towing connection with the vessel, but haven't been able to extinguish the fire because putting too much water on board would cause stability problems.

There are several hundred BMW AG cars on board, as well as roughly 300 Mercedes-Benz Group AG vehicles, representatives for the companies have said. The Panama-flagged Fremantle Highway was en route to Port Said, Egypt, after a recent stop in the German port of Bremerhaven, according to ship-tracking data compiled by Bloomberg.

Shoei Kisen Kaisha Ltd., the Japanese firm that owns the vessel, said the final destination for the carrier was Singapore. The company also owned the Ever Given, the huge

1 · 1 · 6 · 1,106

Dan Tsubouchi @Energy_Tidbits · 11h

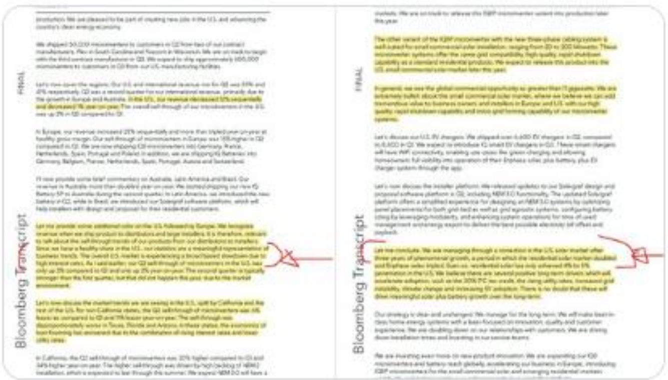
"Overall US market [#Solar] is experiencing a big broad based downturn due to high interest rates" $ENPH in Q2 call.

$ENPH -16% in pre-market.

Wonder what is the all-in payback period?

Thx @business transcripts.

#OOTT



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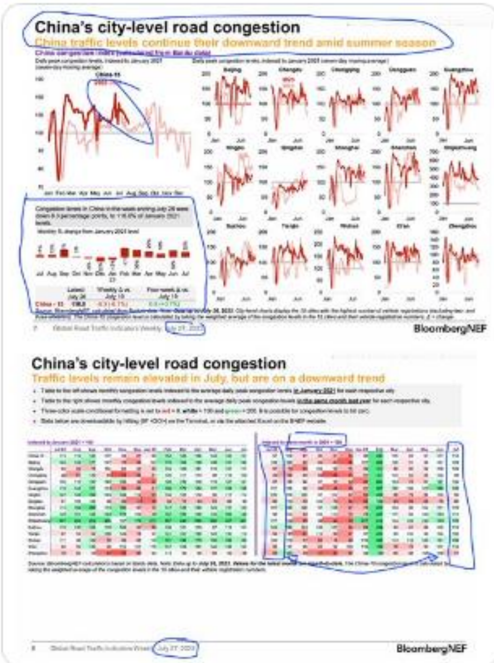
SAF

Dan Tsubouchi @Energy_Tidbits · Jul 27

China Baidu city-level road congestion -8.3% WoW to 116% of Jan/2021 levels.

BUT less city congestion from July start of summer holidays ie. 👇 07/24 tweet 5th consecutive WoW increase in domestic flights.

Top 15 cities congestion July/ 2023 are up YoY to 115% of July/2021... Show more



Dan Tsubouchi @Energy_Tidbits · Jul 24

#Oil Positive

China Scheduled domestic flights +1.3% WoW to 104,011 flights

...

1 3 2,525

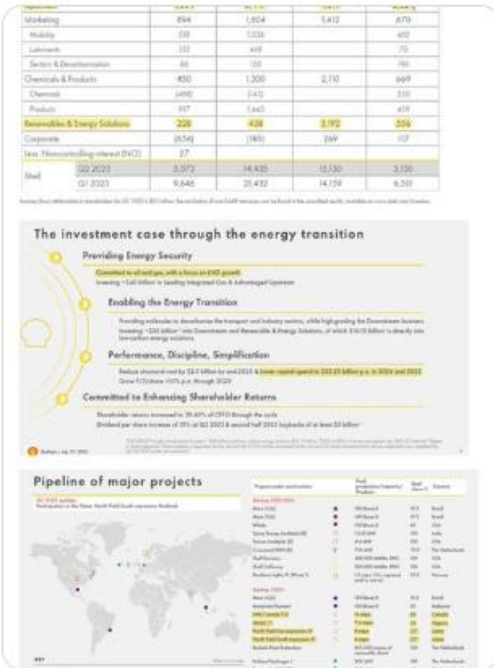
Dan Tsubouchi @Energy_Tidbits · Jul 27

"*committed to* #Oil *and* #NatGas *with a focus on* #LNG *growth*" #Shell Q2.

#LNGCanada Phase 1 is largest Shell share LNG at 0.74 bcfd vs NLNG T7 0.26 bcfd, North Field East 0.26 bcfd, North Field South 0.20 bcfd.

Hmmm! FID LNG Canada Phase 2 FID would add another 0.74 bcfd.

#OOTT



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Dan Tsubouchi @Energy_Tidbits · Jul 26

"substantial backlog of #Oil & #NatGas development projects across offshore and international land markets" #NOV CEO in Q2.

Stronger than expected international oil & gas supply in 2020s??

#OOTT

NEWS

Contact: Blake McCarthy (713) 815-3535

FOR IMMEDIATE RELEASE

NOV REPORTS SECOND QUARTER 2023 EARNINGS

- *Revenue of $2.09 billion, up 7% sequentially and up 21% year-over-year*
- *Operating Profit of $181 million, up $55 million sequentially and up $113 million year-over-year*
- *Net Income of $155 million, up $29 million sequentially and up $86 million year-over-year*
- *Fully diluted earnings per share of $0.39, up $0.07 sequentially and up $0.21 year-over-year*
- *Adjusted EBITDA* of $245 million, up $50 million sequentially and up $95 million year-over-year*

**Adjusted EBITDA is a non-GAAP measure, see "Non-GAAP Financial Measures" and "Reconciliation of Adjusted EBITDA to Net Income" below.*

HOUSTON, TX, July 26, 2023 — NOV Inc. (NYSE: NOV) today reported second quarter 2023 revenues of $2.09 billion, an increase of seven percent compared to the first quarter of 2023 and an increase of 21 percent compared to the second quarter of 2022. Net income for the second quarter of 2023 was $155 million, or 7.4 percent of sales. Operating profit was $181 million, or 8.6 percent of sales. Under Other Items the Company recorded a net pre-tax credit of $7 million (see Corporate Information for additional details). Adjusted EBITDA increased sequentially to $245 million, or 11.7 percent of sales.

"NOV's consolidated revenue increased seven percent sequentially, which helped lift fully diluted earnings per share to the highest level since 2015," stated Clay Williams, Chairman, President, and CEO. "Rising demand in offshore and international land markets led to a two percent sequential increase in capital equipment orders for the Company, despite economic uncertainty and continued declines in North American rig activity. We believe the substantial backlog of oil and gas development projects across offshore and international land markets will continue to push oilfield service asset utilization higher, prompting continued demand for NOV's critical equipment and technologies."

"Encouragingly, the Company's global supply chain is continuing to improve, which is positively impacting sales growth and profitability. However, compressing delivery times from most, but not all, of our vendors led to higher inventories in the second quarter, which contributed to NOV's working capital growth and cash draw. We expect inventory balances to remain elevated as supply chains normalize, before reversing out in the fourth quarter. As the pace of customer backlog conversion accelerates through the second half of the year, we expect both improved profitability and sequentially improving free cash flow, particularly in the fourth quarter and continuing into 2024."

Wellbore Technologies

Wellbore Technologies generated revenues of $804 million in the second quarter of 2023, an increase of eight percent from the first quarter of 2023 and an increase of 21 percent from the second quarter of 2022. Operating profit was $128 million, or 15.9 percent of sales, and included a credit of $1 million from Other Items. Adjusted EBITDA increased $31 million sequentially and increased $42 million from the prior year to $164 million, or 20.4 percent of sales. Significantly improved manufacturing throughput from the segment's drill pipe operations,

1 3 1,802

Dan Tsubouchi @Energy_Tidbits · Jul 26

#PattersonUTI Q2.

Its frac spreads troughed in July, increasing in Q4 & more in 2024.

Its US drilling rigs to bottom in Q3, increasing in Q4 & more in 2024.

Points to stalling US #Oil production in H2/23?

#OOTT

PATTERSON-UTI

Patterson-UTI Energy Reports Financial Results for the Quarter Ended June 30, 2023

2 8 1,412

SAF

Dan Tsubouchi @Energy_Tidbits · Jul 26

#CoreLabs Q2 "multi-yr international recovery ....
increased spending on exploration .... across the globe & expanded development of existing fields ....continued improvement in international onshore & offshore activity, with on-going projects across the globe"

Better than... Show more

On July 17, 2023, the Company terminated the Equity Distribution Agreement dated June 5, 2022 (the "Distribution Agreement"). No shares of the Company's common stock were sold under the Distribution Agreement.

Return On Invested Capital

The Board and the Company's Executive Management continue to focus on strategies that maximize return on invested capital ("ROIC") and FCF, factors that have high correlation to total shareholder return. Core's commitment to an asset-light business model and disciplined capital stewardship promote capital efficiency and are designed to produce more predictable and superior long-term ROIC.

The Board has established an internal metric of demonstrating superior ROIC performance relative to the oilfield service companies listed as Core's Comp Group by Bloomberg, as the Company continues to believe superior ROIC will result in higher total shareholder return. Using Bloomberg's formula to reflect Core's financial performance in the second quarter of 2023, indicates Core Lab's ROIC improved to 13.0%, up from 8.4% at the end of last quarter.

Industry and Core Lab Outlook and Guidance

Based on conversations with the Company's global client base, Core Lab maintains its constructive outlook on international upstream activity for the second half of 2023 and beyond, as a higher level of investment will be required to maintain and grow hydrocarbon production. The Company anticipates spending on long-cycle upstream projects in both onshore and offshore environments will continue to expand. In the near-term, the global crude-oil market may remain volatile due to global recession fears and uncertainty about the extent and timing of China's economic recovery. The recent OPEC+ crude-oil production cuts being implemented to support the current market are not expected to be maintained or required long-term. Additionally, production growth in areas outside of OPEC+ continue to face constraints due to prolonged underinvestment, as well as the loss of production due to natural declines from existing fields.

Core continues to anticipate a multi-year international recovery supported by increased spending on exploration in many regions across the globe and expanded development of existing fields to fortify crude-oil and natural gas reserves. This underlies Core's outlook for continued improvement in international onshore and offshore activity, with on-going projects across the globe, most notably across the Middle East, South Atlantic Margin and West Africa. Turning to the U.S., land activity for the first half of 2023 was lower than expected as reflected by the declining U.S. rig and frac spread counts throughout the second quarter. Core sees U.S. land completion activity for the second half of 2023 to be slightly down compared to the first half of 2023.

As a result, Core projects Reservoir Description's third quarter 2023 revenue to be up sequentially by low-single digits. While Core expects its international revenue to increase sequentially, the segment's revenue growth will be slightly softened by a projected decrease in U.S. activity. Client commitments on international projects have improved nicely year-over-year, however, the cadence at which these long-term projects are executed by Core's clients may vary from quarter to quarter as activity begins to accelerate. Additionally, the Russia-Ukraine conflict continues to create uncertainties with respect to trading patterns of crude-oil and associated crude-oil assay services, which may impact Core's Reservoir Description segment's operations in Russia, Ukraine and Europe. Core's Production Enhancement segment third

3 8 2,100

SAF

Dan Tsubouchi @Energy_Tidbits · Jul 26

Stronger than expected #Oil#NatGas supply in 2020s from resurgence of offshore?

#Weatherford *"Broader indicators support the positive story we see unfolding for offshore. CapEx growth, a significant step up in project sanctions, tightening rig utilization, and rising activity...*Show more

FINAL

Bloomberg Transcript

FINAL

Bloomberg Transcript

2 6 1,797

Dan Tsubouchi @Energy_Tidbits · Jul 26

For those, like me, who weren't near their laptops at 8:30am MT, @EIAgov released its #Oil #Gasoline #Distillates inventory as of July 21. Table below compares EIA data vs @business expectations and vs @APIenergy yesterday. #OOTT

Oil/Products Inventory July 21: EIA, Bloomberg Survey Expectations, API

(million barrels)	EIA	Expectations	API
Oil	-0.60	-2.25	1.32
Gasoline	-0.77	-1.37	-1.04
Distillates	-0.25	-0.42	1.61
	-1.62	-4.04	1.89

Note: Oil is commercial so builds in no change in SPR for the July 21 week

Note: Included in the oil data, Cushing had a 2.60 mmb draw for July 21 week

Source EIA, Bloomberg

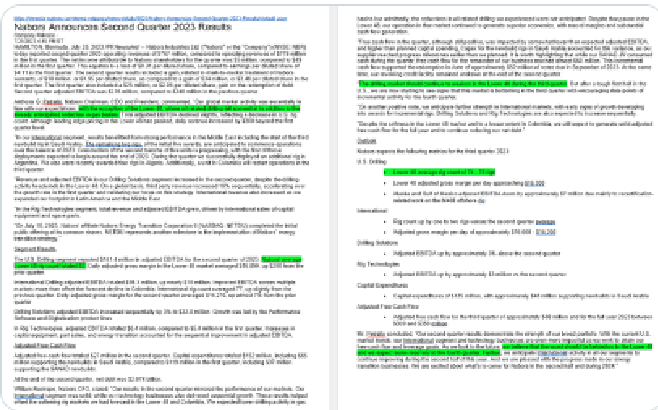
Prepared by SAF Group https://safgroup.ca/news-insights/

1 3 1,260

Dan Tsubouchi @Energy_Tidbits · Jul 25

#Nabors expects its Lower 48 average rig count to bottom in Q3. Average in Q2 was 82 rigs, expect 74-76 in Q3, and "we believe that the worst should be behind us in the Lower 48 and we expect some recovery in the 4th quarter".

#OOTT


Nabors Announces Second Quarter 2023 Results

4 8 1,962

Dan Tsubouchi @Energy_Tidbits · Jul 25

Recovering China consumer spending within China, at least the higher income consumers.

#LVMH H1 call today.

But these Chinese customers still, to the most part, aren't travelling and spending abroad.

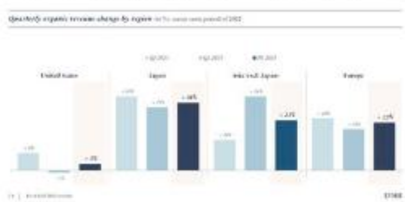
#OOTT

Excerpts Bloomberg transcripts of LVMH H1 results call on July 25, 2023.

- *"This reflected softer demand in the US due to the inflationary economic environment and high inventory at distributors at the beginning of the year. This was offset in part by the recovery in China as COVID restrictions ease."*
- *"But all in all we are very satisfied with the level of business we do with the Chinese client base as it as it has been up compared to 2021, more than 40%."*
- *"The second factor, which is a bit more unusual is that if we look at the breakdown of our business where we got the highest growth, namely in China and in Japan is where we've seen the more currency pressure."*
- *"So the question is about Chinese nationals in Europe and Japan. In Europe, it's very small, it used to be a large, a big chunk of the business in in up to 2019, it's very, very small, I mean we have, we have no groups. We have only individual travelers and there are only a fraction of the total clients, we used to have in Europe. So it's very small and in Japan, it's about 50%. I'm talking Fashion and Leather obviously it's about 50% of the total business, which is pretty close to what we used to do in 2019. So the the rebalancing of the Japanese business".*

Excerpt LVMH H2 results call slides

Europe and Asia growing strongly, US up over the period despite Q2 slowdown



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SAF

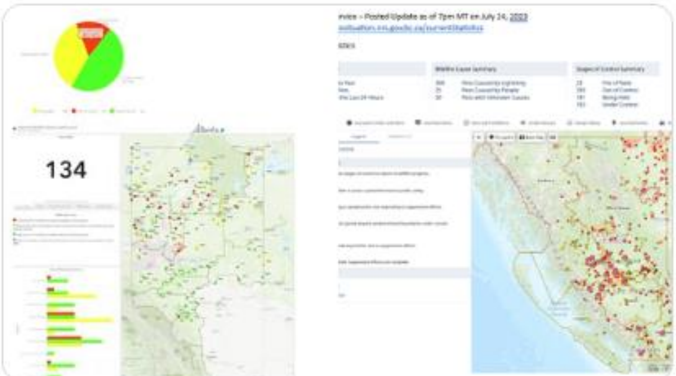
Dan Tsubouchi @Energy_Tidbits · Jul 24

Wildfire update last 48 hrs

BC:
7pm 07/24: 473 fires incl 269 Out of Control
7pm 07/22: 468 fires incl 280 OOC

AB:
7pm 07/24: 134 fires incl 22 OOC
7pm 07/22: 118 fires incl 14 OOC

Stay safe!
#OOTT #NatGas



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Dan Tsubouchi @Energy_Tidbits · Jul 24

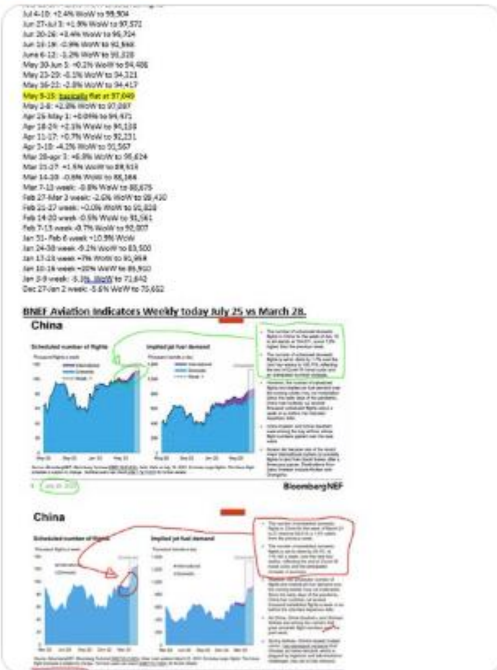
#Oil Positive

China Scheduled domestic flights +1.3% WoW to 104,011 flights

5th consecutive WoW increase.

Chinese consumer didn't get Covid bonus money from govt like in West so spending their own savings/money in summer travel.

Thx @BloombergNEF Claudio Lubis
#OOTT #JetFuel



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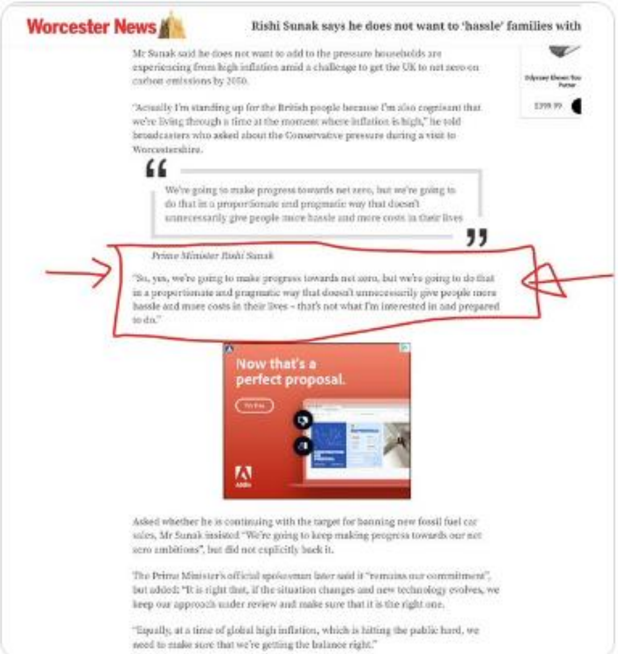
SAF

Dan Tsubouchi @Energy_Tidbits · Jul 24 ···

UK #NetZero backtrack!

"So, yes, we're going to make progress towards net zero, but we're going to do that in a proportionate and pragmatic way that doesn't unnecessarily give people more hassle and more costs in their lives – that's not what I'm interested in and prepared to... Show more



Worcester News

Rishi Sunak says he does not want to 'hassle' families with

Mr Sunak said he does not want to add to the pressure households are experiencing from high inflation amid a challenge to get the UK to net zero on carbon emissions by 2050.

"Actually I'm standing up for the British people because I'm also cognisant that we're living through a time at the moment where inflation is high," he told broadcasters who asked about the Conservative pressure during a visit to Worcestershire.

> We're going to make progress towards net zero, but we're going to do that in a proportionate and pragmatic way that doesn't unnecessarily give people more hassle and more costs in their lives
>
> *Prime Minister Rishi Sunak*

"So, yes, we're going to make progress towards net zero, but we're going to do that in a proportionate and pragmatic way that doesn't unnecessarily give people more hassle and more costs in their lives – that's not what I'm interested in and prepared to do."

Asked whether he is continuing with the target for banning new fossil fuel car sales, Mr Sunak insisted "We're going to keep making progress towards our net zero ambitions", but did not explicitly back it.

The Prime Minister's official spokesman later said it "remains our commitment", but added: "It is right that, if the situation changes and new technology evolves, we keep our approach under review and make sure that it is the right one.

"Equally, at a time of global high inflation, which is hitting the public hard, we need to make sure that we're getting the balance right."

Dan Tsubouchi @Energy_Tidbits · Jul 23

Hmmm!

was @michaelgove's interview a preview the UK is going to back away from expensive #NetZero policies?

...

4 6 4,452