Energy Tidbits

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https://www.washingtonpost.com/business/2021/06/03/lng-export-explosion-vce/

Engineers raise alarms over the risk of major explosions at LNG plants

As the Trump administration pushed hard for new LNG export terminals, federal regulators were slow to respond to warnings

By Will Englund

June 3, 2021 at 6:45 a.m. MDT

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As fracking turned the United States into a major producer of natural gas over the past decade, federal regulators approved the construction of export terminals along the Atlantic and Gulf coasts while relying on industry safety calculations that critics say significantly understate the potential force of a specific type of accidental explosion.

The particular event that worries engineers outside the business has a very low probability of happening but could have exceedingly destructive consequences if it does.

Under new leadership since January, the federal Pipeline and Hazardous Materials Safety Administration, or PHMSA, told The Washington Post it intends to draw up rules at some point next year that would deal with the risk in question.

The move comes as two new plants just outside Brownsville, Tex., are poised to begin construction. Yet each has already passed through the safety permitting process.

The danger is one the United States more or less backed into. It developed with the rush to build export terminals with equipment to liquefy natural gas, and an early assessment that these facilities were no more hazardous than the terminals built to import the stuff back when the United States consumed more gas than it produced.

That was a mistake.

Eventually, regulators and industry engineers came around to the understanding that these terminals do pose inherent new dangers, almost as an afterthought. But even to this day, federal regulators accept at face value the industry's calculations regarding what engineers call a vapor cloud explosion. Critics here and abroad — engineers — have argued since 2016 that those calculations seriously underestimate the destructive potential of such an event. Over the years, those arguments have been enhanced by greater specificity and greater documentation, even as the Trump administration pushed hard for more U.S. export terminals and more sales of American LNG, or liquified natural gas.

The danger is not what you might suppose: It's not the natural gas, though that also poses risks. The threat of a vapor cloud explosion comes from the heavier hydrocarbons an export terminal relies on to chill the natural gas so deeply that it turns into a liquid, which is then loaded onto ships for sale abroad. These hydrocarbons are called refrigerants, and under the right conditions, a major leak of volatile refrigerants on a windless day could lead to the buildup of a cloud of ground-hugging vapor, until a spark sets it off.

The model used by the industry, and implicitly accepted by PHMSA, has held in case after case that the destructive force of a vapor cloud explosion would be spent by the time it reaches the perimeter of whatever terminal is under consideration. But specialists not associated with the gas business say this is wrong.

One study by British experts found that a hypothetical vapor cloud explosion could be up to 15 to 20 times as powerful as what the planners modeled.

They have examples to back up their argument, mostly from facilities that handled petroleum products similar to those used in natural gas liquefaction plants. Vapor cloud explosions are rare, but at least three have occurred in the United States and Latin America since 2009.

That year, one in Puerto Rico demolished a tank farm; the remains looked like Stalingrad. The blast registered as the equivalent of a small earthquake. There were no fatalities, but 300 nearby homes were damaged. The vapor in that case was from gasoline, which is less dangerous than the refrigerants used for natural gas.


A storage tank burns in 2012 in Amuay, Venezuela. (Leo Ramirez/AFP via Getty Images)

An explosion in Venezuela in 2012 destroyed an oil refinery and inflicted heavy damage on a nearby army barracks and several residential areas, killing 47.

Vapor clouds have exploded in Algeria and Britain. One in Philadelphia led to the permanent closure in 2019 of what had been the largest oil refinery on the East Coast. The explosion catapulted a 38,000-pound vessel across the Schuylkill River.

"If something doesn't get corrected, there might be some terrible accidents," said Jerry Havens, the recently retired director of the Chemical Hazards Research Center at the University of Arkansas, who has been sounding the alarm ever more urgently over the past five years. "I can't get anybody to do anything about it."

Developers calculate explosion risks

Jared Hockema is the city manager of Port Isabel, Tex., a community of 6,000 that relies on sport fishing and commercial shrimping for its livelihood. From his office just steps from Laguna Madre, the bay that separates the mainland from South Padre Island, it is a mile and a half back through town to the Brownsville-Port Isabel Highway.

There, just behind the H-E-B Supermarket, on flat reclaimed scrubland between a lake named Vadia Ancha and the Brownsville Ship Channel, a company called Texas LNG wants to build a big new export terminal.

Port Isabel has been fighting every step of the project, before state and federal regulatory bodies and in the courts. The city is worried about air pollution and fires. It is concerned about interference with shrimpers' livelihoods, and certain that a big plant will drive away tourists. Hockema said the site is a habitat for ocelots, an endangered species. And then there is the risk of explosion, overshadowing what is for the most part a community of color.

"A facility like this threatens our way of life," Hockema said. Because Port Isabel is mostly poor, and mostly Brown, he said, "they think they can get away with more here than in other parts of the country."

"This is a blatant example of environmental injustice," said Rebekah Hinojosa, a Sierra Club activist who works with a group called Save RGV, referring to the Rio Grande Valley.

PHMSA has approved the safety plans for three proposed LNG export terminals along the Brownsville Ship Channel, though other regulatory hurdles remain. One was canceled this year when its

developer, Annova, decided that the faltering export market wouldn't justify the investment. Hockema, Hinojosa and their allies hope the remaining two, Texas LNG and Rio Grande LNG, which would abut each other on the Brownsville Ship Channel, meet the same fate before they can be built. But not so far.

During the permit process, all three projects presented calculations regarding vapor cloud explosions based on small potential spills and the model that critics say lowballs the shock wave emanating from a blast. Hockema points to the danger of debris from Elon Musk's SpaceX launch site, just across the channel, falling on the terminal sites, potentially puncturing pipes or tanks. (When a prototype rocket crashed in March, Musk tweeted that the cause was a small methane leak. SpaceX did not respond to a request for comment.)

Texas LNG has the endorsement of Sen. Ted Cruz (R-Tex.). Its founder and chief operating officer, Langtry Meyer, accompanied President Donald Trump on a mission to China in November 2017 to try to drum up business.

A spokeswoman for the company, Camilla Siazon, said Texas LNG would have no comment and referred questions about explosion hazards to federal regulators.

Rio Grande LNG is a subsidiary of a Houston-based energy company called NextDecade. "Rio Grande LNG hired third-party experts to perform modeling using highly complex, globally recognized hazard modeling software tools," Patrick Hughes, a senior vice president, wrote in an email. "The modeling was performed consistent with federal requirements and provides reliable determinations of the potential hazards used for facility siting."

Employees of PHMSA, the pipeline safety agency, knew in at least 2016 that the issue of vapor cloud explosions needed to be considered in greater depth, thanks to Havens's warnings. For most other hazards, federal standards for calculating risk are spelled out, but regulators had not taken that step with vapor cloud explosions — and still haven't. They accept what the project developers provide.

Deflagrations vs. detonations

As the 2016 election approached, the agency, jointly with the British Health and Safety Executive, sponsored an engineering workshop on the topic. A series of slides in that workshop demonstrated the hazards.

A typical export terminal might have 50 tons of refrigerants on site, consisting of some combination of ethylene, propane, isobutane, isopentane or hexane. A leak at a moment when there is no wind is the most dangerous because the vapor that forms as the liquid evaporates won't disperse. It will gather in a cloud that grows until the leak stops or all the liquid spills. The participants reviewed vapor cloud explosions at different sorts of facilities and made the point that various heavier-than-air hydrocarbons, including gasoline, act in similar fashions and can be used for modeling risks.

One difference, though, is that refrigerants are more volatile than gasoline and exist naturally in a gaseous state, so up to 100 percent of a leak could be expected to form a vapor cloud.

Firefighters spray water on oil storage tanks after a 2012 blaze in Amuay, Venezuela. (Juan Barreto/AFP/Getty Images)

The explosion in San Juan, Puerto Rico, occurred 26 minutes after the gasoline leak there began and involved 78 tons of vapor. The leak in Amuay, Venezuela, was slow but kept leaking for more than an hour before the vapor detonated.

The key finding was that the force of the explosion in such cases is not greatest at the center, dissipating outward, but generally homogeneous within the cloud, especially if it is contained by outer barriers, as is typically the case.

The model used by the industry does not account for that. Plans are drafted and calculations made that suggest a maximum "overpressure" — or shock wave — of one pound per square inch would be felt at the peripheries of these terminals. That's enough to break windows. But the 2016 workshop suggested that overpressures can be far greater than that — with buildings destroyed and widespread fatalities.

PHMSA officials shelved the workshop report, and nothing came of it. Drue Pearce, who was named acting administrator when Trump took office a few months later and then served as deputy until this past January, said she had never heard of the workshop or the report.

Tristan Brown, newly appointed as acting head of PHMSA after working as an aide to Sen. Amy Klobuchar (D-Minn.), defended the dedication of the agency's staff and said new rules on vapor cloud explosions are scheduled to be drawn up in the next year, as part of nine safety-related rules on the agency's pipeline regulation agenda.

In a formal response provided to The Post by the agency, PHMSA officials said: "The agency keeps safety at the forefront as we review LNG facility applications and operations — including factoring in the most up to date hazard modeling — and ensuring operators are doing the same. Our work over the last few years on VCE [vapor cloud explosions] has continued and evolved with broad input from researchers and stakeholders."

The statement continued: "Regulations are one tool in PHMSA's toolbelt to ensure safety in the design and operations processes — and under new leadership we have been immediately focused on building out our capacity to more quickly develop and implement new regulations. This is particularly important given the dozens of new regulatory mandates passed in the bipartisan PIPES Act of 2020 (last December) — with updates to the LNG facilities rules being one of our top regulatory priorities."

The dynamics of a vapor cloud as it forms and spreads, and the calculation of overpressures, can seem dauntingly arcane. Engineers even have different words for differentpotential explosions, which are determined by the amount of vapor involved, and act differently. Industry calculations are based on weaker "deflagrations." Critics worry about much stronger "detonations."

Vapor clouds with a diameter exceeding 100 meters, or about 110 yards, are especially dangerous, based on a survey of a representative selection of incidents, HSE, the British agency, said in a statement provided to The Post. It is difficult to find examples of such a large cloud that did not explode. "There may be an element of underreporting, especially where no one is killed, but it still seems appropriate to work on the basis that there is a fairly high probability of explosion for these very large vapor clouds," it said.

The statement suggested that the model used to assess explosion risks is not fundamentally flawed but is only as good as the assumptions made by its users, regarding not only the size of the vapor cloud but its turbulence, the speed with which it forms and the probability of ignition, among other factors.

"Experience has shown," the statement said, following on a 2019 study, that different users "can produce quite different results for the same scenario."

The model is a subset of a software program called FLACS, for Flame Acceleration Simulator, developed by a company called Gexcon. The sub-model for vapor cloud explosions has been dubbed Q9, and this is what has drawn critics' attention.

Vincent Tam of Warwick University in Britain was the lead author of a paper critical of Q9 published this year in Eng, a peer-reviewed journal.

"The results in this paper showed that Q9 systematically underpredicts" the force of vapor explosions, he wrote.

In a follow-up email, Tam wrote that industry risk assessments usually do not consider windless conditions because modeling them is too difficult. (Both the San Juan and Venezuelan explosions occurred in what engineers call nil-wind situations.)

PHMSA said it is reviewing Tam's paper.

Gexcon points to studies by former company engineers that support the Q9 model. One of those engineers, Filippo Gavelli, used Q9 in writing the vapor cloud sections of environmental impact statements for several proposed LNG terminals. He now works for Blue Engineering and Consulting, in Ellicott City, Md.

"Every hazard modeling tool that Blue utilizes has been widely used worldwide and accepted by numerous regulatory agencies," Gavelli wrote in an email. "Blue's work products comply with all federal regulations and applicable codes and standards."

Through his company, Gavelli has a $473,000 PHMSA contract to develop an assessment tool for evaluating vapor cloud models — Q9 among them. The contract, he wrote, was awarded with an eye toward revising federal regulations to require specific hazard modeling.

PHMSA, in its statement, said Blue won the contract because it was the sole bidder.

LNG terminals are typically designed with vapor barriers at the perimeters. These are intended to keep clouds of vapor from drifting off site and potentially toward an inhabited area.

"This is a double-edged sword," Tam wrote. "The barrier stops flammable gas migrating into surrounding buildings leading to multiple explosions."

But when the wind isn't blowing, he wrote, a flammable cloud "can accumulate and eventually fill up the entire facility enclosed by these barriers." This occurred in an accident in Jaipur, India, in 2009. "There was a leak of gasoline, its vapor was trapped by boundary walls. The resultant vapor cloud explosion completely demolished the entire facility."

Havens, the recently retired director of the Chemical Hazards Research Center, is more blunt about the installation of vapor fences.

"It's really stupid," he said. "It's a really bad mistake."

A 1990 Energy Department study, gathering dust for decades, came to the same conclusion.

Slumping demand

Since the 2016 workshop that spelled out the dangers of a vapor cloud explosion, six export terminals, with facilities to chill and liquefy natural gas, have begun operations, in Texas, Louisiana, Georgia and Maryland.

Pearce, the former PHMSA deputy administrator, wrote in an email to The Post that there was never a hint of pressure from the Trump White House to expedite the permitting of LNG export terminals. (The final permits are issued by the Federal Energy Regulatory Commission, but PHMSA signs off on the safety features.) "My first priority was and is safety; I don't believe in taking shortcuts," she wrote.

None of those six terminals has experienced a vapor cloud explosion.

Other proposed terminals, including the two at Brownsville, are in the permitting process. But customers are becoming difficult to find amid a global slump in demand, and some projects have been canceled, including the Annova terminal in Brownsville and one proposed for Jordan Cove, Ore. Last month a Canadian export terminal was canceled, and Sempra Energy said it would push back construction of a new terminal in Port Arthur, Tex., at least a year.

In Port Isabel, Hockema said he fears that the Texas LNG terminal will be approved and built, and then abandoned for lack of business, leaving the town with a permanent, hulking eyesore. That would be unfortunate for his city, but not as unfortunate as the detonation of dozens of tons of volatile hydrocarbons.

https://twitter.com/dpradhanbjp/status/1401035991691907077

Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030

Posted: Wednesday October 23, 2019. 3:45pm MT

It's taking longer than expected, but we are finally getting visibility that India is investing significantly towards its goal to have natural gas be 15% of its energy mix by 2030. Earlier in Oct, India Oil Minister Dharmendra Pradhan said that there are $60 billion of natural gas infrastructure and LNG import terminals that are "under execution". He said "*I am not talking about potential investment. This number relates to the project that are under execution".* Natural gas consumption in India is only now back to 2011 levels at 5.6 bcf/d and represents only 6.2% of its energy mix. If India hits its 15% target of its energy mix by 2030, it would add natural gas demand, on average, of >1.5 bcf/d per year. At the same time India's domestic natural gas production peaked in 2010 at 4.6 bcf/d, but has been flat from 2014 thru 2018 at ~2.7 bcf/d, which means the big winner will be LNG. The most important factor driving this expectation for natural gas consumption growth is likely price. Asian LNG landed prices are down about 50% YoY and, more significantly, the expectation is for future Asian LNG prices to be at lower levels than prior cycles. India, by itself, may not be a LNG global game changer, but it is another positive support for why we believe LNG markets will rebalance sooner than expected ie. in 2022/2023. We see mid term Asian LNG landed prices lower than prior cycles in a rebalanced market (ie. +/- $8), which means that low capital costs will be critical for future LNG projects. We believe that BC's LNG key potential projects (LNG Canada Phase 2 and Chevron Kitimat LNG) can compete in this price environment as they have the potential for brownfield capital costs if they move to a continuous construction cycle following in lockstep to LNG Canada Phase 1, much like Cheniere does for its LNG projects in the Gulf Coast.

India has a pollution crisis. We don't think it is unfair to say India has a pollution crisis. In every pollution ranking, India has several cities among the most polluted cities. The 2018 World Air Quality Report (AirVisual) list of the World's Most Polluted Cities 2018 has 20 of the world's 25 most polluted cities being in India. India has all of the top 25 most polluted cities other than #3 Faisalabad (Pakistan), #7 Hotan (China), #10 Lahore (Pakistan), #17 Dhaka (Bangladesh), and #19 Kashgar (China). Like us, many people have been to Beijing on business and believe Beijing's reputation as a very polluted city is deserved. But to put in perspective, Beijing's ranking isn't even close to the 15 most polluted cities in China, let alone the world. Beijing's score on their scale is 50.9 vs the other Chinese cities #7in the world, Hotan at 116.0, and #19 Kashgar at 95.7, and the world's most polluted city #1 Gurugram (India) at 135.8 .

World's Most Polluted Cities 2018

Rank	City	Country	Rank	City	Country
1	Gurugram	India	14	Varanasi	India
2	Ghaziabad	India	15	Moradabad	India
3	Faisalabad	Pakistan	16	Agra	India
4	Faridabad	India	17	Dhaka	Bangladesh
5	Bhiwadi	India	18	Gaya	India
6	Noida	India	19	Kashgar	China
7	Patna	India	20	Jind	India
8	Hotan	China	21	Kanpur	India
9	Lucknow	India	22	Singrauli	India
10	Lahore	Pakistan	23	Kolkata	India
11	Delhi	India	24	Pali	India
12	Jodhpur	India	25	Rohtak	India
13	Muzaffarpur	India	26	Mandi Gobindgarh	India

Source: Airvisual

India natural gas consumption is only now back to 2011 levels. For the past couple years, we have been highlighting that the growth in India's natural gas consumption (and linked LNG imports) has been very low due to the slow buildout of domestic natural gas infrastructure and LNG import facilities. BP data shows India's natural gas consumption was 5.6 bcf/d in 2018, and this compares to its peak of 5.8 bcf/d in 2011. To put in perspective, China's natural gas consumption in 2011 was 13.1 bcf/d and reached 27.4 bcf/d in 2018.

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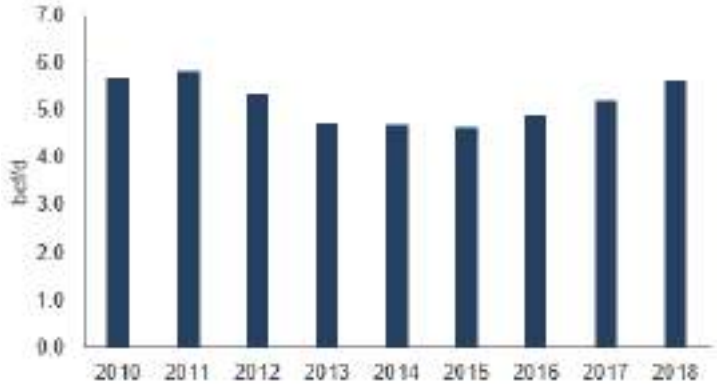
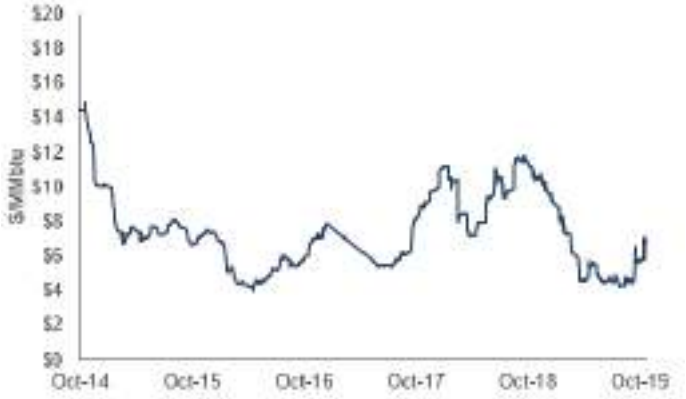
India's Natural Gas Consumption (bcf/d)



Source: BP

Perhaps the best reason why there is better visibility – LNG prices are expected lower than prior cycles. A key reason for this lack of growth has been the price of LNG relative to coal. Our June 17, 2018 Energy Tidbits [LINK] highlighted comments from the Q&A from BP's Chief Economist speech "*Energy in 2017: two steps forward, one step back*" on this relative cost concept. We then wrote on the BP Chief Economist comments from an India company on why there isn't more natural gas and why coal is still going up. He said that the Indian executive said it was because the cost of natural gas was significantly more expensive than domestic coal and that the push in India is to get more power to more poorer people, but if natural gas is significantly higher, it can't be done, they have to rely on coal. What has happened since the BP Chief Economist June 2018 comment is that Asian LNG prices are down 50% and the expectation going forward is that future LNG prices are not expected to be at prior cycle highs. But the other question is what does it mean for LNG prices. There is an increasing supply of reasonable priced LNG around the world, whether it from Qatar, Papua New Guinea, the Gulf of Mexico and even Canada. And each of these areas has anchor projects to support future brownfield development. Couple that with increasing linkage of LNG prices away from oil indexed contracts, we believe this means that a balanced LNG market going forward is going is not going to see sustained high Asian LNG prices from prior cycles, but around more costs related more to lower LNG supply basins ie. LNG prices around mid to long term +/- $8 landed Asian LNG prices, and not the prior $10 - $12 range. As the BP Chief Economist highlights, price is a huge issue for India and it is likely that the expectation for lower LNG prices than prior cycles is the most important reason to push India to increased natural gas consumption.

Japan/Korea Marker (JKM) LNG Price



Source: Bloomberg

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India is now getting serious about increasing natural gas consumption, has $60b of projects under execution. We follow the key India news as part of our weekly news scan for our Energy Tidbits memos and there is no question that the India government and its people realize they have to deal with this increasing pollution problem. And perhaps most of all, India is now taking specific, significant action to set the stage for increasing natural gas consumption and LNG imports. Earlier in Oct, Japan Times picked up a Reuters story "*India investing $60 billion on gas grid to link up nation by 2024*" [LINK]. The story notes "*India, one of the world's largest consumers of oil and coal, is investing $60 billion to build a national gas grid and import terminals by 2024 in a bid to cut its carbon emissions, the oil minister said on Sunday. India has struggled to boost its use of gas, which produces less greenhouse gas emissions than coal and oil, because many industries and towns are not linked to the gas pipeline network. Gas consumption growth was running at 11 percent in 2010 but growth slid to just 2.5 percent in the financial year 2018/19*." The most significant part of this story is that this is $60 billion of projects under execution, not planned or potential projects. The story quotes Oil Minister Dharmendra Pradhan "*I am not talking about potential investment. This number relates to the project that are under execution*". The critical natural gas infrastructure requirement is a domestic natural gas pipeline network to deliver gas throughout India. The India Ministry of Petroleum & Natural Gas Oct 3, 2019 release [LINK] said "*On the issue of moving towards the gas economy, Shri Pradhan said that over 16,000 km of gas pipeline has been built and an additional 11,000 km is under construction. With the tenth bid round for City Gas Distribution completed, it will cover over 400 districts and will extend coverage to 70 percent of our population".* Progress is being made. Plus LNG regasification projects continue to be completed. Below is our updated table of India LNG projects that are estimated to come on stream in 2019 and 2020. We haven't included the projects beyond 2020, but there are several planned projects already on the books.

India Current/Planned LNG Regasification Projects Est. In Service In 2019/2020

	State	Coast	Operator	Capacity (mtpa)	Capacity (bcf/d)	Expected Timelines
Existing Terminals						
Dahej	Gujarat	West	Petronet LNG	10.00	1.32	Operating
Dahej Phase 2	Gujarat	West	Petronet LNG	5.00	0.66	Operating
Hazira	Gujarat	West	Shell	5.00	0.66	Operating
Dabhol RGPPL	Maharashtra	West	GAIL & NTPC JV	5.00	0.66	Operating
Kochi	Kerela	West	Petronet LNG	5.00	0.66	Operating
Ennore Phase 1	Tamil Nadu	East	IOCL	5.00	0.66	Operating
Total Existing				**35.00**	**4.61**	
Upcoming Terminals						
Mundra	Gujarat	West	Adani & GSPC	5.00	0.66	2019
Jaigarh	Maharashtra	West	H-Energy Gateway Pvt. Limited	4.00	0.53	2019
Dahej Phase 3	Gujarat	West	PLL	2.50	0.33	2019
Mundra	Gujarat	West	Adani	5.00	0.66	2020
Digha FSRU	Odisha	East	H-Energy	4.00	0.53	2020
Ennore Phase 2	Tamil Nadu	East	IOCL	1.75	0.23	2020
Jafrabad	Gujarat	West	Swan Energy	5.00	0.66	2020
Total Upcoming				**27.25**	**3.59**	

Source: Bloomberg, Company Reports, Street Reports

It reminds us of when China got really serious about natural gas in 2018. We should be clear that we do not consider India anywhere near as significant to global LNG markets as China. But conceptually, India getting serious about increasing natural gas consumption reminds us of what we were seeing in China in 2016/2017. India is probably more like China in 2016 as opposed to the summer of 2017, when it seemed clear that China was on the cusp of a major push in natural gas consumption and LNG would be the winner in 2018. India's impact should start to play out by year end 2020 as opposed to this winter. We first outlined the China LNG thesis in our Sept 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]. Our Sept 20, 2017 blog wrote "*The news flow from China this summer on its increasing fight and urgency to fight pollution supports China's plan to increase natural gas to 10% of its energy mix in 2020 and 15% of its energy mix in 2030. This is a game changer to global natural gas markets and, by itself, can bring LNG to undersupply 2 to 3 years earlier than expected. China's natural gas consumption increased by ~15% per year from 2005 thru 2016 and ~1.5 bcf/d per year vs China's 8.5%*

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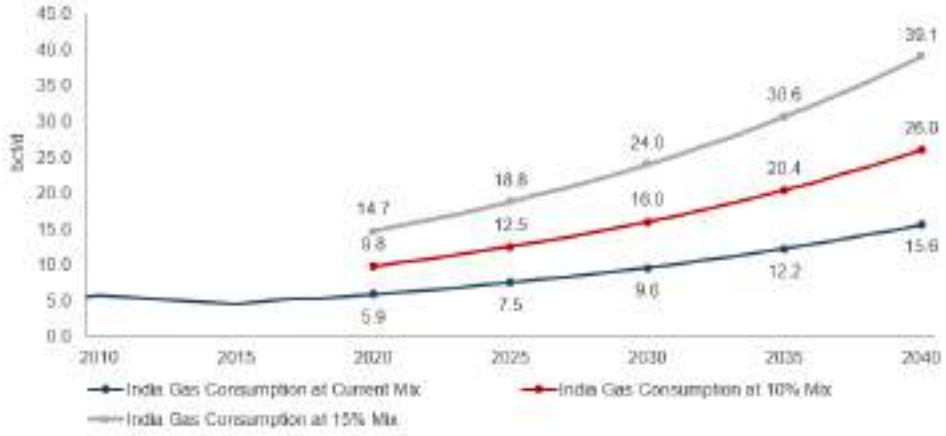
growth rate in energy in total. Yet natural gas only got to 5.9% of China's energy mix. If China is to hit 10% by 2020, it will need to increase natural gas consumption by 4 to 5 bcf/d per year. Assuming China continues to grow its domestic natural gas production by 0.6 bcf/d per year (its growth rate for last five years), China will need to import an additional ~3.5 to ~4.5 bcf/d per year. This is "per year"! And if so, we believe BC LNG will be back and there is a higher probability than ever before for a Shell FID on its BC LNG project in 2018." As it turned out, Shell did FID its LNG Canada project on Oct 1, 2018.

Natural gas is only 6.2% of India's energy mix vs its target of 15% in 2030. India, similar to China, has a target to have natural gas to be 15% of its total energy mix by 2030. This is not a new target, rather it has been in place and we first highlighted India's 15% target of its energy mix in our Nov 23, 2018 blog "*"India's Natural Gas Consumption Would Be Up ~1.3 Bcf/D Per Year If Its To Reach Its Target Of 15% Of Its Energy Mix By 2030*" [LINK] At that time, we noted some specific steps that were happening in 2019 and 2020 to put them on that long term plan. The impact to get to 15% of energy mix is significant to world LNG markets. This is a big increase from natural gas being 6.2% of India's energy mix in 2018. To put in perspective, in 2018, natural gas was 30.5% of US energy mix, 21.9% of Japan's energy mix, 16.0% of South Korea's energy mix, and 7.4% of China's energy. Note, China is up from 6.6% in 2017.

Hitting 15% of its energy mix would increase India's natural gas consumption by >1.5 bcf/d per year. We projected how much India's natural gas consumption would increase if it can hit its target of 15% of total energy mix in 2030. BP data shows India's natural gas consumption in 2018 was 5.6 bcf/d and natural gas was only 6.2% of total energy mix. BP also estimates India's total energy consumption grew at a rate of 5.2% per year for the 2007 – 2017 period, but energy consumption growth increased to +7.9% in 2018 YoY vs 2017 But if we only assume a 5% growth in total energy mix to 2030, then if natural gas is 15% of India's energy mix, it would be 18.8 bcf/d in 2025 and 24.0 bcf/d in 2030 ie. growth of +13.2 bcf/d to 2025 and +18.4 bcf/d to 2030. India's domestic natural gas production peaked in 2010 at 4.6 bcf/d, but has been flat from 2014 thru 2018 at +/- 2.7 bcf/d. We expect there to be some increased focus to at least return India to modest domestic natural gas production. But, until then, any growth in natural gas consumption will be met with LNG. Our model forecasts of >1.5 bcf/d per year, on average, in consumption is the equivalent of 2.5 Cheniere LNG trains per year.

India's Projected Natural Gas Consumption @15% Of Energy Mix (bcf/d)



Source: BP, SAF

India may not be a LNG global game changer by itself like China, but does support the call that LNG markets rebalance sooner than expected. We had our SAF Group 2020 Energy Market Outlook on Monday Oct 7. A replay of the call and the supporting slide presentation are available on our website at [LINK]. Two of our key off consensus calls were on LNG including our view LNG market would balance earlier than expected ie. 2022/2023. We noted that we agree with markets that LNG will be oversupplied thru 2021, but where we disagree is that we see LNG markets balancing in 2022 or 2023. Our presentation reminded that LNG supply capacity needs to be in excess of demand to provide for turnarounds and

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allowance such that suppliers can deliver contract volumes. We also expect the required over capacity of supply is increasing as contract mix shifts away from historical oil indexed take or pay contracts with destination clauses to an increase share of portfolio contracts. There is no firm number, but we believe the required excess supply capacity relative to demand has increased from approx. 5% to 10% to +/-15% ie. LNG markets are effectively balanced when LNG supply capacity is >10% of demand. As a result, we believe that LNG markets rebalance in 2022/2023, a view which is similar to Total's Sept 25, 2019 Investor Day [LINK] (see below graphs). We should note that our view of balanced LNG markets doesn't mean a return to $12 or more Asian landed LNG prices, rather, we see the emergence of anchor LNG projects in areas with brownfield expansion potential means that a planning case for mid term Asian LNG price is in the $8 range. Our outlook presentation also includes our view that BC's LNG key potential projects (LNG Canada Phase 2 and Chevron Kitimat LNG) can compete in this price environment as they have the potential for brownfield capital costs if they move to a continuous construction cycle following in lockstep to LNG Canada Phase 1, much like Cheniere does for its LNG projects in the Gulf Coast. Our outlook call did not specifically work in the India Energy Minister's comment on in execution projects, but, if anything, it provides us with more confidence for the call for LNG markets to rebalance in 2022/2023.

Total's Medium And Long Term LNG Supply & Demand

Source: Total Sept 25, 2019 Investor Day

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https://en.energinet.dk/About-our-news/News/2021/06/03/ENVIRONMENTAL-APPEALS-BOARD-REPEAL-THE-DANISH-ENVIROMENTAL-AGENCYS-PERMIT-FOR-BALTIC-PIPE

ENVIRONMENTAL APPEALS BOARD REPEAL THE DANISH ENVIRONMENTAL PROTECTION AGENCY'S PERMIT FOR BALTIC PIPE

PUBLISHED 3.6.2021 14.30

On 12 July 2019 the Baltic Pipe Project received an environmental permit from the Danish Environmental Protection Agency to build the gas pipeline on land across Denmark. On 31 May 2021 the Environmental and Food Appeals Board ruled to repeal the permit.

The Danish Environmental and Food Appeals Board has repealed the permit for the gas pipeline Baltic Pipe on land. According to the appeals board, the permit from the Danish Environmental Protection Agency did not sufficiently describe the measures taken to protect dormice, Nordic birch mice and bats, that are protected by the European Habitats Directive Annex 4, during the construction of the 210-kilometer-long pipeline across Denmark.

“We are surprised by the ruling by the appeals board. When we received the permit back in 2019 it was specified that we had to develop several remedial measures to secure good living conditions for the dormice, Nordic birch mice and bats, that live in some of the areas, Baltic Pipe will pass through. Since then, we have been working on and implemented these measures, to protect the animals. The appeals board has ruled that all of these measures should have been described more thoroughly, before the permit was given”, says Marian Kaagh, Vice President of projects in Energinet.

Furthermore, the appeals board has found that the remedial measures in the permit are not sufficient to maintain the affected breeding and foraging areas at the same level as prior to the construction work.

Energinet will now - in close contact with the authorities – clarify what consequences the ruling will have for the Baltic Pipe Project. Energinet is at this moment preparing a plan for a temporary shutdown of construction activities until the required permit is in place.

“The appeals board has repealed the permit and sent it back to the Danish Environmental Protection Agency for revision. We will now thoroughly examine what consequences this has for the Baltic Pipe Project and especially the construction in the places where the pro-tected Annex 4-species live. Baltic Pipe is a major infrastructure project that span across Denmark. It is impossible not to affect the areas we work in, but we are fully committed to minimizing impact to both people and nature, and to secure good conditions for protected species during and after the construction of Baltic Pipe”, says Marian Kaagh.

BACKGROUND

The Danish Environmental Protection Agency granted a permit for the onshore part of the Baltic Pipe Project in July 2019. Later the same year the Danish Energy Agency granted the permit for the offshore part.

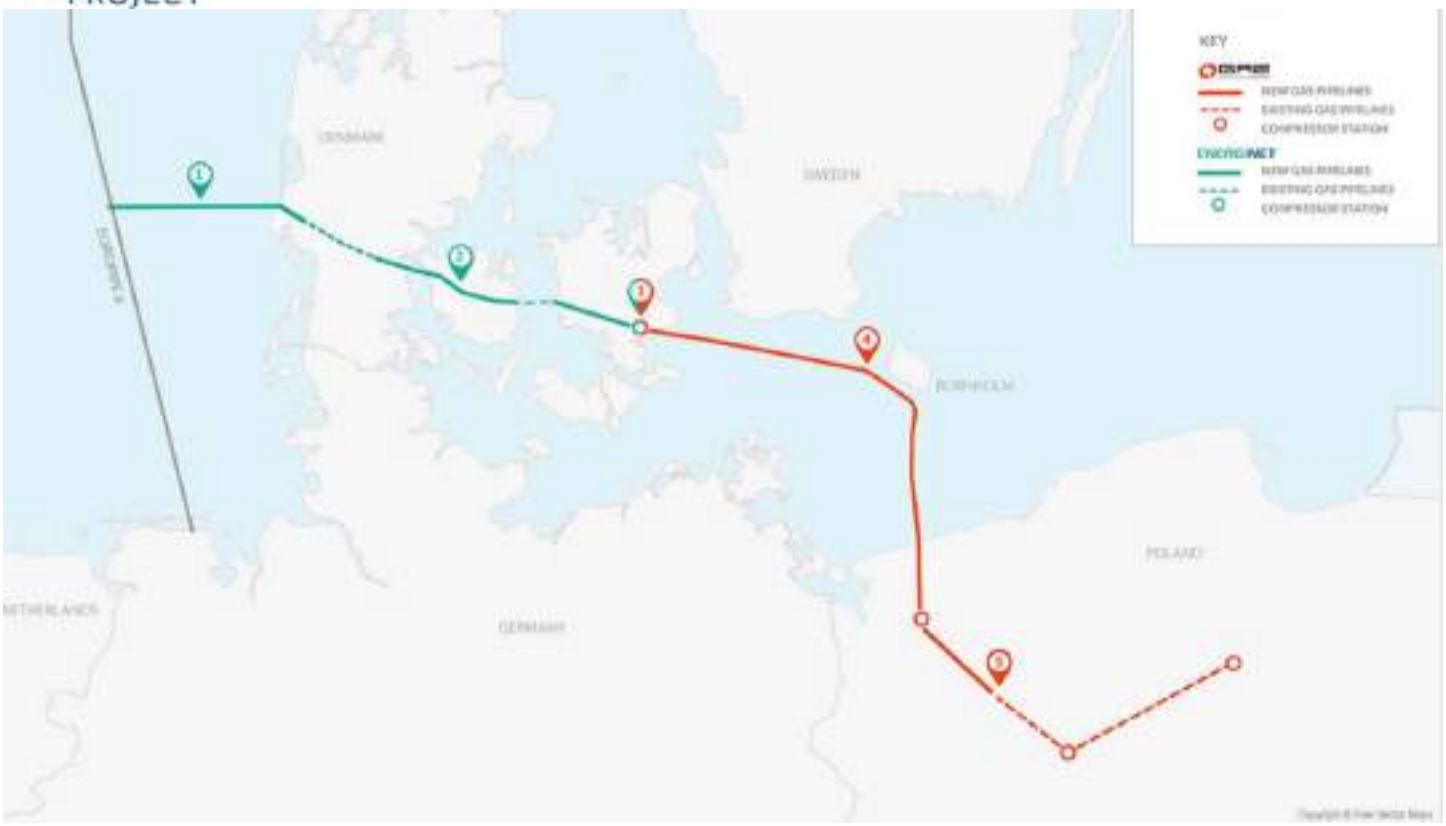
In August 2019 four complaints were sent to the Environmental and Food Appeals Board over the environmental permit. The complaints did not have suspensive effect.

On 31 May 2021 the Environmental and Food Appeals Board has ruled on the complaints. More information visit the appeals board's website (in Danish)

For more information on Baltic Pipe visit www.baltic-pipe.eu

https://www.baltic-pipe.eu/the-project/

BALTIC PIPE PROJECT



The Baltic Pipe Project consists of 5 components

1. The North Sea offshore pipeline

An offshore pipeline between the Norwegian gas system in the North Sea and the Danish gas transmission system

2. Onshore Denmark

Expansion of the existing Danish transmission system from West to East

3. Compressor station in Denmark

Compressor station located in the eastern part of Zealand

4. The Baltic Sea offshore pipeline

An offshore pipeline between Denmark and Poland across the Baltic Sea

5. Onshore Poland

Expansion of the Polish gas transmission system

Note:

1. "Baltic Pipe offshore pipeline will enable transmission of 10 billion m3 of natural gas per year to Poland and 3 billion m3 of natural gas from Poland to Denmark." Ie. Total 1.3 bcf/d with 0.3 bcf/d to Denmark and 1.0 bcf/d to Poland
2. Baltic Pipe "is planned to be operational in October 2022"

Executive summary

30.6m tons

Projected LNG imports in June 2021

+0.7%

Projected growth in global supply in 3Q compared to 2Q

$9.5/MMBtu*

BloombergNEF's estimate for average Japan-Korea Marker price in 3Q

***Disclaimer:** Please note that BNEF does not offer investment advice.*

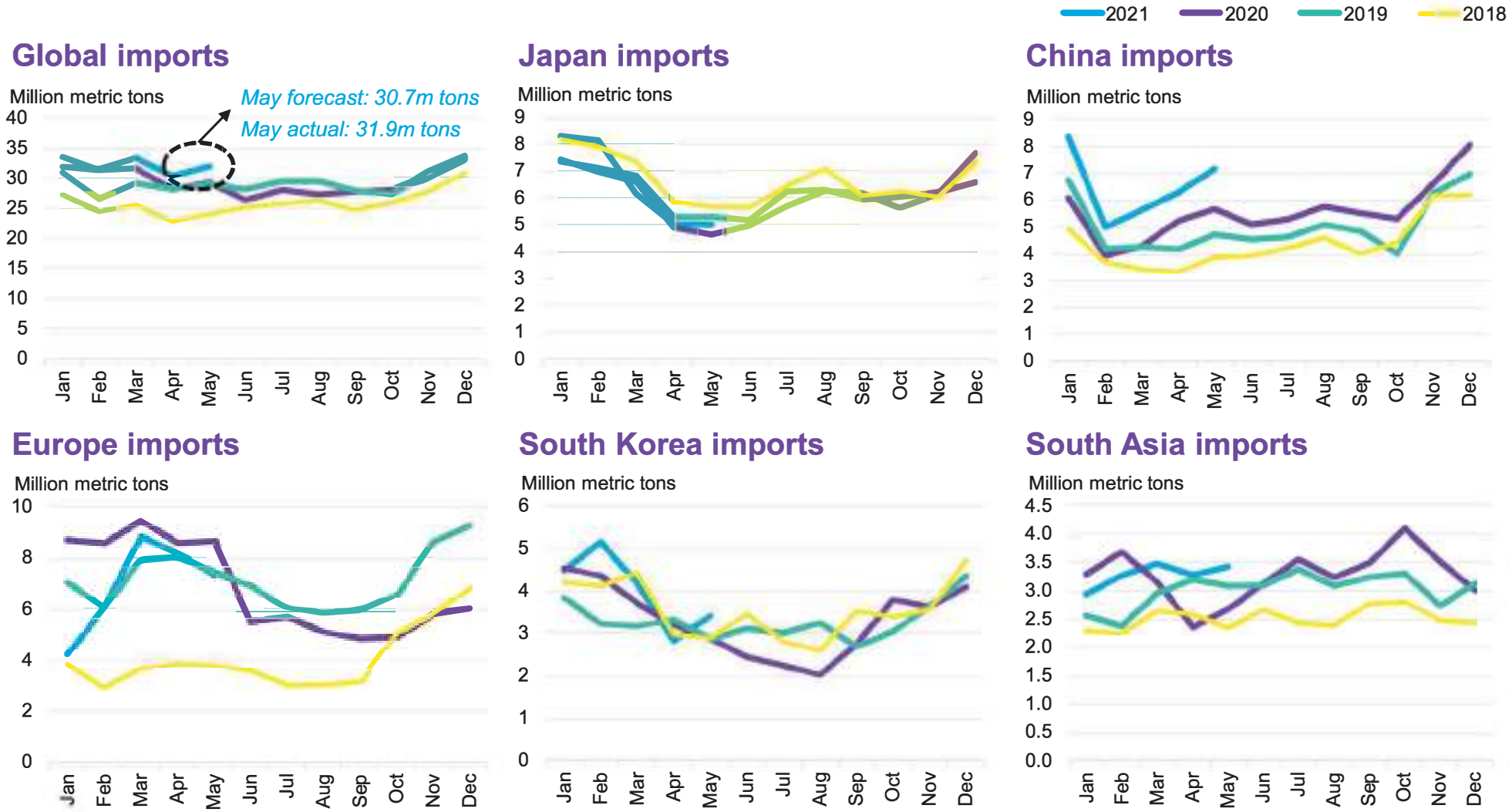
May in review

- Global LNG imports totaled 31.9 million tons in May, up 5.2% from April and 9.1% higher than last May. China, with rising power demand and industrial growth, saw the biggest surge in imports. Korean imports jumped due to increased storage injections after April withdrawals. India's imports rose marginally, indicating limited impact from lockdowns. Europe took in less LNG than last month as Asia received more supply.
- Total LNG exports reached 32.5 million tons in May, down 0.6% from April and 9.8% higher than last year. Maintenance, repair works and outages reduced supply from the Pacific Basin. Qatar increased exports after finishing maintenance in April. U.S. supply rose despite some maintenance at Freeport and Cameron.
- JKM prices continued to rise on higher demand from North Asian buyers to refill gas storage and meet growing power demand as temperatures climb. Upward pressure from higher TTF prices continued. LNG tanker spot charter rates fell, but term charter rates rose on high interest in longer-term hiring from traders.
- Tellurian signed a JKM and TTF linked 10-year deal with Gunvor for 3 million tons a year supply from the planned Driftwood project. BP increased offtake from Woodfibre LNG to 71% of planned plant capacity.

Outlook for June

- June LNG imports are forecast to be 30.6 million tons, 4.2% lower than May. Imports over 3Q could be 1.5% higher than 2Q. Korea could see fewer imports in June as city gas demand falls. Japan's June imports are likely to be higher as power demand increases amid demand for cooling. Japan will continue storage injections over June-July, whereas Korea will do so throughout the remainder of the summer.
- China's gas demand in June could be 7% lower than May due to less demand from the residential and commercial sector, leading to lower LNG imports. Industry gas and power demand will stay high. India's LNG demand could stay level with May due to ongoing lockdowns. Europe's LNG arrivals could fall in June on lower global supply. More supply will go to Middle East and South America to meet seasonal demand.
- Global LNG supply in June is estimated to be 31.6 million tons, 3% lower than May. Maintenance events and ongoing outages across the Pacific are set to reduce output, but will ease by July.
- BloombergNEF estimates JKM prices will average $9.5/MMBtu* in the third quarter. Currently, the average price of awarded Asian spot tender cargoes for third-quarter delivery is $9.05/MMBtu.

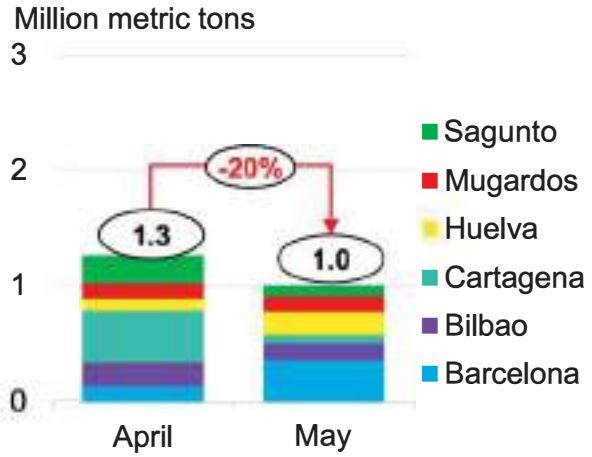
Global trends: May imports higher than expected as China took more LNG



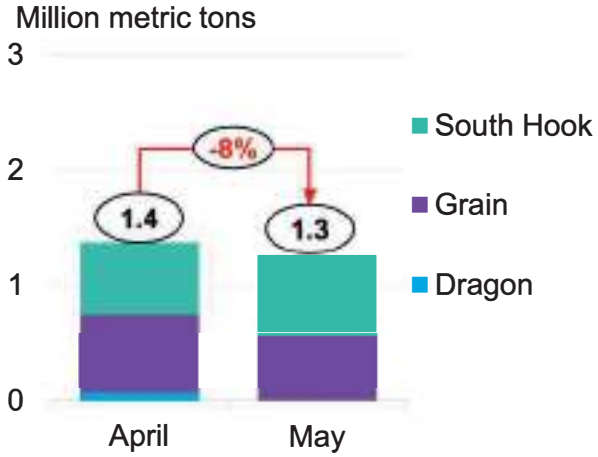
Source: Bloomberg's AHOY JOURNEY <GO>, BloombergNEF. Note: Y/y is year-on-year. South Asia is India, Pakistan and Bangladesh. Scale is different for charts.

Major European markets: Cheaper pipeline imports replace LNG in Spain and Italy

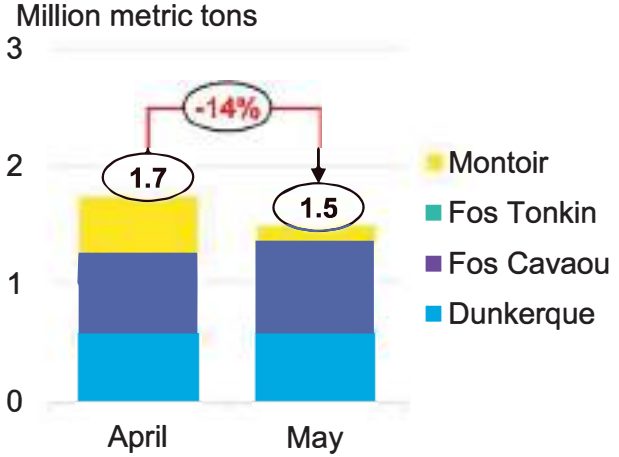
Spain



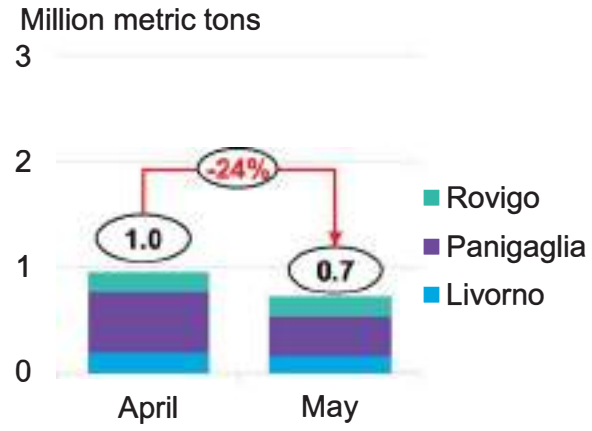
U.K.



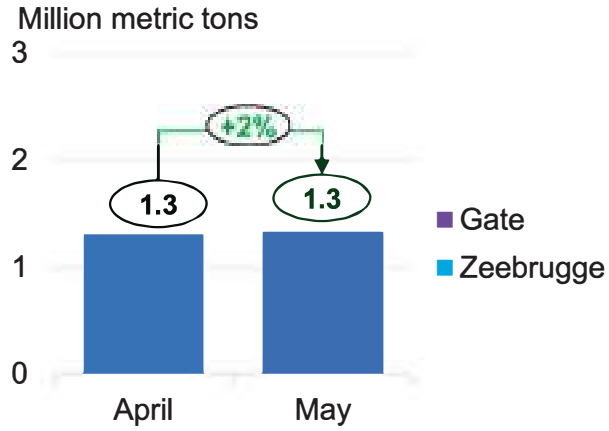
France



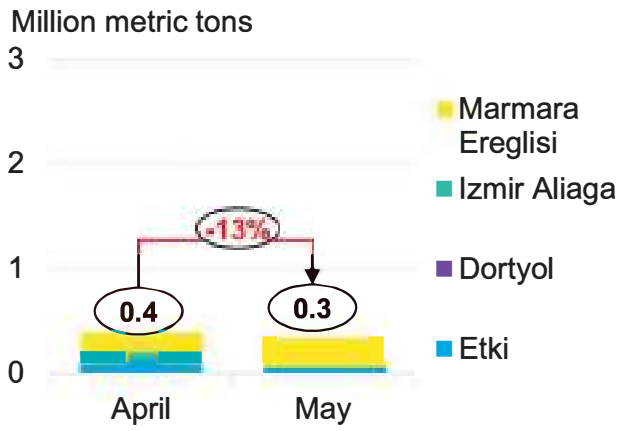
Italy



Belgium and Netherlands



Turkey



Source: Bloomberg's AHOY JOURNEY <GO>, BloombergNEF. Note: Northwest Europe is Belgium, France, Netherlands and U.K. Figures are rounded.

Highlights in May 2021

For more LNG-related news, visit: NI LNG <GO>

SUPPLY

Links

- Novatek aims to bring forward the launch of the second and third trains of its Arctic LNG 2 project to 2024 and 2025, respectively.
- UTM Offshore hires JGC and KBR for Nigeria's first floating LNG project, aiming to start in 2025 with a capacity of 1.2m tons a year.
- Sempra Energy delays FID on its Port Arthur LNG project to 2022 due to the effect of the pandemic and emissions considerations.
- Qatar Petroleum is reportedly in talks with Sinopec and PetroChina for a potential stake in its 33 million ton North Field Expansion.
- Total will resume work at Papua LNG, aiming to reach FID in 2023; project will be integrated with ExxonMobil's existing LNG plant.
- Cheniere and Sempra aim to add CCS to their LNG plants. Sempra is also considering renewable power and hydrogen production.

DEMAND

- Taiwan will hold a referendum on August 28 for the relocation of CPC's third LNG terminal in Taoyuan. *See BNEF analysis:*
- EGAT and PTT proposed a 5m ton FSRU, to support EGAT's 1.4GW power plant in southern Thailand, which could begin 2027-29.
- Indian LNG importers sought several cargo deferrals as the Covid-19 outbreak severely curbs demand. *See BNEF analysis:*
- At least two Chinese second-tier LNG buyers have been told to avoid buying new cargoes from Australia. *See BNEF Analysis:*
- Stena Power and LNG Solutions awarded FEED contract for LNG-to-power project in Bac Lieu, Vietnam. *See BNEF Analysis:*
- Venice Energy signed a HoA with a global shipping firm to supply an FSRU in the Port of Adelaide, targeting FID in 2H 2021.

CONTRACTS & NEGOTIATIONS

- Total signed a 5-year deal to supply ArcelorMittal Nippon Steel with up to 0.5m tons of LNG to Dahej or Hazira terminals, until 2026.
- Woodfibre LNG signed a second deal with BP for 0.75m tons, boosting offtake to 71% of the plant's capacity; targeting FID in 2021.
- Tellurian signed a deal with Gunvor for 3m tons a year of LNG for 10 years, linked to both JKM and TTF, from Driftwood LNG.

SHORT-TERM TENDERS & SPOT MARKET

See LNG tenders: TNI LNG TEN <GO> & OTEN <GO>

- Gail sold three out of six cargoes in a tender on an FOB basis from Cove Point, U.S.; for loading between January to June 2022.
- ArcelorMittal Nippon Steel India is seeking eight cargoes, split into four cargoes in the summer months of 2022-23, on DES basis.

CORPORATE ACTION, POLICY & OTHERS

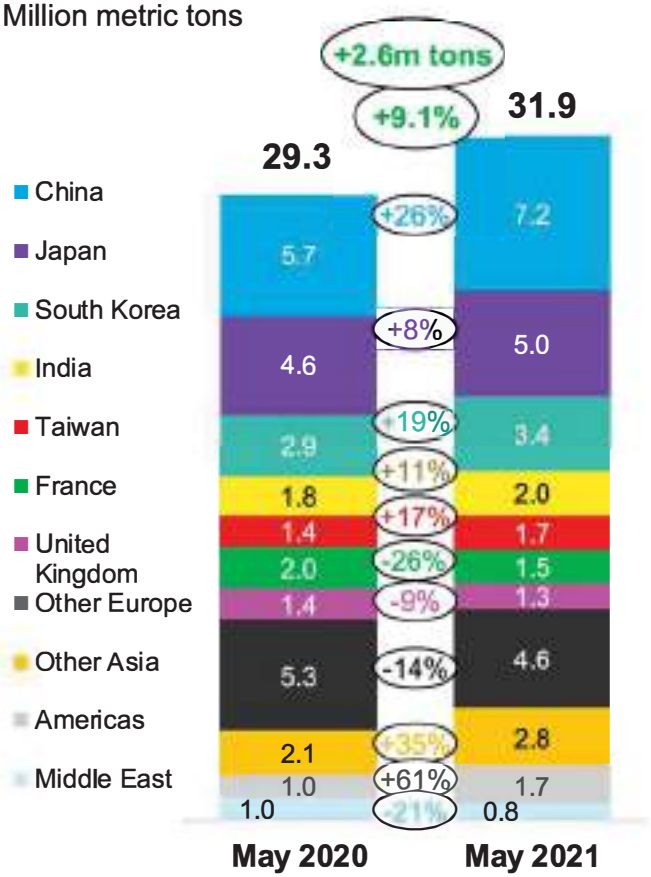
- Japex plans to sell its 10% stake in a Canadian shale project to the operator, Petronas Energy Canada, citing poor E&P outlook.
- Woodside will exit its 50% stake in the proposed Kitimat LNG development, following Chevron's decision to do the same in March.

Source: Bloomberg News, various. Note: CCS is carbon capture and storage, FID is final investment decision, FSRU is floating storage and regasification unit, DES is delivered ex-ship, FOB is free on-board, FEED is front end engineering and design, HoA is heads of agreement, E&P is exploration and production.

Imports: LNG demand rose with rising summer power demand and storage injections

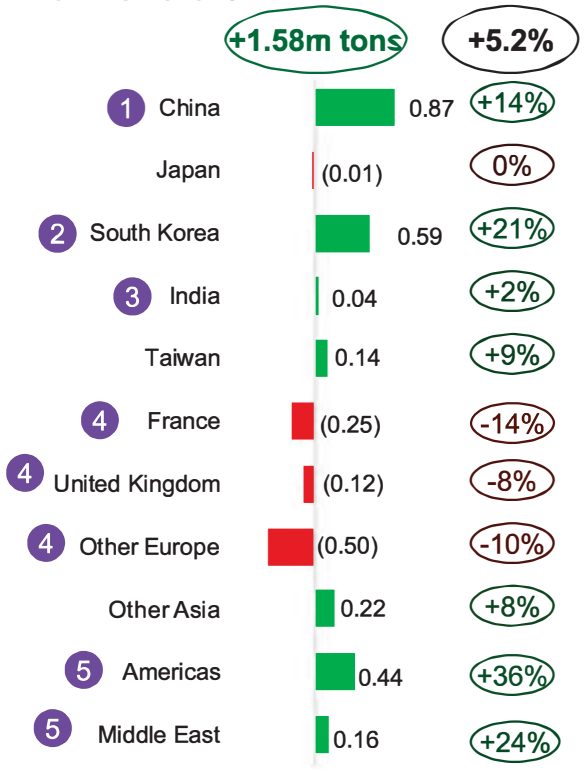
Year-on-year comparison (y/y)

Million metric tons



Month-on-month change (m/m)

Million metric tons



Source: Bloomberg's AHOY JOURNEY <GO>, BloombergNEF. Notes: ***Previous month's net imports were 30.3m tons.*** *Reloads and partial cargoes included. Figures are rounded. Other Europe = Belgium, Greece, Italy, Spain, Lithuania, Malta, Netherlands, Poland, Portugal, Sweden, Norway, Finland, Turkey. Other Asia = Bangladesh, Indonesia, Malaysia, Pakistan, Singapore, Taiwan, Thailand, Myanmar. Americas = Brazil, Canada, Chile, Colombia, Dominican Republic, Jamaica, Mexico, Panama, Puerto Rico, U.S. Middle East = Bahrain, Israel, Jordan, Kuwait, U.A.E.*

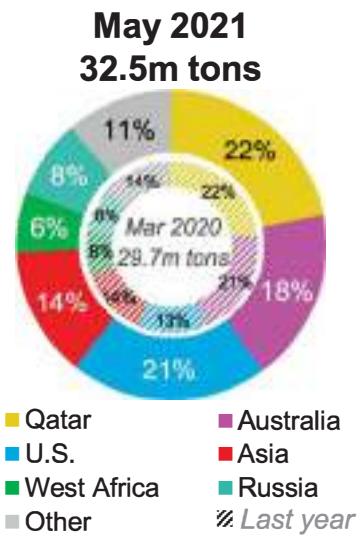
1. China's imports rose m/m on higher gas demand from industry and the power sector. The southern region, where power demand is rising fast due to the approaching summer, accounted for 42% of the m/m increase. Around 33% and 25% of the m/m rise came from the east and north regions of China. Sinopec's terminals saw the largest increase m/m, followed by CNOOC and PetroChina.
2. Korean imports rose m/m on possible storage injections after withdrawals in April. Both Kogas and direct importers saw increased deliveries at their terminals. Kogas accounted for 75% of the total m/m rise. *See BNEF analysis:*
3. India's imports increased marginally m/m despite larger-scale lockdowns than in April. Cargoes possibly discharged into storage tanks at the terminals. Dahej saw the same number of deliveries as April, with two-thirds of the Qatari cargoes arriving in the second half of the month. Hazira's imports more than doubled. Only Dabhol saw a 68% decline m/m. Others were either marginally up or flat.
4. Europe's total imports fell 10% m/m. French imports dropped the most with Montoir terminal not receiving shipments. South Hook led the m/m fall in the U.K. Spain and Italy each saw roughly 20% m/m drops, where cheaper oil-linked pipeline gas replaced LNG.
5. Seasonal trends drove imports higher m/m in South America and the Middle East. Argentina saw the biggest increase in the Americas, whereas the U.A.E. led the growth in Middle East imports.

Exports: Outages and maintenance at Pacific Basin plants offset by Qatar and U.S.

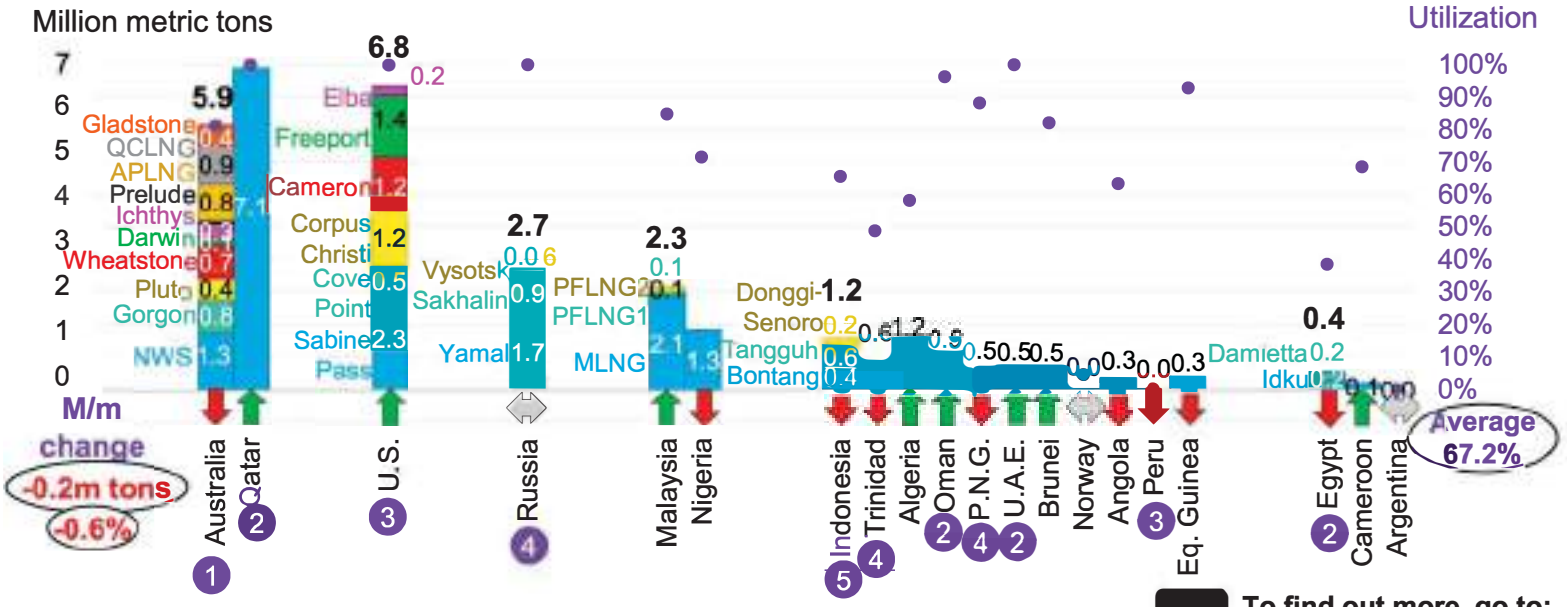
See more on Outages and Maintenance:
GASO <GO>

1. Australian exports fell 15% m/m to 5.9m tons. Maintenance at Gladstone, Ichthys and Darwin reduced output by a total of 0.7m tons m/m, while repairs at Gorgon reduced output by four cargoes m/m. A feedgas issue at NWS had minimal impact, reducing output by around one cargo m/m.
2. Qatar's supply rose 13% m/m as it completed pre-summer maintenance in April. Output from the U.A.E. rose 15% m/m, producing 12% above capacity, while Oman's output rose 13% m/m, reaching 96% utilization. Egypt shipped three cargoes less m/m, with two less m/m from Idku.
3. U.S. exports grew 8% m/m, performing at 10% above capacity. Production at Freeport and Cameron grew m/m, despite conducting maintenance in May and an electrical trip at Freeport. Peru LNG produced no cargoes in April due to a compressor issue.
4. Russian exports were flat m/m, but up 9% from last year. Trinidad output fell 21% m/m to 0.6m tons. This represents a 40% drop from last year's levels, highlighting feedgas issues. PNG LNG produced around three cargoes less m/m as it conducted maintenance at one of its trains.
5. Indonesian output fell 9% m/m. Tangguh produced one cargo less m/m due to a trip at Train 2. DSLNG was similarly down by one cargo m/m.

Year-on-year (y/y) change



Monthly export volume, month-on-month change and utilization rates



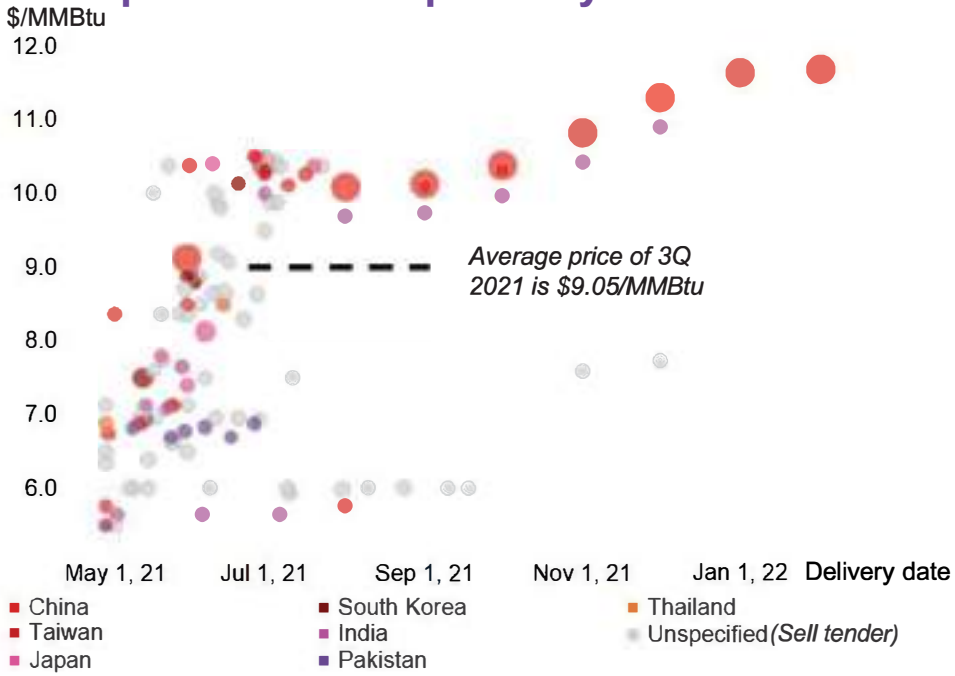
To find out more, go to:
AHOY JOURNEY <GO>

Source: Bloomberg's AHOY JOURNEY <GO>, BloombergNEF. Notes: ***Previous month's exports were 32.7m tons.*** *Figures are rounded. Utilization % is based on cumulative nameplate capacity for each country, in case of rates above 100% figure shown as 100%.*

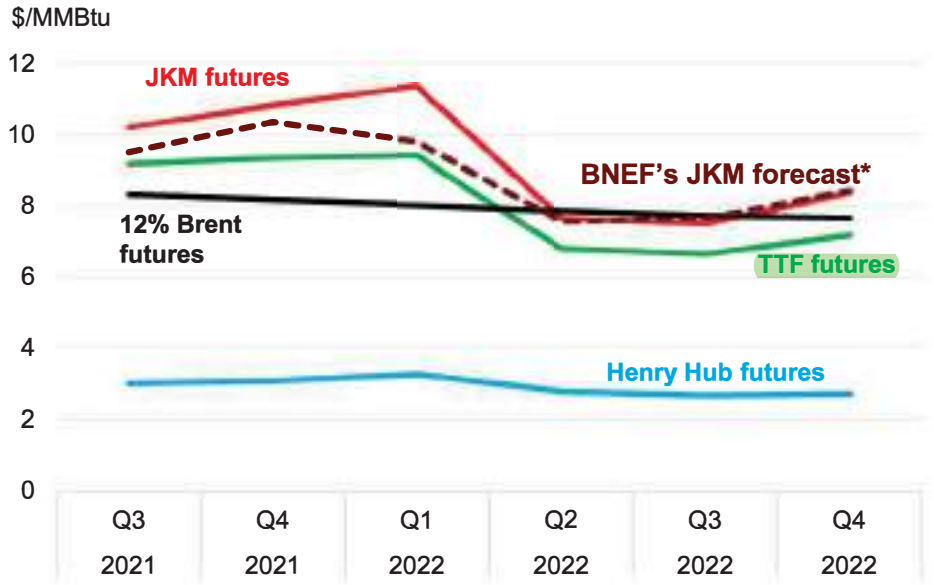
Asia Spot LNG Tenders dashboard:
Tenders News: TNI LNG TEN <GO> & OTEN <GO>

Asia spot prices: BNEF forecasts JKM to range between $9.5-$10.3/MMBtu over 3Q-4Q

Asia spot LNG tender prices by market



LNG benchmark prices – outlook



*Source: BloombergNEF, Bloomberg News, Bloomberg Terminal, NYMEX, ICE. Note: *View disclaimer at the bottom of the slide and review methodology in the Appendix. Tender prices and futures curve are as of May 28, 2021. BNEF makes various assumptions when full details of tenders are not reported. Bubble size depicts cargo number.*

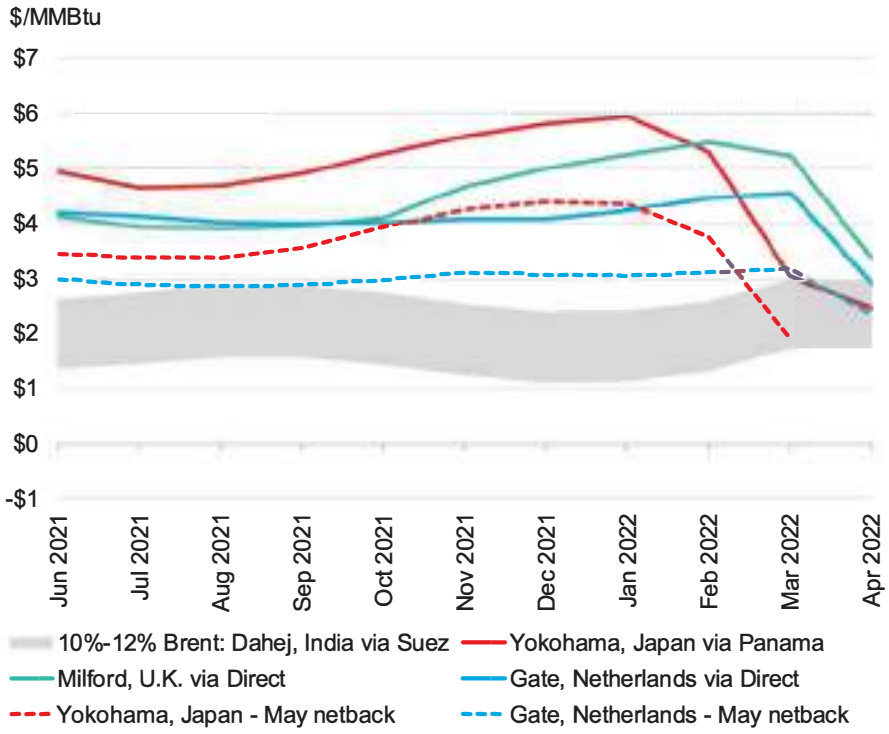
- BNEF estimates quarterly average JKM prices to be between $9.5-$10.3/MMBtu* over 3Q-4Q 2021. We revised price estimates up from $8.8-$9.4/MMBtu, published in the May Monthly, for the same period. Storage withdrawals in Japan and Korea in April raise the expectation of higher demand from the two countries to refill storage over the rest of the summer – *see analysis:* . Chinese buyers are likely to look for more spot cargoes as summer power demand surges in the south. Tightness persists in Europe for the rest of summer, pulling JKM prices up.
- The average price for awarded spot tenders for third-quarter delivery is currently at $9.05/MMBtu, still rising despite multiple Pacific Basin sell tenders coming into the spot market. Vitol bought at least four LNG cargoes at a TTF premium for July delivery to South Korea and China.

DISCLAIMER: Please note that BNEF does not offer investment advice. Clients must decide for themselves whether current market prices fully reflect the issues discussed in this report and if the methodology encompasses all factors that will impact projected prices.

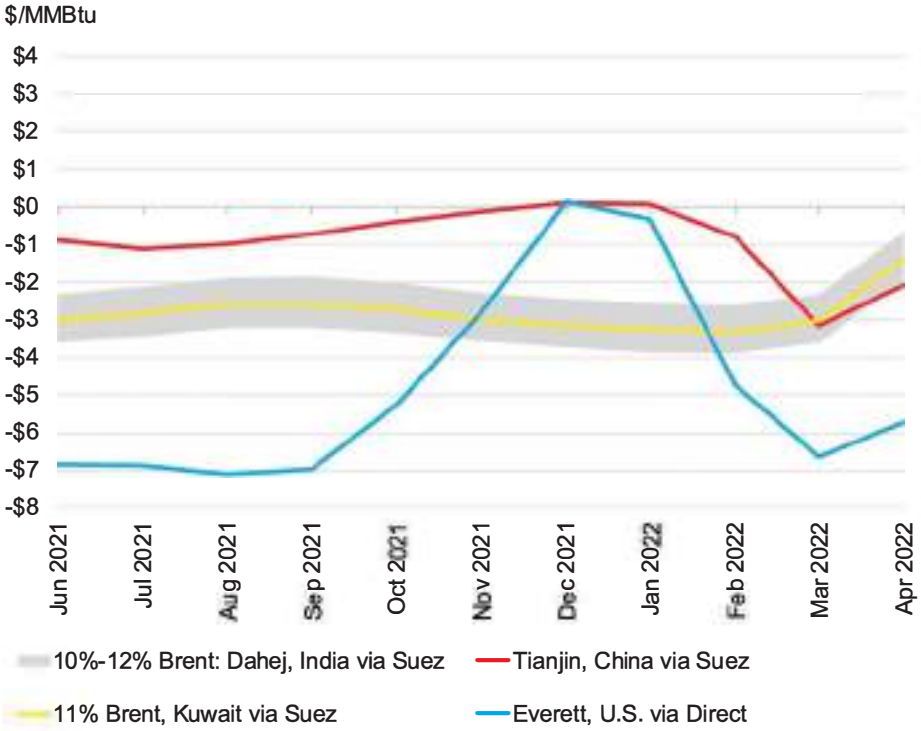
Atlantic netbacks: U.S. netbacks to Asia and Europe continue to climb

Download the BloombergNEF tool:
Global LNG Netback Calculator

U.S. Gulf Coast LNG export netbacks



Europe (TTF) reload export netbacks

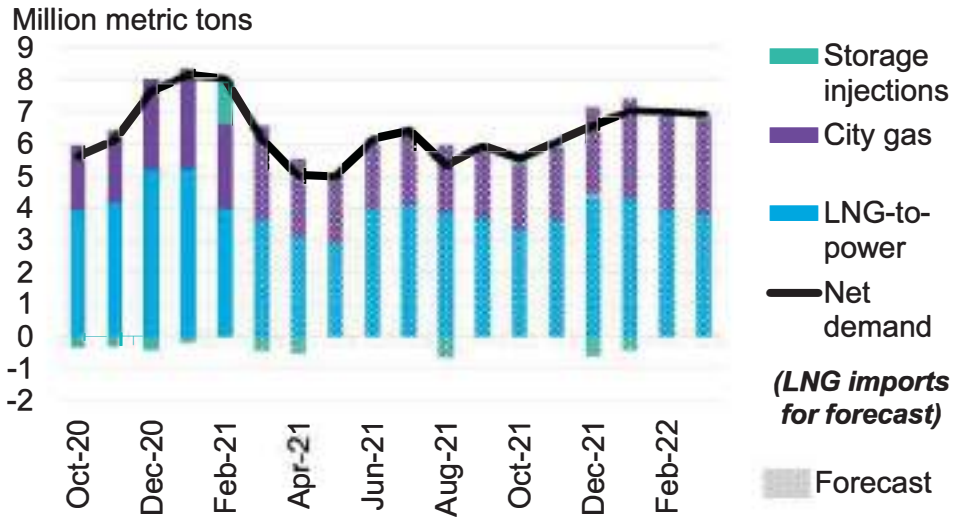


*Source: Bloomberg Terminal, BloombergNEF, Fearnleys. Notes: 'Netback' is the delivered price of LNG at destination, minus variable production and transportation costs. Netbacks are calculated on round-trip journey basis. LNG tanker charter rate assumption is $77k/day for one-year time charter. Brent range assumes average three months prior. *Futures curve based on closing prices as of May 27, 2021, using LNG netback calculator (web | terminal). Asia netbacks using futures curve and not BNEF JKM forecast.*

- Netbacks for U.S. LNG to Asia and Europe for July-September increased by 38% and 42% on average, respectively, compared to last month as JKM and TTF prices rose. U.S. exports to Asia and Europe are profitable throughout the year, assuming current one-year shipping charter rates of $77,000/day.

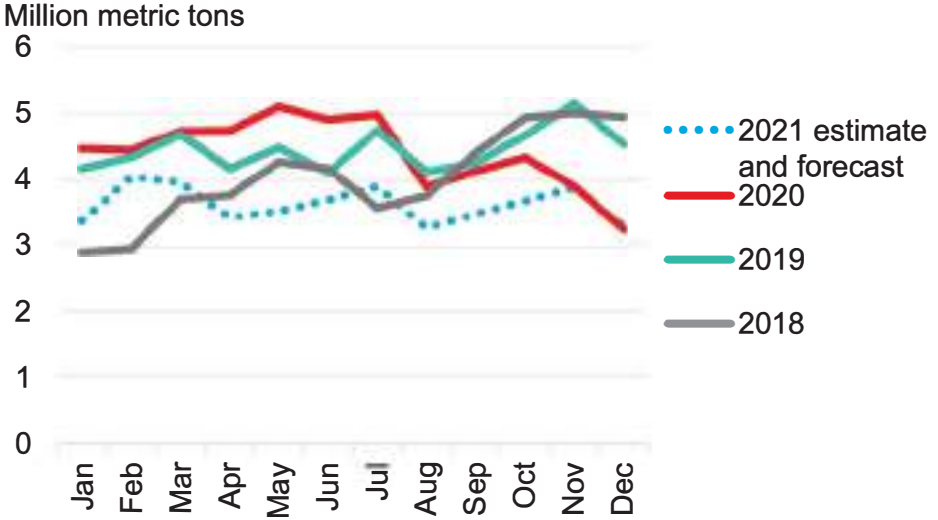
Japan LNG demand: Rising with cooling demand and ahead of August withdrawals

Japan LNG demand



Source: BloombergNEF, Ministry of Economy, Trade and Industry, Ministry of Finance. Note: Storage injection estimates based on Bloomberg's AHOY JOURNEY import data. Net demand equals LNG imports.

Japan LNG inventories

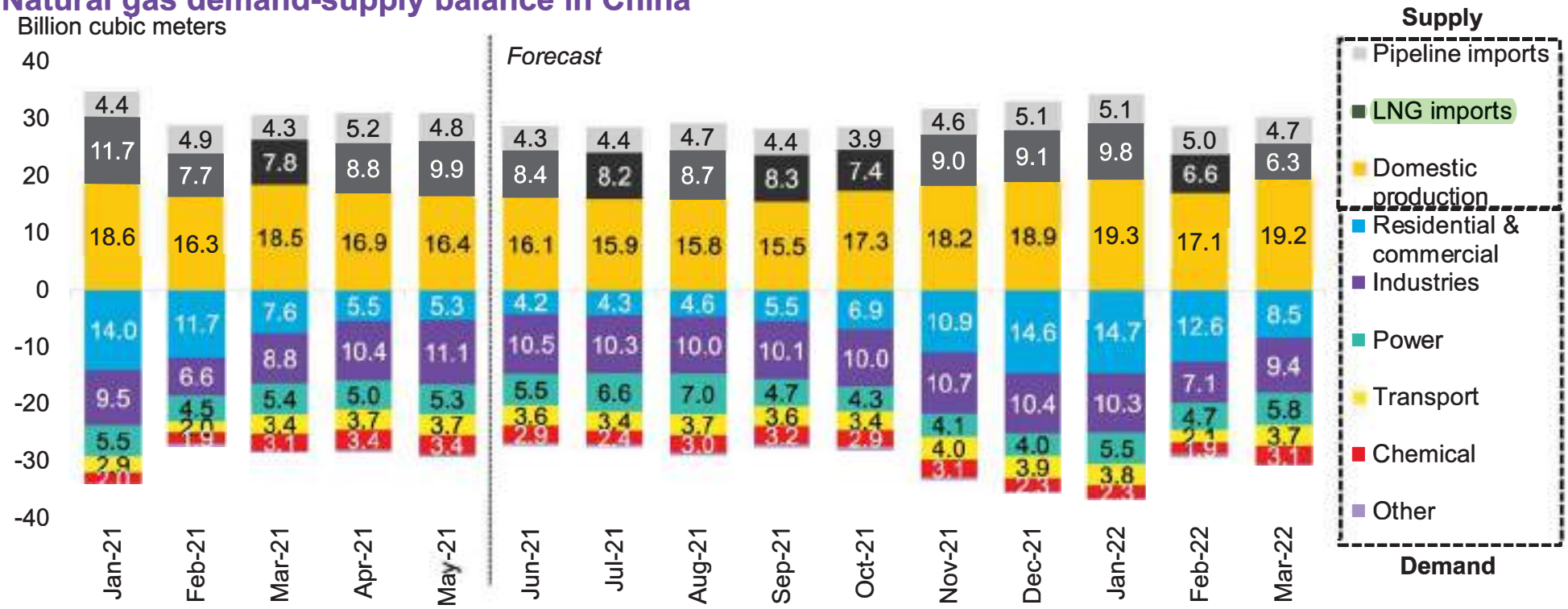


Source: METI, BloombergNEF.

- Japan's LNG imports for June are projected to rise 23% month-on-month, reaching 6.1 million tons. Gas demand for power generation could increase from May on higher cooling demand as temperatures rise. City gas demand is likely to stay flat month-on-month.
- Storage injections could reach 0.2 million tons in June, taking the storage level up to 3.7 million tons. BNEF now expects storage injections to continue until July followed by withdrawals in August.
- BNEF's forecast for the second half of the year is revised down due to higher nuclear generation. The recently announced restart of Kansai Electric's Ohi 3 reactor (1.18 gigawatts) by end-July – after nearly a year of repairs – will lower gas demand after July. Any delays in Kansai Electric's nuclear restarts could potentially boost gas demand. Takahama 1 and 2 (0.9 GW each) have not announced restart dates due to unfinished safety upgrades, but have nonetheless received local approval. Mihama 3 (0.9 GW) could restart by end of July.
- *See additional BNEF analysis:* and .

China gas balance: LNG imports forecast revised up on higher gas demand in power

Natural gas demand-supply balance in China



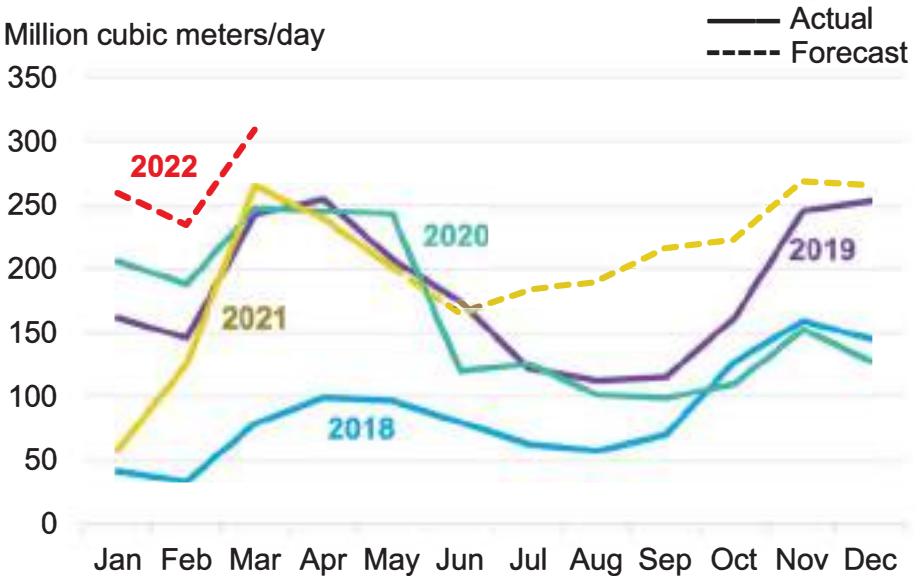
Source: National Development and Reform Commission, BloombergNEF. Note: 'Other' value not shown. Inventory change not included in the chart. Figures rounded.

- Gas consumption is estimated to reach 27.2 billion cubic meters in June, 7% lower from May on less demand from the residential and commercial sector. Gas demand in power is likely to rise due to higher temperatures leading to more cooling demand. BNEF's China gas demand forecast is revised up for June-September as compared to last month's estimates due to higher gas demand for power generation.
- Gas supply in June is expected to decline slightly from May. June LNG imports could fall 14% month-on-month, from 7.2 million tons in May to 6.1 million tons in June, as LNG bears most of the brunt of lower gas demand, as compared to domestic output and pipeline supplies. BNEF revised its China LNG demand forecast up for June-September due to higher gas demand.

Europe LNG outlook: Tightness to persist despite momentum in storage injections

See BNEF's Europe Gas Monthly:

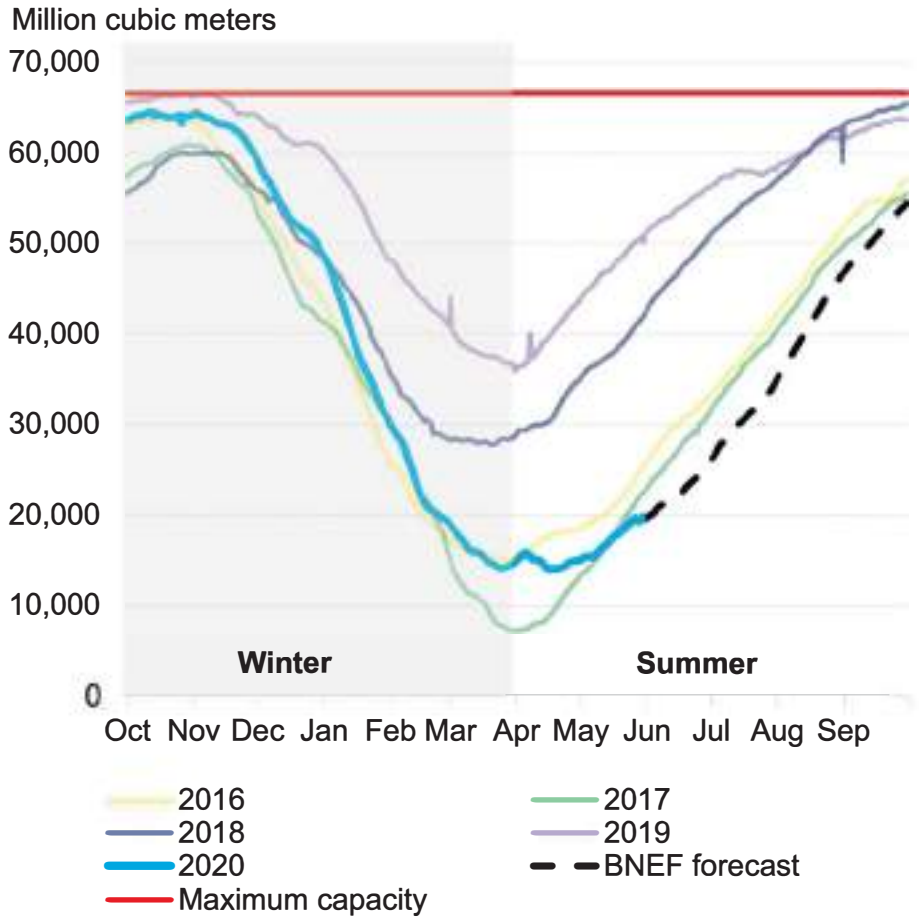
LNG imports to Northwest Europe and Italy



Source: BloombergNEF, Bloomberg Terminal's AHOY JOURNEY <GO>. Note: Northwest Europe includes Belgium, France, Netherlands, U.K

- LNG deliveries to Northwest Europe and Italy are projected to be 189 million cubic meters/day (or 4.2 million tons per month) for the remaining summer, which is in line with BNEF's previous forecasts.
- European storage injections are gaining momentum after a late start. BNEF projects there could be roughly 12.1 billion cubic meters of spare capacity in European gas storage facilities by the end of summer 2021, indicating continued tightness over summer. Inventories are likely to end summer at historical low levels.

European gas underground storage inventories



Source: BloombergNEF. Note: Forecast as of May 28, 2021. Gas year is a 12-month period starting from October, for example, gas year 2020 starts from October 1, 2020.

Global LNG export plant maintenance schedule

Legend

Announced	~Duration
BNEF Predicted	Other events

Market	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22
West Australia	NWS (T4) ~ 1 month QCLNG ~1 month Gorgon (T3) return	NWS (Multiple) ~2 weeks	Pluto 1 week NWS (T2) ~1 month	Wheatstone (T2) ~1 month					
East Australia			APLNG ~1 month		APLNG 1 week				
U.S.				Elba Island ~1-2 weeks Cove Point ~1-2 weeks Sabine (T3-5) ~1-2 weeks	Freeport (T2-3) ~1-2 weeks Cameron (T1-2) ~1-2 weeks Calcasieu Pass start-up		Sabine Pass (T6) start-up		
Atlantic Basin	←	Yamal → ~1-2 weeks	Yamal (T1) ~2 weeks						
Pacific Basin	PNG LNG (T2) ~2 weeks			Tangguh ~3 weeks Brunei LNG ~1 month					
MENA**	NLNG ~2 weeks	Arzew ~2 weeks		Oman LNG ~2 weeks	Qatar ~2 weeks				

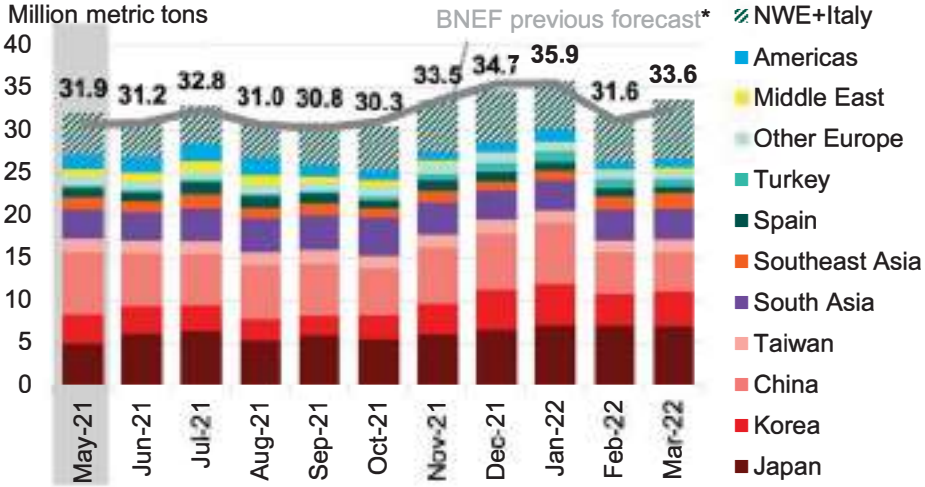
*Source: BloombergNEF, Bloomberg News, AEMO, company presentations. Note: Not all plants shown in table, only maintenance of major plants shown. BNEF Predicted maintenance is based on historical analysis and subject to revisions. Duration is indicative. *CC refers to Corpus Christi LNG. **MENA refers to Middle East and North Africa.*

Global balance: Demand to fall in June on lower deliveries to Asia, except Japan

BNEF's Europe Gas Monthly:
BNEF's China Gas Monthly:
BNEF's U.S. Gas Monthly:

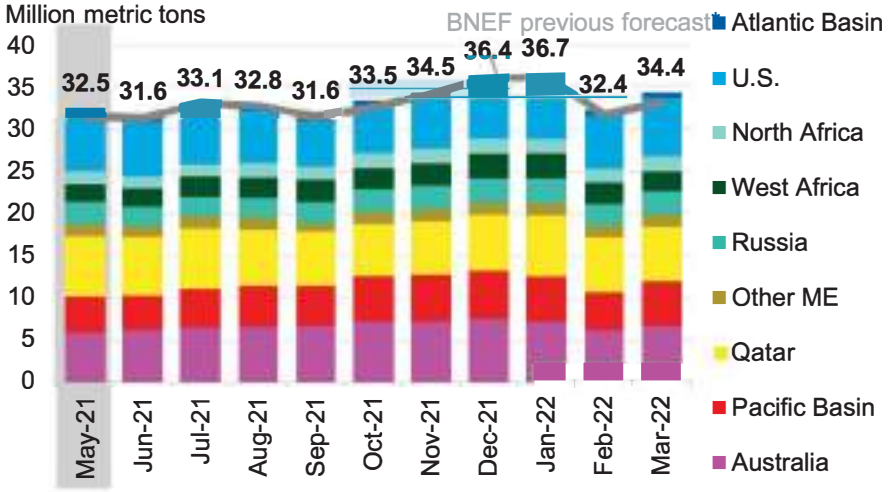
Global LNG demand forecast

June: -4.2% m/m, 3Q: +1.5% vs 2Q



Global LNG supply forecast

June: -3% m/m, 3Q: +0.7% vs 2Q



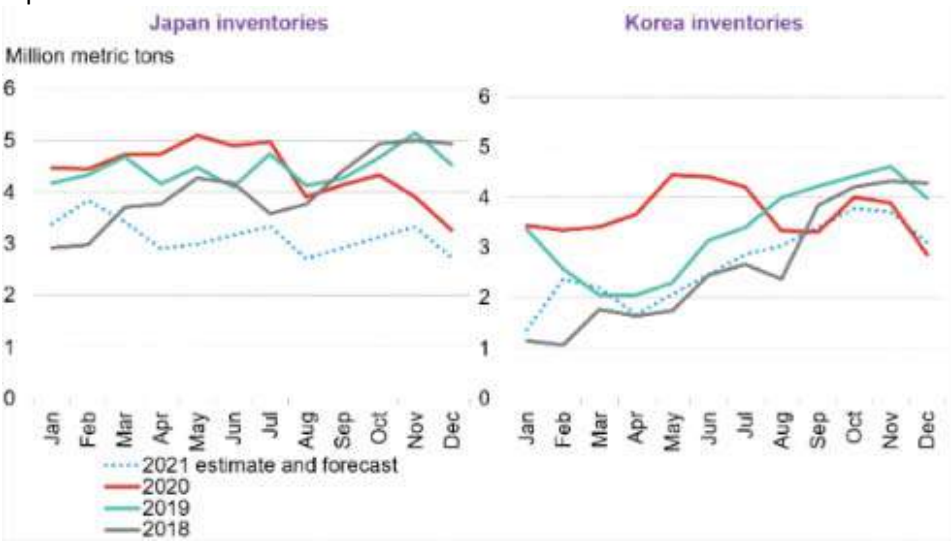
*Source: BloombergNEF, Bloomberg Terminal's AHOY JOURNEY <GO> (historical). Note: M/m is month-on-month and y/y is year-on-year . *Previous forecast is as per previous Global LNG Monthly (web | terminal). **Numbers shown on chart are revised LNG forecast.** Refer to appendix for country breakdown of regions*

- **Global LNG supply** in June could be 3% down from May. Supply in 3Q could be 0.7% higher than 2Q. Output will continue to decline further in June from May due to ongoing outages, partially offset by a 74% increase in output from Gorgon running with three trains. Actual May exports were 0.9m tons higher than our forecast due to stronger output from Qatar, Malaysia and U.S. projects.
- **Global LNG imports** in June could be 4.2% lower than last month. Total 3Q imports are expected to be 1.5% higher than 2Q. China and Korea could take less LNG in June from last month as gas demand falls. Deliveries to the Middle East and Americas will rise in June to meet seasonal demand. Actual May imports were 1.2m tons higher than forecast mostly due to higher-than-expected demand from China.
- **Supply forecasts** for June were revised up 0.2m tons from the previous forecast as U.S. exports were adjusted higher based on recent performance. Forecasts for Corpus Christi were raised until the end of summer due to continued strong output. Calcasieu Pass is assumed to begin production in October, albeit small volumes. First production from Tangguh Train 3 is now assumed to be delayed to March 2022.
- **Demand forecasts** for June are marginally lowered by 0.2m tons compared to the previous forecast. India's demand is adjusted down to account for delayed delivery of June scheduled cargoes. China and Japan could take more LNG than expected due to rising power demand, and lower European imports than previous estimates.

Japan, Korea LNG Storage Drop Could Lead to Summer Crunch: BNEF
2021-05-31 00:00:00.901 GMT

By Olympe Mattei
(BloombergNEF) -- Japan and South Korea saw liquefied natural gas inventories drop in April. To see gas storage withdrawals at the end of the winter season is unusual. April is when big LNG importers typically start building up their LNG stockpile. Both countries could find themselves with lower-than-normal LNG supply ahead of peak summer demand.
In Japan, LNG storage levels at the incumbent electric utilities, which includes Jera Co., decreased about 0.4 million tons in April, as per recently released data by the Ministry of Economy, Trade and Industry. BloombergNEF estimates the drop in total LNG storage across electric and gas utilities could be even higher.
For Korea, BNEF estimates that total April storage withdrawals reached 0.5 million tons, based on available import data and Korea Gas Corp. sales reports.
Current LNG spot price levels in Asia have likely deterred stockpiling efforts. Lower-than-average LNG inventory levels mean both countries could face supply crunches in the run-up to summer, especially if it turns out to be hot.

Japan and Korea LNG inventories



For more BNEF analysis on this topic, see here

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To view this story in Bloomberg click here:
https://blinks.bloomberg.com/news/stories/QTY2O0DWRGGC

Executive summary

China's LNG imports in May surprisingly reached a new record, higher than last November when the country entered peak heating season. Eastern coastal provinces may potentially increase LNG imports in order to meet continued growing power demand. June gas consumption is expected to be 27.2 billion cubic meters, growing to 27.5Bcm in July.

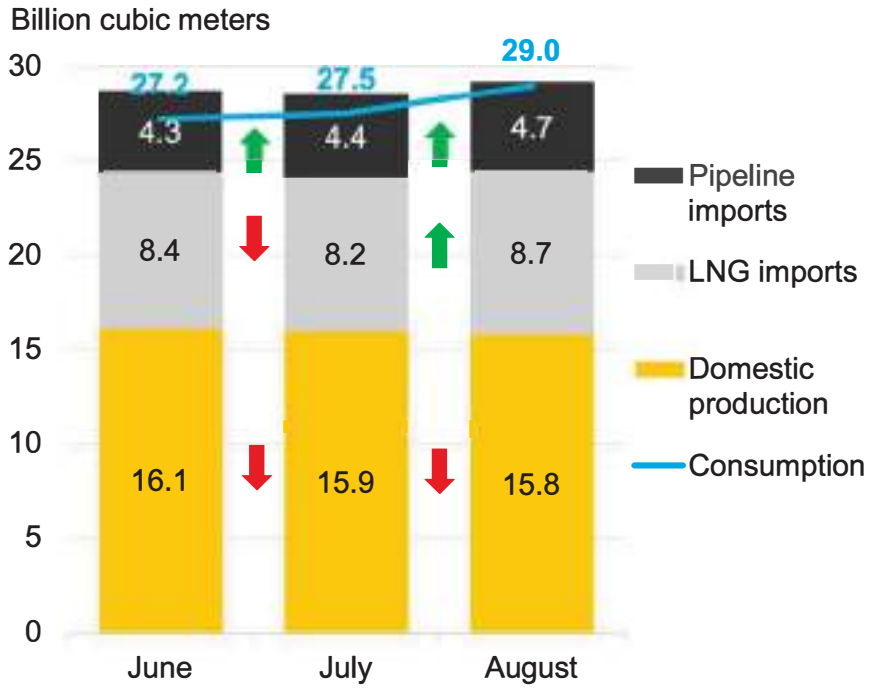
- **LNG imports:** In May, China imported 7.2 million metric tons of LNG, increasing 26% year-on-year and 13% month-on-month – according to Bloomberg's AHOY JOURNEY <GO>. With U.S. exports well in the money for deliveries to Asia at current prices, U.S. supply to China climbed to third place, reaching 0.8 million tons. This is 2.5 times more than April, with cargoes coming from each of the five major U.S. plants.
- **Spot activities**: Guangzhou Gas, Shenzhen Energy and Vitol were reported to have awarded spot tenders in May. The average awarded tender spot price for May to September deliveries is $9.27/MMBtu. Three cargoes that Vitol purchased for July delivery were linked to TTF index.
- **Gas outlook:** BloombergNEF estimates China's gas demand in June will increase 10% year-on-year to 27.2 billion cubic meters, and further increase to 27.5Bcm in July. June LNG imports may drop 16% from May to 6.1 million tons. Pipeline imports are estimated to reach 4.3Bcm in June and grow to 4.4Bcm and 4.7Bcm in July and August, respectively.
- **LNG upside:** Among the coastal areas, LNG imports to Guangdong saw a drop mainly due to a new round of Covid-19 cases in the province, while Jiangsu topped LNG import growth in May. Bloomberg News reported that five provinces may face power shortage risks in the summer as power demand sees continuous growth and coal stocks are low. The coastal provinces, such as Jiangsu and Zhejiang, may intend to purchase more LNG for gas power usage.
- **Infrastructure updates**: Guangdong plans to invest 8 billion yuan (US$ 1.3 billion) in building provincial gas pipeline networks to expand natural gas use. Sinopec commissioned the Guxi underground storage, the first in the Northeast region under its portfolio.

26% China's May LNG imports growth year-on-year

90% LNG terminal average utilization rate from January to May

27.2Bcm Estimated June total gas demand

Estimated China gas demand-supply

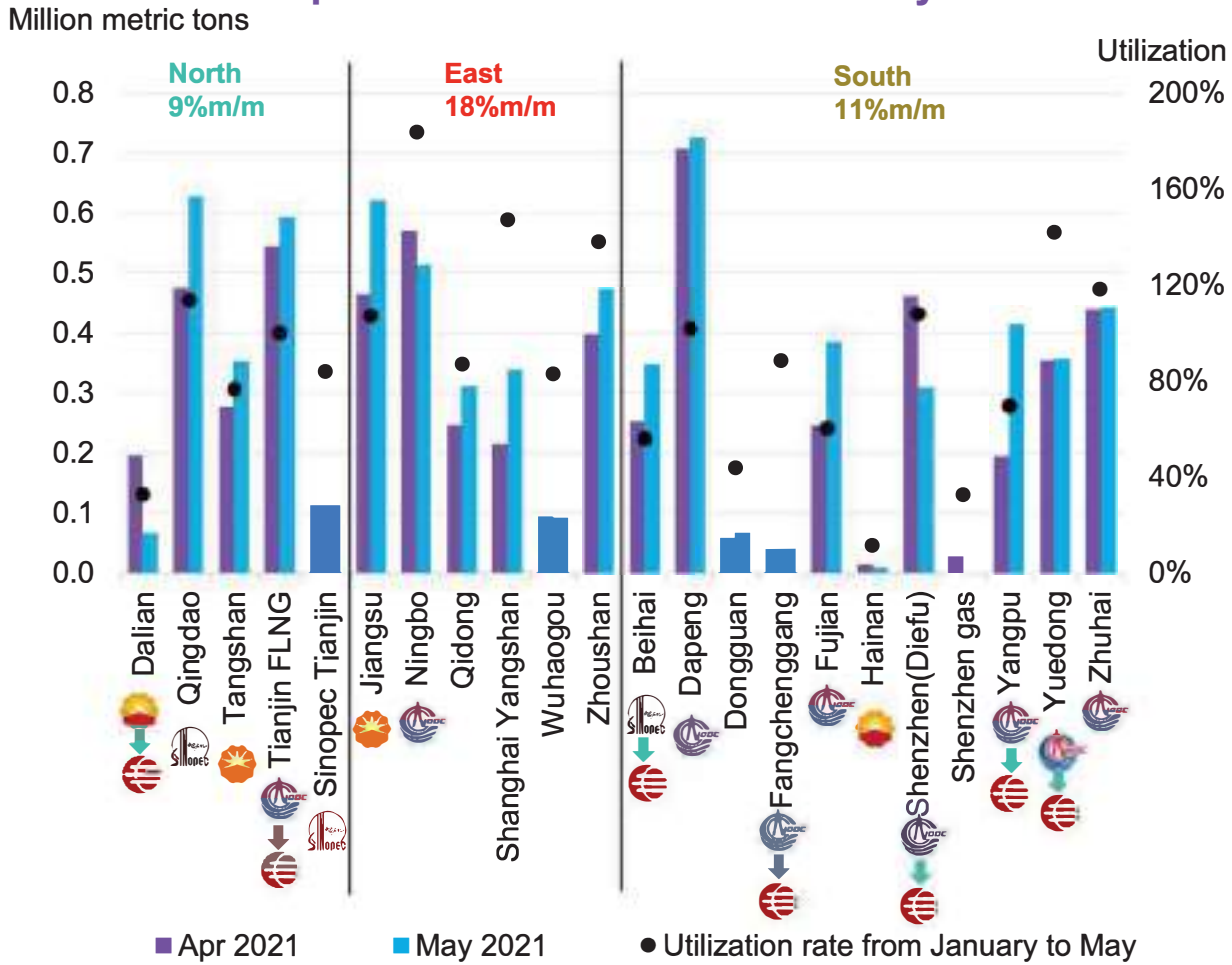


Source: BloombergNEF. Note: Arrows are for month-on-month change.

China monthly data

LNG imports: Increased deliveries in all regions, with biggest increase in the east

LNG terminal imports and utilization rates in May 2021



Source: Bloomberg Terminals' AHOY JOURNEY <GO>, BloombergNEF. Note: m/m refers to month-on-month change. Logos from company websites. Qidong's capacity was expanded to 3 million tons from 1.2 million tons in October 2020, new capacity not reflected until 2021.

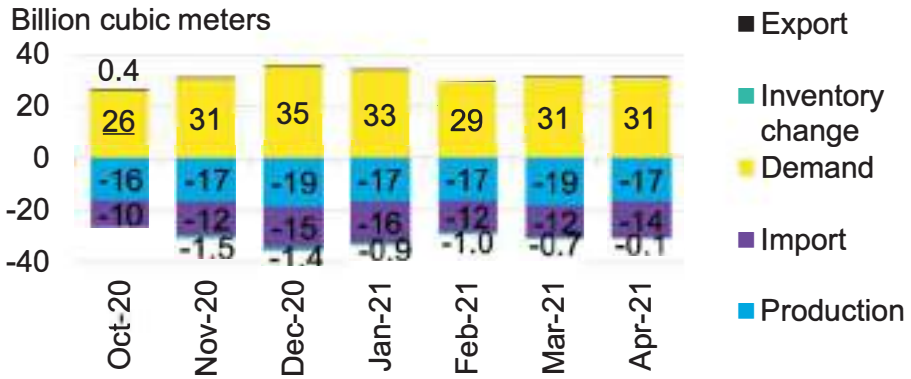
Map of existing LNG terminals

Source: BloombergNEF.

BloombergNEF

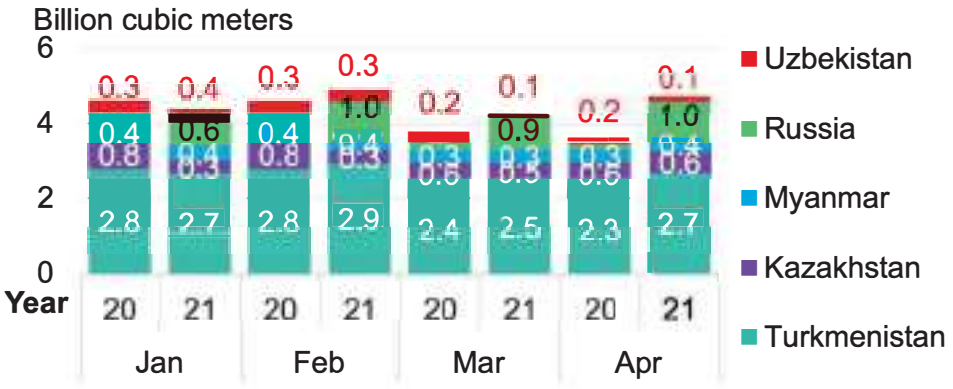
Gas dashboard: April pipeline gas imports grow, LNG import prices fall from last year

Monthly supply demand balance



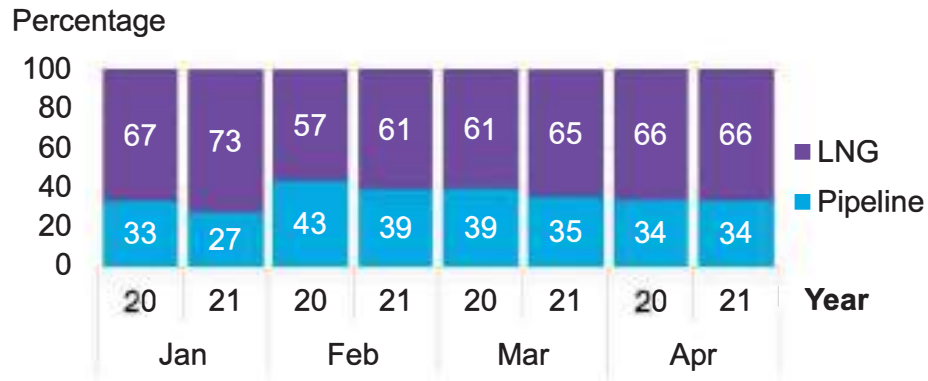
Source: JLC, BloombergNEF. Note: Export figures not shown.

Pipeline gas imports by country breakdown



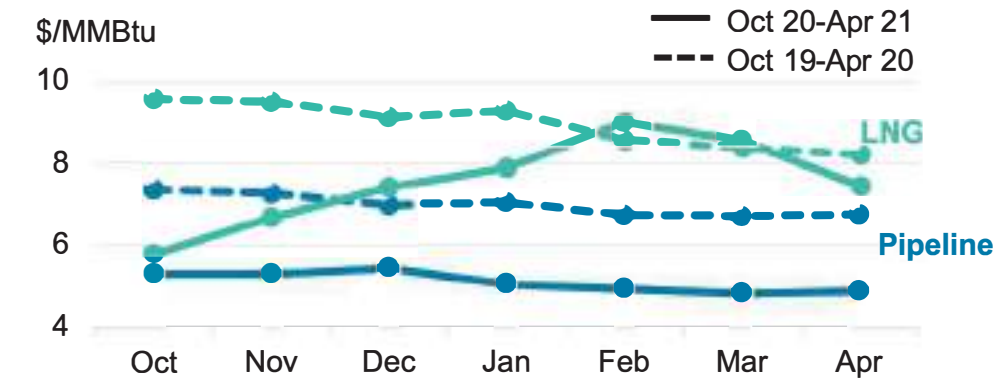
Source: China customs, BloombergNEF.

Pipeline imports versus LNG imports share



Source: China customs, BloombergNEF.

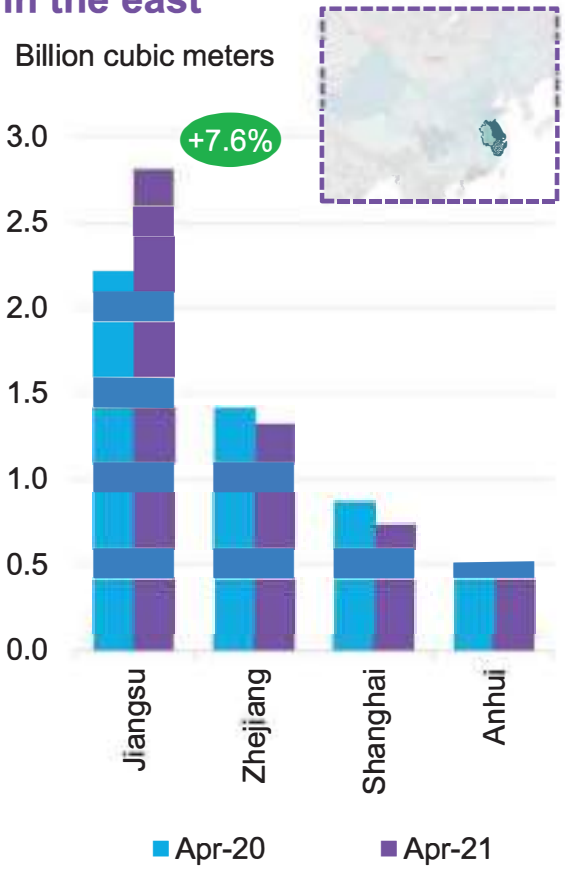
Gas import prices



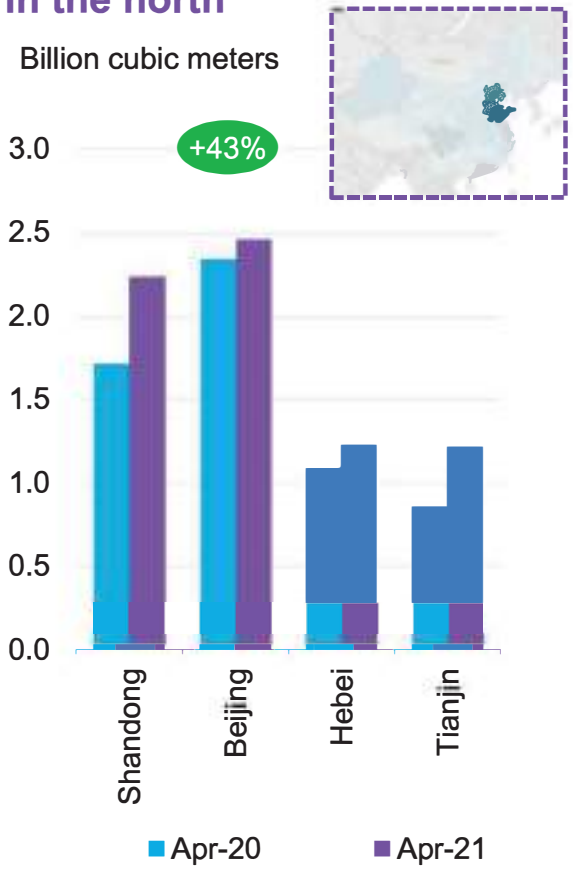
Source: China customs, BloombergNEF.

Regions: Gas demand continues to rise across all regions, especially in the north

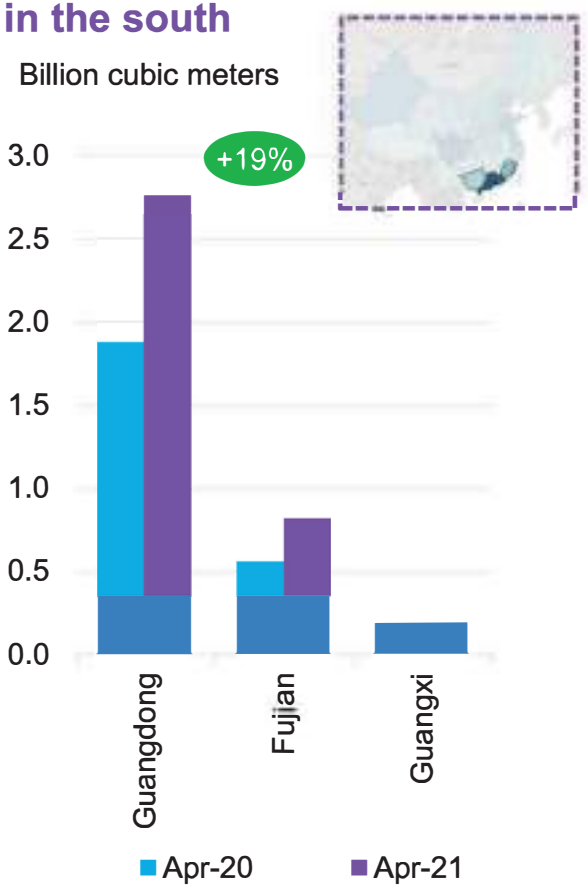
Major gas demand provinces in the east



Major gas demand provinces in the north



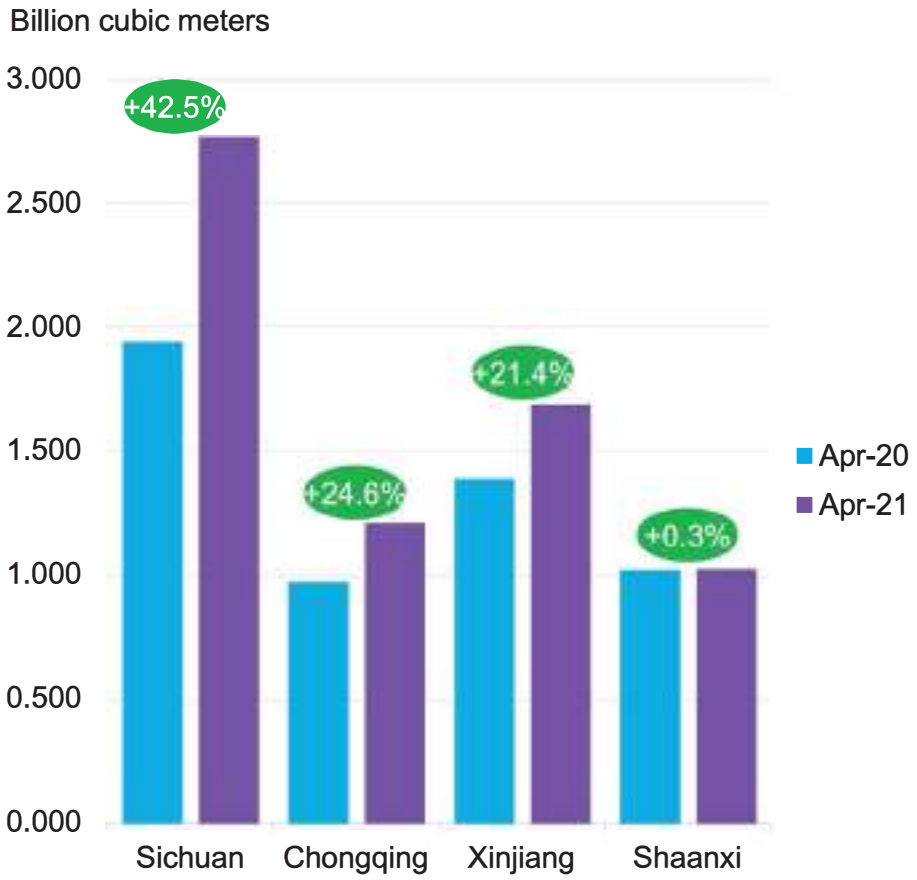
Major gas demand provinces in the south



Source: JLC, BloombergNEF. Note: Not all provinces are included in the regions.

Regions: Chongqing sees double-digit year-on-year demand growth while supply output dips

Demand in southwest and northwest (inland)

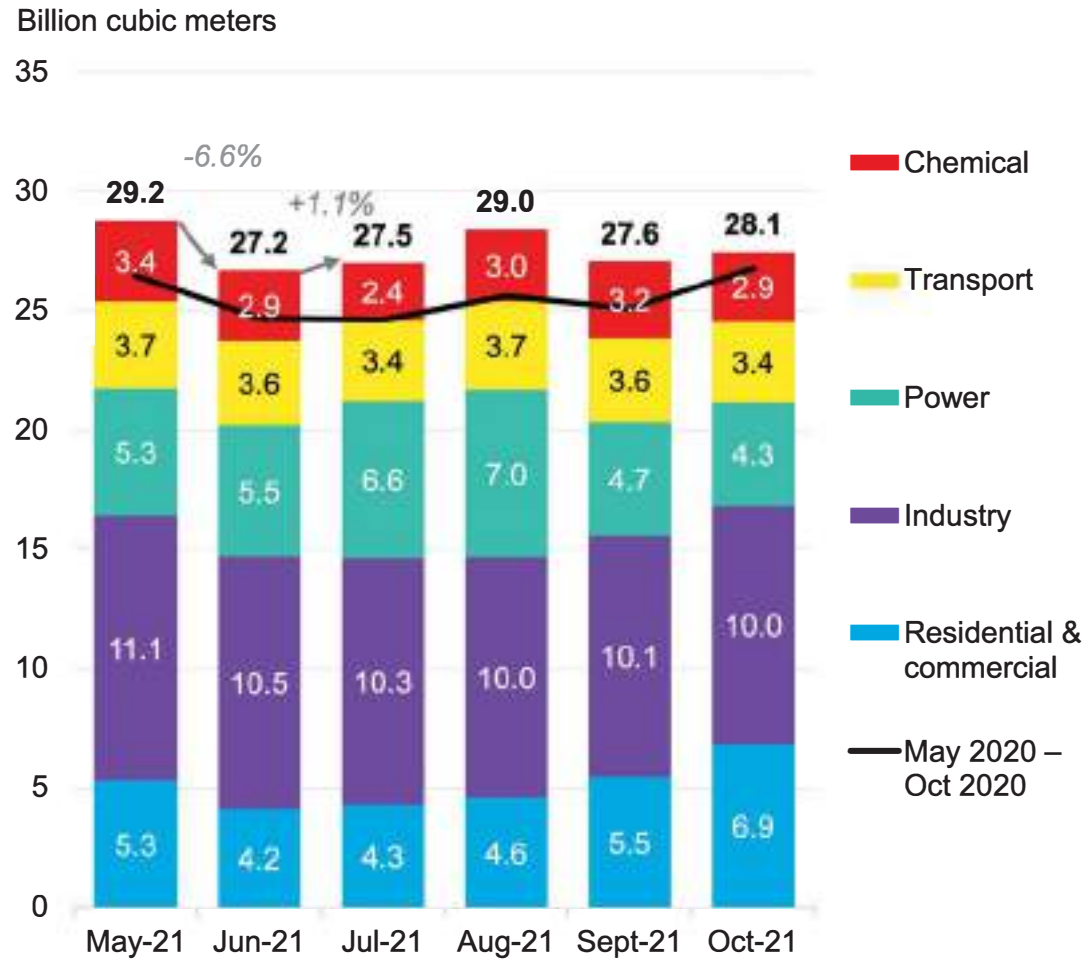


Output in southwest and northwest (inland)

Source: JLC, BloombergNEF. Note: Southwest here includes Sichuan, Chongqing and northwest includes Xinjiang, Shaanxi.

Gas demand: Higher consumption pushed up by gas power demand

China gas demand forecast and annual change

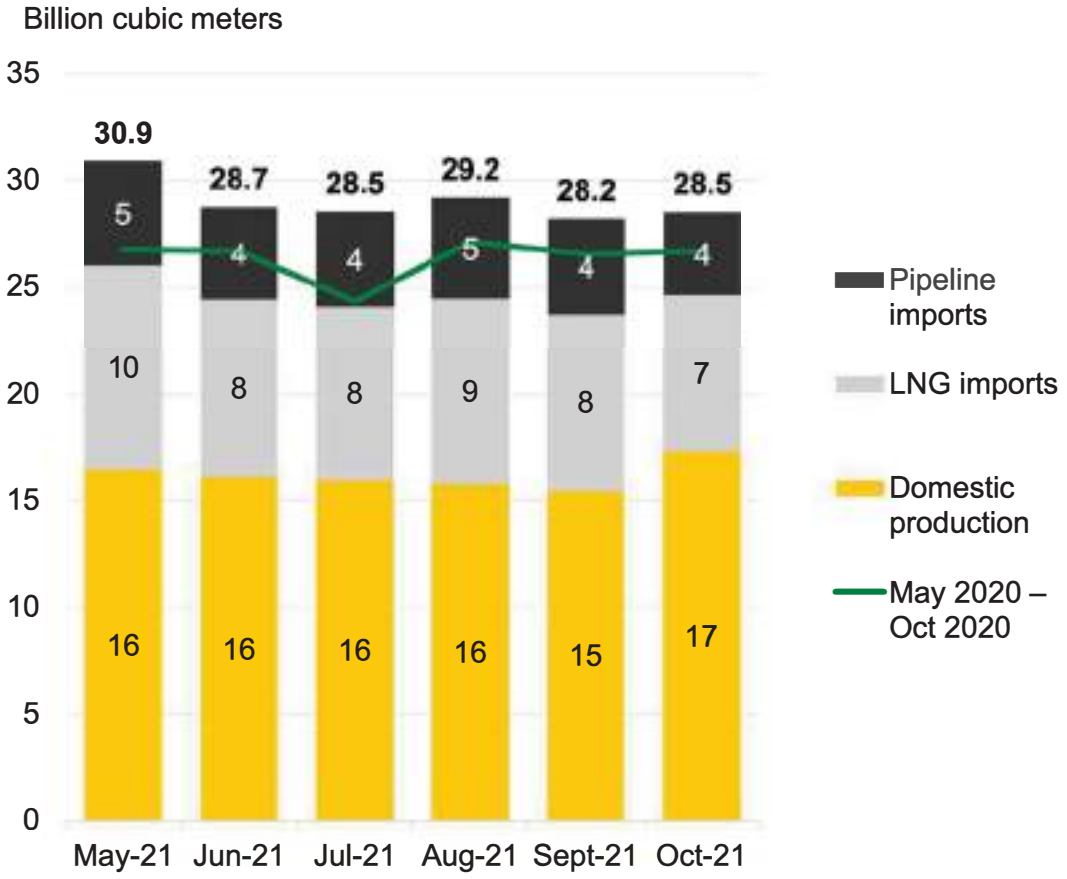


Source: BloombergNEF. Note: Figures are rounded.

- Apparent gas consumption during June to July is likely to increase steadily by 11.1% year-on-year to 54.8 billion cubic meters. Strong demand growth, especially from the power sector, is expected to boost gas burn.
- BNEF estimates May gas demand to be 29.2Bcm, up 10.2% year-on-year. May gas consumption for power generation may increase 0.8Bcm from last year, due to a lack of power supply in the southern region.
- Five Chinese provinces (Guangdong, Jiangsu, Shandong, Zhejiang and Yunnan) have warned of power shortages in the upcoming summer. Three are coastal provinces which also import LNG – Guangdong, Jiangsu and Zhejiang – which also have the largest gas power fleets. A resurgence in activity from businesses and factories is the main reason for strong power demand. High temperatures are also boosting air-conditioning demand, while low rainfall in Yunnan province means less hydropower supply.
- Anticipated June gas demand may drop 6.6% vs. April to 27.2Bcm, which would still be 10.3% higher year-on-year. July gas consumption is likely to inch up 1.1% from June to 27.5Bcm, 11.8% higher from year ago.
- Gas demand in the second quarter is expected to reach 83.9Bcm, up 10.8% compared to the same period last year. Total apparent gas consumption from May to October 2021 is likely to reach a total 168.6Bcm, increasing 10.2% on a yearly basis.

Gas supply: LNG imports could decline from May in the coming two months

China natural gas supply forecast and annual change



Source: BloombergNEF. Note: Gas inventory changes are not included. Therefore, supply change is different from demand change. Figures are rounded.

- May domestic gas production is expected to increase 3% to 16.4 billion cubic meters year-on-year but down 3% from April. June and July gas output is forecast to rise 9% on a yearly basis to 32.1Bcm. Domestic gas production in the second quarter is likely to grow 4% year-on-year to 49.4Bcm.
- LNG imports surged 26.1% year-on-year in May, reaching 7.2 million metric tons, up 13% from April – according to Bloomberg's AHOY JOURNEY <GO>. LNG imports remain strong due to robust industrial gas consumption and higher-than-expected gas power demand, despite higher JKM prices. Average JKM front-month futures prices in May reached $9.6/MMBtu, 23% higher than in April. June LNG imports may drop 16% from May due to possible demand reduction with higher rainfall, power rationing and pandemic-control measures in Guangdong. Imports in the second quarter could rise 22% year-on-year to 19.2 million tons.
- Pipeline gas imports in May are estimated to be 4.8Bcm, up 2.3% from April due to robust gas demand and the end of maintenance at the Power of Siberia. June pipeline imports may decline to 4.3Bcm and gradually grow to 4.4Bcm in July and 4.7Bcm in August. Second-quarter pipeline imports are estimated to total 14.3Bcm, surging 33% year-on-year as last year's second quarter's deliveries were slashed.
- Total gas supply in 2Q may increase 13% to 90.5Bcm to meet growing gas demand and refill storage.

https://tass.ru/ekonomika/11546517

SPIEF-2021

JUN 3, 00:34Updated Jun 3, 03:20

Novak said that it remains to build 100 km of Nord Stream 2

The construction of the gas pipeline is planned to be completed by the end of 2021

© Axel Schmidt / Nord Stream 2

SAINT PETERSBURG, June 3. / TASS /. Russia expects to complete the construction of the Nord Stream 2 gas pipeline by the end of 2021, with about 100 km remaining, Russian Deputy Prime Minister Alexander Novak said on the sidelines of the St. Petersburg International Economic Forum.

"The work continues, it has not stopped. The operator with the companies that participate in the project continue its implementation. We hope that this work will be completed by the end, perhaps this year," he said. depends on the builders, technological and technical conditions, weather conditions. "

Novak added that it remains to build about 100 km of the gas pipeline. "It [the construction project of Nord Stream 2] continues to be implemented and meets all the requirements of the European Union," the Deputy Prime Minister summed up.

The Nord Stream 2 project involves the construction of two lines of a gas pipeline with a total capacity of 55 billion cubic meters. m per year from the coast of Russia through the Baltic Sea to Germany. The work was suspended in December 2019 after the Swiss Allseas abandoned pipe-laying due to possible US sanctions. Since December 2020, the laying of the pipeline has been resumed - now the work is being carried out by two Russian pipelayers - Akademik Chersky and Fortuna.

Excerpt from

http://en.kremlin.ru/events/president/transcripts/65746

St Petersburg International Economic Forum plenary session

Vladimir Putin took part in the plenary session of the 24th St Petersburg International Economic Forum.

June 4, 2021

17:20

St Petersburg

Multilateral projects are primarily capable of reviving and developing the global economy and we are grateful to our partners for the cooperation that is continuing during the epidemic and despite the difficult situation in international relations.

Incidentally, I would like to tell you in this connection that the laying of the first line of the Nord Stream 2 gas pipeline was completed today, two and a half hours ago. The work on its second line continues.

In fact, the line pipe, including the offshore section, has been laid. The pipe in Germany is in place. Now parts of the pipe must be lifted and welded on the Russian side. That is all. Anyway, pipe laying is over.

The readiness of the Russian line of the gas route to the Slavyanskaya compressor station was also ensured this week. Why am I talking about this? Because this station is one of the most powerful compressor facilities in the world and is a point of departure for the new gas pipeline. Slavyanskaya has been supplied with gas.

To sum up, Gazprom is ready to fill Nord Stream 2 with gas. This route will create direct links between the Russian and German systems and will ensure energy security and reliable gas supplies for the Europeans, like Nord Stream 1. I must add that this project is profitable economically and fully conforms to the most stringent environmental and technical requirements.

June 1, 2021

COVID-19 UPDATE

State of Local Emergency (SOLE) declared in the RMWB.

On Monday, April 26, the Regional Municipality of Wood Buffalo declared a State of Local Emergency (SOLE) to help stop the continued spread of COVID-19 in the region, protect the local health care system and take action to address other local challenges and risks related to the on-going pandemic. The SOLE will remain in effect for 90-days or until terminated. At this time, no further public health measures have been made. Municipal information regarding the pandemic will continue to be updated and available at rmwb.ca/covid19.

RMWB Case Outcomes: 456 Active Cases 6813 Resolved Cases 9 Deceased Cases

- **Fort McMurray**
- 11 New cases
- 423 Active Cases (-70)
- 6102 Recoveries (+81)
- 532.6 per 100,000 pop

- **Rural RMWB**
- 10 New Cases
- 33 Active Cases (+7)
- 279 Recoveries (+3)
- 813.2 per 100,000 pop

- **Alberta**
- 209 New Cases
- 1083 New Recoveries
- 6771 Active Cases (-875)

- **Canada**

2439 New Cases
31,246 Active Cases

- **Alberta Vaccines**

29,738 doses distributed in last 24 hours

- 2.81M first doses (63.4%) - Stage 2 of "Open for Summer" plan reached and will begin June 10 as long as hospitalizations stay under 500.
- 397K people are fully vaccinated
- Hospitalizations: 438 (-1)
- ICU: 127 (-6)
- "Rest of Alberta" R-Value: 0.72
- **Effective today, all positive Covid-19 Cases are being screened for all variants of concern.**

- **Second Doses - every Albertan who has recieved vaccine will recieve second dose by end of summer.**
- **March or earlier - Book Now**
- **April - Start Booking June 14**
- **May - Start Booking June 28**
- **Book your appointment online here, or find a pharmacy offering vaccine here.**
- AHS and pharmacies will contact you when you are eligible, but you can book as soon as the dates above.
- There are quarantine requirement changes for Close Contacts depending if you are fully or partially vaccinated.

Stage 1 - 50% Vaccinated, Under 800 Hospitalizations - June 1

- Places of Worship 15%
- Outdoor Social Gatherings up to 10 people
- Outdoor physical activity with restrictions
- Personal Wellness by appointment
- Restaurant Patios (Household Only - 4 per table)

Stage 2 - 60% Vaccinated, Under 500 Hospitalizations

- Outdoor gatherings up to 20 people
- Restaurants indoor/outdoor up to 6 people
- Indoor recreation, entertainment settings at 1/3 fire code
- Indoor Fitness - open for solo, class and drop-in activities
- Youth Camps, Youth and Adult Sports with restrictions

Stage 3 - 70% Vaccination

All restrictions lifted, including ban on indoor social gatherings.

Isolation requirements for confirmed cases of Covid-19 and some protective measures in continuing care settings remain.

"Open for Summer"

Alberta's plan to gradually remove restrictions due to Covid-19. Full details can be found here. Premier Kenney projected:

Stage 1: Began today, June 1st

Stage 2: Reached on May 28th

- **Will start June 10 if hospitalizations remain under 500**

Stage 3: 2 weeks after target met

- **Could be as early as June 28**

rmwb.ca/covid19

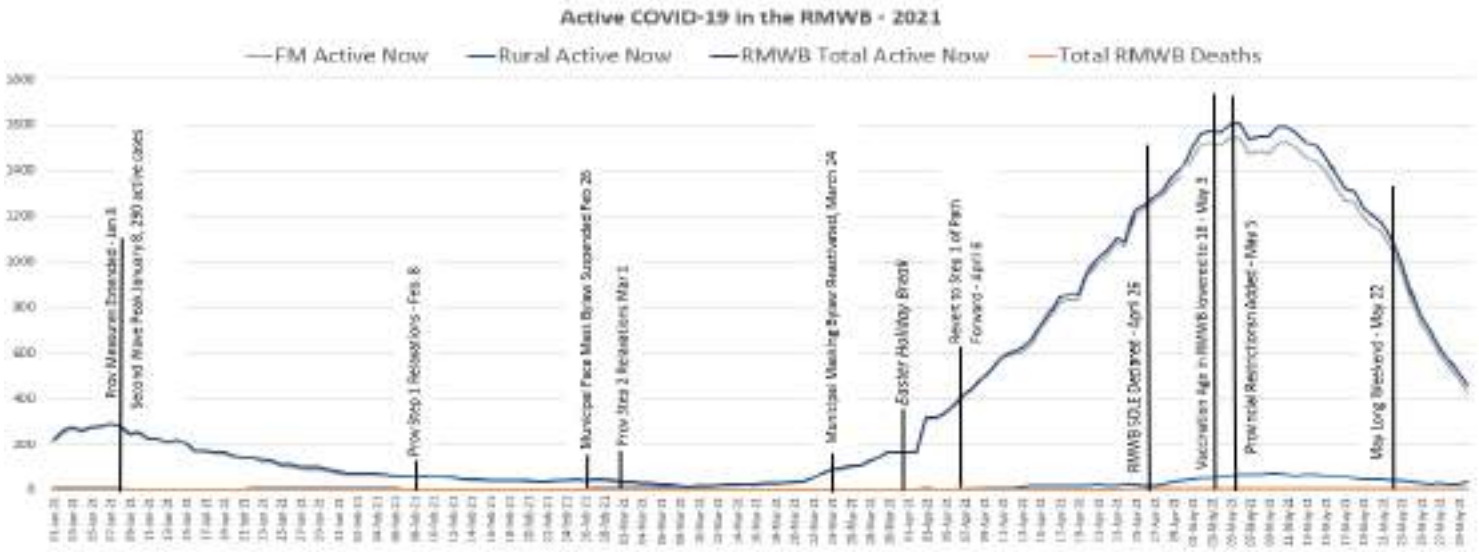
Regional Municipality of Wood Buffalo

June 1, 2021

COVID-19 UPDATE

State of Local Emergency (SOLE) declared in the RMWB.

On Monday, April 26, the Regional Municipality of Wood Buffalo declared a State of Local Emergency (SOLE) to help stop the continued spread of COVID-19 in the region, protect the local health care system and take action to address other local challenges and risks related to the on-going pandemic. The SOLE will remain in effect for 90-days or until terminated. At this time, no further public health measures have been made. Municipal information regarding the pandemic will continue to be updated and available at rmwb.ca/covid19.



Outbreaks in RMWB

Industrial:

MEG Energy
CNRL Horizon
CNRL Albian
CNRL Jackfish
Kearl Lake
Civeo Lynx Lodge
Civeo McClelland Lake
Wapasu Creek Lodge
Civeo Athabasca
Cenovus Sunrise Lodge
Suncor Base Plant
Suncor Firebag
Suncor Mackay River
Syncrude Mildred Lake
Syncrude Aurora
Suncor Fort Hills
CNOOC Long Lake
Oilsands Industrial Lodge
- Fort McKay

Outbreaks in RMWB

Other:

Chez Madamme Piccolo/Ecole Boreal
Joly's Your Independent Grocer
Salvation Army Shelter
Centre of Hope
Pastew Place Detox Centre
Birch Mountain Enterprises
Walmart
Safeway

Schools: Outbreaks

Outbreak 10+ Cases:

Holy Trinity High School
Ecole Dickinsfield
Fort McMurray Comp.
Ecole Boreal
St. Martha
Ecole McTavish

Outbreak 5-9 Cases:

Fort McMurray Christian
St. Paul's Elementary
Walter & Gladys Hill
Father J A Turcotte
Dr. Karl A Clark
Thickwood Heights
Sister Mary Phillps

Alert 2-4 Cases

St. Gabriel

June 1, 2021

COVID-19 UPDATE

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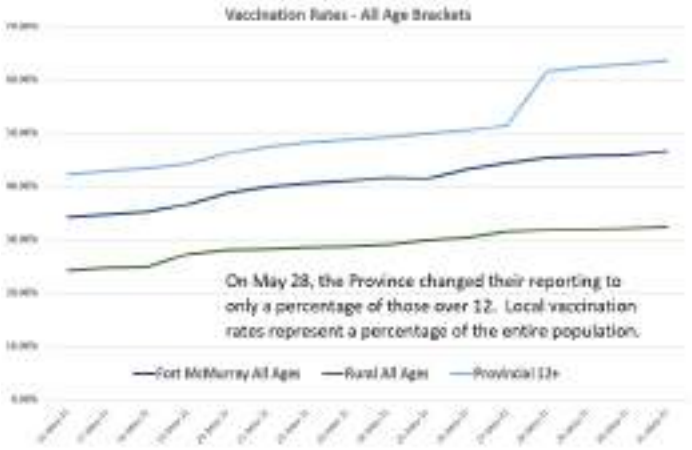
Local Vaccination Rates:

	Fort McMurray	Rural	Alberta
75+	68.0%	58.5%	86.3%
60-74	68.7%	54.8%	80.4%
40-59	65.0%	46.7%	66.7%
20-39	47.3%	27.8%	51.3%
12-19	50.4%	23.5%	46.5%
All Ages	46.5%	32.3%	54.0%

Local vaccination rates can be found here.



New vaccination information:

Moderna and Pfizer have been declared as interchangeable for 2nd doses.

Those who had AstraZeneca, may choose AstraZeneca or an MRNa for their second dose. The risk of blood clots is exceptionally low if no blood clot issues were experienced after the first dose.

More information on Vaccinations can be found here.

Second Dose:

Every Albertan should get their second dose when they're eligible. A single dose of COVID-19 vaccine offers at least 80% protection against severe outcomes, including hospitalization and death. However, second doses are needed to get the best and most long-lasting protection.

mRNA (Pfizer or Moderna)

- **Should get mRNA for second dose**

AstraZeneca:

- **Timeline for second dose has been shortened to at least 8 weeks after first dose.**
- **If you choose, you can ask for AstraZeneca for your second dose, or an mRNA. Both options will provide additional protection.**

Variants Identified in the AHS North Zone

B.1.1.7 (UK)	5611
B.1.351 (SA)	4
B.1617 (India)	0
P.1 (Brazil)	687
Total:	6302

AHS NZ Recovered:	5759
AHS NZ Deceased:	24
AHZ NZ Active:	519

Effective today, all positive Covid-19 cases will be tested for all 4 variants of concern. This will likely result in increased statistics in the coming days, while active cases will continue to decline.

Bloomberg @TheTerminal Colombia Had 6.3 Years of Oil Reserves by End-2020: Ministry
2021-06-01 17:18:16.416 GMT

By Oscar Medina
(Bloomberg) -- Colombia had enough oil reserves to last 6.3 years at the end of 2020, the Energy Ministry said in its annual report.
* Proven oil reserves fell 11% y/y to 1.8 billion barrels at end-2020, but life of reserves didn't fall because crude output declined in 2020 at the same pace
* Gas reserves fell 6.8% y/y to 2.949 billion cubic feet, or 7.7 years worth

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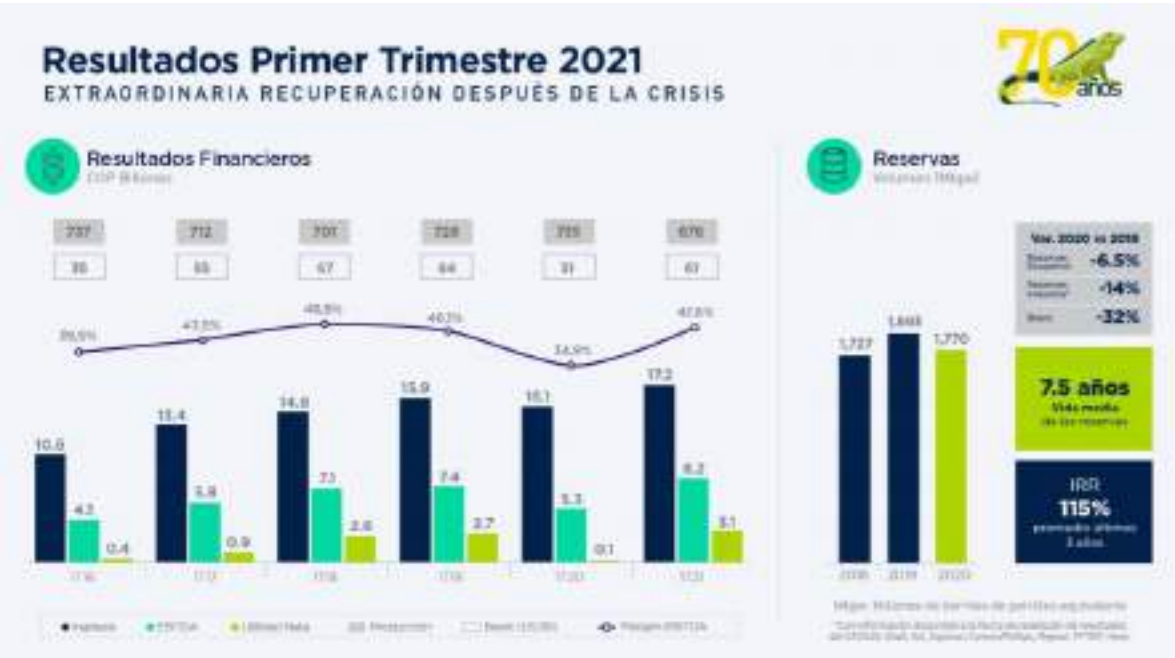
https://blinks.bloomberg.com/news/stories/QU17LYT0AFB5



Source: Ecopetrol June 1 presentation "impulsando la transicion energetica y la sosTecnibilidad"

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06/02/2021 01:42:27 [BN] Bloomberg News

Russia Keeps Output Almost Flat in May Amid Wider OPEC+ Hikes

- **Crude and condensate output was 10.45 million barrels a day**
- **OPEC+ deal allows Russia to pump more oil between May and July**

By Olga Tanas and Dina Khrennikova

(Bloomberg) -- Russia kept its oil production almost flat in May as ramp-ups, which were earlier granted to the nation as an exception, were extended to the entire OPEC+ alliance.

Russian producers pumped 44.21 million tons of crude and condensate last month, according to preliminary data from the Energy Ministry's CDU-TEK unit. That's about 10.453 million barrels a day, or 0.2% less than April levels.

It's difficult to assess Russia's compliance with its quota for the output restraint deal, agreed by the Organization of Petroleum Exporting Countries and its allies, as the data don't provide a breakdown between crude and condensate -- a light oil extracted from natural gas that's excluded from the agreement. If condensate output in May was on the same level as in April, about 940,000 barrels a day, then crude-only production would be around 9.513 million a day, some 95,000 above Russia's quota.

Between February and April, Russia and neighboring Kazakhstan were the only OPEC+ nations allowed to increase production, while other members of the group kept their output flat. Saudi Arabia, however, voluntarily agreed to cut its production. Between May and July, OPEC+ agreed to increase production by about 2 million barrels a day as the global economy is expected to continue its recovery from the pandemic. Earlier this week, OPEC+ confirmed its plan to ramp up output in July as the market tightens.

Russia's compliance with the OPEC+ pact slipped to 91% in April, according to the International Energy Agency, down from an average level of 95% between May 2020 and April 2021. Deputy Prime Minister Alexander Novak said last month that Russia is aiming to reach 100% compliance with the pact.

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https://www.opec.org/opec_web/en/press_room/6448.htm

17th OPEC and non-OPEC Ministerial Meeting concludes

No 12/2021
Vienna, Austria
01 Jun 2021

The 17th OPEC and non-OPEC Ministerial Meeting (ONOMM), held via videoconference, concluded on Tuesday, 1 June 2021.

The Meeting noted the ongoing strengthening of market fundamentals, with oil demand showing clear signs of improvement and OECD stocks falling as the economic recovery continued in most parts of the world as vaccination programmes accelerated.

The Meeting welcomed the positive performance of Participating Countries in the Declaration of Cooperation (DoC). Overall conformity to the production adjustments was 114% in April (including Mexico), reinforcing the trend of high conformity by Participating Countries.

In view of current oil market fundamentals and the consensus on its outlook, the Meeting:

Reaffirmed the existing commitment of the participating countries in the DoC to a stable market in the mutual interest of producing nations; the efficient, economic and secure supply to consumers; and a fair return on invested capital.

Reconfirmed the existing commitment of the 10th OPEC and non-OPEC Ministerial Meeting in April 2020, amended in June, September, and December 2020, as well as in January and April 2021 to gradually return 2 million barrels a day (mb/d) of the adjustments to the market, with the pace being determined according to market conditions.

Reiterated the critical importance of adhering to full conformity, and taking advantage of the extension of the compensation period until the end of September 2021, as requested by some underperforming countries. Compensation plans should be submitted in accordance with the statement of the 15th OPEC and non-OPEC Ministerial Meeting.

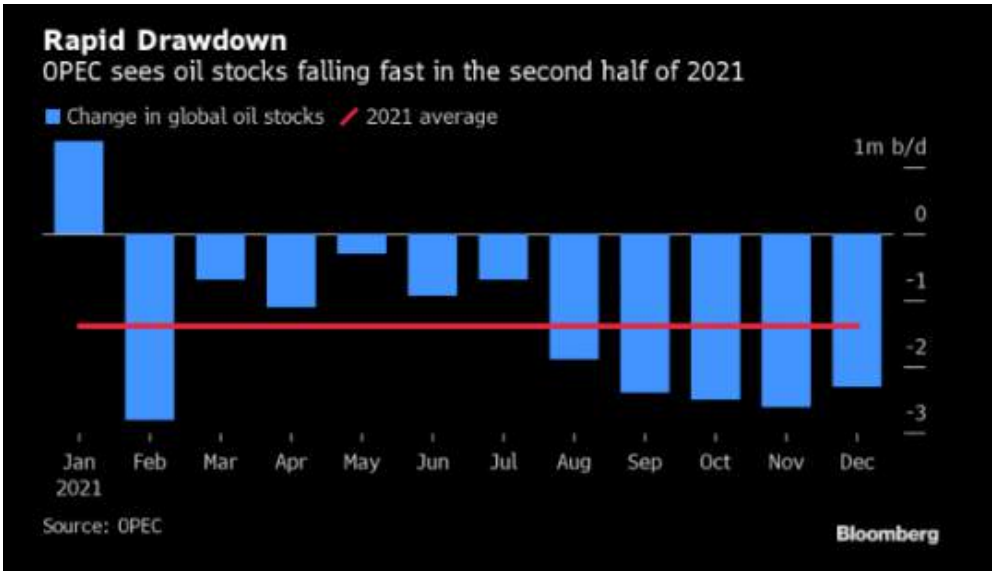
Reconfirmed the decision made at the 15th OPEC and non-OPEC Ministerial Meeting with regards to production adjustments for the month of July 2021, given the observed market fundamentals.

Emphasized the need to continue to consult and closely monitor market fundamentals and maintain the monthly OPEC and non-OPEC Ministerial Meetings until the end of the decision made at the 10th OPEC and non-OPEC Ministerial Meeting on 12 April 2020.

The 18th OPEC and non-OPEC Ministerial Meeting is scheduled for 1 July 2021.

OPEC Sees Tight Oil Market as Ministers Set for Supply Talks (1)
2021-06-01 06:47:39.490 GMT

By Grant Smith, Salma El Wardany and Javier Blas
(Bloomberg) -- A year after cutting unprecedented volumes of crude, the OPEC+ alliance is expecting world oil markets to get acutely tight.
The coalition, led by Saudi Arabia and Russia, believes the glut created when the coronavirus pandemic crushed businesses and fuel demand has nearly gone, and that oil stockpiles will diminish rapidly in the second half of the year as lockdowns ease and travel picks up.
That leaves the Organization of Petroleum Exporting Countries and its partners with a decision to start pondering on Tuesday: whether to pump more oil or hold back while the outlook is still so mired in uncertainty.
Keeping output steady would support the market against the twin risks of renewed virus outbreaks and a potential flood of exports from Iran if it renews a nuclear deal with the U.S. and other world powers. But with Brent crude already up 36% this year to more than $70 a barrel, that could hurt the global economy and worsen the inflationary pressures fixating Wall Street.
“There are many moving parts when it comes to factors affecting the global oil market, such as the pace of change during the pandemic,” OPEC Secretary-General Mohammad Barkindo said after preliminary consultations on Monday.



At their virtual meeting on Tuesday, ministers are expected to press ahead with a gradual increase already penciled in for July, completing the return of just over 2 million barrels a day

since May. According to a historic deal struck in the depths of the oil crisis last year, the group has committed to holding supply levels from then until early 2022. But a tight market may call for the agreement to be revised.
Delegates said initial discussions would begin on Tuesday about the alliance's moves after July. No decision will be made, they said. But oil and bond traders will be closely scrutinizing their comments for any hints.

Stocks Shrink

OPEC's Joint Technical Committee estimates that by the end of July stockpiles in developed nations will be below the 2015-2019 average -- a key benchmark for the group. Between September and December, inventories will be depleted at a brisk clip of more than 2 million barrels a day.
That's led many observers to conclude OPEC+ will need to open the taps in the second half of the year.
"The market is now facing the exact opposite dilemma of April 2020," said Louise Dickson, an analyst at consultancy Rystad Energy. "Producers now have just as delicate of a task to bring back enough supply to match the swiftly rising oil demand. If markets over-tighten, a flare-up in prices could jeopardize the global economic recovery."
But the demand outlook remains beset with uncertainties, particularly in Asia. Indian energy consumption has taken a big hit as Covid-19 rages through the country. Japan and Malaysia, key consumers of OPEC's crude, recently announced tougher measures to deal with new infections.
"The resurgence of Covid-19 cases in some Asian and Latin American countries remains a source of concern," the JTC said in its report.

Iran Talks

Iran will be another critical factor. The Islamic Republic is in talks to revive a 2015 accord that limited its atomic activities in return for U.S. sanctions relief. Tehran is keen to reach an agreement before it holds presidential elections on June 18.
Russian and Iranian officials involved in the nuclear talks in Vienna said on Monday that there were still complicated issues to resolve. They hinted that the negotiators may not be able to strike a deal during the current, and fifth, round of talks.
Mikhail Ulyanov@Amb_Ulyanov
The areas of disagreement reduced significantly at the Vienna talks on #JCPOA. But Mr. Araghchi is right: the remaining outstanding issues are rather complicated. A very creative and

responsible approach is needed to find solutions.
Abas Aslani@AbasAslani
#Iran DepFM Araghchi: Negotiations are very complex & we've reached to the main issues of dispute… I'm not sure we can reach a conclusion in this round of talks… The return of delegations to the capitals may be necessary for another round of consultations…We've not decided yet
http://twitter.com/AbasAslani/statuses/1399359025955971072 Sent via Twitter for iPhone. View original tweet.
If a deal is reached and Washington lifts sanctions, Iran may be able to ramp up exports quickly. Analysts estimate daily output could rise to about 4 million barrels from 2.4 million.
OPEC's Barkindo said that Iran's comeback would be "orderly and transparent," causing no upset to the oil-market stability that other OPEC+ nations have toiled to achieve.
Read: Iran and World Powers Begin 'Final Round' of Nuclear Talks
As ministers weigh the risks of bringing more oil back onto the market, the debate may well re-open old fault-lines within the alliance.
Riyadh and Moscow have often diverged on how quickly to bolster output, with the kingdom typically advocating restraint and Russia more impatient to expand sales volumes. The United Arab Emirates, another key player, has also shown eagerness to boost exports.
"It remains a delicate balancing act," said Bill Farren-Price, a director at research firm Enverus and veteran observer of the cartel.

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SAF Group Created Transcript –
Saudi Energy Minister tells CNBC's @_HadleyGamble he doesn't "see any threat to price stability."
https://twitter.com/CNBCMiddleEast/status/1400462025793237006 June 3 June 3, 2021

All items in "*italics*" are SAF Group created transcript

HG: Hadley Gamble CNBC
MoE: Minister of Energy Abdulaziz

HG: "What do you see as the greatest threat to price stability at this point? Are we talking about inflation, are we talking about the new strains in Asia of COVID-19?"

MoE: "No, I don't believe that there is a threat to the market stability. I don't talk about prices anymore."

HG: "When you think about this, with regards to the IEA report, you said it was from La-La-Land- How do you describe that?"

MoE: "Sequel, sequel."

HG: "The sequel to La-La-Land."

MoE: "Yes."

HG: "Walk us through that, how Do you think that gives OPEC and Saudi Arabia more clout in Washington?"

MoE: "It's not a realistic scenario that's why you know, it's a good, its good fun to think about it but when it comes to applying it in reality I don't think its going to be"

HG: "So these investors and governments are out of touch with reality"

MoE: "No, I'm suggesting whoever put that scenario is not in touch with reality."

HG:" In terms of production. When are we going to see Saudi Arabia begin to produce more oil in line with what you suggested?"

MoE: "We are going to be doing in July.

HG: "And as of now, how many barrels are we talking?"

MoE: "Well, in accordance to what we agreed yesterday, we will go back to the 9.4 something, 9.450 or something like this."

HG: "And in terms of what happens next with regards to your partners and OPEC+?"

MoE: "That's a good, we have to shroud our moves and acts in a great deal of mystery."

HG: "A veil of secrecy"

MoE: "Absolutely. I have to promise the whole world, the whole market, the whole industry, that I shall try with my support of my co-chair mr novak and everybody in OPEC+. We need to make sure that speculators are not on their toes but on their knees."

Transcript created by SAF Group http://www.safgroup.ca/insights/trends-in-the-market/

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Bloomberg Transcripts

STATE DEPARTMENT PRESS BRIEFING WITH SPOKESPERSON NED PRICE

JUNE 3, 2021

SPEAKERS:
STATE DEPARTMENT SPOKESPERSON NED PRICE

PRICE: Good afternoon. It's been a long time. Good to see everyone.

Just one thing at the top. The U.S. government, through the U.S. Agency for International Development, has airlifted emergency medical supplies to Maldives, Pakistan and Sri Lanka to help save lives, stop the spread of COVID-19 and continue to meet the urgent health needs across South Asia.

In Maldives, this emergency assistance will deliver -- this emergency assistance delivery will provide 600 pulse oximeters and 292,000 vital pieces of personal protective equipment to support frontline healthcare workers and people most affected by the current outbreak.

In Pakistan, this flight will bring 1,200 pulse oximeters, 340,000 pieces of personal protective equipment for healthcare professionals on the ground.

In Sri Lanka, this assistance include 880,000 vital pieces of personal protective equipment and 1,200 pulse oximeters to support frontline healthcare workers and others most affected by the current outbreak.

USAID is coordinating additional shipments for South Asia in the coming weeks, and we'll have more details on that in the days and weeks ahead.

So with that, I'm -- this is just a habit. I will -- I will start there.

QUESTION: I'm Matt today. (inaudible).

PRICE: Yeah. Congratulations.

QUESTION: Thank you. On the Vienna talks, what can you tell us about the outcome of the latest round? There were signs of optimism from both the E.U., as well as the Iranians. Does the U.S. share that optimism that the next round could be the last?

PRICE: Well, we have tried to leave emotions aside. We are neither optimistic nor pessimistic about this. We're clear-eyed. We're clear-eyed about the stakes. We're clear-eyed about our objectives, and ultimately, our objective here is to ensure that Iran is once again subject to the most stringent verification and monitoring regime ever negotiated. That's what the 2015 JCPOA imposed. That is the benefit that it accrued to us, and of course, we have been discussing indirectly with the Iranians on the ground via our allies and partners the modalities by which we might reengage in mutual compliance with the terms of the 2015 JCPOA. Special Envoy Malley is, I believe, at this moment on his way back to Washington. You are right that the fifth round has now concluded. We've always said that this will be a set of negotiations that spans multiple rounds. We expect there will be a sixth. I think there's just about every expectation there will be subsequent rounds beyond that.

The fact is that we have made progress. The past rounds have helped to crystallize the choices that Iran would need to make, the steps that Iran would need to take to resume its own compliance with the nuclear deal, the steps that it would need, once again, to be subject to the stringent verification and monitoring regime, the limitations on heavy water, the limitations on centrifuges, the limitations that permanently, and again, verifiably prevent Iran from ever obtaining a nuclear weapon, and on our end, too. It has helped to illuminate for us what we would need to do with -- including with our own sanctions to resume our compliance with the 2015 nuclear deal.

This progress notwithstanding, challenges remain, and there remain questions as to whether there is a seriousness of purpose and -- and a determination on the part of all parties to resume compliance with the deal. Again, that is a proposition the president has laid out. It was -- it is what we would like to see happen, given the benefits that are accrued to our national interest by ensuring that Iran is once again subject to these, but we're not there yet, and a ways ahead remains.

Yes?

https://tass.ru/ekonomika/11557019

SPIEF-2021

JUN 3, 09:48Updated 10:13

If sanctions are lifted, Iran could potentially offer the market up to 1.5 million bpd of oil

According to the deputy head of Lukoil Leonid Fedun, the potential increase in oil production in Iran is a key factor for OPEC in making decisions

SAINT PETERSBURG, June 3. / TASS /. If the sanctions are lifted, Iran will potentially be able to offer the market up to 1.5 million barrels per day of oil in the near future. But the potential for increasing production in the country is much higher, Leonid Fedun, vice president of Lukoil, told reporters on the sidelines of the SPIEF.

"Up to 1.5 million barrels per day," he said, noting that this volume could quickly enter the market.

“I don’t know what the situation is in Iran now, to what extent they are ready to rehabilitate all their fields, but the potential there is huge,” Fedun added.

The factor of Iran for OPEC is key and is more important than the demand on the world oil market, said the vice president of Lukoil.

"A deficit can turn into a surplus. That is why OPEC is so careful in all its actions," he said, answering a question about the impact of a potential increase in Iranian oil production on the world oil market after the lifting of sanctions.

“I think so,” he said, answering the question if this is a more important factor for OPEC than demand.

https://tass.ru/ekonomika/11576925

SPIEF-2021 JUN 5, 02:23Updated Jun 5, 03:10

Sechin believes that the world is at risk of facing an acute shortage of oil and gas

Oil demand will recover as large-scale vaccinations and a decrease in the impact of the pandemic on the global economy, the chief executive officer of Rosneft said.

SAINT PETERSBURG, June 5. / TASS /. Rosneft warned of the possibility of an acute shortage of oil and gas due to underinvestment in these industries. This was stated by the chief executive officer of Rosneft Igor Sechin at the energy panel "Transformation of the world energy" of the St. Petersburg International Economic Forum.
"The increase in oil and gas reserves in recent years is at historic lows, and a certain shortage of resources is already visible. This trend may become a" new normal "for the world majors and lead to depletion of the resource base. The world is at risk of facing an acute shortage of oil and gas." , - he said.
According to the head of Rosneft, the pandemic has led to the regionalization of markets and the strengthening of a multipolar world. At the same time, China has become an example of a dynamic recovery from the crisis due to the emphasis on the recovery of the real sector of the economy.

Oil demand

Oil demand will recover as large-scale vaccinations and the impact of the pandemic on the global economy decrease, but by 2040 it will take about $ 17 trillion in investments in the oil and gas industry to maintain current production levels, Sechin said.
"As large-scale vaccinations and the impact of the pandemic on the global economy decrease, the demand for oil will recover, and you need to be prepared for this. The demand for energy will continue to grow, and new waves of infections can only slow down, but not stop this process," he said. ...
"According to available estimates, to maintain the current level of production until 2040, it is necessary to invest about $ 17 trillion in the global oil and gas industry, which will be about a third of all world investments in energy," Sechin added.
In the world, a large number of industries are much dirtier than oil, but the pressure on them is not comparable to the oil industry, Sechin said.

https://tass.ru/ekonomika/11577401

SPIEF-2021 JUN 5, 03:21

Sechin believes that oil production in Russia is many times more environmentally friendly than in the United States

In matters of environmental protection, it is necessary to focus on the rejection of oil from environmentally dirty industries, believes the chief executive officer of Rosneft

SAINT PETERSBURG, June 5. / TASS /. Oil production in Russia is now much more environmentally friendly than in the United States. At the same time, in matters of environmental protection, it is necessary to focus on the refusal of oil from environmentally dirty industries, and not to put pressure on all projects. This was stated by the chief executive officer of Rosneft Igor Sechin at the energy panel "Transformation of the world energy" of the St. Petersburg International Economic Forum.
"Russian environmental regulation in the oil and gas industry is significantly stricter, which predetermines the high quality of Russian projects," he said and added that to maximize production in the United States, four to five times more hydraulic fracturing (hydraulic fracturing) is carried out than in Russia.

"In this regard, one can ask - whose oil is actually cleaner? And is it not time to change the way the question of the future of oil is raised? It should not be about rejecting oil as such, but about rejecting oil from environmentally dirty projects," he added Sechin.

https://tass.ru/ekonomika/11577097
SPIEF-2021 JUN 5, 02:31Updated Jun 5, 03:02

Sechin: electric cars in this decade will be twice as expensive as traditional cars

According to Rosneft's chief executive officer, the transition to electric vehicles could be a problem for the European middle class

SAINT PETERSBURG, June 5. / TASS /. Rosneft expects electric vehicles to be twice as expensive to consumers this decade as traditional fuel vehicles. This was stated by the chief executive officer of Rosneft Igor Sechin at the energy panel "Transformation of the world energy" of the St. Petersburg International Economic Forum.

"The transition to electric vehicles could be a problem for the European middle class, since their cost until the second half of the 2020s (years) will be significantly - almost twice - higher than that of conventional cars," he said.

Sechin also noted that the transition to hydrogen energy will require huge investments. According to him, the transition of 15-20% of the world's energy to hydrogen by 2050 will require $ 15 trillion, which is comparable to the costs of the entire oil and gas sector of the world on an annualized basis.

Eco-activist pressure

Rosneft believes that the existing environmental agenda and the pressure of environmental activists on the oil industry have created new tools that allow manipulating the value of shares in large companies, Sechin said.

“We see that new tools are being created and behaviors are being formed that allow manipulating the value of stocks,” he said.

"Regulatory pressure continues to increase, as well as pressure from environmental activists on conventional energy, while support for green energy continues to grow. Some radical investor activists, in an attempt to put pressure on major hydrocarbon producers, are choosing non-trivial ways to solve this problem." - added Sechin.

RES in the APR countries

The commissioning of renewable energy capacities in the APR countries will be more than 2.5 times higher than the increase in such capacities in Europe and the United States in the next 10 years, Sechin said.

"The locomotive for the development of renewable energy is the Asia-Pacific region, where the growth in renewable energy capacity over the past 10 years is several times higher than that in Europe and the United States. Analysts' forecasts indicate that this trend will continue in the next 10 years, and the commissioning of renewable energy energy in China, India and other countries of the region will be more than 2.5 times higher than the increase in capacity in Europe, "he said.

According to Sechin, this growth is taking place in a balanced manner and in parallel with the development of traditional energy. "At the same time, despite significant investments, renewable energy has not turned into a significant reserve for world economic development," he stressed.

Competition of types of generation

Market competition for all types of generation should become the basis for a balanced development of the energy industry, the chief executive officer of Rosneft believes.

"The basis for a balanced development of the energy sector should be a healthy, market competition of all types of generation, which guarantees a stable supply of clean and affordable energy to consumers with a minimum impact on the environment," he said.

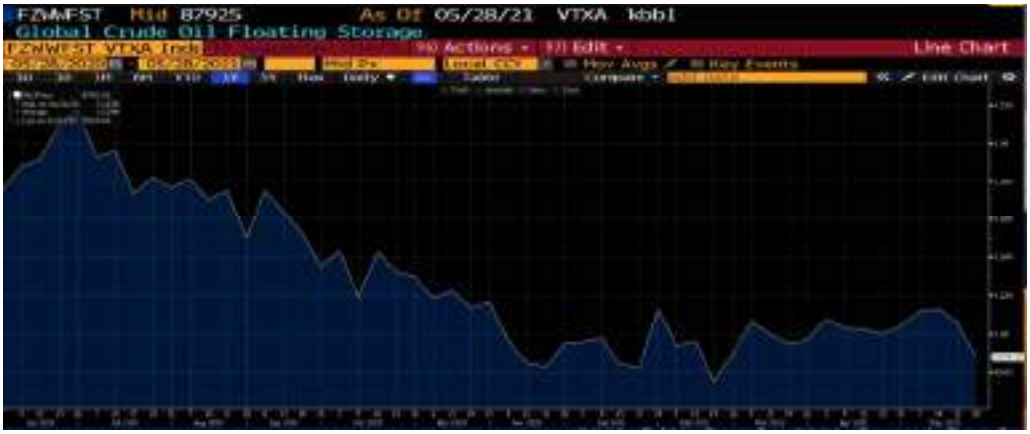
According to Sechin, the key task of the global energy sector is a reliable and efficient supply of consumers to ensure economic growth, taking into account environmental responsibility.

SAF Group created transcript comments by Mike Muller (Head, Vitol Asia) on Gulf Intelligence PODCAST: Daily Energy Markets Forum – New Silk Road "Live" June 6th Hosted By Sean Evers (Managing Partner Gulf Intelligence)
https://soundcloud.com/user-846530307/podcast-daily-energy-markets-forum-new-silk-road-live-june-6th

Items in "*italics*" are SAF Group [LINK] created transcript

At 8:10 min mark. Re OPEC+ meeting. Muller "*yes, it was a quick meeting Sean and I guess I would rephrase my earlier quick by saying producers have it because the global stock draw is still continuing unabated despite the demand setbacks that we are seeing from places we have been talking about a lot in recent weeks such as the terrible situation we are seeing in India. and as a consequence, the market expects OPEC to have done their job and return global inventories to a baseline, which we mustn't talk about 2020 baselines because the [???] we get double digit percentage growth everywhere. But we see global inventories moving exactly as OPEC+ intended back to that 2019 average sometime later this year, which, essentially, if I want to paraphrase, means that all the spare capacity will sit with those who want to control the price. And therefore, the market has confidence that the Saudis will stick to their successful formula in leading by example and putting back their share, their extraordinary 1 million barrels per days, for example, in a responsible way. and we got the OSPs that came out just a couple of days ago, which showed that also with numbers that were, in my personal opinion, designed to keep consistent with that message that they want to continue managing the market. and of course, Christof will now chime in and talk about US production. But the fact is that we are still, despite the big increase that seemed to shock people that the market wasn't expecting 11.2 million barrels per day out of the US in the month of March, which is the latest data point we have. But that is still nearly 2 million barrels per day off the high pre pandemic and I see no way the US is going to catch up in the time horizon I am talking about in terms of the next 3 to 6 to 9 months. because that's just not possible to mobilize the shale sector that quickly. And as a consequence, the spare capacity will be with the two major protagonists or three major protagonists in OPEC+ and, of course, with Iran, which is my seque to the next topic I guess."*

as a baseline,



Crude Oil in Floating Storage Falls 17% in Past Week: Vortexa
2021-05-31 07:00:01.258 GMT

By Bloomberg Automation
(Bloomberg) -- The amount of crude oil held around the world on tankers that have been stationary for at least 7 days fell to 87.93m bbl as of May 28, Vortexa data show.
* That's the lowest since February, and down 17% from 105.87m bbl on May 21
* Asia Pacific down 17% w/w to 58.61m bbl; lowest since February
* Middle East down 36% w/w to 4.64m bbl
* Europe down 50% w/w to 3.80m bbl
* West Africa down 29% w/w to 3.27m bbl
* U.S. Gulf Coast down 34% w/w to 2.10m bbl
* North Sea down 68% w/w to 824.00k bbl
* Company Exposure:
** Asia: Cosco Shipping Energy Transportation Co., HMM Co. Ltd., Mitsui O.S.K. Lines Ltd., Nippon Yusen KK
** Europe: Euronav NV, Frontline, Vopak
** U.S.: DHT Holdings, International Seaways, Nordic American Tankers, Teekay Tankers, Tsakos Energy Navigation
* NOTE:
** Vortexa data exclude FPSO units, oil products and Iranian condensate
** Crude oil transferred by STS isn't included until that volume has been stationary on receiving vessel for 7 days
** Data don't include vessels booked for floating storage until they are actually stationary for the minimum period
** See VTXA or DATA FLOAT for more data, which is subject to revisions, and see NI TANTRA for all tanker-tracking stories
** See SPOT FREIGHT for freight rate assessments using shipbroker data

To contact Bloomberg News for this story:
+1-212-617-2000 or newsauto@bloomberg.net

Embargoed until 0945 CST (0145 UTC) 1 June 2021

Caixin China General Manufacturing PMI ™

New work expands at quickest rate for five months

China's manufacturing sector continued to expand in May, with firms reporting the strongest increase in new work for five months. As a result, production expanded further, though the rate of growth softened since April amid reports of material shortages and higher purchasing costs. Suppliers' delivery times lengthened solidly, which in turn drove a rapid increase in input prices. As part of efforts to contain costs, employment was broadly stable in May. At the same time, firms raised their factory gate prices at the quickest rate for over a decade.

The headline seasonally adjusted Purchasing Managers' Index™ (PMI™) – a composite indicator designed to provide a single-figure snapshot of operating conditions in the manufacturing economy – climbed from 51.9 in April to 52.0 in May, to signal a further improvement in operating conditions. Though mild, the upturn was the strongest recorded in the year to date.

Latest data signalled a further increase in demand for Chinese manufactured goods, with total sales rising at the fastest rate for five months. The expansion was supported by greater demand both at home and overseas. Notably, new export order growth improved to a six-month high in May.

Greater amounts of new work led to a further increase in Chinese manufacturing output during May. The rate of expansion softened since April and was moderate. Anecdotal evidence indicated that material shortages and higher purchasing costs had dampened the latest upturn in output.

The sustained improvement in customer demand led firms to raise their buying activity at a solid rate. However, average vendor performance deteriorated again in May, and at a faster pace than in April. According to panel members, greater demand for inputs and low stock levels at suppliers drove the latest deterioration in lead times.

Inventories data meanwhile pointed to a slight drop in stocks of both pre- and post-production items. The falls were often linked to the greater usage of current inventories for production and fulfilment of orders.

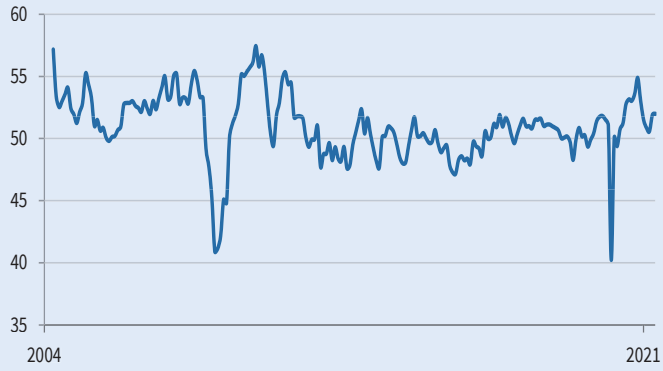
After rising slightly in April, employment was broadly unchanged in May. While some firms added to their payrolls in order to expand capacity, other companies expressed a more cautious approach to hiring due to rising input costs. Consequently, backlogs of work rose for the third month in a row.

Average cost burdens rose rapidly in the latest survey period, with the rate of inflation the quickest since December 2016. Panel members frequently mentioned that higher raw material costs pushed up expenses. Firms generally passed on greater input costs to clients by raising their output prices which increased at the fastest rate since February 2011.

Manufacturing firms remained confident that output would increase over the year ahead amid forecasts of rising customer demand and new product releases. That said, the level positive sentiment dipped to a four-month low, largely due to concerns over rising costs and pandemic-related uncertainty.

China General Manufacturing PMI

sa, >50 = improvement since previous month



Sources: Caixin, IHS Markit

Key findings:

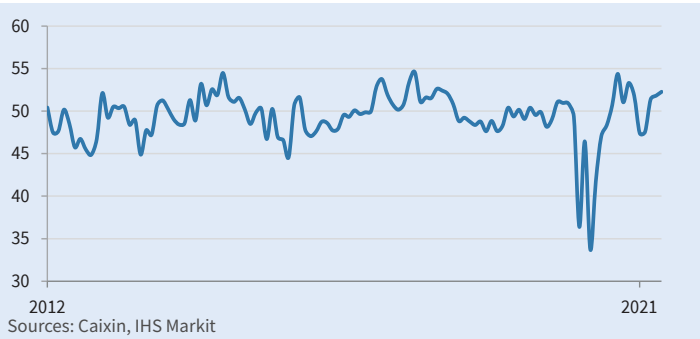
Total new business rises solidly, supported by stronger export sales

Production growth softens slightly due to supply chain strain

Staffing levels broadly stable as companies face steep rise in costs

New Export Orders Index

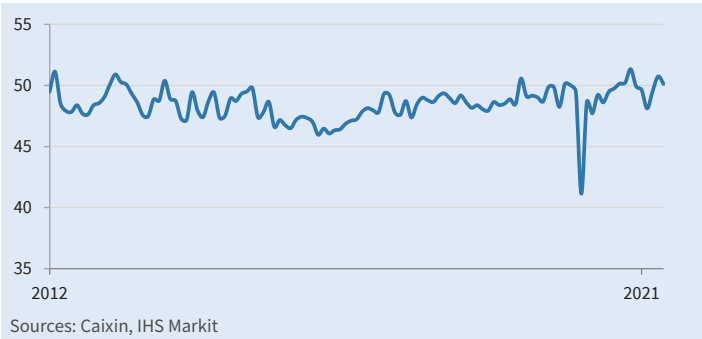
sa, >50 = growth since previous month



Sources: Caixin, IHS Markit

Employment Index

sa, >50 = growth since previous month



Sources: Caixin, IHS Markit

Commenting on the China General Manufacturing PMI ™ data, Dr. Wang Zhe, Senior Economist at Caixin Insight Group said:

"The Caixin China General Manufacturing PMI came in at 52 in May, its 13th straight month of expansion. The reading was the highest this year so far and 0.1 point higher than the previous month, indicating a steady recovery of manufacturing activity.

1. Both supply and demand expanded, and demand was slightly stronger than supply. The subindex of total new orders hit its highest point in 2021 and the gauge for new export orders was at its highest since November. Supply was relatively weak as raw material shortages and high prices hindered expansion. The output subindex was slightly lower than in the previous month.

2. The job market remained stable. While some enterprises added staff amid strong demand, some others were cautious about hiring due to concerns about rising costs. The two groups offset each other, which resulted in few changes in the overall level of employment. The employment subindex came in just marginally above 50, the line between expansion and contraction.

3. Inflationary pressure grew as prices surged. The gauge for input costs pushed deeper into expansionary territory and rose to the highest reading since December 2016. The pressure of upstream costs was transmitted downstream. The measure for output prices jumped above 60, hitting the joint-highest point since November 2010. The measure for export prices rose to the highest in three years amid rising transportation costs.

4. Inventories decreased and delivery times grew. As demand was stronger than supply last month, stocks of purchased and finished goods both continued shrinking and delivery times became substantially longer. The gauge for suppliers' delivery times dropped deeper in contractionary range.

"To sum up, manufacturing expanded in May as the post-epidemic economic recovery kept its momentum. Both domestic and overseas demand were strong and supply recovered steadily. The job market remained stable. Manufacturers stayed confident about the business outlook as the gauge for future output expectations was higher than the long-term average. Inflation was still a crucial concern as prices continued rising.

"Policymakers mentioned rising commodity prices at the State Council executive meetings on May 12 and May 19 and issued instructions about stabilizing commodity supplies and prices. Inflationary pressure would limit the room for monetary policy maneuvers. The price transmission effect emerged as manufacturing output prices surged last month. Rapidly rising commodity prices began to disrupt the economy as some enterprises began to hoard goods, while some others suffered raw material shortages. Supply chains were also significantly affected."

PRESS RELEASE

Updated EUROCONTROL Traffic Scenarios for 2021: Clear hope for some recovery this summer and beyond

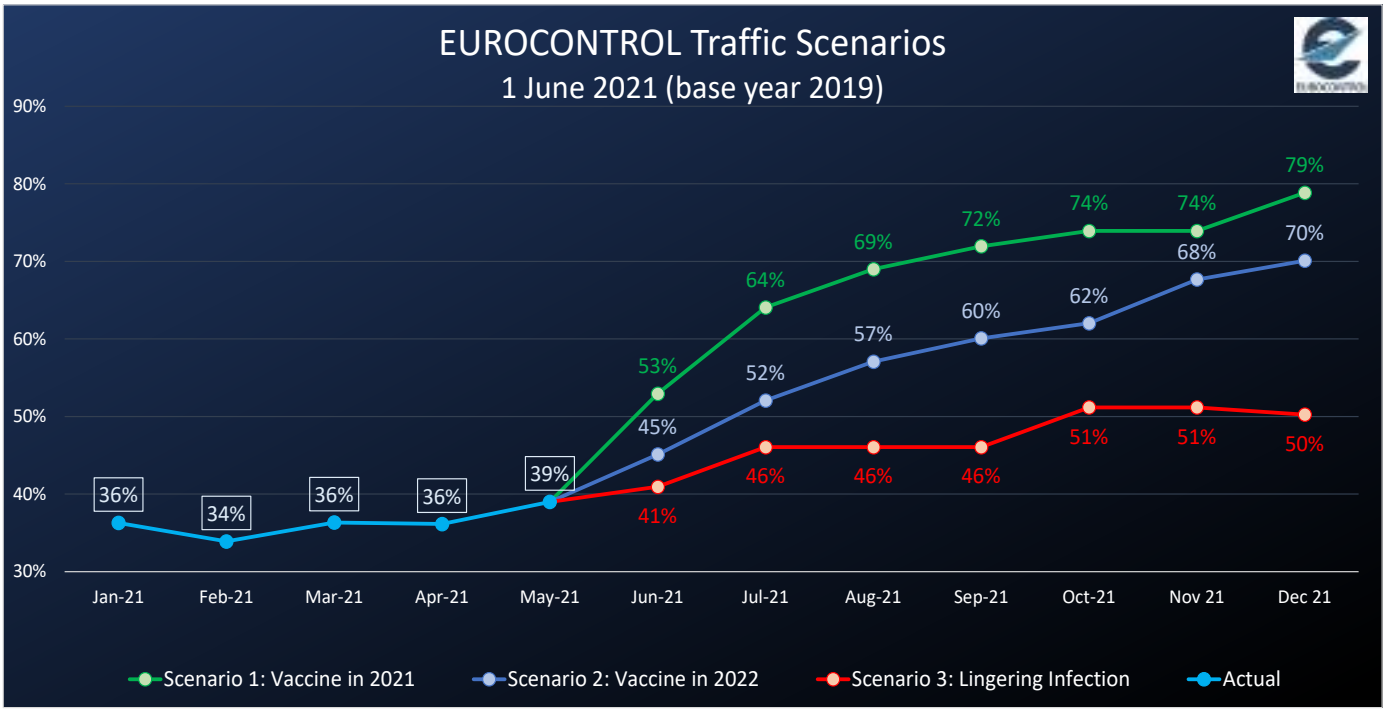
For immediate release, 1 June 2021

Brussels – EUROCONTROL has issued a new set of Traffic Scenarios detailing the monthly evolution for the period up to December 2021. Air traffic throughout Europe was 61% down in May 2021 compared to May 2019. While the crisis continues, the trend is moving upwards and there is hope of some recovery this summer.

Eamonn Brennan, Director General EUROCONTROL said, "*It is very clear that there is massive underlying demand for air travel so, as travel restrictions ease, we can expect a good increase in traffic. Our baseline scenario indicates that the number of flights should rise from 39% of 2019 levels in May to 57% in August. Traffic has been hovering at around 35% since January, so we're looking at around 5.5 million flights for the full year, which is 50% of 2019.*

However, if more States relax their restrictions sooner and fully implement procedures such as the EU's Digital COVID Certificate as soon as possible, then our optimistic scenario could see the network handling 69% of 2019 traffic levels in August. Naturally, there will be significant variations linked to individual States' travel restrictions, so some parts of the network might perform better than others."

This new short-term monthly forecast for the period June to December 2021 is based on three scenarios. The vaccine progress and the relaxation of State measures on non-essential travel are the key drivers determining the forecasting of travel levels between the baseline projection for the network (Scenario 2), the optimistic projection (Scenario 1) and the pessimistic projection (Scenario 3).



EUROCONTROL summarises the situation between now and the end of December 2021 as follows:

- Scenario 1 assumes widespread vaccination take-up across the European network by summer 2021 coupled with a coordinated easing of travel restraints, and the resumption of a few long-haul flows. This scenario is aligned with the airlines' plans for the summer months built on the pent-up demand effect, particularly for the VFR (Visiting Friends and Relatives) market.
- Scenario 2 assumes widespread vaccination take-up across Europe and coordinated easing of travel restraints being reached by Q1 2022 between global regions, with more long-haul flows starting to return.
- Scenario 3 envisages persistent restrictions over the coming years owing to patchy vaccine uptakes and/or renewed outbreaks of new virus strains, with passenger confidence negatively impacted.

EUROCONTROL's monthly traffic scenarios produced in April 2020, September 2020 and January 2021 have shown a high degree of accuracy. Eamonn Brennan explained, *"On 28 January 2021, we predicted that the total number of flights handled by the European network would about 39% of 2019 levels in May, which was precisely what occurred. It's very difficult to forecast numbers at the moment as there are so many variables at play, but we've been pretty close consistently since the start of the pandemic. We are developing these numbers in close consultation with individual airlines across a large sample of airlines and market segments."*

For more details please see: Updated EUROCONTROL Traffic Scenarios for 2021: Clear hope for some recovery this summer and beyond | EUROCONTROL

EUROCONTROL recently released a new four-year traffic forecast covering the period 2021 up to 2024 – please see: https://www.eurocontrol.int/sites/default/files/2021-05/eurocontrol-four-year-forecast-2021-2024-full-report.pdf

For further information, please contact:
Kyla Evans, Email: press@eurocontrol.int
For more information via the website: www.eurocontrol.int

SUPPORTING EUROPEAN AVIATION

About EUROCONTROL:
EUROCONTROL is a pan-European, civil-military organisation dedicated to supporting European aviation. As Europe's Network Manager, we play a central coordination role, using our technical expertise to support Member States and a wide range of stakeholders (air navigation service providers, civil and military airspace users, airports and aircraft/equipment manufacturers). We strive to make European aviation safe, efficient, scalable, cost-effective and environmentally sustainable, partnering the European Union to make the Single European Sky a reality.
EUROCONTROL has 41 Member States: Albania, Armenia, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland. EUROCONTROL has Comprehensive Agreements with Morocco and Israel.

EXTENDED RANGE FORECAST OF ATLANTIC SEASONAL HURRICANE ACTIVITY AND LANDFALL STRIKE PROBABILITY FOR 2021

We have maintained our above-average forecast for the 2021 Atlantic basin hurricane season. Current neutral ENSO conditions are anticipated to persist for the next several months. While sea surface temperatures averaged across portions of the tropical Atlantic are near to slightly below normal, subtropical North Atlantic sea surface temperatures are much warmer than average. We anticipate an above-normal probability for major hurricanes making landfall along the continental United States coastline and in the Caribbean. As is the case with all hurricane seasons, coastal residents are reminded that it only takes one hurricane making landfall to make it an active season for them. They should prepare the same for every season, regardless of how much activity is predicted.

(as of 3 June 2021)

By Philip J. Klotzbach[1], Michael M. Bell[2], and Jhordanne Jones[3]

In Memory of William M. Gray[4]

This discussion as well as past forecasts and verifications are available online at http://tropical.colostate.edu

Jennifer Dimas, Colorado State University media representative, is coordinating media inquiries into this verification. She can be reached at 970-491-1543 or Jennifer.Dimas@colostate.edu

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Project Sponsors:

[1] Research Scientist
[2] Associate Professor
[3] Graduate Research Assistant
[4] Professor Emeritus

ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2021

Forecast Parameter and 1991-2020 Average (in parentheses)	Issue Date 8 April 2021	Issue Date 3 June 2021	Observed Activity Through June 2 2021	Total Seasonal Forecast (Includes Ana*)
Named Storms (14.4)	17	17	1	18
Named Storm Days (69.4)	80	78.25	1.75	80
Hurricanes (7.2)	8	8	0	8
Hurricane Days (27.0)	35	35	0	35
Major Hurricanes (3.2)	4	4	0	4
Major Hurricane Days (7.4)	9	9	0	9
Accumulated Cyclone Energy Index (123)	150	149	1	150
Net Tropical Cyclone Activity (135%)	160	158	2	160

*Ana formed prior to the start of the Atlantic hurricane season on June 1st.

PROBABILITIES FOR AT LEAST ONE MAJOR (CATEGORY 3-4-5) HURRICANE LANDFALL ON EACH OF THE FOLLOWING COASTAL AREAS:

1) Entire continental U.S. coastline - 69% (average for last century is 52%)

2) U.S. East Coast Including Peninsula Florida - 45% (average for last century is 31%)

3) Gulf Coast from the Florida Panhandle westward to Brownsville - 44% (average for last century is 30%)

PROBABILITY FOR AT LEAST ONE MAJOR (CATEGORY 3-4-5) HURRICANE TRACKING INTO THE CARIBBEAN (10-20°N, 88-60°W)

1) 58% (average for last century is 42%)

ABSTRACT

Information obtained through May 2021 indicates that the 2021 Atlantic hurricane season will have activity slightly above the 1991-2020 average. We estimate that 2021 will have 8 hurricanes (average is 7.2), 18 named storms (average is 14.4), 80 named storm days (average is 69.4), 35 hurricane days (average is 27.0), 4 major (Category 3-4-5) hurricanes (average is 3.2) and 9 major hurricane days (average is 7.4). The probability of U.S. major hurricane landfall is estimated to be about 135 percent of the long-period average. We expect Atlantic basin Accumulated Cyclone Energy (ACE) and Net Tropical Cyclone (NTC) activity in 2021 to be approximately 120 percent of their long-term averages.

This forecast is based on an extended-range early June statistical prediction scheme that was developed using 39 years of past data. Analog predictors are also utilized. We are also including statistical/dynamical models based off data from both the ECMWF SEAS5 model and the Met Office GloSea6 model as two additional forecast guidance tools. The statistical model, the two statistical/dynamical models and the analog model all call for an above-average Atlantic hurricane season. We also present probabilities of exceedance for hurricanes and Accumulated Cyclone Energy to give interested readers a better idea of the uncertainty associated with these forecasts.

The tropical Pacific is currently characterized by neutral ENSO conditions, with anomalous eastern and central tropical Pacific warming over the past several months putting an end to this past winter's La Niña event. We anticipate that neutral ENSO conditions are the most likely scenario for the peak of this year's Atlantic hurricane season, and it seems unlikely that El Niño conditions will develop over the next few months. El Niño typically reduces Atlantic hurricane activity through increases in vertical wind shear.

The tropical Atlantic currently has near-normal sea surface temperatures, while most of the subtropical North Atlantic is warmer than normal. A warmer subtropical North Atlantic in the late spring typically correlates with a weaker subtropical high that then leads to anomalous warming of the tropical Atlantic by the peak of the Atlantic hurricane season.

Coastal residents are reminded that it only takes one hurricane making landfall to make it an active season for them, and they need to prepare the same for every season, regardless of how much activity is predicted.

The early June forecast has moderate long-term skill when evaluated in hindcast mode. The skill of CSU's forecast updates increases as the peak of the Atlantic hurricane season approaches.

https://calgaryherald.com/news/local-news/notley-announces-plans-to-move-albertas-electricity-grid-to-net-zero-by-2035-if-elected

Notley announces plans to move Alberta's electricity grid to net-zero by 2035 if elected

Author of the article:
Alanna Smith
Publishing date:
Jun 04, 2021 • 18 hours ago • 2 minute read • 136 Comments

Ahead of the NDP's weekend convention, Alberta's Opposition leader has committed to transforming the province's energy sector and moving the province's electricity grid to net-zero by 2035 should an orange crush wash over Alberta in the next election.

NDP Leader Rachel Notley said they would achieve this as part of the path towards Canada's 2050 net-zero emissions goal, which will help preserve and create jobs in the province.

"I think it's an important goal. It's a way of framing the work that we're going to do within our energy industry and our energy sector," said Notley. "We know the world is moving toward different objectives and we still have the ability to lead on that front, but we need to lay down the markers early and focus on reaching those goals."

Premier Jason Kenney has previously called the 2050 target "aspirational," but Notley said, once the work begins, it's likely they would meet the objective earlier than proposed to reduce greenhouse gas emissions that contribute to global warming.

This is just one key issue that will be addressed at the party's online convention, which is the first since the NDP's defeat by the UCP in the last provincial election. Notley said other key issues will address economic diversification, economic recovery, job creation and social issues. The focus, as she puts it, is "jobs, jobs, jobs."

Attendees will also debate more than 140 policy resolutions over the weekend, including the development of a safe supply drug policy, banning coal mining in the Rocky Mountains and providing paid sick leave for workers.

Notley said an area of growing focus for the NDP will be rural Alberta, which is typically a conservative stronghold. One panel presentation during the convention will focus on connecting and building relationships with rural Albertans and growing the NDP profile in those areas.

"We think that we have a lot to offer rural Alberta and that, quite frankly, the UCP and (Kenney), in particular, have profoundly taken rural Alberta for granted," she said. "Because of that, we think with a renewed energy amongst our membership to go out to parts of the province where we haven't been previously as active, and talk about what they have been subjected to in the last two years, that we have huge opportunities there."

Delegates will be asked to support a call for high-speed internet coverage across Alberta, which would remove barriers to access in rural Alberta and Indigenous communities, said the convention guidebook.

The convention comes as the NDP has a wide lead on the UCP, according to the latest polls. A Leger online survey of 1,001 Albertans conducted between March 5 to 8 found 40 per cent of respondents support the NDP, compared to just 20 per cent for the UCP.

Notley said it's "encouraging" to see, but they aren't taking anything for granted.

"I've always believed that Alberta Democrats have to work twice as hard as anybody else in the political spectrum, or the political arena," she said. "So what we're going to do is continue to do exactly what we have been, not only being a strong and I would argue fearless Opposition, but also trying to match every oppositional position with something that is propositional — offering Albertans a different vision."

alsmith@postmedia.com Twitter: @alanna_smithh

Excerpt Alberta Energy System Operator (AESO) 2020 Annual Report

LOOKING FORWARD

The AESO continues to monitor the impacts of the COVID-19 pandemic on its operations. Precautions to minimize risk will remain in place in alignment with continued direction from the government. The AESO will continue to be an organization that is flexible, resilient and adaptable.

In 2021, the AESO remains committed to minimizing cost, reducing red tape, developing appropriate pricing signals, and actively participating in ongoing transmission policy work. With the economic challenges impacting the province, continuing to create efficiencies through the optimization of existing infrastructure to achieve long-term cost reduction also remains a top priority.

The AESO's comprehensive understanding of the Alberta Interconnected Electric System, in-depth expertise across the full value chain, strong leadership and strategic focus will be instrumental to our success.

The AESO is well-positioned to safely and efficiently integrate all forms of generation and load requirements onto the transmission system, ensuring investor confidence and supporting Alberta's economic recovery.

INSTALLED CAPACITY 2020

PROVINCIAL ELECTRICITY DEMAND

83,115 GWh

▼ 2.4% decrease from 2019

TOTAL GENERATING UNITS

390

▲ increase of 38 units from 2019

SUMMER PEAK DEMAND

10,532 MW

TOTAL GENERATION CAPACITY

16,270 MW

▼ 1.5% decrease from 2019

AVERAGE POOL PRICE

$46.72 /MWh

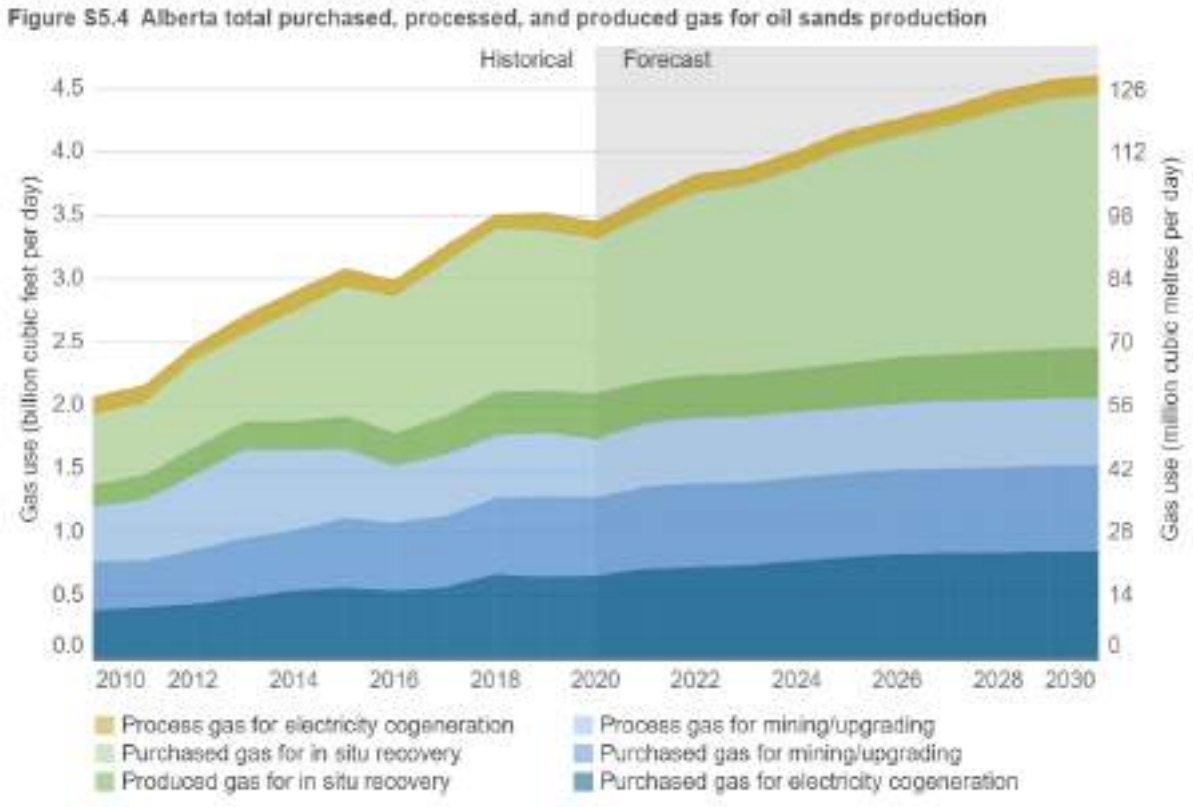
▼ 15% decrease from 2019

WINTER PEAK DEMAND

11,729 MW

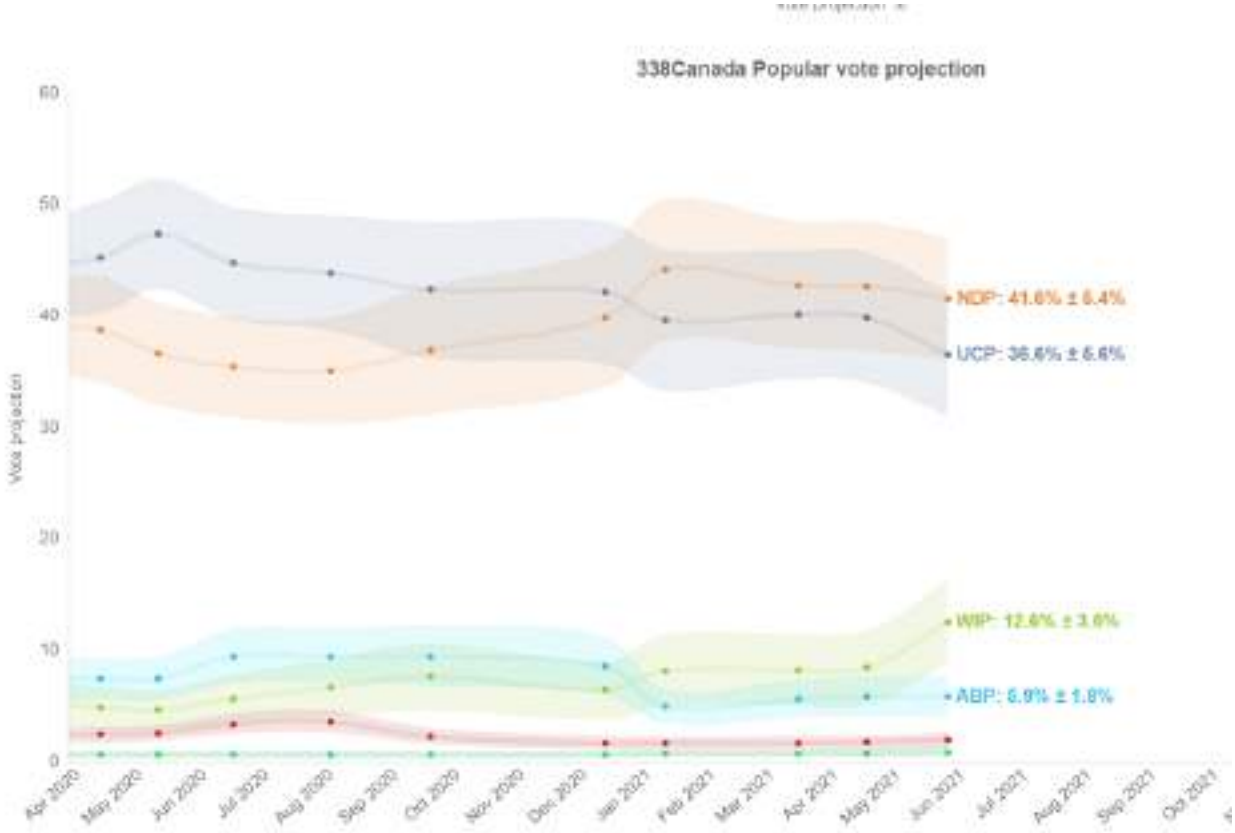
(New all-time peak load)

Alberta Energy Regulator AER https://www.aer.ca/providing-information/data-and-reports/statistical-reports/st98/natural-gas/production



Note: for 2021, AER estimates 0.7 bcf/d purchased gas for electricity cogeneration and 0.1 bcf/d process gas for electricity cogeneration

https://338canada.com/alberta/



Take Home Messages

Dry past three months brought seasonal precipitation down for the basin

- Most of the basin below normal for the water year

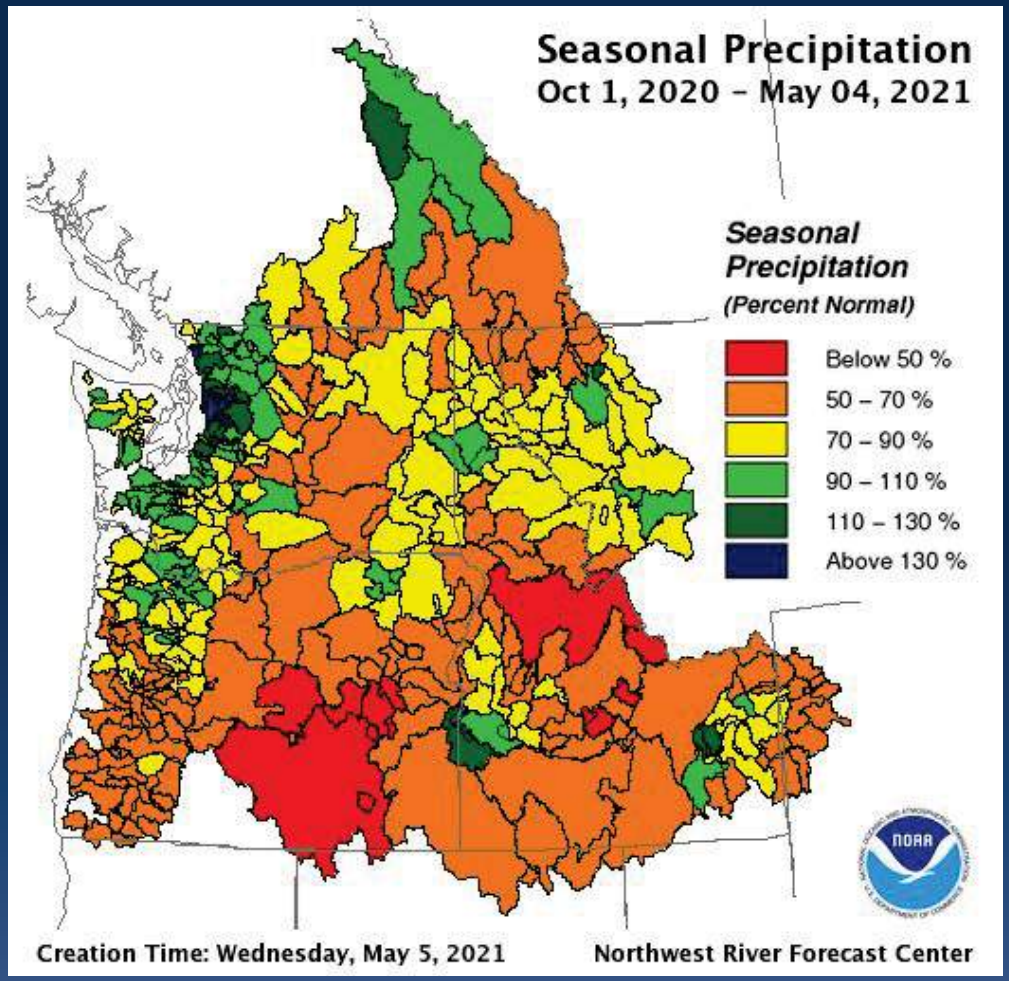
May saw above average temperatures for the interior basin

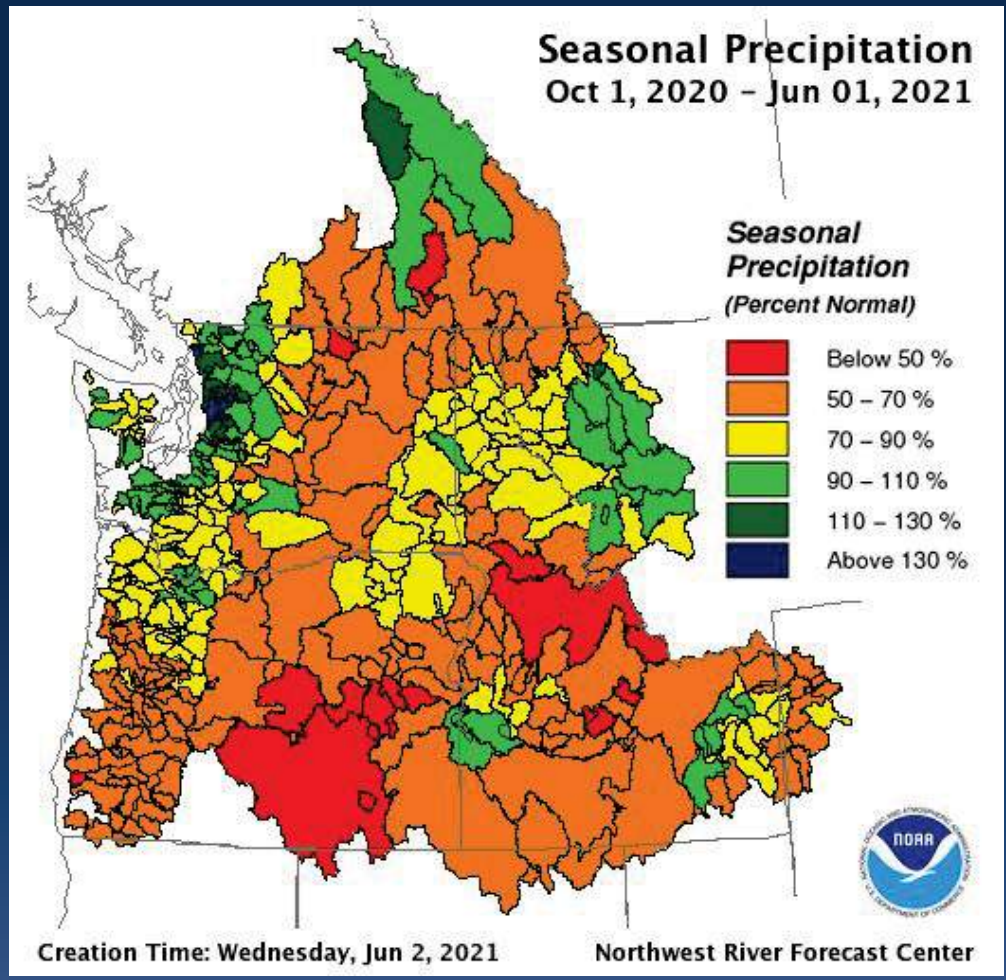
- Snowmelt underway where snow is present

Water supply forecasts for April-September

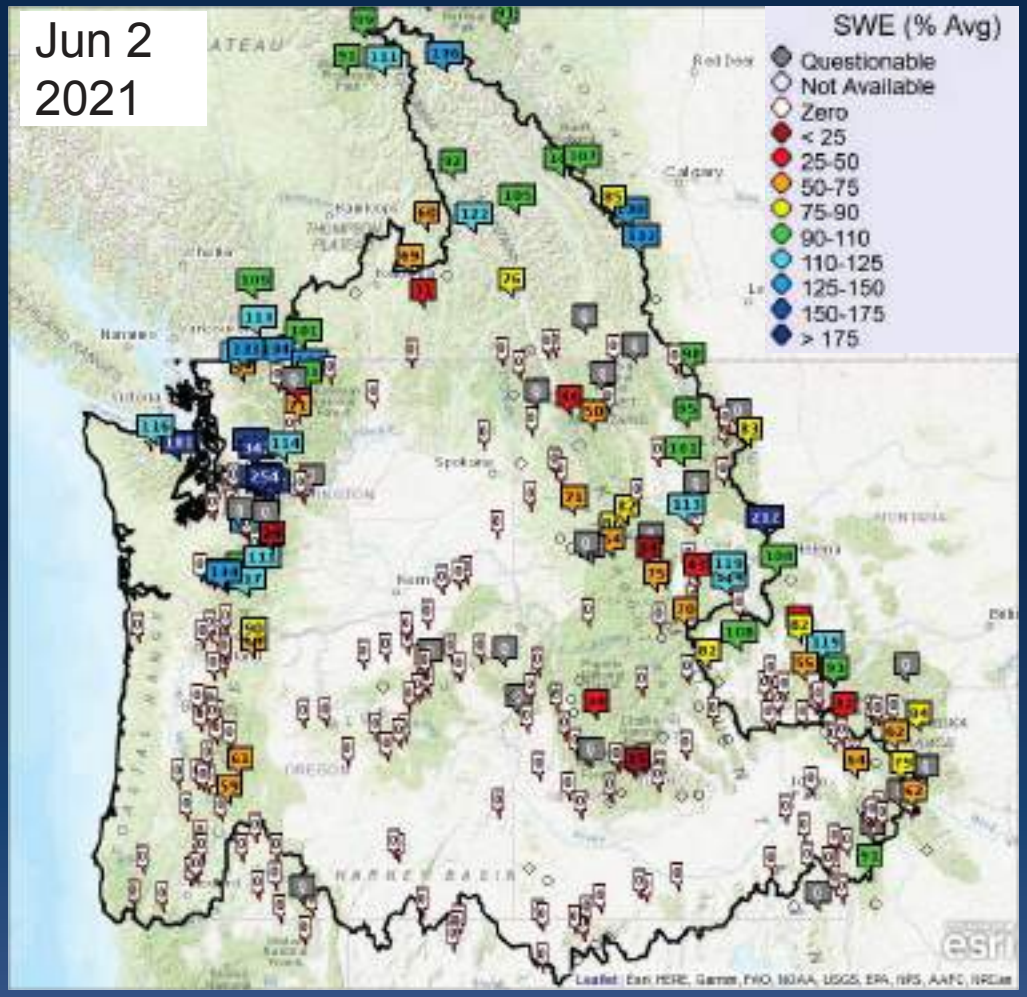
- Slight decline in forecasts basin-wide
- Mixed near and below normal in the north
- Below normal in the south

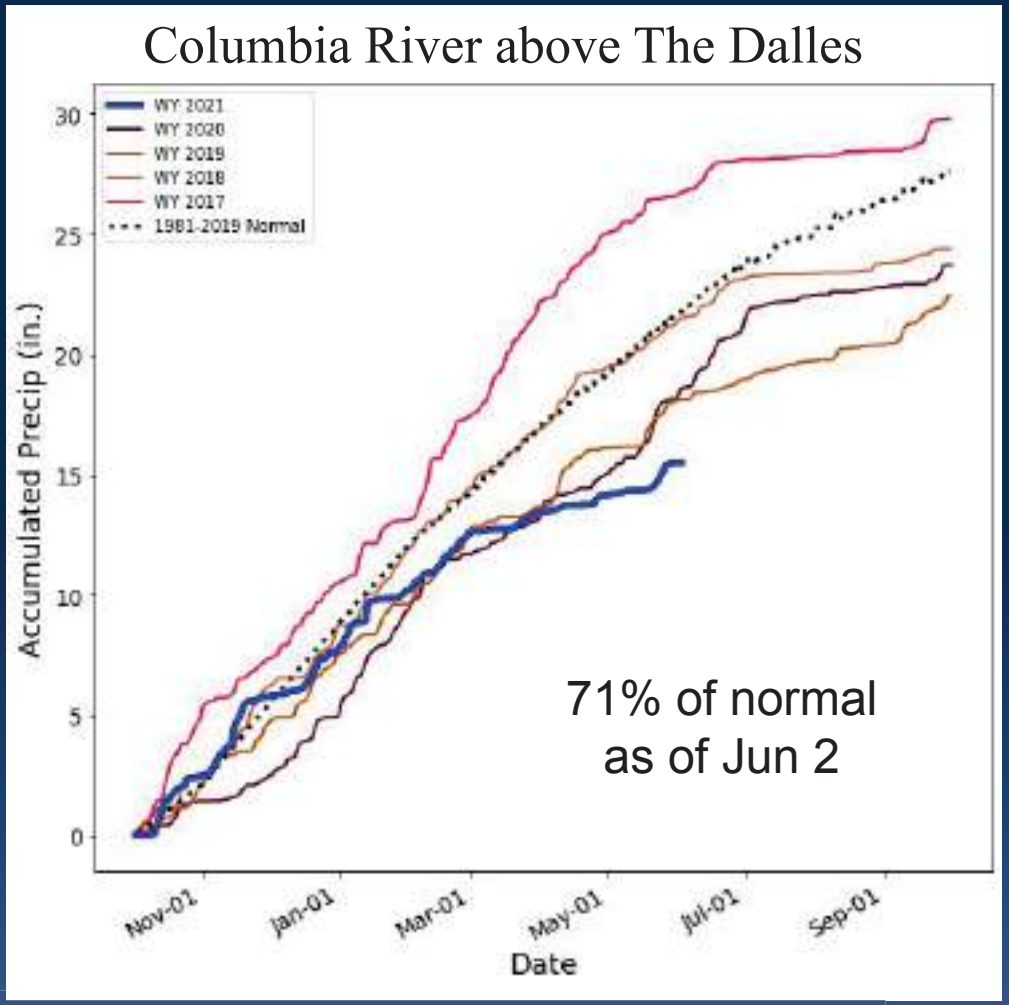
Water Year to Date Precipitation





Snowpack and Seasonal Precipitation





Snow data from NRCS, BC Hydro, and Alberta EP.

ESP10 Apr-Sep Water Supply Forecasts

COLUMBIA - THE DALLES DAM (TDAO3)
Forecasts for Water Year 2021

Official Water Supply

ESP with 10 Days QPF Ensemble: 2021-06-02 Issued: 2021-06-02

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	75468	77732	84	80582	92704
APR-JUL	64532	66778	82	68581	79855
APR-AUG	71076	72604	83	75748	87532
JAN-SEP	91700	93964	82	96814	114216
JAN-JUL	80765	82011	81	84814	101368
OCT-SEP	106871	109134	84	111984	130518

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2021-06-02 Issued: 2021-06-02

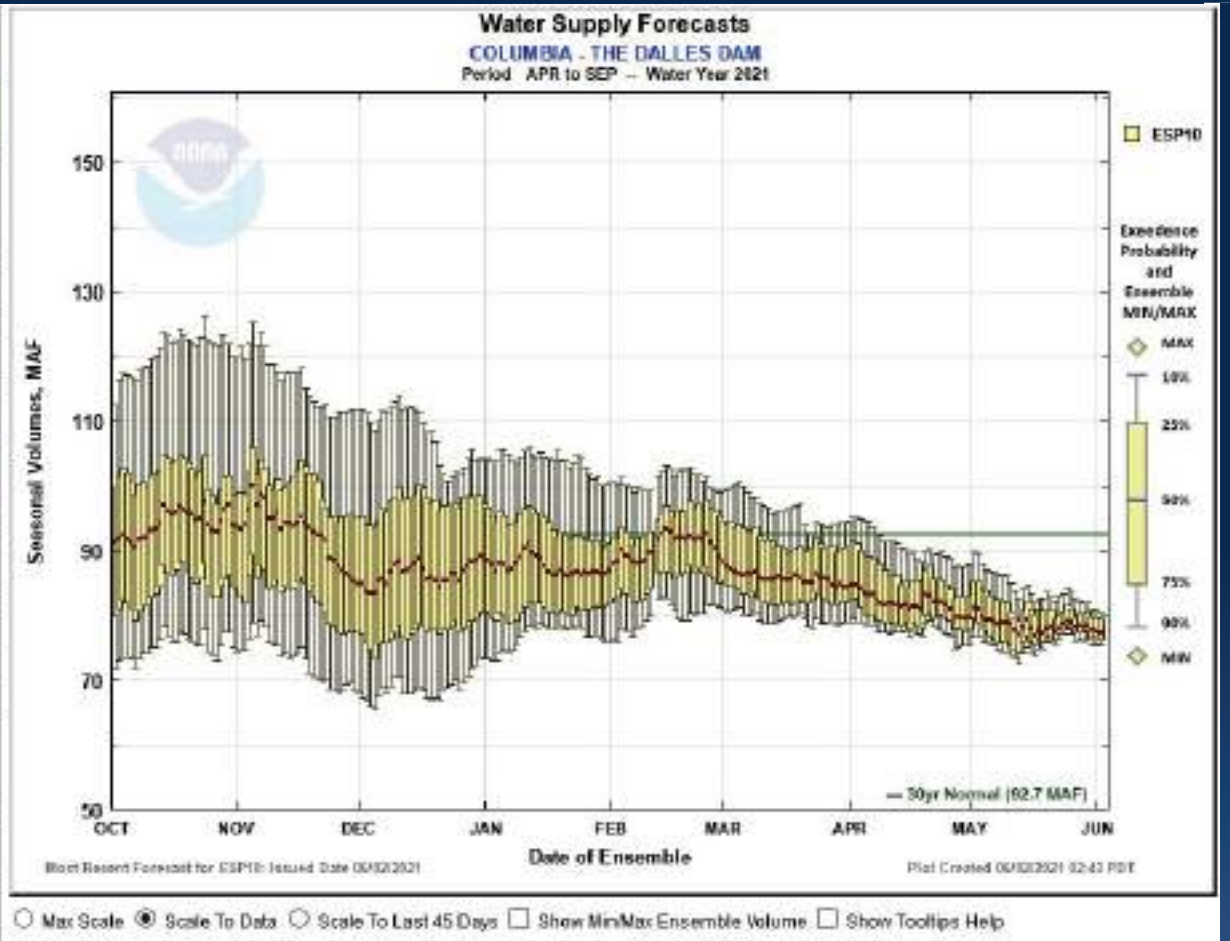
APR-SEP	77199	78882	85	82562	92704
APR-JUL	65808	66942	84	69252	79855
APR-AUG	71991	73667	84	76837	87532
JAN-SEP	93432	95115	83	98794	114216
JAN-JUL	82040	83174	82	85485	101368
OCT-SEP	108602	110285	84	113965	130518

Reference

ESP with 0 Days QPF Ensemble: 2021-06-02 Issued: 2021-06-02

APR-SEP	78426	80194	87	85107	92704
APR-JUL	66370	68163	85	71893	79855
APR-AUG	72910	75212	86	79732	87532
JAN-SEP	94659	96427	84	101339	114216
JAN-JUL	82603	84396	83	88125	101368
OCT-SEP	109829	111597	86	116509	130518

Move the mouse over the desired "Forecast Period" to display a graph



Take Home Messages

Dry past three months brought seasonal precipitation down for the basin

- Most of the basin below normal for the water year

May saw above average temperatures for the interior basin

- Snowmelt underway where snow is present

Water supply forecasts for April-September

- Slight decline in forecasts basin-wide
- Mixed near and below normal in the north
- Below normal in the south

https://www.terrapower.com/natrium-demo-wyoming-coal-plant/

TerraPower, Wyoming Governor and PacifiCorp announce efforts to advance nuclear technology in Wyoming

June 2, 2021

NATRIUM™ REACTOR DEMONSTRATION PROJECT WILL BRING CLEAN ENERGY AND JOBS TO THE STATE

BELLEVUE, Washington (June 2, 2021) – TerraPower, Wyoming Gov. Mark Gordon and PacifiCorp today announced efforts to advance a Natrium™ reactor demonstration project at a retiring coal plant in Wyoming. The companies are evaluating several potential locations in the state.

"Together with PacifiCorp, we're creating the energy grid of the future where advanced nuclear technologies provide good-paying jobs and clean energy for years to come," said Chris Levesque, president and CEO of TerraPower. "The Natrium technology was designed to solve a challenge utilities face as they work to enhance grid reliability and stability while meeting decarbonization and emissions-reduction goals."

"This project is an exciting economic opportunity for Wyoming. Siting a Natrium advanced reactor at a retiring Wyoming coal plant could ensure that a formerly productive coal generation site continues to produce reliable power for our customers," said Gary Hoogeveen, president and CEO of Rocky Mountain Power, a division of PacifiCorp. "We are currently conducting joint due diligence to ensure this opportunity is cost-effective for our customers and a great fit for Wyoming and the communities we serve."

The location of the Natrium demonstration plant is expected to be announced by the end of 2021. The demonstration project will be a fully functioning power plant and is intended to validate the design, construction and operational features of the Natrium technology.

"I am thrilled to see Wyoming selected for this demonstration pilot project, as our great state is the perfect place for this type of innovative utility facility and our experienced workforce is looking forward to the jobs this project will provide," said Wyoming Gov. Mark Gordon. "I have always supported an all-of-the-above energy portfolio for our electric utilities. Our state continues to pave the way for the future of energy, and Wyoming should be the place where innovative energy technologies are taken to commercialization."

The project features a 345 MW sodium-cooled fast reactor with a molten salt-based energy storage system. The storage technology can boost the system's output to 500 MW of power for more than five and a half hours when needed, which is equivalent to the energy required to power around 400,000 homes. This innovative addition allows a Natrium plant to integrate seamlessly with renewable resources and could lead to faster, more cost-effective decarbonization of electricity generation. In addition, the technology's novel architecture separates and simplifies major structures, reducing complexity, cost and construction schedule, while delivering safe and reliable electricity.

In October 2020, the U.S. Department of Energy (DOE), through its Advanced Reactor Demonstration Program (ARDP), awarded TerraPower $80 million in initial funding to demonstrate the Natrium technology. TerraPower signed the cooperative agreement with DOE in May 2021. To date, Congress has appropriated $160 million for the ARDP and DOE has committed additional funding in the coming years, subject to appropriations.

The Natrium system is a TerraPower and GE Hitachi technology. Along with PacifiCorp and GE Hitachi Nuclear Energy, members of the demonstration project team include engineering and

construction partner Bechtel, Energy Northwest, Duke Energy and nearly a dozen additional companies, universities and national laboratory partners.

Next steps include further project evaluation, education and outreach, and state and federal regulatory approvals prior to acquisition of a Natrium facility.

About TerraPower

TerraPower is a leading nuclear innovation company that strives to improve the world through nuclear energy and science. Since it was founded by Bill Gates and a group of like-minded visionaries, TerraPower has emerged as an incubator and developer of ideas and technologies that offer energy independence, environmental sustainability, medical advancement and other cutting-edge opportunities. It accepts and tackles some of the world's most difficult challenges. Behind each of its innovations and programs, TerraPower actively works to bring together the strengths and experiences of the world's public and private sectors to answer pressing global needs.

About PacifiCorp

PacifiCorp provides safe and reliable electric service to 2 million customers in six western states. Through its operating divisions, Rocky Mountain Power in Utah, Wyoming and Idaho; and Pacific Power in Oregon, Washington and California, the company works to meet the growing electricity needs of our customers while protecting and enhancing the environment. More information at pacificorp.com.

let's use this competitive advantage. What is your view? Is Europe still upfront in the ESG field, or is there a shift and balance here?

Laurence Fink

First, I would answer, Jörg, to say it's not a race. It's certainly not a competitive race. No question, society in Europe stated that sustainability is a societal risk. In the United States, it took a number of years for society and government to start talking that way. It was harder in the United States to move forward when government was saying climate risk was not a societal risk. I think, globally now, including Asia and China, our conversations, and this began about two years ago, are saying -- more and more societies are saying climate risk is a societal risk.

And once you go over that hurdle, then you have more cooperation. And that's what we're seeing now. And to me, I see a huge movement, very accelerated movement by the Biden administration. I see huge movement by investors now in the United States. I don't think it matters who's first or second on this, because this is not a race. We're all trying to improve society and improve the earth's health. And so I would start there. But I would say -- saying it's a societal risk and actually moving to a true net zero, that's the difficulty. Okay. We can all believe in it, but now getting there we're not seeing what I would say an aggressive stance by many governments yet.

They're talking the talk. Many societies, including Europe, are talking the talk but not walking the talk. Because to really get to a net zero, we don't have the science yet. A great article today about as much as airlines want to move forward on more sustainable, they can't do it yet. Biofuels right now are 50% to 60% more expensive than hydrocarbons. The margins on airlines is so severe. Now, basically, if we want to get every airline to use biofuels, I think within a number of years, we could do it. But are we then really getting back to your inflation story in question? Maybe that it will reduce the cost differential of the green premium. But to do that, are we willing to say to everybody in the world that you're going to be -- your cost of flying is up 30% to offset the cost or whatever the differential is?

Jörg Eigendorf

Should it be up 30%, because it's external costs of environmental damage? Should it be up 30%?

Laurence Fink

With the cost of flying or the biofuel costs?

Jörg Eigendorf

No, the cost for carbon -- for cost for flying in general?

Laurence Fink

Yes, did we create a giant carbon tax is that what you're referring to that offsets it? The problem is it displaces so many jobs. It displaces -- I don't think politically you can do that day one, it displaces jobs. When I write in my CEO letters, a transition has to be fair and just. And so if you can tell me we can increase a carbon tax to X, Y without displacing jobs, without having regional inequalities, without

having all these other issues, let's do it. It's just not feasible now. Now, what is feasible that I don't see movement in Europe. If Europe really is about this, and if the U.S. is really going to be about this, to name two parts of the world, we need to develop a continental power grid.

Okay. We all know we're going to move to electric cars. We now have solar and wind having no green premium versus any other source of energy today. Now it's intermittent. We have to have storage and all that. But that's a great example of these issues. It took 30 years to bring the cost of solar and wind back down to the same level of other hydrocarbon costs. We need to do that for every industry. So what I'm trying to suggest is, and this is why I say transition is an opportunity, but it's an opportunity because we have to be investing more and more.

We need to do the R&D. Governments are going to need to do much more R&D in credits on developing new science and technologies. It's not just about the carbon tax. Here's my issue in many of the countries of Europe. If they really want to have a true carbon tax, shouldn't 100% of the revenue from carbon tax go into green? In many countries in Europe, the carbon tax goes to balance a budget. Okay. That's not a good solution. And so what I'm trying to say is, it's not so simple here. And my last thing I would like to say, and I'm saying it loudly to every person who will listen to me, if society believes that all public companies need to now report under TCFD, the IFR standards, whatever standard one wants to use, it can't just ask public companies of doing it and not ask for a society.

Right now, what we are seeing worldwide is a movement by regulators and policymakers moving very rapidly for disclosure of public companies. You see that in Europe right now, some countries have mandated it. But there's no conversation about the rest of society. So the burden is, if Deutsche Bank and BlackRock tomorrow needed to report under TCFD Scope 3, which is all our supply chains, we are then the policeman. We are the organization that is policing the down streaming. I don't think politically that's going to work. They're going to hate us more than ever; big companies, banks, because isn't it the responsibility of government setting policy that policy is good for all of society.

But right now, all I'm seeing is mostly governments and regulators are asking public companies to move forward. BlackRock is too, by the way. We don't manage a lot of private money. But the key of getting this done to really get into net zero, and to doing it effectively, is that asking all the society moving together. And the last thing, if we only ask public companies to disclose and to report, if they don't ask the rest of society, we're going to have some very important companies that are in hydrocarbons or chemicals to go private. And that's not a solution. That doesn't change the net zero of the world.

Two, what we have witnessed in Europe are some of the hydrocarbon companies what they do, they sell some of the worst and dirtiest of their assets. And that's considered good. We as a shareholder like how those companies look now because they have less of a carbon footprint. But the world doesn't change. It just goes from a transparent organization to an opaque organization. That is not going to get us to where we want to go as a society. And so these are issues we need to ask. And so I'm urging everybody to focus on this in a societal way, not just with public companies. And we need regulators.

When you ask Christian about coming together, if we could get one thing done in the G20s, the COP26 is have a one taxonomy, which we don't have at the moment, so we can judge companies worldwide in the same way. But two, we come to terms with the idea that we're trying to get all parts of society moving together, not just public companies, or we're going to have this incredible arbitrage of companies leaving the private -- leaving public domain into the private domain. We're going to see a lot of the worst assets just going into the private domain, then we don't change the world.

Jörg Eigendorf

Thank you, Larry. You touched very important topics here. Effectively, [indiscernible] short is how do we manage this transition? It's not black and white. It's not green or brown. It's how do we get from A to B as quickly as possible? What role for governments to play, what role for banks to play and what role for society?

Christian Sewing

Well, first of all, it's important that we are really not talking about a race, but that we are talking from ambition to impact. We need an impact now and not only the talk, but really impact. By the way, that was the reason why we declared last week or two weeks ago in our sustainability deep dive, that we don't want to even raise our absolute numbers for the time being, but we move it forward by two years in order to have an impact. Number two, the most important, because when we talk about ESG, of course, climate change is super important and it's a societal task. But we have to do it in a way that the S part is not lost on people's mindset. And that's what I'm always saying.

When we talk about the climate change and the transformation, for instance, German corporates have to do, it's our task as the bank to support the transformation integrate, but not to stop in an abrupt way the relationship with corporate. I think that would be the worst thing to do, because you leave something on the table, which is twofold. A, a societal problem in countries like, for instance, Germany or in others and the real issue exactly what Larry is saying is only moved from one country into another because the production will take place but at another part of the world, and it's not addressed.

And in this regard, I really do think that when we talk about the role of banks, the role of regulators; a, we need to take this jointly together with the governments. Secondly, there must be a clear understanding that with a certain ratio to be achieved or implemented by the end of next year, nothing is actually one. We need the understanding that this is a transformation over the next four, five, six years in order to come into the direction of net zero. But if we stop from one day to the other, also what we as public companies are sometimes by some of our shareholders, we do actually nothing good for the long term to the society, to the environment, and it will net zero not help the climate. And therefore, we need the joint understanding that this is a long way of transformation.

In this regard, I think the banks are very much there to support that. This is something where we want to be part of, but we need the understanding that this is a long-term race, that this needs joint understanding of regulators, governments and the private economy. And what Larry is saying is more than true. I can tell you in our M&A activities, in the mandates we are getting, we get so many mandates that we should advise public companies in order to get rid of the so-called bad part of their

production facilities. That goes privately. That goes somewhere else where it's not reported. That doesn't help the next generation. That is not the right thing to do. But therefore, we need to change the direction of speech, the direction how people and public companies are measured and we need a different understanding what is really needed.

And getting it right, ESG, getting it right is a 10-year task starting now and it must be a fundamental transformation. For that, the banks are there. And for that, to be honest, we need two other things. You need balance sheet in order to finance it, happy to do this. And in Europe, other than in the U.S., more than ever, we need the Capital Markets Union, because the financing needs in order to transform the economy in Europe cannot only be done by banks. We need a deeper capital market. And therefore, I kept saying and I keep saying the Green Deal in Europe will only come if the Capital Markets will also come -- the Capital Markets Union will come to Europe. The one thing is the necessity for the other and we should jointly work on both.

Jörg Eigendorf

Larry, we see the huge volume targets out and [indiscernible] very clear coming to an end and the final 1.5 minute, we see the huge volume targets out there. What will be the future metrics banks have to follow, companies have to follow? Is it carbon footprint? Is it green asset ratio? What will be the future of what everybody will scrutinize?

Laurence Fink

It has to be more than that. Just to further the conversation that Christian and I just had, Jörg, I don't believe in divestiture of public companies. And so their carbon footprint is going to be larger for a while. But I want to understand how are they evolving into a more green foundational company? How are they moving? How are they creating green hydrogen from regular hydrogen? How are they doing this? Some of the top energy companies are going to be the leaders in the decarbonization component of sequestering carbon.

And so it can't just be done through a metric as saying, and this is some of the risks we have, and we just use carbon footprint, then you have massive divestiture and the world doesn't get anywhere. These are very complex solutions that have to be done. And so to me, it's not about okay, what's your carbon footprint? If they could do it for BlackRock and we could do that, we can measure there. But the companies that are essential in the carbon world, and I'm talking about agricultural companies, because agriculture represents 18% of the footprint of carbon. I'm talking about steel and cement, they represent 10%.

We focus on a lot of other things, but there are many components that create this carbon footprint. It is not about just okay, a numeric number of where's your carbon footprint but I want to understand over this journey, how are you migrating and changing it? How are you creating -- I look at this using a financial term. I use the carbon or let's say energy and oil, that's an iostream. Okay. How are you going to navigate your iostream and create a new stream of revenues? Those are the things that we're going to do this fairly and justly is going to be how we're going to have to do it.

The last thing I just want to say and to link in ESG&E with the question on inflation, let's be clear. If we rush this and if our solution is entirely just to get a green world, we're going to have much higher inflation, because we do not have the technology to do all this yet to have it equivalent to the cheapness of hydrocarbons. And so that's going to be a big policy issue going forward too. Are we going to be willing to accept more inflation if the inflation is to accelerate our green footprint? And that's going to be a big policy question.

Jörg Eigendorf

A final question to both of you and just one word answer before I hand over then to Christian also for the one word answer and his final remarks. But, Larry, with that complex issue, are you an optimist or a pessimist that we get that done fast enough?

Laurence Fink

I've lived my life as being an optimist. Because when we talk about the problems and when we see the problems and the severity of the problems, we solve solutions. That is the beauty of human beings. We proved it with COVID, having a vaccination within 10 months. So if we focus on it, we talk about it, we talk about how severe it is, we'll fix it.

Jörg Eigendorf

Christian, you're an optimist.

Christian Sewing

I couldn't agree more. I think I said in my first answer to one of the question and now it depends on leadership. And if you have the right people around with the right mindset and with the long-term horizon and with the right spirit, to be honest, we will get the stuff. You need now to really get the right people in the world together in order to address it. And we have proven so many things over the last years and decades that I don't think this will stop us.

Question-and-Answer Session

Jörg Eigendorf

Thank you so much for this seventh conversation with Larry Fink on our Global Financial Services and FinTech Conference. I think for everybody who has followed us in the last 40 minutes, Larry, we would like to see an eighth conversation with Larry Fink and Christian next year again. Thank you so much. And thanks to everybody who followed us in the last 40 minutes. Thank you and goodbye.

Will The Demise Of Oil Take Longer, Just Like Coal? IEA and Shell Highlight Delays/Gaps To A Smooth Clean Energy Transition

Posted Thursday June 11, 2020. 1:45 MT

We expect one of the major global energy themes in 2021 will be that the world is not on track for a smooth energy transition to a world of clean energy. And this will be elevated to the #1 global energy theme if Joe Biden becomes President and moves to "r*ally the rest of the world to meet the threat of climate change."* There has been no pull back from the aspirational goal of almost every country for a clean energy transition, even in the face of a global economic crash. It is going to happen. The world is on a path for clean energy at the cost of fossil fuels. But this transition is not just adding more wind and solar. Rather it is complex, requires advancing a wide range of "*critical energy technologies*" and, most of all, a major jump up in investment capital. The IEA has just provided data to show the world is far behind in "*critical energy technologies*" and in invested capital for the energy transition. And this week, Shell's CEO noted his concerns (similar to the IEA) that also point to a disorderly energy transition. If the world isn't ready for this energy transition, it should point to a need for more oil and gas to fill the delay gap, and this should lead to delays in oil demand declines on the path to peak oil demand. We don't think the energy transition will impact oil demand by millions b/d. However, even if the energy transition delay only reduces oil demand declines by 0.5 mmb/d or more, it should help push back peak oil demand a few years. And this should be happening as non-OPEC oil supply sees an impact from the lower upstream capex over the past couple years and the massive capex cuts in 2020. And we think this helps support a higher WTI oil price by $5 for the 2022 to 2027 period whether you believe in the current forward strip for WTI averages ~$44 for 2022 thru 2027, or, if you are like us, believe in oil above the strip. Its support for a view that oil in the 2022 to 2027 period will stronger than expected. And maybe the demise of oil will be like the expected demise of coal – it will take longer than expected.

Shell warned the world is not ready for a smooth energy transition. Shell CEO's message was very clear and was captured clearly in the title of the Bloomberg Green Tuesday story "S*hell's CEO Worries About a Disorderly Energy Transition: Q&A".* The Shell CEO said "*The energy transition is massively complex. It will require orchestration on a scale that the world has never seen. If you don't start with it soon, it's going to be highly disruptive at the end or it's not going to happen. And both are unpalatable conclusions".*

"The energy transition is massively complex", its not just adding more wind/solar. The Shell CEO reminded of something that is overlooked by almost everyone, he said "t*he energy transition is massively complex. It will require orchestration on a scale that the world has never seen."* We think the most overlooked aspect of the energy transition is that it is much more than just adding more solar and wind to replace some portion of the fuel supply. One of the major challenges is replacing an electricity grid that has been built on fossil fuels, nuclear and hydro delivering high intensity energy on a continuous as needed for whatever is needed basis. Again, its not just adding solar and wind, its having the proper electricity storage, generation and delivery system to support this fossil fuels out/renewables in switch.

The IEA reminds the energy transition has many "*critical energy technologies*", the vast majority of which are not on track. 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

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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	

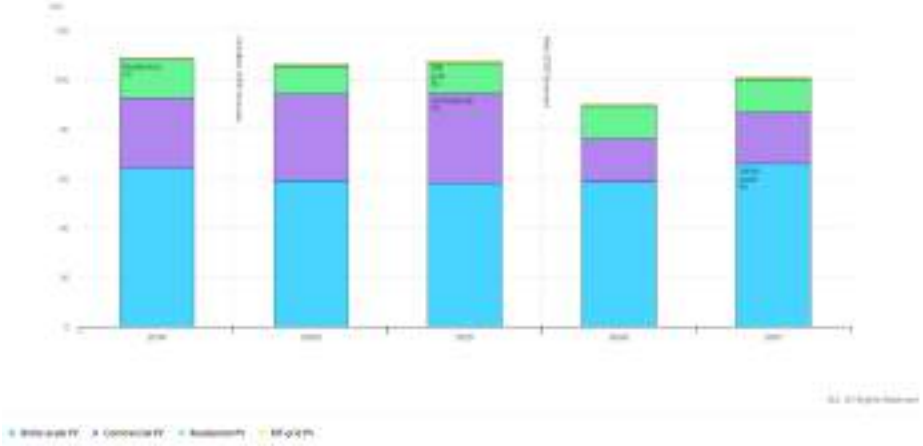
Source: IEA

On Track More Efforts Needed Not on Track

Source: IEA Tracking Clean Energy Progress, June 2020

Even the "on track" items like solar PV are seeing a pause in growth especially with lower 2019 and 2020 investment capital. As noted in the above chart, the IEA ranks Solar PV as one of its few green dots "on track" critical energy technologies. However, the IEA's tracking update also shows how COVID-19 has led to the IEA revising down its solar PV capacity additions forecast down by ~15% for 2020 and by ~5% for 2021 ie. solar PV additions won't get back to 2019 levels at least until 2022 or possibly 2023. The IEA explains "*Covid-19 has led to construction delays and weaker than anticipated investment, requiring us to revise capacity addition projections down by over 15% for 2020".*

IEA's Solar PV Capacity Additions, 2019-2021, October 2019 Forecast vs May 2020 Forecast



Source: IEA Tracking Clean Energy Progress, June 2020

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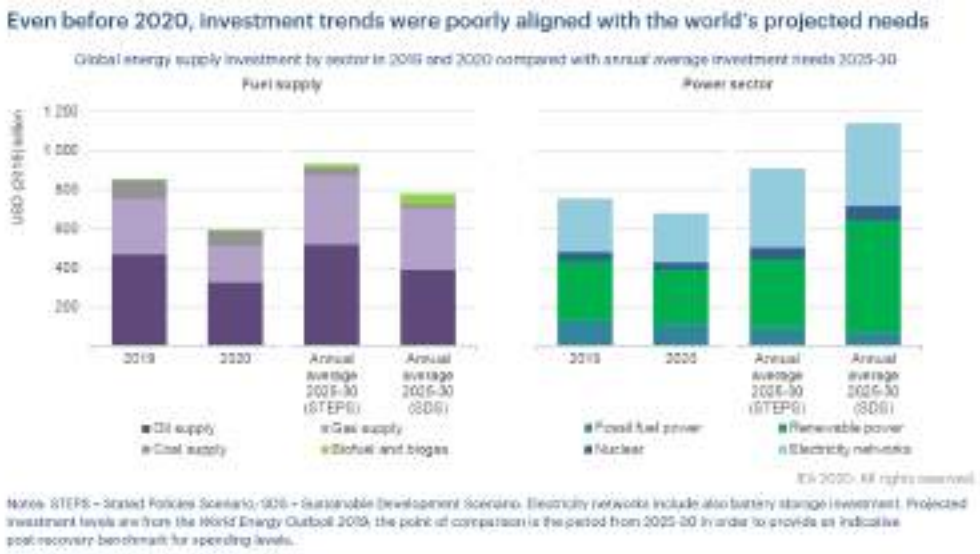
No surprise the energy transition is not on track, there hasn't been enough capital invested in the transition even before COVID-19. On May 27, we tweeted [LINK] "*Seems clean energy supply + related grid/infra won't be anywhere close to meet aspirational goals of many countries"* based on the IEA's just released that morning major report "*World Energy Investment 2020*" [LINK]. The IEA reviews investment in the full spectrum of energy including in 2020 and provided some excellent insight into the implications of the capital, or lack thereof, for the future. The IEA notes the required investment capital for clean energy wasn't being spent in 2019 and COVID-19 made the investment gap larger in 2020. Prior to 2020, the IEA estimated clean energy spending was relatively flat for 2015-2019, before declining in 2020. As is happening in almost every sector, the world economy crash in 2020 has led to be declines in invested capital in all energy sectors, including power and clean energy. In discussing renewables, one of the many shortfall IEA comments was on slide 90 "*Current investment levels are not aligned with a sustainable pathway. Compared with the average annual investments projected in the IEA SDS, power sector spending in 2019 was about 35% short of the level required a decade from now. There is a continued need for capital reallocation to meet energy security and sustainability goals, to bring in more low-carbon power and to ensure that renewable-rich systems can operate with sufficient system flexibility. The largest projected growth in investment to align with such a pathway would be required in solar PV and wind, on average an extra USD 160 billion of spending each year. Electricity networks would require an extra USD 150 billion from today's levels, in addition to a higher level of capital for other renewables and nuclear."*

IEA's Estimated 2019 and 2020 Invested Vs Future Required Investment



Notes: STEPS = Stated Policies Scenario; SDS = Sustainable Development Scenario. Electricity networks include also battery storage investment. Projected investment levels are from the World Energy Outlook 2019; the point of comparison is the period from 2025-30 in order to provide an indicative post-recovery benchmark for spending levels.

Source: IEA Tracking Clean Energy Progress, June 2020

Massive government intervention will be needed to get the energy transition closer to its energy transition miss. It doesn't make a difference what side of the clean energy fence someone is on, everyone knows that the energy transition has been, and must continue to be, driven by governments if there is to be any shot of trying to get closer to the energy transition target. The Shell CEO said something everyone knows – leaving it to the private sector to somehow fit all the pieces together on a timely basis won't work. It will require increasing government intervention. Bloomberg asked the Shell CEO "*All that will need a very heavy-handed government. Do you support that?"* And he replied "*If we believe that somehow the market is going to take care of this, that you put a price on carbon and everything will sort itself out, or that we can shame companies into doing it by having ESG frameworks that will tell them what is right and what is wrong, then I think we're kidding ourselves. This needs a very significant interventionist approach, and all industries have to be part of the intervention."*

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2021 could see a major global (and Canada) renewal push and commitment to the energy transition aspirational goal. The Nov 3 US presidential elections will determine if there is a renewed and urgent global push on climate change. The united global push for climate change was given a major kick in the pants when, on Nov 4, 2019, the Trump administration announced it was starting the formal process to withdraw from the Paris Accord. The official withdraw date would be Nov 4, 2020, one day after the upcoming US presidential election. And the reality is that the US had effectively ceased to have any interest in working on climate change since President Trump was elected in Nov 2016. It still ~5 months to the election, but Joe Biden is currently running well ahead. One of his climate change priorities [LINK] is to "*Rally the rest of the world to meet the threat of climate change"* and he also tries to deal with the need to catch up investment saying "*the United States urgently needs to embrace greater ambition on an epic scale to meet the scope of this challenge*". But, at least in the US, we see Biden's initial 2021 push for climate change initiatives to be more aspirational than specific programs as he will be restrained to some degree by the increasing US debt and the expected slower recovery of the US economy as noted by Fed Chair Powell yesterday. In Canada, we believe we could see a similar new urgency to climate change in 2021. We recognize it isn't a major topical item today, but we believe there is a good chance for an early fall federal election and, if the polls hold, the Liberals would likely have a majority government. We believe that, even with the massive debt increases, this would lead to increasing federal government support for clean energy initiatives in Canada and possibly (likely?) to support clean energy initiatives in developing countries.

The aspiration to spend more will be there, but increasing government debt levels will have to limit government incentives that require government capital or hurt government revenues. The reason why the IEA report caught our attention is that the investing gap was worse in 2020 when 2019 was already lagging Its hard to see the scenario where 2021 investing jumps up significantly above 2019 to start to close the gap. Rather, we have to believe the gap will, at best, be maintained in 2021. No one has to be an economist to know that every country in the world is taking on massive debt in its fight against the economic shut down from COVID-19. Our concern is that the increased debt has to force all governments to go slower than they would want on the clean energy transition. This will just widen the gap. The countries that have a reasonable financial position will continue to support clean energy advancement, but their pace will inevitably be slowed down due to balance sheets. Its why we think a Biden presidency will be more aspirational in 2021. Yesterday, the US Treasury Dept [LINK] reported there continues to be an accelerating in US federal government debt. It reached $26 trillion, after hitting $25 trillion on May 5, and $24 trillion on April 7. US debt is up over $6 trillion since the Nov 2016 elections. Our SAF June 7, 2020 Energy Tidbits [LINK] highlighted the Thurs June 4 German government $145b stimulus package and that it included a doubling of EV purchase incentives, but did not include any incentives for ICE vehicles. It was also interesting to see how the German government targeted cheaper EVs as the priority to get a broader EV penetration. But then there are most countries, such as Mexico, that are having a much tougher time with the economic hit from COVID-19. On May 16, we tweeted [LINK] "*Not yet law, but seems Mexico will move to "temporarily" limit renewables. COVID-19 has been impacting near term power/#NatGas demand, but any limit on renewables should restore Mexico's steady increase in #NatGas consumption as economy restarts and need for US #NatGas supply".* Mexico's concern was that it needed to maintain the reliability of the electricity grid in the face of the COVID-19 health crisis, but the reality is that it doesn't have any financial flexibility to support any new renewable initiatives for the time being. If governments are going to provide some form of incentive, they need to have the financial capacity to do so and many governments do not have that luxury. COVID-19 is only going to increase the gap and put the energy transition further behind. This is a key point from the IEA's reports.

We think the decline rate in oil demand on the path to peak oil demand will be like coal's demise – slower than expected, especially with the delays and gaps in the clean energy transition. We believe the world is on the path to a clean energy transition and there will be peak oil demand. But we always think about coal when we think about the energy transition that will lead to peak oil demand. No one ever disagreed that governments will going to intervene to move to eliminate coal power generation. But it hasn't happened anywhere near as quickly as expected. When we see the Shell CEO comments and IEA reports, its clear that the energy transition isn't going as smoothly and quickly as expected. Most importantly, the IEA highlighted that investment in clean energy is too low and there are too many "*critical energy technologies*" that are not on track. And to use the demise of coal analogy, this should point to better demand for oil for a good portion of the 2020s. Our May 27 tweet on the IEA investment report also said "*Seems clean energy supply + related grid/infra won't be anywhere close to meet aspirational goals of many countries. Good for oil/gas prices in mid 20's, will need more oil/gas just as impact of big capex cuts kick in*." It doesn't have to be a huge change in demand, even

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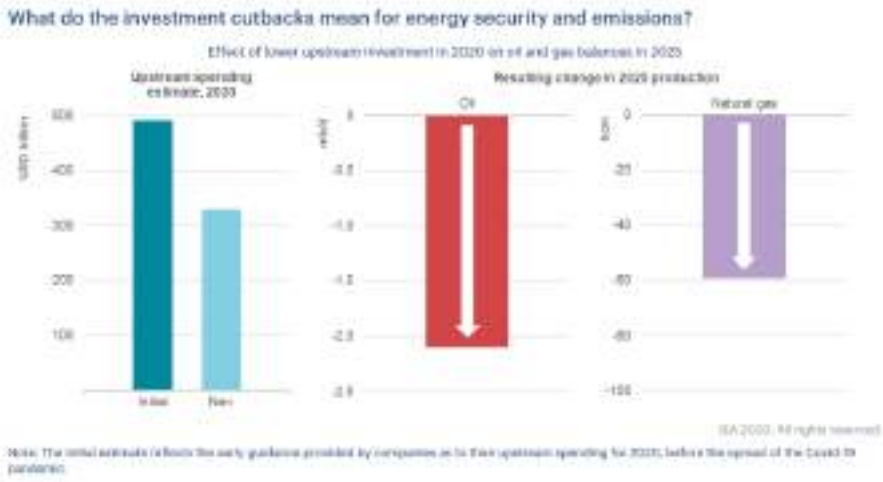
if demand is only 0.5 mmb/d or a little better than the expected decline in oil demand growth rates in the 2020s on the path to peak oil demand. It will be a positive to oil price expectations as it will happen during the period that will see the impact of underinvestment in oil today from the past couple years, and more so from the massive upstream underinvestment in 2020. Below is the IEA's May 27 below graph showing how the underinvestment in oil in 2020 will hurt 2025 production by ~2 mmb/d. Plus the global oil industry has moved away from long cycle projects like major 100,000 b/d oil sands projects so there aren't an inventory of large long cycle projects in inventory. And even if oil prices are much stronger than expected, oil companies won't re-add long cycle oil projects given that that the energy transition (while delayed) is solidly the goal.

IEA Impact of Lower Upstream Spending In 2020



Source: IEA World Energy Investment 2020

There is a big difference for oil if WTI is >$50 versus >$40. There is a big difference to the US/Canada oil sector if WTI is >$50 or >$40. We don't think we need to see hugely better oil prices, just better visibility looking to oil for 2022 thru 2027. We think the IEA and Shell views will become more broadly accepted once there is a focus on a post COVID-19 world. We don't see a huge impact, but rather believe its reasonable to see this clean energy transition delay will lead to a lesser decline in oil demand growth rates on the way to peak oil demand. It doesn't have to be a huge impact, but even if its only delaying oil demand decline by 0.5 mmb/d thru 2027, we could see the potential to impact oil by $5 whether you believe in the WTI forward strips (currently average ~$44 for the 6 years 2022 thru 2027, before WTI reaches $50 in 2028), or if you are already more bullish (as we are) expecting oil above these forward strips. As noted above, these delays should happen when the impact of upstream underinvestment kicks in. In addition, we don't expect to see any major oil company approve a large long cycle oil project like the former +100,000 b/d oil sands projects, especially as these major oil companies are all committing to reduce emissions and be leaders in the clean energy transition. If there is stronger oil demand in the 2022 to 2027 period and WTI >$50, it means that the likely winners will be those with spare capacity (ie. OPEC+), or effective spare capacity from short cycle quality shale/tight oil in US and Canada, and also oil projects that have multi phase quick cycle development like Exxon in offshore Guyana, or even small scale SAGD.

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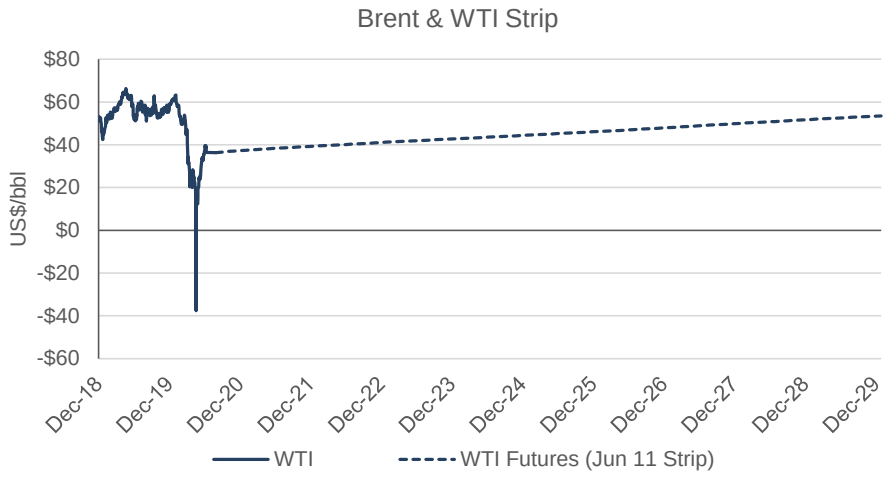
WTI Oil Price Futures



Source: Bloomberg

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Excerpt Bloomberg transcript Chevron at Bernstein June 2 conference

Bernstein analyst. "*I think about the remaining resource in Venezuela or frankly in Canada, it is an oil sands type project. Can you think about the future of oil sands investment in sort of the context of the energy transition and Scope 1 and Scope 2 emissions? Is there a future for significant growth there?"*

Chevron CEO. ": *Well, I think it's one of the most challenged asset classes there is, because it's an energy intensive asset class to develop. And so absent some real significant progress on carbon capture and storage and offsets, I think production that requires thermal production techniques becomes really at the margin, right, it's more costly, it's more energy intensive, it's more carbon intensive. And so we're trying to preserve the option to help rebuild the country. We will have to see what would be the technical approach, which classes of fields would we prioritize and how would we try to deal with reducing the carbon intensity of that if we got back into a development mode there*".

Bernstein analyst. "*We had an investor question on the Canada side of that. Thoughts on your oil sands assets in Canada still like over the long-term or could you change to non-core to invest in your other assets or M&A?*

Chevron CEO. "*Yeah. So we -- our one meaningful position up there is a 20% interest in the Athabasca Oil sands project. CNRL is the operator, Shell initially was the large partner, Marathon within there as well. And it's an asset that's within the scale of our overall portfolio, not especially large, doesn't call for much capital here over the next period of time, and generates pretty good cash flow on a market like we're in right now. But I wouldn't deem at a strategic position. I mean, I think we've done some portfolio high grading here over the last few years, and at the right value, and we don't need to sell anything, because our balance sheet is strong and our cash position is good. So we're not in the kind of fire sale mentality, but if we've got what we think is fair value for an asset like that, we've been willing to transact on things that are of that scale and kind of relative important in the portfolio*."

https://hub.united.com/2021-06-03-united-adding-supersonic-speeds-with-new-agreement-to-buy-aircraft-from-boom-supersonic-2653216403.html

United Adding Supersonic Speeds with New Agreement to Buy Aircraft from Boom Supersonic

First U.S. airline to sign commercial agreement with Boom Supersonic

June 03, 2021

CHICAGO and DENVER, June 3, 2021 /PRNewswire/ -- United Airlines today announced a commercial agreement with Denver-based aerospace company Boom Supersonic to add aircraft to its global fleet as well as a cooperative sustainability initiative – a move that facilitates a leap forward in returning supersonic speeds to aviation.

Under the terms of the agreement, United will purchase 15 of Boom's 'Overture' airliners, once Overture meets United's demanding safety, operating and sustainability requirements, with an option for an additional 35 aircraft. The companies will work together on meeting those requirements before delivery. Once operational, Overture is expected to be the first large commercial aircraft to be net-zero carbon from day one, optimized to run on 100% sustainable aviation fuel (SAF). It is slated to roll out in 2025, fly in 2026 and expected to carry passengers by 2029. United and Boom will also work together to accelerate production of greater supplies of SAF.

"United continues on its trajectory to build a more innovative, sustainable airline and today's advancements in technology are making it more viable for that to include supersonic planes. Boom's vision for the future of commercial aviation, combined with the industry's most robust route network in the world, will give business and leisure travelers access to a stellar flight experience," United CEO Scott Kirby said. "Our mission has always been about connecting people and now working with Boom, we'll be able to do that on an even greater scale."

Capable of flying at speeds of Mach 1.7 – twice the speed of today's fastest airliners – Overture can connect more than 500 destinations in nearly half the time. Among the many future potential routes for United are Newark to London in just three and a half hours, Newark to Frankfurt in four hours and San Francisco to Tokyo in just six hours. Overture will also be designed with features such as in-seat entertainment screens, ample personal space, and contactless technology. Working with Boom is another component of United's strategy to invest in innovative technologies that will build a more sustainable future of air travel.

"The world's first purchase agreement for net-zero carbon supersonic aircraft marks a significant step toward our mission to create a more accessible world," said Blake Scholl, Boom Supersonic founder and CEO. "United and Boom share a common purpose—to unite the world safely and sustainably. At speeds twice as fast, United passengers will experience all the advantages of life lived in person, from deeper, more productive business relationships to longer, more relaxing vacations to far-off destinations."

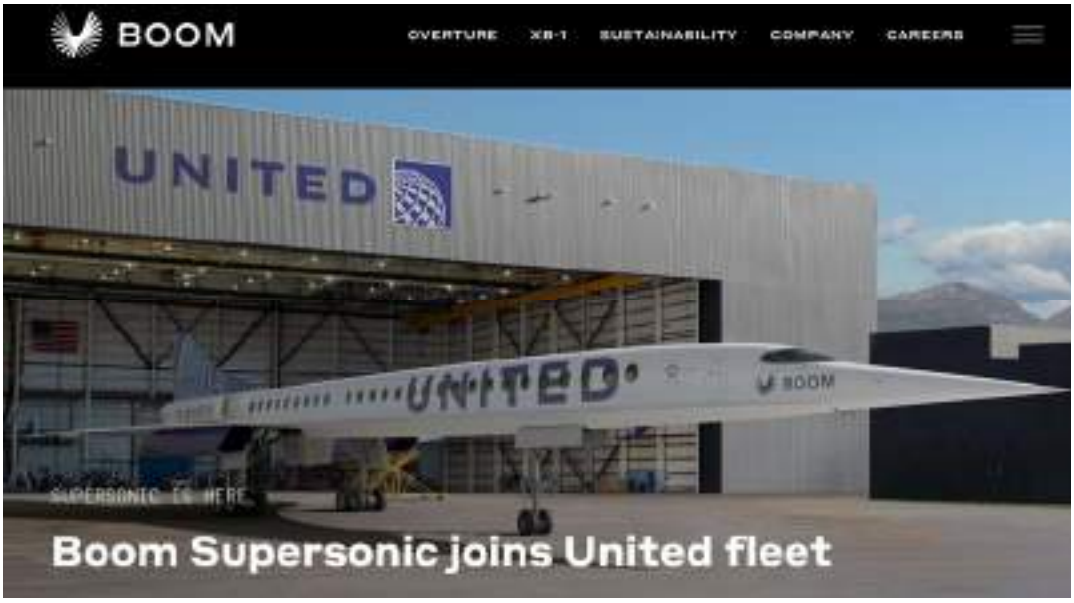
About United

United's shared purpose is "Connecting People. Uniting the World." For more information, visit united.com, follow @United on Twitter and Instagram or connect on Facebook. The common stock of UAL is traded on the Nasdaq under the symbol "UAL."

About Boom Supersonic

Boom Supersonic is redefining commercial air travel by bringing sustainable, supersonic flight to the skies. Boom's historic commercial airliner, Overture, is designed and committed to industry-leading standards of speed, safety, and sustainability. Overture will be the first commercial aircraft to be net-zero carbon from day one, capable of flying on 100% sustainable aviation fuels (SAF) at twice the speed of today's fastest passenger jets. Overture's order book, including purchases and options, stands at 70 aircraft, and Boom is working with the United States Air Force for government applications of Overture. XB-1, a demonstrator aircraft, rolled out in 2020, and its net-zero carbon flight test program is underway. The company is backed by world-class investors, including Bessemer Venture Partners, Prime Movers Lab, Emerson Collective and American Express Ventures. For more information, visit https://boomsupersonic.com.

https://boomsupersonic.com/



https://boomsupersonic.com/united

UNITED GOES SUPERSONIC

United becomes first U.S. airline to sign aircraft purchase agreement with Boom Supersonic

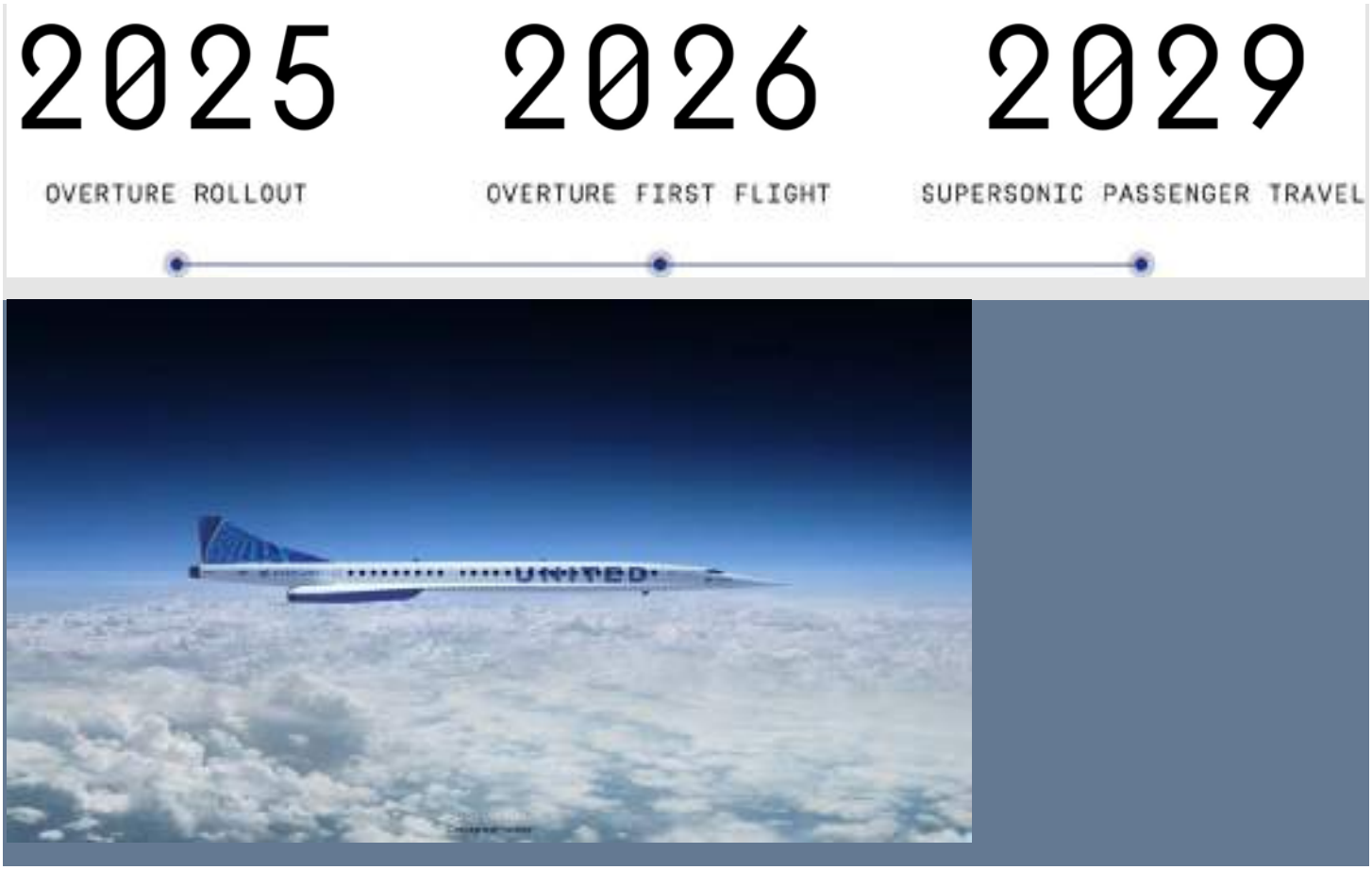
United will purchase 15 of Boom's 'Overture' airliners, once Overture meets United's demanding safety, operating and sustainability requirements, with an option for 35 more aircraft. Slated to carry passengers in 2029, the net-zero carbon aircraft will fly on 100% sustainable aviation fuel (SAF).

PARTNERSHIP

Transforming the way we travel

Through innovation and collaboration, United and Boom are realizing a shared mission to connect the world safely and sustainably. At speeds twice as fast as today's passenger jets, United's new Overture fleet will open countless possibilities for new experiences and human connection.

Roadmap to supersonic travel



“United continues on its trajectory to build a more innovative, sustainable airline and today’s advancements in technology are making it more viable for that to include supersonic planes. Boom’s vision for the future of commercial aviation, combined with the industry’s most robust route network in the world, will give business and leisure travelers access to a stellar flight experience. Our mission has always been about connecting people and now working with Boom, we’ll be able to do that on an even greater scale.”

Scott Kirby

CEO, UNITED AIRLINES

LEARN MORE ABOUT UNITED'S ENVIRONMENTAL COMMITMENT

POSSIBILITIES

Where would you go?

Overture travels at twice the speed of today's fastest passenger jets, leaving no destination out of reach.

NEW YORK/NEWARK TO LONDON

NEW YORK/NEWARK TO FRANKFURT

SAN FRANCISCO TO TOKYO

“The world’s first order of net-zero carbon supersonic aircraft marks a significant step toward our mission to create a more accessible world. At speeds twice as fast, United passengers will experience all the advantages of life lived in person, from deeper, more productive business relationships to longer, more relaxing vacations to far-off destinations.”

Blake Scholl
FOUNDER & CEO, BOOM SUPERSONIC

The Overture experience

Get on board

The Overture onboard experience is designed for comfort, productivity and privacy, featuring in-seat entertainment screens, ample personal space, and contactless technology.

PASSENGER CAPACITY

65 to 88

CRUISING ALTITUDE

60,000 FT

CARBON

NET-ZERO

LENGTH

205 FT

SPEED

MACH 1.7

RANGE

4250 NM (4888 MI

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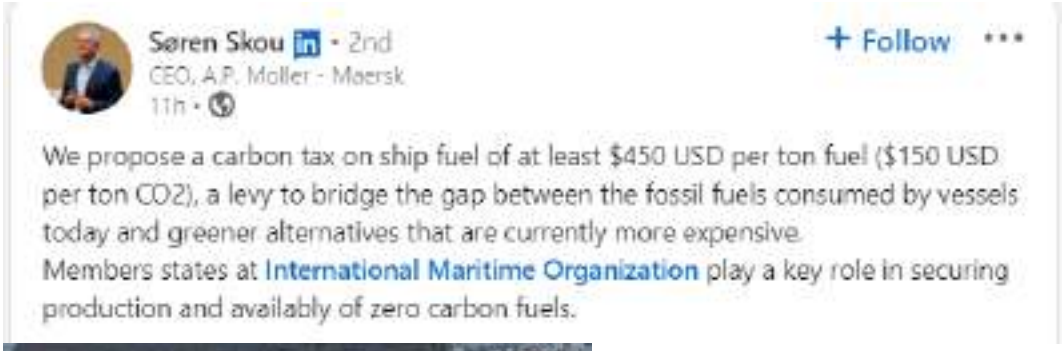
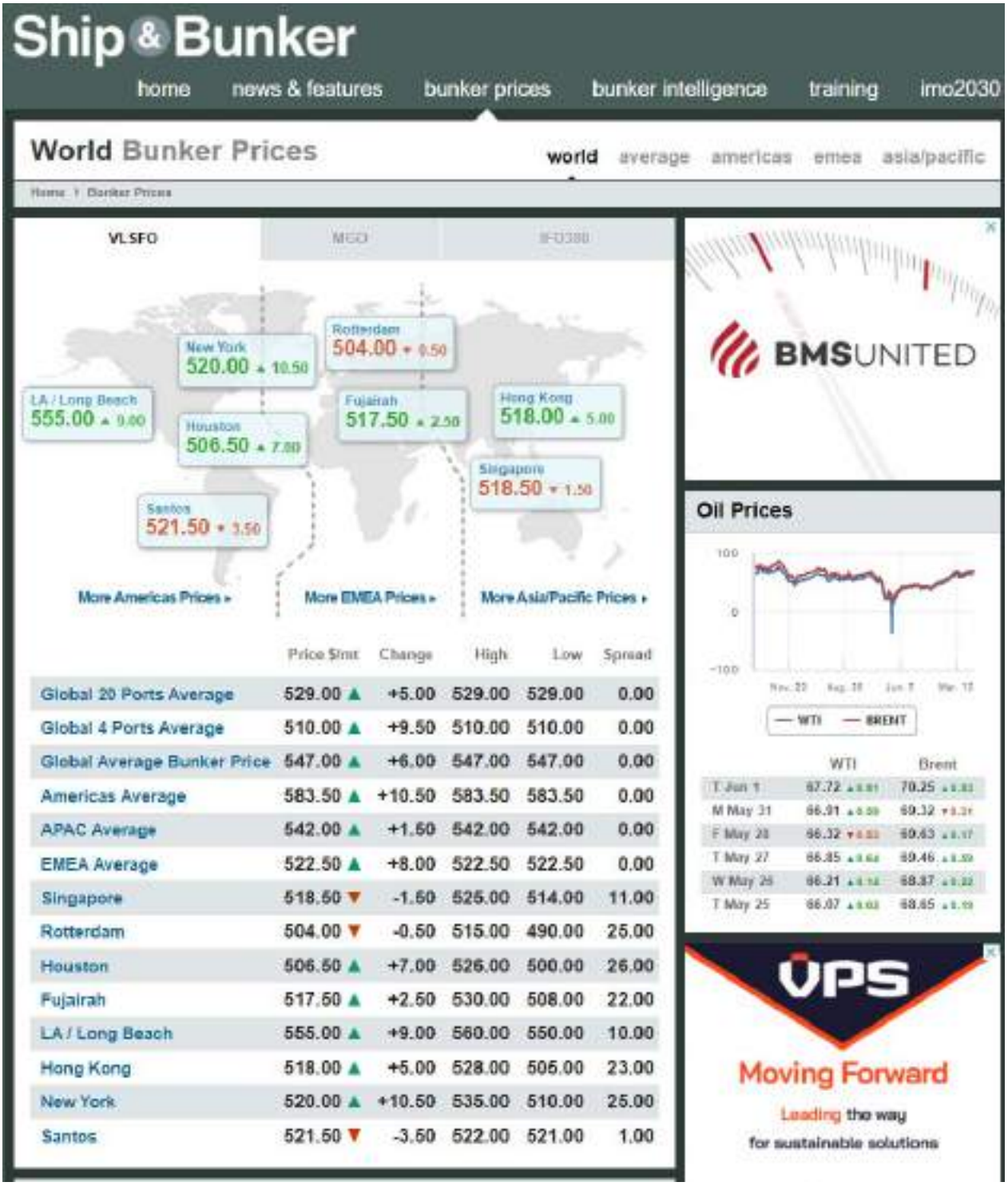


https://shipandbunker.com/prices



Excerpts from https://www.adb.org/sites/default/files/institutional-document/699206/energy-policy-draft-consultation.pdf
Asian Development Bank
Draft Paper for Consultation
May 2021
Energy Policy: Supporting Low Carbon Transition in Asia and the Pacific

86. ADB will not finance any coal mining, oil and natural gas field exploration, drilling or extraction activities. ADB will not finance any new coal-fired capacity for power and heat generation or any facilities associated with new coal generation. ADB will support DMCs to mitigate the health and environmental impact of existing coal-fired power plants and district heating systems through financing of emission control technologies. However, ADB will not participate in investments to modernize, upgrade, or renovate coal facilities that will extend the life of existing coal-fired power and heating capacity unless it is to re-engineer such plants for use of cleaner fuels, such as natural gas or renewable energy sources. For re-engineering to natural gas, the project must demonstrate how it will contribute to a country achieving net neutrality by mid-century, such as through retirement or adoption of carbon capture, utilization and storage by that time. ADB will support DMCs in planning for early retirement of coal power plants and will support decommissioning of coal power plants and site redevelopment for new economic activity, including cleaning of hazardous materials, restoring soil and water, redevelopment of the buildings, and upgrading existing infrastructure. In providing support for coal phase out, ADB will support new job creation in cooperation with the local communities and stakeholders. The development of an approach for just transition will support ADB in this development.

87. ADB may finance natural gas projects (including gas transmission and distribution pipelines, LNG terminals, storage facilities, gas-fired power plants, natural gas for heating and cooking) when the following conditions are all met: (i) provides energy services to those who currently are without said energy service or will provide a more modern means of providing the same energy service (e.g., natural gas stoves to replace traditional biomass stoves or natural gas power to provide last-mile electricity); ii) demonstrates that no other technology can provide the same energy service at an equivalent economic cost that considers the social cost of carbon (i.e., natural gas power would be compared to renewables plus storage to provide the same level of service); iii) uses high-efficiency and internationally best available technologies for new plants, retrofit or fuel switching, replacement, energy efficiency improvement, or heating projects; (iv) for natural gas power generation, will result in a net reduction in grid emission factor (e.g., natural gas or replacing diesel or coal power); and v) demonstrates alignment with targets to achieve carbon neutrality by mid-century, avoiding long-term lock-in into carbon infrastructure and significant risk of creating stranded assets. ADB will define sound screening criteria for other fossil fuel-generation projects, notably natural gas. A detailed guidance note will be issued to staff.

bp boosts its renewables business in the US with 9GW solar acquisition from 7X Energy

1 June 2021

- Acquiring 9GW pipeline of high-quality solar projects
- Accelerates progress towards target of developing 20GW of low carbon energy by 2025
- Demonstrates bp's continued commitment to investing in clean energy in the US
- Projects expected to meet bp's disciplined 8-10% returns threshold.

bp reached an agreement today to purchase 9GW of solar development projects in the US from independent US solar developer 7X Energy. The acquisition represents a significant step towards bp's target of growing its net developed renewable generating capacity to 20GW by 2025 and aim to increase this to 50GW by 2030.

The deal will also grow bp's renewables pipeline from 14GW to 23GW. The assets will be developed through bp's 50-50 solar joint venture Lightsource bp, a global leader in solar energy, applying Lightsource bp's capabilities to accelerate bp's renewables targets.

bp will pay 7X Energy $220 million for the projects and 1GW of "safe harbour" equipment and expects the acquisition to complete in 30 days. The projects are expected to meet bp's disciplined low carbon investment criteria, generating returns of at least 8-10%.

Dev Sanyal, bp executive vice president of gas and low carbon energy, said: "With this purchase, we are continuing to put our strategy in action as we grow our renewables business in a deliberate and disciplined way. It brings us 9GW of high-quality solar projects in markets where we can create integrated renewable energy offers through our trading and customer franchises.

"We will bring the industry-leading expertise of Lightsource bp together with the breadth of bp's integration capabilities in the US to develop this portfolio of projects. This is a significant step as we continue to deliver on our net zero ambition."

Dave Lawler, bp America chairman and president, said: "bp's new high-quality solar portfolio will provide low carbon energy, create US jobs and deliver the competitive returns our shareholders expect.

"In line with our strategy, we'll aim to integrate these projects with our existing onshore and offshore wind, natural gas, and trading and shipping businesses to give customers what they want - reliable, affordable and clean energy."

Solar energy is the fastest growing power source in the US and is expected to quadruple over the next 10 years. It currently accounts for more than 40% of all new electricity generating capacity added in the US.

The projects are spread across 12 US states, with the largest portfolios in Texas (ERCOT) and the Midwest (PJM). Assets with a combined generating capacity of 2.2GW are expected to reach final investment decision (FID) by 2025, with the remaining progressing by 2030. Once developed, these projects will have the capacity to generate enough clean energy to power around 1.7 million US homes. The development is also expected to support thousands of jobs through construction.

As an integrated energy company, bp is able to combine its trading, mobility and customer expertise with Lightsource bp's world-class solar project development experience and execution capabilities.

Nick Boyle, group chief executive officer of Lightsource bp, added: "This transaction speaks volumes about the success of our JV with bp, and how we leverage each other's strengths to realize our ambitions for solar and a low-carbon future. It also positions Lightsource bp as a growing force in the US solar market, as we expand our portfolio across the United States."

bp is America's largest energy investor since 2005, investing more than $125 billion in the economy and supporting more than 125,000 additional jobs through its business activities.

Further enquiries:

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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 forecasts, projections and other 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. By their nature, forward-looking statements involve risk and uncertainty because they relate to events and depend on circumstances that will or may occur in the future and are outside the control of bp. 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’.

Our most recent Annual Report and Form 20-F is 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

bp capital markets days

Bernard Looney
Chief executive officer

INTRODUCTION

Thank you Spencer for a brilliant overview – and highly entertaining, as always.

What we have just heard has informed everything else you are going to hear from us for the rest of this week.

What I'd like to do now is three things.

First, emphasize the connections between our strategy, our ambition and the context provided by the energy outlook.

Second, to provide a brief recap of the three things we set out on the 4th of August – the strategy itself, the financial frame and the investor proposition.

And third, introduce five key questions we have heard so far about the strategy – and that we are aiming to answer this week.

1. CONTEXT

Now starting with those connections.

As you just heard, global energy demand is going up.

Emissions do not look like they are coming down fast enough.

The world is not on a sustainable path.

But as Spencer points out – this is not set in stone – there is no one fixed pathway – there is no one single solution.

There are a range of possible pathways to Paris, and that range is fundamental to how we

Lightsource bp alone has 16 gigawatts in its pipeline – up from 9.8 gigawatts this time last year and just 1.6 gigawatts in 2018.

And, of course, we are now entering the offshore wind sector, which is growing faster than any other form of renewable energy.

I am really excited about the partnership we have agreed to create with Equinor. They are a world-class offshore wind company and we look forward to growing with them.

[PAUSE]

But let me be clear.

We know what happens when volume becomes more important than value.

And therefore we will only pursue opportunities that we believe can generate the disciplined returns we expect, and our shareholders expect.

And that links to the fourth question.

Can we deliver the 8-10% returns from renewables?

The answer is very simply – yes.

We actually believe we can do better, and these returns could turn out to be conservative. But let me take you through why we have absolute confidence in our plan.

It is firstly based on experience – specifically with Lightsource bp

Since we formed the partnership at the start of 2018, Lightsource bp has expanded its presence from 5 to 13 countries.

As I mentioned, it has grown its project pipeline from 1.6 gigawatts to 16.

And it has delivered 17 projects since 2018.

They typically achieve returns in the 8 to 10% range.

So how do we get to 8 to 10% across our renewables portfolio as a whole?

First, we know returns start at around 5 to 6% on an equity basis in a competitive auction.

Second, we believe that through our extensive experience in operations and project management – we can add value through applying our processes. We have track record here. For example in Biofuels – where we have, and more recently through bp Bunge, have increased the efficiency in harvesting by 50% since 2016.

Third, we'll integrate with the rest of bp. Through Trading where we have a long track record – over 30 years – of delivering close to a 2% return uplift. Or through the application of our digital expertise to drive additional performance. Or by bundling our renewables offer with different forms of energy along with our Natural Climate Solutions and offsets portfolio, to give customers what they want – clean, low cost and firm energy.

Fourth, we will use leverage which is typical in this industry.

The combination of these four areas gets us to 8-10%.

Beyond this – we have the choice to optimize the portfolio – to farm down or not – and if we do – that could add a further 1 to 2%.

So yes – we are confident we can deliver the returns we are targeting.

Now the fifth and final question – why bp? What is our competitive advantage – really?

Especially in this new world.

And there are four reasons:

First – our strong track record in operations and project management.

Second – our focus on relationships and partnerships around the world,

Third – our approach to digital and how we are using it to drive cost benefits and generate incremental value

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https://www.wsj.com/articles/solar-powers-land-grab-hits-a-snag-environmentalists-11622816381

Solar Power's Land Grab Hits a Snag: Environmentalists

Mojave Desert residents say they support clean energy, but not giant projects, citing threat to tortoises and views

Solar arrays at the Harry Allen Solar Project near Moapa, Nev., in February.

By Jim Carlton

/ Photographs by Bridget Bennett for The Wall Street Journal

June 4, 2021 10:19 am ET

MOAPA VALLEY, Nev.—This windswept desert community is full of clean energy supporters including Suzanne Rebich, an airline pilot who recently topped her house with 36 solar panels. About 200 homes generate their own solar energy and a quarter of the local electricity supply comes from hydroelectric power.

All the same, many here are dead set against a planned solar plant atop the Mormon Mesa, which overlooks this valley 50 miles northeast of Las Vegas. Slated to be the biggest solar plant in the U.S., the Battle Born Solar Project by California-based Arevia Power would carpet 14 square miles—the equivalent of 7,000 football fields—with more than a million solar panels 10 to 20 feet tall. It would be capable of producing 850 megawatts of electricity, or roughly one-tenth of Nevada's current capacity.

"It will destroy this land forever," Ms. Rebich, 33, said after riding her bicycle on the 600-foot high mesa.

Across the U.S., more than 800 utility-scale solar projects are under contract to generate nearly 70,000 megawatts of new capacity, enough to power more than 11 million homes, equivalent to Texas and then some. More than half this capacity is being planned for the American Southwest, with its abundance of sunshine and open land.

These large projects are increasingly drawing opposition from environmental activists and local residents who say they are ardent supporters of clean energy. Their objections range from a desire to keep the land unspoiled to protection for endangered species to concerns that their views would no longer be as beautiful.

Unlike past fights between polluting industries and environmentalists, this one pits people who say they want more renewable power against companies that want to generate it. It threatens to

significantly slow efforts by the Biden administration and businesses to fight climate change by reducing America's carbon emissions.

"An energy system based on renewables is still an industrial-scale system, with large generation and transmission projects that people don't necessarily want in their neighborhoods," said Samantha Gross, director of the Energy Security and Climate Initiative at the nonpartisan Brookings Institution.

Tortoise habitat

Conservationists say clean energy shouldn't come at the cost of damaging the environment or threatening endangered species. The Sierra Club, which describes itself as "a relentless advocate for the decarbonization of the electric grid via renewable energy sources," is one of several environmental groups opposing a 690-megawatt solar plant on prime desert tortoise habitat off Interstate 15 about 35 miles northeast of Las Vegas.

The $1 billion project, known as Gemini, would, like Battle Born, be developed by Glendale, Calif.-based Arevia and connect to the NV Energy Inc. transmission system.

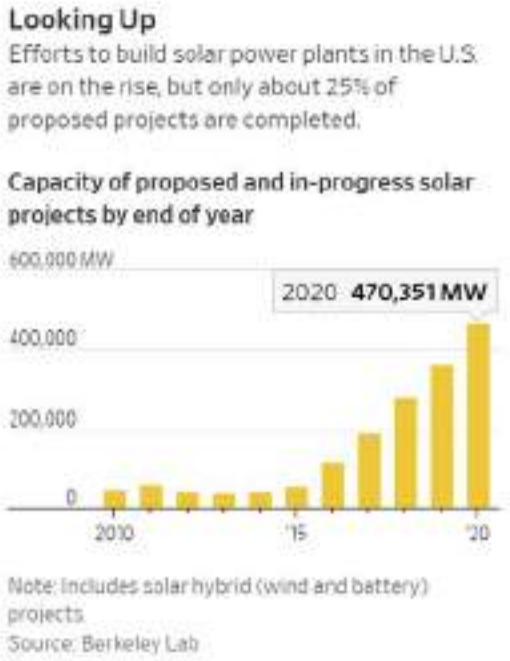
While the Sierra Club supports utility-scale clean energy, their expansion "must be done with care to avoid impacts to imperiled wildlife and their habitats," among other considerations, said Karimah Schoenhut, an attorney with the Oakland, Calif.-based group.

Desert vegetation on Mormon Mesa, where Arevia Power wants to build the Battle Born Solar Project on land owned by the U.S. Bureau of Land Management.

Solar generation has grown to 4.5% of the nation's electricity supply from 0.1% in 2010, due largely to plummeting prices for equipment. Producing utility-scale solar is now similar to or

below the cost of gas and all other energy technologies, even before including government incentives, according to investment bank Lazard Ltd.

Of the total 97 gigawatts of solar energy capacity installed in the U.S., 16, or nearly one-fifth, comes from residential sources such as rooftop panels, according to a 2020 report by the Solar Energy Industries Association and Wood Mackenzie.



Expanding solar and wind power is part of President Biden's plan to convert the nation's power grid to 100% renewable energy by 2035. One of the biggest obstacles is local residents and environmental groups that can tie up solar and wind projects in regulatory reviews or courts for years. Already, activists have blocked or are seeking to block projects in Nevada, Washington, Indiana and Virginia.

Similar battles have broken out over other big renewable energy projects, such as offshore wind turbines in places including Martha's Vineyard, which on May 11 received a go-ahead from the Interior and Commerce departments 12 years after state and federal officials first started the process of building there.

San Bernardino County, Calif., which lists renewable energy as a foundation of its move toward sustainable development, in 2019 put the brakes on new proposals for large solar projects near more than a dozen rural communities, where residents complained of potential dust.

“There were tons of these proposed, so the communities got together and started to fight back,” said Brian Hammer, a leader of the fight to stop solar plants in the Lucerne Valley, where three would have nearly encircled his desert home.

Solar-industry executives say they construct their projects responsibly and that building them fast can help combat climate change. “Responsibly developing solar and storage projects on public lands delivers tremendous benefits to the region, state and everyone wanting to preserve this valuable ecosystem,” Ricardo Graf, managing partner of Arevia, said in a written statement.

Signs alert visitors to desert tortoises and other wildlife at an entrance to the approved Gemini Solar Project site northeast of Las Vegas.

A spokesman for the Bureau of Land Management, which oversees public land where 81 applications for solar plants are pending, said the agency works with residents, interest groups and other affected parties “to develop mitigations which allow solar projects while protecting resources.”

The BLM is charged under the Energy Act of 2020 with permitting at least 25,000 megawatts of renewable energy capacity by 2025, but spokesman Richard Packer said some projects would get approved faster than others. The agency now has 6,900 megawatts in operation, enough to power 1.1 million homes.

Feinstein bill

Solar power plants have faced opposition from activists and politicians from both parties since the industry’s early days. In 2009, California Democratic Sen. Dianne Feinstein—a longtime supporter of renewable energy—introduced a bill to create the Mojave Trails National Monument on one million acres to safeguard pristine desert where several solar plants had been planned. The bill didn’t try to stop those plants altogether, just redirect them onto private

property and public lands that had already been disturbed, such as by grazing. President Barack Obama signed the bill into law in 2016.

Sen. Feinstein has backed clean energy projects in parts of the desert that need less conservation, such as are allowed in a 2016 state-federal agreement called the Desert Renewable Conservation Plan. “It’s important to understand that we don’t have to choose to either protect the desert or build more clean energy infrastructure—we can and already are doing both,” she said in a written statement.

Recently, Nevada has gone all in on solar development. On Earth Day of 2019, Gov. Steve Sisolak, a Democrat, signed a bill to increase Nevada’s renewable energy portfolio to 50% by 2030—one of the most ambitious targets in the nation.

Over the past five years, more than 50 solar plants have been built in Nevada with generating capacity of about 1,000 megawatts, enough to power Reno. Another two dozen totaling more than 3,500 megawatts are in the planning stage, led by the two biggest,Gemini and Battle Born.

Both projects had been in the offing under different companies since 2007, but didn’t gain momentum until the current push for clean energy. Gemini was put on a regulatory fast track. It drew opposition from environmental groups and the Moapa Band of Paiutes, whose reservation sits next to the proposed solar plant along Interstate 15 about 35 miles east of Las Vegas.

“This is a clear environmental justice issue that cannot go unaddressed,” the tribe said in an Oct. 10, 2019, letter to Bureau of Land Management officials, citing impacts including noise, dust and damage to its ancestral homeland.

Tribal power

Tribal members say they support solar power, noting that they allowed a 250-megawatt facility to be built on their lands in 2017.

Co-founder of Basin and Range Watch Kevin Emmerich walks near the site of the Gemini Solar Project.

Kevin Emmerich, co-founder of the Nevada-based Basin and Range Watch environmental group, is a longtime supporter of solar energy. He once fried an egg on the pavement at Death Valley National Park when he worked there as a park ranger. “It’s something you have to do,” he said.

Mr. Emmerich also believes big solar projects represent a threat to a desert landscape he has worked for decades to protect. In particular, he worries about the impact on the threatened desert tortoise, a reclusive creature whose shrinking habitat is imperiled by development, according to federal studies. An estimated 1,000 desert tortoises inhabit the Gemini site.

At a July 23, 2019, public hearing in Las Vegas, Mr. Emmerich suggested the panels needed to run the Gemini plant could instead be installed atop buildings in Las Vegas—a possibility industry officials call too spread out to be economical. “Approving this project would be a shame,” he said. “You shouldn’t do it.”

The Interior Department in May 2020 approved the project anyway, stipulating Arevia Power would have to take mitigation measures such as relocating tortoises to new habitat. In all, a U.S. Fish and Wildlife Service report estimates 15,390 of the threatened turtles stand to lose nearly 70,000 acres of habitat in solar projects planned for the Southwestern deserts. “It is difficult to assess how desert tortoise populations will respond because of the long generation time of the species,” the report said.

In his statement, Mr. Graf said Arevia intends to work with federal agencies to protect both the tortoises and native plants at this and other projects and that they will have “far less impact” on the desert than off-road vehicle use.

Desert tortoises will be able to rest in a manmade shelter along this fence on the boundary of the Gemini Solar Project. Laura Cunningham, a co-founder of Basin and Range Watch, warned that the project will harm prime habitat for the threatened species.

Mr. Emmerich and his wife, Laura Cunningham, who co-founded Basin and Range Watch, in late February stood dejectedly outside a newly erected fence at the Gemini site as survey crews roamed the desert in all-terrain vehicles, with tortoise biologists in tow.

“They will tear up every tortoise burrow,” Mr. Emmerich said.

About 15 miles to the east, the roughly 10,000 residents of the three main Moapa Valley towns—Overton, Logandale and Moapa—are determined to avoid a similar fate for Battle Born.

Founded in the 19th century as an outpost of Mormon settlers, the valley in recent decades has become home to a mix of commuters, retirees and tourism businesses. The valley went through a slump 10 years ago, following the 2007-09 recession and closure of nearby boating facilities amid falling levels at Lake Mead.

A driver on an all-terrain vehicle approaches Mormon Mesa, a popular recreation area.

But since then, it has been on the rebound, with the Mormon Mesa drawing four-wheelers, bicyclists and skydivers onto its plateau of yucca and creosote. The mesa is filled with Native American artifacts and features a 1,500-foot trench called the Double Negative, created in 1969 by artist Michael Heizer as one of the world's largest pieces of land art.

Kyle Grimes is one of relatively few local residents who publicly support Battle Born, as well as Gemini, which he says are needed "just to get away from the fossil fuel." But the business consultant said he would like to see Battle Born moved off areas of the mesa where people recreate.

Facebook campaign

More common are the local residents who formed a group called Save Our Mesa and began campaigning against the site on Facebook, in sign-waving protests and at a public meeting held at a community center in Overton last October. Among their other concerns: more dust and hotter temperatures from the solar operation, as well as destruction of the mesa and the tourism industry it supports. "We don't want to be the guinea pigs," Lisa Childs, co-founder of the citizens group, said in the meeting.

Mr. Graf told the overflowing room of about 200 people it was still early in the process but that Battle Born would be built in an environmentally friendly way and that benefits to the community would include more than 1,000 jobs, mostly in the construction.

Supporters of Save our Mesa, a local group co-founded by Lisa Childs to fight the proposed Battle Born Solar Project, prepare to ride their all-terrain vehicles on Mormon Mesa.

Mr. Graf challenged the concerns on dust, heat and economic harm—saying the plant's footprint would take up less than a tenth of the mesa's 200 square mile area. "We are just beginning the public portion of the permitting process and feel that through open, considered dialogue with all stakeholders, we can find common ground," Mr. Graf said.

For now, the opponents have gained a delay in the permitting for Battle Born. On a mild February morning, Ms. Childs and other project opponents headed up to Mormon Mesa in their gasoline-powered all-terrain vehicles to inspect favorite overlooks that they fear will be forever marred.

"Once it's done," said Ms. Childs, with her engine switched off, "it can't be undone."

Write to Jim Carlton at jim.carlton@wsj.com

https://www.rystadenergy.com/newsevents/news/press-releases/to-meet-its-2050-net-zero-target-the-us-needs-to-cover-land-50-times-the-size-of-austin-with-solar-pv/

To meet its 2050 net-zero target, the US needs to cover land 50 times the size of Austin with solar PV

March 16, 2021

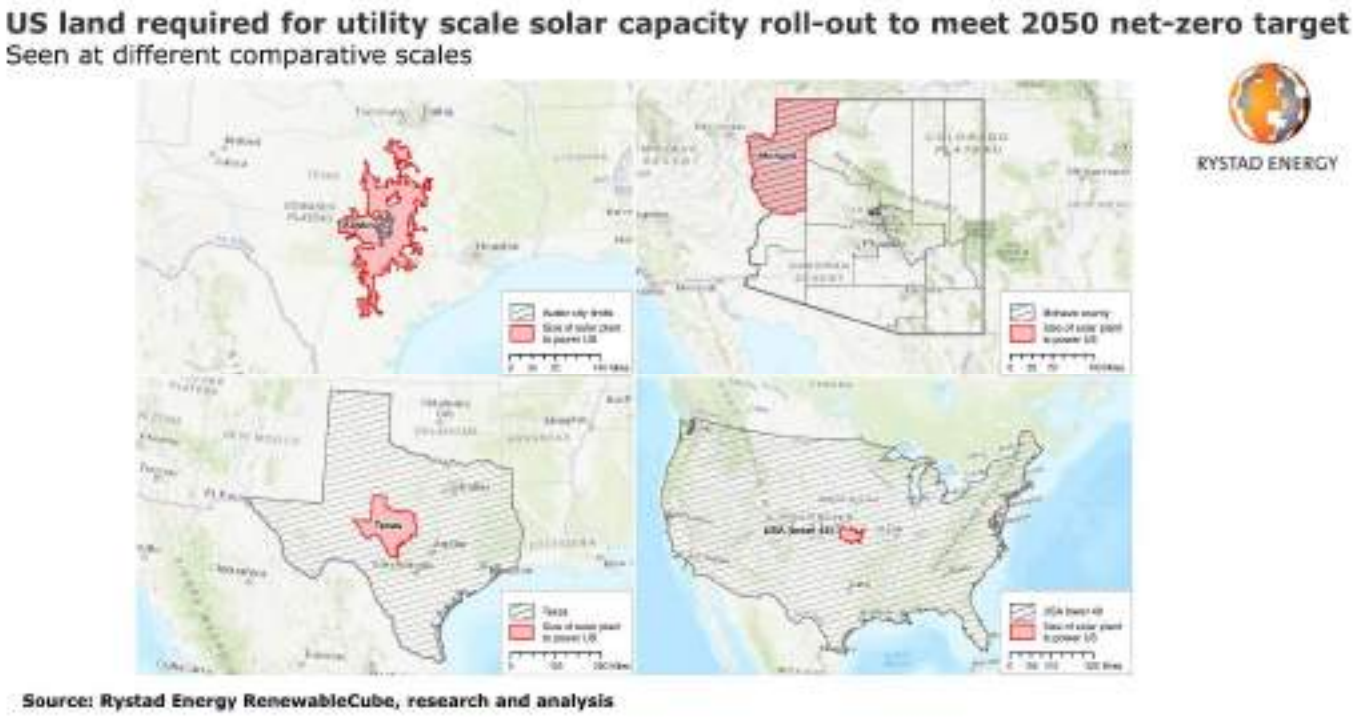
US President Joe Biden clinched the top role last November on the back of a campaign promise to launch the Clean Energy Revolution in the country, with a chief aim of achieving net-zero emissions by 2050. Rystad Energy estimates that the significant utility solar PV installed capacity required to meet the target would occupy around 13,412 square miles of land, equivalent to 0.43% of the total land area in the lower 48 states, or roughly 50 times the size of Austin, Texas.

Land scarcity is often cited as a key barrier to ramping up solar and wind energy capacity in the US, thus undermining the country's revitalized decarbonization ambitions for the next 30 years. Solar farms, in particular, require a lot of real estate and, unlike wind farms, could take land away from agriculture or other uses.

"Although building all these solar farms is no easy task, with the right choice of unoccupied land and with sufficient investments in infrastructure, it can be done. Not every state is a good fit for large-scale solar plants, but certain southern states could take on larger gigawatts-scale projects than others," says Felix Tan, senior analyst at Rystad Energy.

Rystad Energy expects assumes a compound annual growth rate of 1.7% in power demand between now and 2050. As such, to achieve Biden's decarbonization goal and displace all coal-fired plants and large amounts of gas demand, the US would need around 600 gigawatts (GW) of new wind capacity and 1,000 GW of new solar capacity. This could put at risk more than 56 billion cubic feet per day (Bcfd) of future gas demand.

The operational utility solar PV capacity in the US as of February 2021, according to Rystad Energy's RenewableCube, is only about 48.8 GW, which covers merely 654 square miles of land.



While this analysis aims to give an idea about just how much land is required for solar PV development, the reality of ramping-up massive renewables capacity also poses additional challenges. Upgrading the current transmission network and building new lines will be crucial in order to deliver electricity from remote locations – where solar and wind plants are generally located – to centers of demand with high population density.

The intermittent nature of solar and wind will also require an unprecedented roll-out of storage infrastructure. Energy storage plays a key role in balancing the grid, shifting the peak load to ensure a lower cost of electricity for consumers, as well as providing ancillary services when demand rises to unexpected levels, and generally serving as power backup.

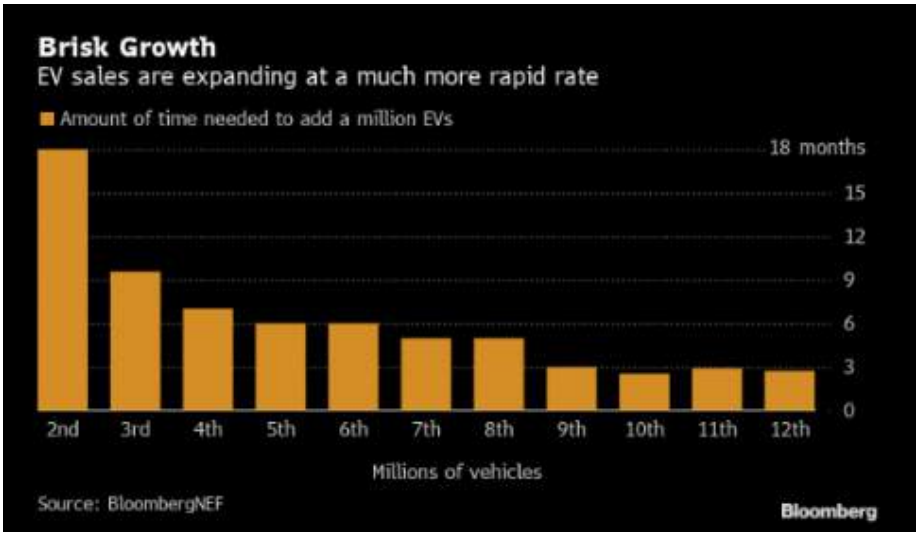
The ramp-up in storage and transmission will only lead to more and larger utility scale solar PV projects in the US. The 600 MW Topaz solar farm in California, which came online in 2013 and 2014, currently ranks as the largest plant in the country. The next four years could see the ceiling smashed as various phased projects become operational, including the Samson Solar Energy Center in Texas and the Edwards & Sanborn Solar project in California – both of which will breach the gigawatt mark.

“Bearing in mind that the Biden Administration is also planning a major expansion of transmission networks across the country, the scene is set for gigawatt-scale solar PV projects to be launched. We expect more gigawatt-scale solar PV projects to follow, including hybrid developments,” Tan concludes.

For more analysis, insights and reports, clients and non-clients can apply for access to Rystad Energy’s Free Solutions and get a taste of our data and analytics universe.

Bloomberg @TheTerminal
EVs Are One Percent Of All Cars On The Road: Hyperdrive Daily
2021-06-01 11:07:56.843 GMT

By Colin McKerracher
(Bloomberg) -- Welcome to the Hyperdrive daily briefing, decoding the revolution reshaping the auto world, from EVs to self-driving cars and beyond.News Briefs
* Global EV battery sales more than doubled from January to April.
* Daimler and Nokia settle dispute over licensing of wireless tech patents in cars.
* Foxconn strikes multibillion-dollar EV deal in Thailand.
The 1% Milestone
Sometime this month, and maybe even this week, the total number of passenger EVs on the road will hit 12 million*. That's up from 1 million in 2015. And the 12 million number represents a significant milestone: EVs are now 1% of all cars on the road globally.
A note of caution here: nailing down the total number of vehicles on the road globally is tricky. While new vehicle sales are easy to track, how long they stay on the road is much harder. Vehicles have a habit of migrating to emerging economies as they get older — digging up data on this from different corners of the world is more art than science. If you cross reference enough sources, you find there are about 1.2 billion passenger vehicles on the road, though some estimates put this as high as 1.4 billion.
So we're at about 1%. What are some different ways to think about this?
Where they are: Just over 44% of all the EVs are in China, and about 35% are in Europe. North America is a distant third at around 17%; the rest are spread out in other markets, including South Korea and Japan. Just under 70% of the total EVs on the road are battery electrics, and the balance are plug-in hybrids.
Sales of plug-in hybrids are surging right now in Europe to help automakers meet their CO2 targets, but haven't really caught on in other countries.
When they were sold: About 70% of those 12 million EVs were sold in the last 3 years, and almost half were sold in the last year and a half. The passenger EV fleet has been doubling about every 18 months for the last few years, and there are good reasons to think that pattern will continue over at least the next four years, and maybe longer.
Time needed to add a million: This is shortening quickly. Knowing when to start the clock for the first million is difficult, but the second million took 18 months, the third just under 10 months and the fourth took 7 months. It now takes under 3 months to add a million, and by the end of 2021, that will be down to 2 months.



That all may sound impressive, but a herculean task remains of getting road transport emissions down in a meaningful amount of time. There's quite a lag between what happens to new sales and what that means for the fleet. Even in a scenario where battery electric vehicles are 50% of global sales by 2030, they'll still only be around 15% of the fleet. Looking at it another way, over the last 10 years, about 200 million cars have been added to the global vehicle fleet and almost all of those were traditional combustion models. That segment continues to grow quickly because

automakers have gotten really good at making cars that last a long time.
Even so, there are plenty of good reasons for optimism on the EV front. Sales of combustion vehicles peaked in 2017 and have been falling since. With EVs now running at 10% of sales in in China, 15-20% in Europe's main auto markets, and about to get a very big boost from the Biden administration in the U.S., it's hard to see a route back to growth for the internal combustion engine. Investment tends to chase growth, rather than absolute market share. With sales of combustion vehicles now in permanent decline, automaker strategies will start to shift rapidly. The first 1% was definitely the hardest.
BloombergNEF will publish its annual Electric Vehicle Outlook next week. The report will look at these trends across different vehicle segments and will consider what's needed to keep the transport sector on track for a net zero world.

*Light duty passenger EVs only. There were about 1 million electric vans and trucks at the end of 2020, 600,000 electric buses and over 260 million electric two- and three-wheelers. Before You Go
What would you pay for this beat up 1960 Jaguar? The hammer price for the coupe, at a Bonhams auction on May 22, was $127,552 — six times over the sale estimate. The vehicle is what's known among serious collectors as a "barn find" — "any variety of derelict vehicles that have been left forgotten," Hannah Elliott reports. This segment of car collecting has exploded in the past year.

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To view this story in Bloomberg click here:
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Asian Cities Face Greatest Environmental Risks, Report Shows

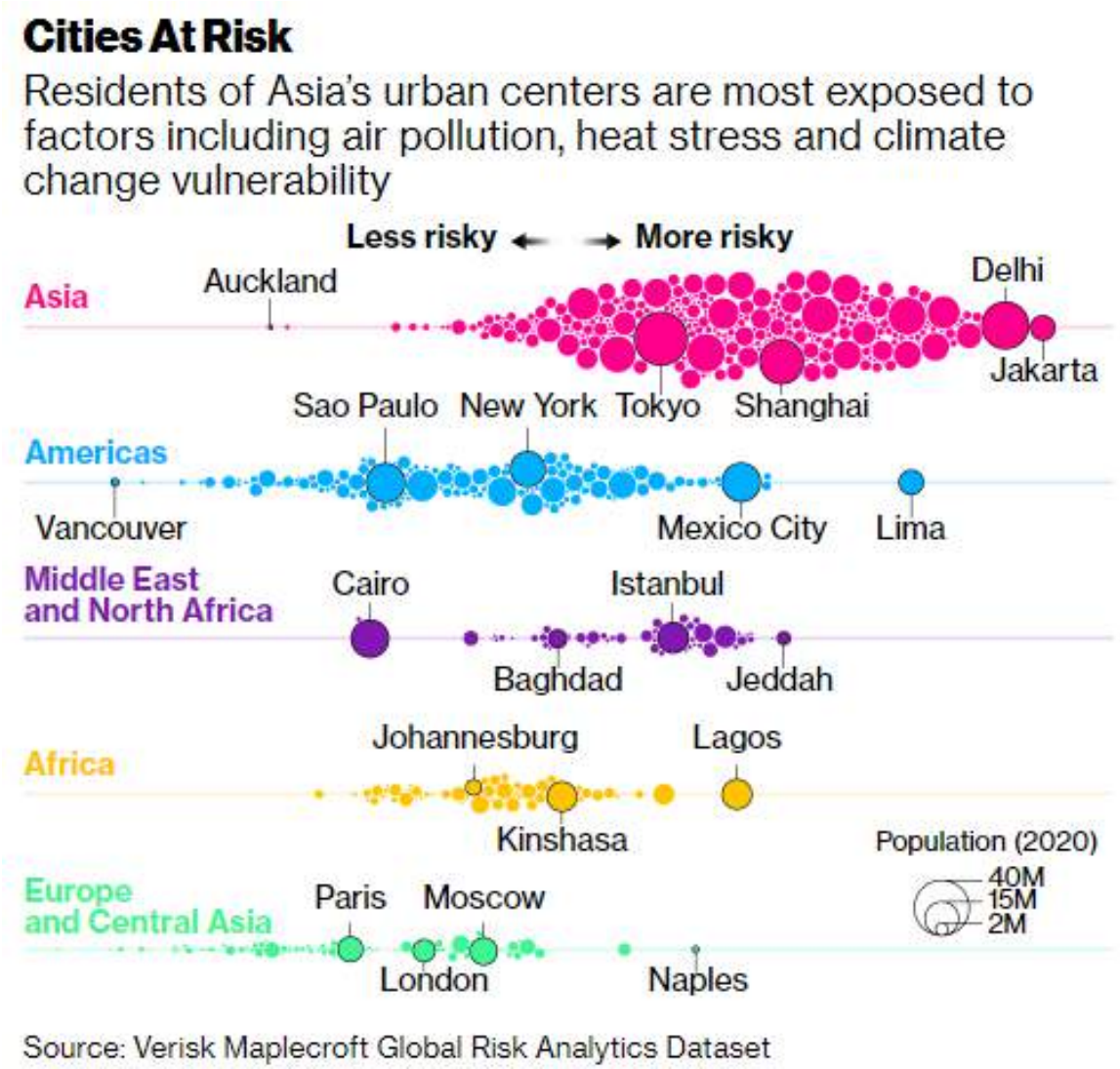
Globally, 1.5 billion people live in cities that are at high risk from pollution, water shortages, extreme heat and natural hazards.

Bloomberg News

May 12, 2021, 5:01 PM MDT

Asian cities face the greatest risk from environmental issues including air pollution and natural disasters, according to a report by research firm Verisk Maplecroft.

Of the 100 most vulnerable cities, 99 are in Asia, according to the report released on Thursday. Of those, 37 are in China and 43 are in India, the world's first and third biggest emitters of greenhouse gases respectively. Globally, 1.5 billion people live in 414 cities that are at high risk from pollution, water shortages, extreme heat, natural hazards and the physical impacts of climate change.



Jakarta, the capital of Indonesia, topped the list of combined risk based on all nine factors analyzed by Verisk Maplecroft. India is home to 13 of the 20 riskiest cities in the world, a result of its extreme levels of air and water pollution. China's flood-prone Guangzhou and Dongguan topped the list of cities facing threats from natural hazards, followed by Japan's Osaka and Tokyo for being vulnerable to earthquakes and typhoons. Lima is the only city outside Asia among the top 100 most at-risk cities overall.

A significant danger for many cities is how climate change will amplify weather-related risks, said Will Nichols, Verisk Maplecroft's Head of Environment and Climate Change. "Higher temperatures and the increasing severity and frequency of extreme events will change the quality of living and economic growth prospects of many cities across the globe," he said.

African cities face some of the worst risks from climate change and have the least ability to mitigate those impacts. Glasgow was ranked the safest among the 576 cities examined for that factor.

"Environmental risk needs to be a central consideration when it comes to making your business, investments or real estate portfolio more resilient," said Nichols. The hope is that identifying these risks and stressing strategies for future climate scenarios will help investors can "gain a clearer view of the costs and benefits of investment decisions."

Excerpt from

http://en.kremlin.ru/events/president/transcripts/65746

St Petersburg International Economic Forum plenary session

Vladimir Putin took part in the plenary session of the 24th St Petersburg International Economic Forum.

June 4, 2021

17:20

St Petersburg

Ladies and gentlemen,

As I have said earlier, international cooperation must be instrumental in overcoming the socioeconomic consequences of the pandemic. It is all the more important for us to pool our efforts in the face of common, systemic, long-term challenges that do not depend on the situation in the market or political disputes and setups, but determine the future of entire societies in a decisive way.

What am I talking about now? What am I referring to? Primarily, the climate agenda. Scientists estimate that over 2 trillion tonnes of greenhouse gases have accumulated in the Earth's atmosphere because of human economic activity. Every year, the volume goes up by 50 billion tonnes, gradually warming up the planet.

I often hear that Russia is not that interested in resolving global environmental problems. I can say that this is nonsense, a myth, and sometimes outright distortion. Like other countries, we feel the risks and threats in this area, including desertification, soil erosion and melting permafrost. Many of those here work in the Arctic and know that we have entire cities built on permafrost in the Arctic. If it all starts to thaw, what consequences will Russia face? Of course, we are concerned.

We are consistent supporters of the UN Framework Convention on Climate Change, the Kyoto Protocol, and the Paris Agreement. I must emphasise that there is no separate Russian, European, Asian, or American climate. All our countries bear a common responsibility for today's world and for the lives of future generations. We must set aside political and other differences and avoid turning the transition to "hydrocarbon neutrality" into an instrument of dishonest competition where attempts are made to change investment and trade flows in someone's specific interests under the pretext

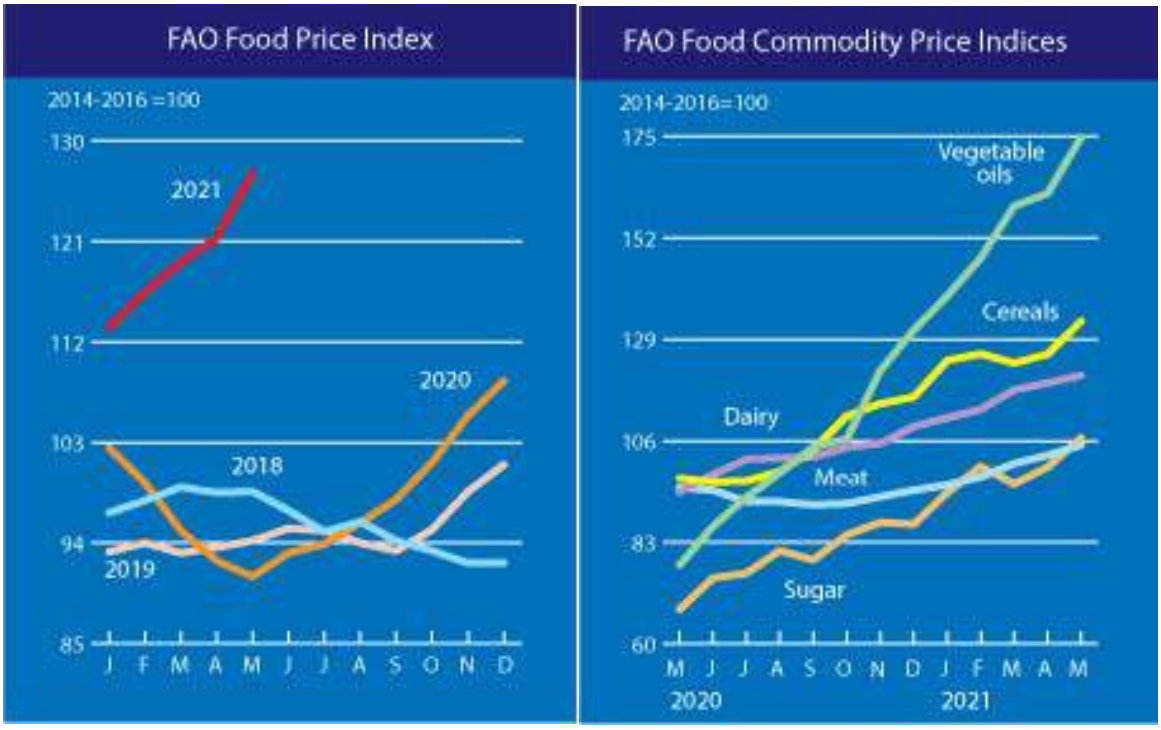
http://www.fao.org/worldfoodsituation/foodpricesindex/en/

FAO Food Price Index

The FAO Food Price Index (FFPI) is a measure of the monthly change in international prices of a basket of food commodities. It consists of the average of five commodity group price indices weighted by the average export shares of each of the groups over 2014-2016. A feature article published in the June 2020 edition of the Food Outlook presents the revision of the base period for the calculation of the FFPI and the expansion of its price coverage, to be introduced from July 2020. A November 2013 article contains technical background on the previous construction of the FFPI.

May registered a sharp increase in the value of the FAO Food Price Index

Release date: 03/06/2021



» **The FAO Food Price Index** (FFPI) averaged 127.1 points in May 2021, 5.8 points (4.8 percent) higher than in April and as much as 36.1 points (39.7 percent) above the same period last year. The May increase represented the biggest month-on-month gain since October 2010. It also marked the twelfth consecutive monthly rise in the value of the FFPI to its highest value since September 2011, bringing the Index only 7.6 percent below its peak value of 137.6 points registered in February 2011. The sharp increase in May reflected a surge in prices for oils, sugar and cereals along with firmer meat and dairy prices.

» **The FAO Cereal Price Index** averaged 133.1 points in May, up 7.6 points (6.0 percent) from April and 35.7 points (36.6 percent) above its May 2020 value. Among the major cereals, international maize prices rose the most, gaining 12.9 points (8.8 percent) in May, reaching 75.6 points (89.3 percent) above their value last year and their highest level since January 2013. Downgraded production prospects for Brazil added pressure to already tight global supplies amidst sustained strong demand. However, towards the end of the month maize prices started to retreat, mostly in expectation of higher production prospects in the United States. International barley and sorghum prices also increased in May, rising by 5.4 percent and 3.6 percent, respectively. Following a surge in wheat prices in early May, improved crop conditions, particularly in the European Union and the United States, led to sharp price declines by the end of the month. However, wheat prices still averaged 8.0 points (6.8 percent) up from April and 27.7 points (28.5 percent) above May 2020. International rice prices held steady in May, with logistics and shipping costs keeping trading activity subdued through the month.

» **The FAO Vegetable Oil Price Index** averaged 174.7 points in May, gaining 12.7 points (or 7.8 percent) month-on-month and marking a twelfth consecutive monthly rise. The continued strength of the index mainly reflects rising palm, soy and rapeseed oil values. International palm oil quotations remained on an upward trajectory in May and reached their highest level since February 2011, as slow production growth in Southeast Asian countries, together with rising global import demand, kept inventories in leading exporting nations at relatively low levels. As for soyoil, prospects of robust global demand, especially from the biodiesel sector, lent support to prices, while international rapeseed oil values were underpinned by continued global supply tightness.

» **The FAO Dairy Price Index** averaged 120.8 points in May, up 1.7 points (1.5 percent) from April, marking one year of uninterrupted increases and lifting the value 26.4 points (28 percent) above its level of one year ago. However, the index is still 22.8 percent below its peak value reached in December 2013. In May, international quotations for skim milk powder rose the most, reflecting solid import demand amid limited spot supplies from the European Union, and those for whole milk powder increased on high import purchases, especially by China, despite New Zealand's offer of large sales. Cheese quotations also strengthened, mostly due to lower supplies from the European Union amidst strong demand. By contrast, butter prices fell on increased export supplies from New Zealand, marking the end of an eleven-month long price rally.

» **The FAO Meat Price Index*** averaged 105.0 points in May, up 2.3 points (2.2 percent) from April, registering the eighth monthly increase and lifting the index 10 percent above its level of one year ago, but still nearly 12 percent below its peak reached in August 2014. In May, price quotations for all meat types represented in the index rose, principally underpinned by a faster pace of import purchases by East Asian countries, mainly China. Tightening global supplies also provided price support across all meat products, reflecting multiple factors ranging from slaughter slowdowns in the cases of bovine and ovine meats to rising internal demand for poultry and pig meats in leading producer regions.

» **The FAO Sugar Price Index** averaged 106.7 points in May, up 6.8 points (6.8 percent) from April, marking the second consecutive monthly increase and the highest level since March 2017. The rise in international sugar price quotations was mostly related to harvest delays and concerns over reduced crop yields in Brazil, the world's largest sugar exporter, as the prolonged dry weather conditions impacted crop development. Additional support was provided by higher crude oil prices and a further strengthening of the Brazilian Real against the US dollar, which tends to restrain shipments from Brazil. Large export volumes from India, however, contributed to easing the price surge and prevented larger monthly price gains.

* Unlike for other commodity groups, most prices utilized in the calculation of the FAO Meat Price Index are not available when the FAO Food Price Index is computed and published; therefore, the value of the Meat Price Index for the most recent months is derived from a mixture of projected and observed prices. This can, at times, require significant revisions in the final value of the FAO Meat Price Index which could in turn influence the value of the FAO Food Price Index.

FAO food price index

		Food Price Index [1]	Meat [2]	Dairy [3]	Cereals [4]	Vegetables Oils [5]	Sugar [6]
2003		**57.8**	**58.3**	**54.5**	**59.4**	**62.6**	43.9
2004		**66.5**	**67.6**	**69.8**	**64.0**	**69.6**	44.3
2005		**67.4**	**71.8**	**77.2**	**60.8**	**64.4**	61.2
2006		**72.6**	**70.6**	**73.1**	**71.2**	**70.5**	91.4
2007		**94.2**	**76.9**	**122.4**	**100.9**	**107.3**	62.4
2008		**117.6**	**90.2**	**132.3**	**137.6**	**141.0**	79.2
2009		**91.7**	**81.2**	**91.4**	**97.2**	**94.4**	112.2
2010		**106.7**	**91.0**	**111.9**	**107.5**	**121.9**	131.7
2011		**131.9**	**105.3**	**129.9**	**142.2**	**156.4**	160.9
2012		**122.8**	**105.0**	**111.7**	**137.4**	**138.3**	133.3
2013		**120.1**	**106.2**	**140.9**	**129.1**	**119.5**	109.5
2014		**116.0**	**112.2**	**130.2**	**116.8**	**110.6**	105.2
2015		**93.1**	**96.7**	**87.1**	**96.9**	**90.0**	83.2
2016		**91.9**	**91.0**	**82.6**	**88.3**	**99.4**	111.6
2017		**98.0**	**97.7**	**108.0**	**91.0**	**101.9**	99.1
2018		**95.9**	**94.9**	**107.3**	**100.6**	**87.8**	77.4
2019		**95.0**	**100.0**	**102.8**	**96.4**	**83.3**	78.6
2020		**98.0**	**95.5**	**101.8**	**102.7**	**99.4**	79.5
2020	May	**91.0**	95.4	94.4	97.5	77.8	67.8
	June	**93.1**	94.8	98.3	96.7	86.6	74.9
	July	**93.9**	92.2	101.8	96.9	93.2	76.0
	August	**96.8**	92.2	102.1	99.0	96.7	81.1
	September	**97.9**	91.5	102.3	104.0	104.6	79.0
	October	**101.2**	91.8	104.5	111.6	106.4	84.7
	November	**105.5**	93.3	105.4	114.4	121.9	87.5
	December	**108.5**	94.8	109.2	115.9	131.1	87.1
2021	January	**113.3**	98.0	111.2	124.2	138.8	94.2
	February	**116.4**	97.8	113.1	125.7	147.4	100.2
	March	**119.1**	100.8	117.5	123.6	159.2	96.2
	April	**121.3**	102.7	119.1	125.6	162.0	100.0
	May	**127.1**	105.0	120.8	133.1	174.7	106.7

1 Food Price Index: Consists of the average of 5 commodity group price indices mentioned above, weighted with the average export shares of each of the groups for 2014-2016. In total 95 price quotations considered by FAO commodity specialists as representing the international prices of the food commodities are included in the overall index. Each sub-index is a weighted average of the price relatives of the commodities included in the group, with the base period price consisting of the averages for the

2 Meat Price Index: Based on 35 average export unit values/market prices of four meat types (bovine, pig, poultry and ovine) from 10 representative markets. Within each meat type, export unit values/prices are weighted by the trade shares of their respective markets, while the meat types are weighted by their average global export trade shares for 2014-2016. Quotations for the two most recent months may consist of estimates and be subject to revision.

3 Dairy Price Index: Computed using 8 price quotations of four dairy products (butter, cheese, SMP and WMP) from two representative markets. Within each dairy product, prices are weighted by the trade shares of their respective markets, while the dairy products are weighted by their average export shares for 2014-

4 Cereals Price Index: Compiled using the International Grains Council (IGC) wheat price index (an average of 10 different wheat price quotations), the IGC maize price index (an average of 4 different maize price quotations), the IGC barley price index (an average of 5 different barley price quotations), 1 sorghum export quotation and the FAO All Rice Price Index. The FAO All Rice Price Index is based on 21 rice export quotations, combined into four groups consisting of Indica, Aromatic, Japonica and Glutinous rice varieties. Within each varietal group, a simple average of the relative prices of appropriate quotations is calculated; then the average relative prices of each of the four rice varieties are combined by weighting them with their (fixed) trade shares for 2014-2016. The Cereal Price Index combines the relative prices of sorghum, the IGC wheat, maize and barley price indices (re-based to 2014-2016) and the FAO All Rice Price Index by weighing each commodity with its average export trade share for 2014-2016.

5 Vegetable Oil Price Index: Consists of an average of 10 different oils weighted with average export trade shares of each oil product for 2014-2016.

6 Sugar Price Index: Index form of the International Sugar Agreement prices with 2014-2016 as base

related to the global economy is a function of vaccination. And through vaccinations, we have confidence and we feel safe as human beings. And I want to underline the whole concept of safety. When you feel safe, you go to the store. You will go to cultural events. You will travel again. And until we feel safe and safe is only going to be occurring through vaccinations, we are witnessing right now in parts of Asia, they're actually now closing down the economies right now.

In so many economies, they thought the best solution to COVID was isolation. And it worked for some period of time. But it doesn't fully work because you have to have a closed economy. And so for economies that are accustomed to tourism and other forms, these economies are very harmed by this. And so a vaccination, just the speed in which we get vaccinations, the speed in which the world gets herd immunity. So, yes, in New York, I was -- it was indicated that 8 million vaccinations have been administered in the New York Region. So New York is actually ahead of most places, even in the United States. And so we are coming back to office. We're trying to move more people in. We're not fully going to be back into office until probably post summer. But when I think about the world of the global economy, it's going to be very uneven.

We're going to see furthering of inequalities in the world, because you have some economies that were very swift in administering the vaccinations and other economies I said used isolation or was in denial. And that denial is now paying a huge cost to those economies. So we're going to have a very uneven world. But overall, when you think about the strength of the Chinese economy growing at 6% plus, the strength of the U.S. economy growing at 4% to 5.5%, when you have the one in two economy growing that fast that list more and more economies, and it appears in Europe, the UK will be one of the first economies to open up in Europe. And hopefully in the next 30 days, more and more continental Europe opens up. And that will then unlock the economy and create the growth.

The big question will be how is that growth being designed in an economy? Is it isolated growth, like we saw in 2020, or is it growth that is more broadened? And that's going to be a function of vaccinations and how quickly we all feel safe going out; going to restaurants, going to concerts, going to business meetings. And so all of this is going to take some time. And I do believe more and more people want to get back to free COVID. They have this deep desire. I can tell you in New York City right now, the restaurants are mobbed. People want to get out. They're tired of the last year and a half. They don't want to just forget about it. And so you see this pent-up demand people are consuming, and I think this is going to be the foundation for 2020. And it will lead to a furthering strengthening of the world economy as more vaccinations occur in 2021.

Jörg Eigendorf

Let me follow up with one question, Larry. If we take it word by word what you just said, a worldwide vaccination program would be exactly what we need. But the world hasn't been or the developed economies haven't been -- countries haven't been very good in having this in mind and taking care of it. What is the remedy?

Laurence Fink

Well, I think politicians first and foremost have to focus on their own population. And that's what we've witnessed. And for those countries that were able to work with the pharmaceutical companies to

could go up. What is your view on what will happen? And if inflation expectations go up, do the central banks have the rule to increase rates or have we gotten used to that track of low interest rates?

Laurence Fink

I think this is going to be probably the most important question that we're going to have to answer, and understand over the next 12 months. I think other than that one question, and barring any geopolitical issues, I believe that with the monetary stimulus, the fiscal stimulus and the liquidity that Christian talked about, the economy should do quite well. Right now, what we are seeing worldwide are shortages of products. We have -- much of it has to do with -- the whole world economy was based on just-in-time manufacturing. The pandemic created weakness in that just-in-time manufacturing. And so we have supply chain problems in every industry right now. We miscalculated the demand. And as a result, we have chip shortages in many industries. And so all of this is creating supply shortages. And with all this liquidity we're seeing, we are seeing rising prices across almost all industries today.

And so question one we will have to answer is we're seeing commodity prices increases from steel and cement. Lumber is up dramatically because of demand for housing. So we're seeing all the demand increasing. We have the supply problems going on right now. The question is, do we rather rectify some of the supply issues as more people go to work and as more economies turn back on, does that satisfy the demand curve? Or is the demand curve now more and more people are vaccinated increase, and we're going to have severe supply shocks, and the supply shock will then lead to much higher inflation? I'm on the opinion and I've been in this business 40 something years, so I started my career during the hyperinflation.

And let's be clear, most people haven't had a 40-plus year career. And they've only seen declining inflation over the last 30-plus years. And so this is going to be a pretty big shock. And I do believe it's going to be a bigger shock if it happens. I'm not saying it will happen. But if it happens, if we see inflation above 3.5%, which comparing to the 1970s and early '80s, 3.5% would be a dream. But we're not accustomed to that type of inflation. Now, the big issue is going to be if it is determined that demand still is higher than the supply curve, even as we fix some of the supply curve issues, if demand remains high across the board, it will probably lead to central banks reassessing their policies. Now the difficulty is, how do they do that? Like in the United States, can a central bank raise interest rates at a time politically we are still working on a very large fiscal stimulus, whether it's infrastructure or other forms of stimulus. That would be pretty odd to raising interest rates the same time we do have this giant fiscal stimulus.

So the timing of this is really critical too. And this is where my deepest difficulties are. We are accustomed not only to monetary policy related to setting short-term interest rates, we the world, we the global capital markets are very custom to central banks doing QE, buying a lot of financial assets; in some places, buying a lot of equities; in most places, buying a lot of bonds. So let's assume the Federal Reserve has no choice but -- or any central bank has no choice but to raise short-term rates. How do they reassess their quantitative purchasing? Do they stop buying the short end, which will then lead to that raising the short rates? Do they then continue to buy the intermediate range? And if

that's the case, and this is my big fear, if that's the case, we're going to see a flattening of the yield curve.

Right now, the marketplace and all the valuations of financial services companies is assuming the yield curve will continue to steepen and great profits with a steep yield curve that are going to be occurring. If you look at the big rally in banks and insurance companies is so predicated on this, the steepening of the yield curve. If monetary policy has to be adjusted, and we have to now flatten the yield curve, because they want short rates up but they don't want to stop the intermediate side of the yield curve, and the marketplace is kind of telling you that. I was even asked this morning by an investor, why can't the 10-year treasury break 2%? And so the market is kind of getting a little worried that we might have a flattening coming on. And if that's the case, then you're going to have to reevaluate a lot of different assumptions in the financial markets and the valuations of many different financial services companies.

Jörg Eigendorf

A short question for short ancillary, what is -- is this priced in the market already or is it not? The markets have gone really, really well recently?

Laurence Fink

I don't think it's priced in at all.

Jörg Eigendorf

Thank you. Christian, Larry just created a scenario which would at least mean that short-term interest rates go up, and we know, and we've been waiting for it for quite some time that we are paying negative rates on the deposits, we have for central bank. So would that be good news for the banks or would that scenario that Larry just painted, would have so detrimental effects on the other side? What is good for the bank's higher interest rates?

Christian Sewing

It's not that easy to answer, because there are many factors actually which are driving your portfolio. But, of course, on the one hand, we always said that negative interest rates is something which is not the nicer thing for us. And hence, an increase in interest rates per se would be something positive. But I really do believe, and I said it for Deutsche Bank, the time to use negative interest as an excuse for your performance is over. You need to manage it differently. We have done it. Others have done it. So, we shouldn't come into that discussion. We have our measures in place. We need to price differently. We have done this. And therefore, you can also see the upside.

The real issue is what does it mean for the recovery of the economy? What does it mean also if you talk about the [indiscernible]? What does it mean for the individual countries in Europe? And therefore, it is a very difficult and complex question. And therefore, I said -- I'm absolutely sure that central banks around the world, and including the ECB, are heavily thinking about this. They are doing this because they know it may be good for the one sector, it may be actually worse for

Excerpt Costco Q3/31 call transcript. May 27, 2021

From the Q3/2021 call on Thurs.

From a supply chain perspective, port delays are continuing to have an impact. We are utilizing additional carriers, in some cases, to help alleviate some of that. Containers and pallets are also facing shortages anecdotally, 35% to 50% increase in incoming containers this year versus a year ago. Some of that's pent-up demand, but just from the low points a year ago. The turnaround of a container hitting the U.S., delivering its contents and being back at the U.S. port to head back overseas has gone from approximately 25 days to 50 days. So a combination of things in terms of delays.

Chips shortages are impacting many items from an inflation standpoint, some items more than others. And again, as I mentioned, with regard to containers and shipping, transportation costs have increased as well. Despite these issues, we continue to work to mitigate cost increases and supply chain delays in a variety of different ways as best we can. The biggest way we've handled supply chain delays is adjusted ordering and front-loading, if you will, orders of many items. And we think we've got that pretty well under control.

This will continue -- the feeling is that this will continue for the most part of this calendar year. We've had a lot of questions about inflation over the past few months. There have been and are a variety of inflationary pressures that we and others are seeing. Inflationary factors abound. These include higher labor costs, higher freight costs, higher transportation demand, along with the container shortage and port delays that I mentioned, increased demand in various product categories some shortages, various shortages of everything from chips to oils and chemical supplies by facilities hit by the Gulf freeze and storms and, in some cases, higher commodity prices.

Some inflationary sound bites, if you will. Price increases on items shipped across the ocean with suppliers paying up to double for containers and shipping. Price increases of pulp, paper goods, some things up 4% to 8%, plastic and resin increases from trash bags to plastic cups, plates, et cetera, and plastic wraps. Metals, aluminum foil, mid-single-digit cost increases also cans for sodas and other beverages. Higher import prices on cheeses, the combination of the product itself as well as some FX strength of some foreign currencies as well as freight, anywhere from 3% to 10% increases on certain apparel items, not all.

In terms of fresh, higher protein prices, for example, meat overall year-over-year is up 7%. Beef in the last month has been up as much as 20%. Some of that is due to feed labor and transportation costs as well as restocking some of the additional increased demand coming now from institutional needs as restaurants start to reopen. And the list could go on and on

SAF

Dan Tsubouchi @Energy_Tidbits · 3h

Why Saudi will keep market stability. @vitolnews Mike Muller global #Oil inventory to 2019 baseline in H2/21. then "all the spare capacity will sit with those who want to control the price" "3 major protagonists in OPEC+ and of course Iran". Usual great podcast @sean_evers! #OOTT

Dan Tsubouchi @Energy_Tidbits · Jun 4

Gotta love KSA Abdulaziz? @_HadleyGamble asks re threats to "price stability". He says no threat to "market stability", "i don't talk about prices anymore". Hmmm, wasn't purpose of 2020 amazing market stabilization to protect a certain #Oil price? See SAF transcript. #OPE...

4 4

SAF

Dan Tsubouchi @Energy_Tidbits · 17h

first wedding of the year in the field above the old coal mine by the Bow River in #Canmore in cdn rockies. note the Bow is murky and running at high levels as the hot weather this week melted a lot of snow in the mountains. congrats to the couple!

4

Dan Tsubouchi @Energy_Tidbits · 20h

Be a big hit to Cdn E&P. @theAESO AB electricity generation ~50% #NatGas ~31% #Coal. @AER_news est ~0.8 bcf/d AB #NatGas used for electricity. Electricity bills will be going higher, need something for 24/7 electricity reliability. Next AB election by May 31/23. #OOTT

> **Calgary Herald** @calgaryherald · Jun 4
>
> Notley announces plans to move Alberta's electricity grid to net-zero by 2035 if elected bit.ly/3fSqBx5

1 · 1 · 2

Dan Tsubouchi @Energy_Tidbits · Jun 5

Great report & food for thought. @PHMSA_DOT tells @willenglund coming up with new regs re refrigerants explosion risk in #LNG? any risk they pause new US LNG projects during review? what can they do, refrigerants are critical in liquefaction? More in SAF Energy Tidbits tomorrow.

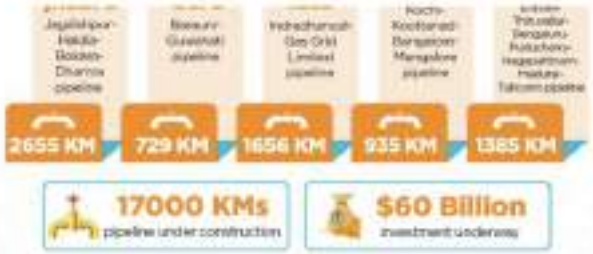
> **willenglund** @willenglund · Jun 3
>
> LNG export terminals play down risks of vapor cloud explosions, critics say - The Washington Post washingtonpost.com/business/2021/...

1

Dan Tsubouchi @Energy_Tidbits · Jun 5

Big + to #LNG. IND hasn't grown domestic #NatGas prod so Demand ↑ = LNG ↑. See SAF Oct 23/19 blog "Finally some visibility that India is moving towards its target for natural gas to be 15% of its energy mix by 2030", could add >9 bcf/d LNG import to 2030
safgroup.ca/insights/trend...

> **Dharmendra Pradhan** @dpradhanbjp · Jun 4
>
> 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.
>
> One Nation, One Gas Grid is being implemented to remove regional imbalances in access to natural gas. #IndiasGreenFuture



> India's Natural Gas-grid is being expanded from existing 13,800 KMs to 34,500 KMs
>
> Impetus to increase share of gas in India's energy basket from 6% to 15%.

4

Dan Tsubouchi @Energy_Tidbits · Jun 5

"world is at risk of facing an acute shortage of oil and gas" says #Rosneft CEO Sechin. Its just math - need to add enough new reserves/production capacity to offset #Oil decline rate or resources are being depleted. Sechin reminds recent reserve adds are historic lows. #OOTT

> Sechin believes that the world is at risk of facing an acute shortage of oil and gas
>
> Oil demand will recover as large-scale vaccinations and a decrease in the impact of the pandemic on the global economy, the chief executive officer of Rosneft said.
>
> SAINT PETERSBURG, June 5. / TASS /. Rosneft warned of the possibility of an acute shortage of oil and gas due to underinvestment in these industries. This was stated by the chief executive officer of Rosneft Igor Sechin at the energy panel "Transformation of the world energy" of the St. Petersburg International Economic Forum.
>
> "The increase in oil and gas reserves in recent years is at historic lows, and a serious shortage of resources is already visible. The trend may become a" new normal "for the world majors and lead to depletion of the resource base. The world is at risk of facing an acute shortage of oil and gas [...]," he said.
>
> According to the head of Rosneft, the pandemic has led to the regionalization of markets and the strengthening of a multipolar world. At the same time, China has become an example of a dynamic recovery from the crisis due to the emphasis on the recovery of the real sector of the economy.
>
> **Oil demand**
>
> Oil demand will recover as large-scale vaccinations and the impact of the pandemic on the global economy decrease, but by 2040 it will take about $ 17 trillion in investments in the oil and gas industry to maintain current production levels, Sechin said.
>
> "As large-scale vaccinations and the impact of the pandemic on the global economy decrease, the demand for

1 9 38

Dan Tsubouchi @Energy_Tidbits · Jun 4

Gotta love KSA Abdulaziz? @_HadleyGamble asks re threats to "price stability". He says no threat to "market stability". "I don't talk about prices anymore". Hmmm, wasn't purpose of 2020 amazing market stabilization to protect a certain #Oil price? See SAF transcript. #OPEC #OOTT

MbS: "Sequel, sequel."

HG: "The sequel to LaLa-Land."

MbS: "Yes."

HG: "Well us through that, how Do you think that gives OPEC and Saudi Arabia more clout in Washington?"

MbS: "It's not a realistic scenario that's why you know, it's a good, its good fun to think about it but when it comes to applying it in reality I don't think its going to be."

HG: "So these investors and governments are out of touch with reality."

MbS: "No, I'm suggesting whoever put that scenario is not in touch with reality."

HG:" in terms of production. When are we going to see Saudi Arabia begin to produce more oil in line with what you suggested?"

MbS: "We are going to be doing in July.

HG: "And as of now, how many barrels are we talking?"

MbS: "Well, in accordance to what we agreed yesterday, we will go back to the 9.4 something, 9.450 or something like this."

CNBC Middle East @CNBCMiddleEast · Jun 3

Saudi Energy Minister tells CNBC's @_HadleyGamble he doesn't "see any threat to price stability."

6 5

Dan Tsubouchi @Energy_Tidbits · Jun 4

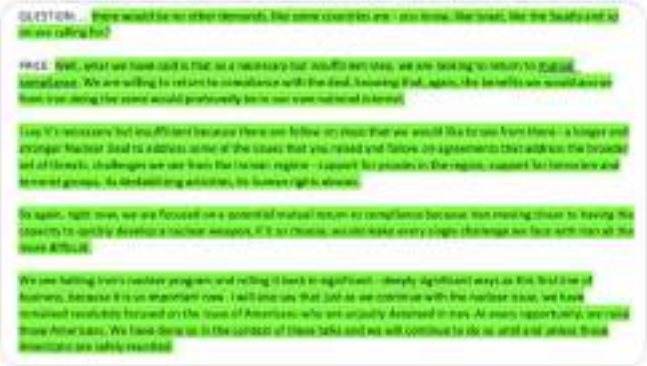
Denmark doesn't play favorites. #NordStream2 type delay (though not a year) due mice/bats on Norway to Poland #BalticPipe #NatGas pipeline leading to temp construction shutdown. reminds always timing execution risk even to an approved project

Environmental appeals board repeal the Danish Environmental Protection Agency's permit for Baltic...

en.energinet.dk

Dan Tsubouchi @Energy_Tidbits · Jun 3

#JCPOA agreement looks weeks away at earliest. US expects a 6th and subsequent rounds beyond that of negotiations. But positive that not trying to link in a broader deal as precondition. Thx @TheTerminal for transcript #OOTT

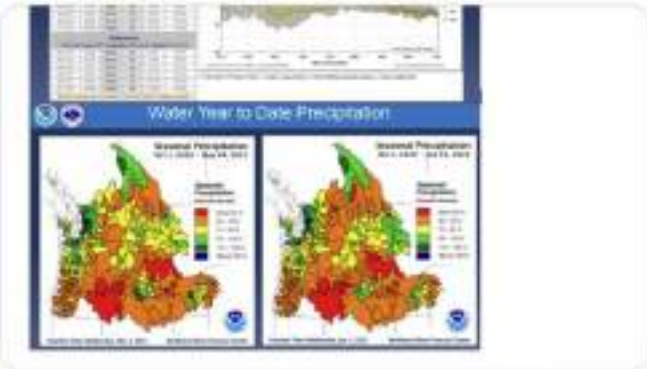


4 · 5

Dan Tsubouchi @Energy_Tidbits · Jun 3

Low Pacific NW accumulated seasonal precipitation means updated NWRFC foast for key The Dalles is 84% of average water supply for Apr-Sept. Less water supply = less #Electricity for export. #NatGas

nwrfc.noaa.gov/presentations/...



1 · 1

SAF

Dan Tsubouchi @Energy_Tidbits · Jun 3

ICYMI. Key reason for strong LNG, China new record LNG imports in May so kept its #LNG cargoes in May and didn't redirect to Europe. Thx @BloombergNEF Lujia Cao & Daniela Li for China Gas Monthly. #NatGas

SAF

Dan Tsubouchi @Energy_Tidbits · Jun 3

The only way for #BigOil to make big cuts in near term emissions is sell & pass on higher emissions oil to someone else. Operational items work but take time. Any $CHV sale of #OilSands helps on #ESG compliance, likely compensation targets. thx @Bloomberg for transcript #OOTT

Chevron CEO, "Well, I think it's one of the most challenged asset classes there is, because it's an energy intensive asset class to develop. And so absent some real significant progress on carbon capture and storage and offsets, I think production that requires thermal production techniques becomes really at the margin, right. It's more costly, it's more energy intensive, it's more carbon intensive. And so we're trying to preserve the option to help rebuild the country. We will have to see what would be the technical approach, which classes of fields would we prioritize and how would we try to deal with reducing the carbon intensity of that if we get back into a development mode there".

Bernstein analyst, "We had an investor question on the Canada side of that. Thoughts on your oil sands assets in Canada still like over the long-term or could you change to non-core to invest in your other assets or M&A?

Chevron CEO, "Yeah. So we -- our one meaningful position up there is a 20% interest in the Athabasca Oil sands project. CNRL is the operator, Shell initially was the large partner, Marathon within there as well. And it's an asset that's within the scale of our overall portfolio, not especially large, doesn't call for much capital here over the next period of time, and generates pretty good cash flow on a market like we're in right now. But I wouldn't deem at a strategic position. I mean, I think we've done some portfolio high grading here over the last few years, and at the right value, and we don't need to sell anything, because our balance sheet is strong and our cash position is good. So we're not in the kind of fire sale mentality, but if we've got what we think is fair value for an asset like that, we've happy

SAF

Dan Tsubouchi @Energy_Tidbits · Jun 2

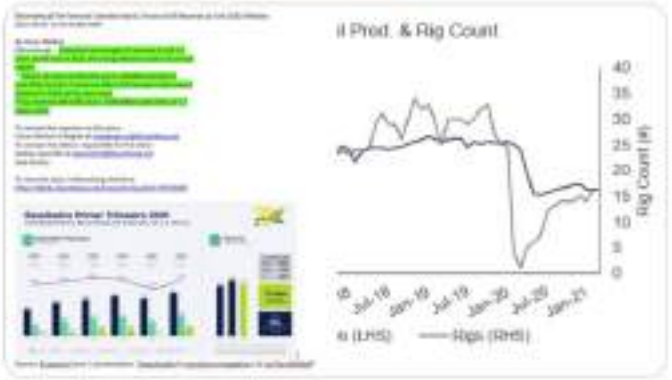
#EnergyTransition = Higher Costs. Shipping fuel costs almost double under #Maersk CEO proposes #CarbonTax of >$450/ton fuel ($150/ton CO2) to bridge gap between VLSFO and greener alts that are currently more expensive. Almost double of ~$525 VLSO. Thx @ShipandBunker #OOTT

1 4 2

SAF

Dan Tsubouchi @Energy_Tidbits · Jun 2

Colombia #Oil sector challenges aren't fixed overnight or wherever protests end. Low drilling in 2020 led to lower 2020 oil production and now proven oil reserves -11% YoY to 1.8b barrels or only 6.3 yr RLI. Need a burst of new capex. Thx @Bloomberg @omedinacruz #OOTT



2

SAF

Dan Tsubouchi @Energy_Tidbits · Jun 2

Positive for #Oil. If no #JCPOA agreement in principle before #Biden in Europe (G7 June 11-13, G7, June 14, Putin June 16) and Iran presidential election June 17, does this not push any likely deal until at least in July? #OOTT

> **Mikhail Ulyanov** @Amb_Ulyanov · Jun 2
>
> The Vienna talks on full restoration of #JCPOA reached the point when there is an objective need to consult with capitals on the remaining issues which require political decisions. Therefore the Joint Commission decided to make a break and resume talks at the end of next week.

1 1

Dan Tsubouchi @Energy_Tidbits · Jun 2

Positive for #Oil. Saudi nest egg (net foreign assets) peaked $737.0b on Aug 31/14, now down $300.7b to $436.3b on Apr 30/21. Its why big Saudi 2020s theme is increasing use of Other People's Money & also why Saudi will keep being disciplined to maintain high oil prices. #DOTT

3 6

Dan Tsubouchi @Energy_Tidbits · Jun 1

Great @colinmckerrach recap of accelerating global #EV penetration. Takes 3 mths to add 1 mm EVs, sb down to 2 mths by yr end, but even if ICE sales peaked 2017 still "herculean task" to get road emissions down ie. EVs only 15% of global fleet even if 50% of 2030 sales #DOTT

3 6

SAF

Dan Tsubouchi @Energy_Tidbits · Jun 1

US Strategic Petroleum Reserve weekly inventory changes typically don't impact #WTI price, reminder @ENERGY posts weekly #SPR inventory changes a day before @EIAgov weekly #Oil inventory data on Wed. Draw of 0.7 mmb for week ending May 28. #OOTT
spr.doe.gov/dir/dir.html

STRATEGIC PETROLEUM RESERVE INVENTORY

CURRENT SPR INVENTORY AS OF May 28, 2021 (MMB)

SPR OIL MOVEMENTS in Millions of Barrels[1]

MONTH	OIL EXCHANGE/PURCHASE RECEIPT BARRELS	DRAWDOWN/SALES/OIL EXCHANGE RETURN BARRELS	NET MOVEMENT
Jan-21	[illegible]	[illegible]	[illegible]
Feb-21	[illegible]	[illegible]	[illegible]
Mar-21	[illegible]	[illegible]	[illegible]
Apr-21	[illegible]	[illegible]	[illegible]
May-21	[illegible]	[illegible]	[illegible]
May-21		[illegible]	[illegible]

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Dan Tsubouchi @Energy_Tidbits · Jun 1

Breaking: Iran hopes to able to announce full revival of #JCPOA before the end of the current administration in Iran. ie. by Aug before Rouhani steps down as President. Iran sneaking out #Oil but full return would be still a few month away. #OOTT

No deadlocks in Vienna talks: govt. spox

TEHRAN, Jun. 01 (MNA) – Stating that the Vienna talks had not reached a stalemate, Iranian Government Spokesman Ali Rabiei said that these ...

en.mehrnews.com

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Dan Tsubouchi @Energy_Tidbits · Jun 1

In Sept, $BP said 8-10% on #RenewableEnergy by adding corporate upsides ie trading, leverage. Today, 7X Energy solar projects to generate >8-10%, by "together with the breadth of bp's integration capabilities". Reminds returns are <#NatGas #Oil. #OOTT
bp.com/en/global/corp...

> **Dan Tsubouchi** @Energy_Tidbits · Feb 8
>
> 2/2 In Sept, $BP CEO explained math of 8-10% return across renewables portfolio as a whole. 5-6% on equity basis at competitive auction + add value thru applying our processes +integrate with trading + use leverage. What else besides #NatGas can fill 2020s growth in electricity?
>
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Dan Tsubouchi @Energy_Tidbits · May 31

China Caixin manufacturing PMI in May 52.0 vs 51.9 estimate and 51.9 in Apr and 50.6 in Mar. "New work expands at quickest rate for five months". Worth a read for good China recap. Thx @IHSMarkitPMI #OOTT

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Dan Tsubouchi @Energy_Tidbits · May 31

Positive #Oil outlook for 2021. Thx @Bloomberg gsmith52@bloomberg.net reporting on #OPEC Secretariat document to JTC today, sees global oil stocks probably fall below 2015-19 average in July. Stock draws >2 mmb/d each month from Sept thru Dec. #OOTT

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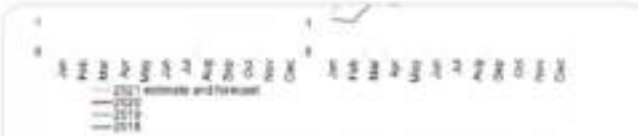
Dan Tsubouchi @Energy_Tidbits · May 31

Positive for #LNG in Q3. Lower than average LNG inventory in Japan/Korea. Note prior May 14 tweet, est summer peak power reserve is only 3.7-3.8%. Japan will want to keep LNG tanks topped up until worst of summer demand is over. Thx @BloombergNEF
omattei@bloomberg.net.



For more BNEF analysis on this topic, see here

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Dan Tsubouchi @Energy_Tidbits · May 14

Japan will want to keep #LNG tanks topped up until worst is over. Japan summer peak power reserve only 3.7-3.8%. Positive for LNG & US LNG, less cargos redirected to refill EU storage. Imagine the AC bill if they had 0.5 mm visitors for olympics. Thx ...

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Dan Tsubouchi @Energy_Tidbits · May 31

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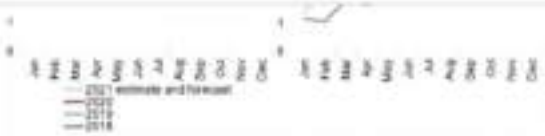

For more BNEF analysis on this topic, see here

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Dan Tsubouchi @Energy_Tidbits · May 30

Our weekly SAF May 30, 2021 Energy Tidbits memo was just posted to our SAF Group website. This 49-pg energy research piece expands upon and covers many more items than tweeted this week. See the research section of the SAF website. #Oil #OOTT #OPEC #LNG safgroup.ca/insights/trend...

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