GLOBAL LNG-LNG prices continue to soar as buying ahead of winter starts

* Bangladesh pays nearly $30/mmBtu for prompt cargo – sources

* China and Turkey seek cargoes for winter

* Cameron LNG says Louisiana plant unit to return online this week

SINGAPORE, Sept 24 (Reuters) – Asian liquefied natural gas (LNG) prices surged by about 10% this week as demand continues to rise in the region despite higher prices and amid a supply crunch.

The average LNG price for November delivery into Northeast Asia LNG-AS was estimated at about $26.50 to $27 per metric million British thermal units (mmBtu), up at least $2 from the previous week, industry sources said.

“The post-COVID recovery in some places has been fast, which is pushing up demand, while there are some supply issues in several places, which is causing a crunch,” a Singapore-based trader said, adding that prices are expected to rise even higher during winter when demand for heating peaks.

Bangladesh, for instance, bought a cargo for delivery in late September from Vitol at $29.89 per mmBtu, the highest the country has paid for the super-chilled fuel, three industry sources said.

It did not award a separate tender seeking a cargo for October delivery as the offer was at around $35, two other sources said. Instead, it will issue two tenders next week to buy two cargoes for delivery in October, a third source said.

Demand from China was also firm with Unipec Singapore, the trading arm of Sinopec, seeking 11 cargoes for delivery in winter while Beijing Gas and Guangzhou gas also sought a cargo each for delivery in October and November, traders said.

Turkish state energy company Botas is also seeking 20 cargoes for delivery in winter, while Thailand's Egat was seeking two cargoes for delivery in October, they added.

Some spot cargoes were offered in the market from Angola, Australia, Russia and Indonesia from October to January, but lower shipments from Egypt and Malaysia were supporting prices, traders said.

Cameron LNG in the U.S. said on Wednesday the liquefaction train shut for maintenance at its Louisiana export plant was expected to return later this week, which could add some supply. (Reporting by Jessica Jaganathan. Editing by David Evans)

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Another headwind?: global gas price spike worries energy execs

DUBAI/LONDON, Sept 21 (Reuters) – Energy executives gathered in Dubai on Tuesday for the first time since the COVID-19 pandemic started, but despite being upbeat on economic recovery, they were concerned about another headwind: a global gas price spike.

Natural gas prices have soared by around 280% in Europe this year and by more than 100% in the United States, pushing up winter fuel bills, and exacerbating a near-term spike in inflation in another blow to a world economy as it recovers from the coronavirus crisis.

Low storage inventories, high demand for gas in Asia, less Russian and liquefied natural gas (LNG) supply to Europe than usual, high carbon prices and outages have led to the spike and analysts expect prices to remain elevated until 2022 or even 2023. read more

At the Gastech industry conference, energy executives were concerned about the "sweet spot" of prices acceptable for customers and still high enough to incentivise investments, while others warned of shortfalls in the event of a severe upcoming winter.

The chief executive of Malaysia's state energy firm Petronas (PETRA.UL) said that a gas price of $7-$8/mmBtu could be a "sweet spot" for customers and allow infrastructure investments to continue.

"Natural gas needs to be embraced as a transition fuel. A decarbonised future does not mean a hydrocarbon-free future," Tengku Muhammad Taufik said.

Meanwhile, OPEC Secretary General Mohammed Barkindo blamed high prices on the shift to renewable energy sources.

The average LNG price for November delivery into Northeast Asia was estimated at about $24-$25 per metric million British thermal units (mmBtu) last week, while benchmark European natural gas prices have surged to around $25/mmBtu from around $6-7/mmBtu at the start of the year.

BURDEN BUT 'NOT A CRISIS'

Qatar's energy minister said he believes high gas prices

reflect a lack of investment, as well as a shortage of supply, but stopped short of calling the situation a crisis.

“I don’t think it is a crisis (yet). Unfortunately, in my view, this (price spike) is due to the market not investing enough in the industry,” said Saad al-Kaabi, Qatar’s energy minister and the CEO of state-owned Qatar Petroleum (QATPE.UL), the world’s top liquefied natural gas (LNG) supplier.

“We don’t want these high prices: we don’t think it is good for consumers. We don’t want $2 and we don’t want $20, we want to have a reasonable price that is sustainable.”

United Arab Emirates energy minister, Suhail al-Mazrouei, said current prices could be a burden on many countries.

He too blamed the spike on a slowed pace of investments in gas, adding that gas prices were not sustainable at a level of $2 or $3 either.

“New investments need to be there, we are talking about investments to the north of a trillion dollars to satisfy (demand) requirements for the years to come,” Mazrouei said.

“I am afraid it is not going to be magical…we will go through ups and downs until the market realises the right price,” he added.

Some countries have agreed to reduce emissions to net zero by 2050 or earlier, meaning a shift away from fossil fuels, but many energy officials said consumers will pay the price.

The Qatari energy minister said the “euphoria around energy transition” was pressuring companies not to invest in gas or oil projects, while his Emirate counterpart called for honest, practical plans.

“There is a drive for being emotional about net-zero carbon emissions, but I think we need to be honest with the consumers

and tell them what is going to be the cost associated with net zero," UAE's Mazrouie said.

Analysts at WoodMackenzie said separately on Tuesday that the economics of existing gas operators are difficult and new-buld can present a substantial and unattractive risk, particularly in climate-wary Europe.

For French energy group Engie (ENGIE.PA), the price spike was "not good news" and the company's deputy chief executive, Didier Holleaux, said he was worried that current gas prices may continue for foreseeable future with gas storage levels not as high as usual for this time of year.

"Hopefully the start of the winter will not be so cold in the north hemisphere. If not, we are in trouble. Forecasts for temperatures in three months' time are just the worst."

(This story was refiled to remove reference to event being held in hotel in lede)

Additional reporting by Yousef Saba in Dubai, writing by Marwa Rashad and Nina Chestney in London; editing by Jason Neely and Barbara Lewis

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How the US and Iran compete to fuel Lebanon

Hezbollah has imported fuel from Iran to supply Lebanon, while the US wants to power Lebanon with Egyptian gas and Jordanian electricity. The energy race between the geopolitical rivals has implications for the region.

Lebanon has been mired in economic crisis since 2019.

Recently, a severe fuel crisis has gripped the country and has exacerbated the situation considerably.

The fuel shortages hit so hard that a fuel crisis soon became a humanitarian crisis. Lebanese citizens found themselves lining up for hours at petrol stations to receive limited rations of fuel, the price of which has skyrocketed.

Generators, starved of diesel, provided fewer hours of electricity to houses and businesses. Even hospitals were deprived of power.

With the government struggling to manage the crisis, Hassan Nasrallah, the political leader of the Iran-backed Shiite militant group Hezbollah, announced in August that Iranian fuel would be brought into Lebanon.

The first two shipments arrived via Syria on September 16 and 17. Several videos and pictures posted on social media showed people celebrating the arrival of the fuel convoys. A third shipment is expected to arrive this week.

The delivery was not officially approved by the government. The trucks entered via an illegal crossing which violates US sanctions against Iran. So far, the US has not tried to block the shipments.

US counterproposal to contain Iran’s influence

The US didn’t sit back. Following Nasrallah’s announcement, the US ambassador to Lebanon, Dorothy Shea, revealed that the United States was working closely with the governments of Egypt, Jordan and Lebanon, along with the World Bank, to find sustainable solutions for Lebanon’s fuel and energy needs.

On September 8, the US-backed effort to satisfy Lebanon’s

energy needs took place in Amman, Jordan, where ministries from Egypt, Jordan, Lebanon and Syria outlined a road map to pipe Egyptian natural gas to Lebanon via Jordan and Syria through the Arab Gas Pipeline (AGP). Another part of the plan involves providing electric power to Lebanon from the Jordanian grid.

Although the US proposals would not alone be enough to satisfy market demand, Roudi Baroudi, chief executive of the consultancy Energy and Environment Holding, told DW that the proposals were good ideas as they could increase the supply of electricity to the country.

He explained that, though the AGP is ready for use, the electric cables passing through Damascus were heavily damaged during the Syrian civil war and needed to be repaired. “The gas from Egypt will be sufficient for 8-10 hours per day. Electricity from Jordan and Syria would add 2-3 hours,” he said.

Iran’s new foreign affairs policy and Syria’s comeback

Technical issues apart, the competition between the US and Iran to help Lebanon in the energy sector has wider implications for the region.

In Lebanon, the Iranian fuel shipment cemented Hezbollah’s powerful image. The new Lebanese Prime Minister Najib Mikati said Iranian fuel imports constituted a breach of Lebanon’s sovereignty, but he didn’t follow with any actions.

For Iran, shipping fuel to Lebanon is a sign of a new vision of its foreign policy, according to Sina Toossi, a senior research analyst at the National Iranian American Council (NIAC). He told DW that Iran wanted to become a regional power and neutralize the effects of imposed sanctions by increasing

trades with its neighbors.

“New Iranian President Ebrahim Raisi’s foreign policy strategy focuses on the region and increasing regional economic interconnectivity and interdependence. However, if the US doesn’t enforce sanctions, it may be a sign that Biden has a good intention to get the nuclear deal talks with Iran back on track,” he said.

Conversely, the United States is trying to contain Iran’s influence in the region by backing the proposals to provide natural gas and electricity to Lebanon. However, it found itself in an awkward situation. By involving Syria in the plan, which already expressed its availability, the US would break its own sanctions imposed on Bashar Assad’s government through the 2019 Caesar Syria Civilian Protection Act.

Chris Abi-Nassif, Lebanon program director at the Middle East Institute, told DW that the involvement of Assad’s government in the plan might be perceived as the US reaching out to Syria.

“Syria, which had effectively been taken out of the Arab world equation, has been suddenly put back in the picture,” he said. Furthermore, Syria may take not only a political advantage by letting gas and electricity pass through its territory but also profits, according to Abi-Nassif.

Fueling Lebanon doesn’t solve the crisis

Lebanon has had an issue in the energy sector since the end of the civil war in 1990. For decades, the political class has developed no long-term plans in the energy sector to satisfy market demand.

The Iran-Hezbollah initiative to supply fuel won’t be enough to satisfy the country’s demand for a long time, although

Lebanese may breathe a sigh of relief in the immediate term.

Meanwhile, the US proposals are still being negotiated. It may take several months before they make any difference.

Those proposals may relieve the crisis, but it won’t resolve the issue of paying for gas and electricity, according to Abi-Nassif.

“The fundamental question is how Lebanon will pay for natural gas and electricity, ” he said. “To answer this question, Lebanon should focus on how to settle the debt crisis, restructure the banking system, and how to distribute losses. This is the key to unlock the long-term prospect not only for the energy sector but for any other single sector in Lebanon as well.”

لو استفاد لبنان من خط الغاز العربي لوفّر 5 مليارات دولار… بارودي لـ”النهار”: إبعاد السياسة عن قطاع الطاقة مفتاح الحلول

طرأت في الأيام الأخيرة معطيات إيجابية تعطي ال#لبنانيين بارقة أمل بالنسبة إلى التخفيف من ساعات التقنين الكهربائي القياسي، مع وصول الفيول #العراقي إلى لبنان والذي قد يساهم في تأمين حتى 6 ساعات من التغذية على الشبكة، لتبقى الأنظار إلى مسار استجرار الغاز المصري إلى معمل دير عمار وكذلك استجرار الكهرباء الأردنية.

حصول لبنان على الطاقة الكهربائية من مصادر متعددة وتأمينها على نحو مستدام هو خطوة أولى من أجل وضع البلاد على طريق النهوض وتأمين الاستقرار نظرا إلى اهمية الطاقة في تشغيل العديد من المرافق والقطاعات الحيوية، فيما التدخل السياسي في هذا القطاع هو الذي ادى إلى ما وصلت إليه الأمور. اليوم، تبذل الجهود من أجل استجرار الغاز من مصر والكهرباء من الأردن، ما يحتم على الجهات والدول المعنية تسهيل هذه العملية التي ستعطي لبنان دفعا قويا في ظل الظروف الصعبة التي يمر بها، وما يعيد إلى الواجهة أهمية خط #الغاز العربي الذي انكبت الدول المعنية على إعادة إصلاحه وتعزيز بنيته التحتية لاستخدامه في استجرار الغاز المصري عبر الاردن و#سوريا وصولا إلى شمال لبنان.

نشأت فكرة الخط كنتيجة لتوسيع التعاون الثنائي بين الدول العربية في شرق البحر المتوسط وشمال افريقيا، وذلك منذ اواخر تسعينات القرن الماضي. ففي حين كان لبنان وسوريا يحضّران لمشروع خط الغاز الطبيعي الذي يربط البلدين، كانت الاردن ومصر في طور البدء بتنفيذ الخط المصري – الاردني مرورا بخليج العقبة، وتزامن ذلك مع الاستعداد لاطلاق المشروع الاورو- متوسطي لربط دول حوض المتوسط بشبكة غاز طبيعي تمتد لاحقا إلى اوروبا. وفي عام 2001، شارك لبنان في الاجتماعات التمهيدية لمشروع نقل الغاز الطبيعي وتسويقه وتصديره إلى دول الحوض الشرقي للمتوسط، وكانت مشاركة لبنان في العديد من الاجتماعات على مستوى تمثيل رئاسة الحكومة والتمثيل الوزاري والتقني. وقد سعت الاجتماعات المتلاحقة إلى التحضير لاتفاق انشاء الهيئة العربية للغاز وتأسيس الشركة العربية لنقل الغاز الطبيعي وتسويقه. وبعدما أقر مشروع إنشاء الشركة تمت المصادقة عليه في كل من الاردن ومصر وسوريا ولبنان حيث اقره المجلس النيابي في العام 2005 بموجب القانون 683.

لقد منعت المناكفات السياسية وعدم اجراء الانتخابات الرئاسية في مواعيدها الدستورية كما الفراغ الحكومي في السنوات الماضية اللبنانيين من الاستفادة من خط الغاز العربي الذي كان يمكن ان يحلّ معظم مشاكل انتاج الكهرباء بحسب الخبير في شؤون الطاقة رودي بارودي، لو تمّ وصل خط الغاز العربي بمعامل انتاج الطاقة الاخرى في الزهراني والجية الجديد والزوق الجديد وصور وبعلبك، خصوصا ان هذه المعامل يمكنها انتاج الطاقة الكهربائية بواسطة الغاز. فلو استفاد لبنان من خط الغاز العربي منذ 18 عاما، لكان وفّر على خزينته حوالي 5 مليارات دولار، في ما لو فرضنا ان سعر برميل النفط

يراوح ما بين 50 و60 دولارا اميركيا، ولكان لِبنان نعِم بوقود صديق للبيئة طوال السنوات الماضية، ما يؤدي حتماً إلى انخفاض التكاليف المالية للتشغيل والصيانة. وأكد بارودي انه "لو استفاد لبنان يومها من تلك الشراكة ومن خيرات الانبوب العربي لكانت معظم مشاكله الكهربائية حُلت، اذ انه كان سيستفيد طوال تلك السنوات سواء من اسعار الغاز المصري التنافسية او من ارباح الشركة العربية لنقل الغاز وتسويقه بصفته شريكا اساسيا تصل نسبة ارباحه إلى 25% من الارباح العامة. كذلك، كان ليستفيد من رسم الترانزيت".

خط الغاز السوري – اللبناني

بدأ تنفيذ هذا المشروع خلال شهر آذار 2003، وهو عبارة عن انبوب للغاز قياس 24 انش يمتد من سوريا إلى محطة البداوي وينقل الغاز السوري إلى المحطة المذكورة (راجع الخريطة المرفقة). وبحسب بارودي يشمل المشروع صيانة وتشغيل وادارة هذا الخط، في حين ان اهميته تكمن في انه كان معدا يومها لينقل الغاز السوري بسعر مشجع حدده القانون الرقم 509 الذي اقره البرلمان اللبناني في العام 2003 (الاجازة للحكومة ابرام اتفاقية بيع الغاز من الشركة السورية للنفط). وبالفعل، استفاد معمل دير عمار عبر هذا الخط من الغاز المصري والسوري وانما لفترات متقطعة، وتوقف لاسباب عديدة. ويعتبر بارودي ان سعر الغاز أصبح منافسا جدا مما يؤمن للخزينة وفرا ماليا كبيرا يمكن الحصول عليه في ما لو تم تحويل معامل انتاج الطاقة في دير عمار، الزهراني، الجية، والزوق للعمل على الغاز الطبيعي كما يظهر الجدول التالي، وذلك بحسب الاسعار المختلفة لبرميل النفط. ولا بد من التذكير بأن الكميات المتفق عليها والعائدة لمعملَيِ دير عمار والزهراني تراوح ما بين مليون ومليون ونصف مليون يومياً .

سعر برميل البرنت (دولار اميركي)	كلفة كهرباء لبنان من الفيول اويل والغاز اويل* (بملايين الدولارات الاميركية)	كلفة الغاز الطبيعي (بملايين الدولارات الاميركية)	الوفر المتوقع سنويا (بملايين الدولارات الاميركية)
50$	770$	542$	228$

*استنادا إلى استهلاك معامل الطاقة وفقا لتقرير الانتاج الصادر عن مؤسسة كهرباء لبنان

هذا الجدول يشمل الوفر الناتج عن تحويل العمل من الغاز اويل والفيول اويل إلى الغاز الطبيعي في البداوي، الزوق، الجية، والزهراني. أما سعر الغاز المستعمل في هذا النموذج فهو وفقا للقانون الرقم 509 الموقع بين لبنان والشركة السورية للنفط وسعر الغاز اويل المتبع هو 136% من سعر برميل النفط بينما سعر الفيول اويل المتبع هو 88% من سعر برميل النفط. وفي حال أضيفت قيمة الفوائد من الوفر البيئي واطالة حياة المعامل والتوفير في صيانة وعمل المعامل قد تتخطى حدود التوفير الـ 250 مليون دولار سنويا. ولا بد من الاشارة إلى ان معدل عدد ساعات العمل للمعامل وفقا لتقرير الانتاج لمؤسسة كهرباء لبنان يقدر بـ 55%. وإذا ما تحسن اداء العمل فيها (خصوصا في الزهراني ودير عمار) إلى 75% سيرتفع الوفر إلى أكثر من 350 مليون دولار سنويا.

مميزات هذه الطاقة النظيفة

بالانتقال إلى الموضوع البيئي، فالمحافظة على البيئة في لبنان لم تعد ترفا. لذلك لا بد من التوقف عند الوفر البيئي المتوقع من استعمال الغاز الطبيعي، خصوصاً ان معامل انتاج الطاقة الحالية تنبعث منها كميات كبيرة من الغازات الملوثة، وهي بمعظمها ناتجة عن عمليات حرق الفيول وغيره من المحروقات الاحفورية لتوليد الطاقة الكهربائية. ويؤكد بارودي ان اهمية استعمال الغاز الطبيعي في معامل الانتاج تتعدى الوفر المباشر لتشمل حوافز اخرى تساعد في التخلص من أعباء مالية كبيرة ناتجة عن استعمال وقود غير نظيف،

اضافة إلى كلفة النقل والتوزيع والخسائر التقنية ومشاكل الصيانة وعمل الوحدات. لذلك ثمة حاجة حقيقية للتحول إلى استعمال الغاز الطبيعي في معظم معامل الانتاج في لبنان، لأنه يؤدي إلى خفض المشاكل التقنية والحد من أعبائها المالية، ونذكر من المشاكل ما يتعلق بموضوع صيانة المعامل والاوساخ والضرر البيئي الناتج عن احتراق الفيول. من هنا، يمكن القول ان الفترة التي تفصل مراحل الصيانة للعديد من المعدات والآلات تكون أطول، وبالتالي فان ذلك يطيل عمر المعمل لجهة استعماله لتوليد الكهرباء بما لا يقل عن 5 إلى 7 سنوات. ويساهم استعمال الغاز الطبيعي في الحد من هذه الملوثات بشكل كبير مما يؤدي إلى تخفيف الضرر على البيئة وعلى الصحة العامة، ويكون هذا القطاع قد ثبت دوره الريادي في المحافظة على مصادر البيئة اللبنانية. وسوف يشجع التحول إلى الغاز الطبيعي على انخفاض الانبعاثات الآتية:

1. 100% من انبعاثات الكربون.
2. 60 % من انبعاثات ثاني أوكسيد الكربون.
3. 70 % من انبعاثات أوكسيد النيتروجين.

منعت الحكومات السابقة لبنان من الاستفادة من خط الربط الكهربائي السداسي (مصر، الاردن، العراق، سوريا، لبنان وليبيا) وبالتالي توفير سنوي قدره 250 مليون دولار طوال السنوات الماضية، علماً أن محطة مجدل عنجر قد انجزت الاعمال فيها عام 2006 وتستطيع أن تستوعب 400 ميغاواط يمكن ربطها بالشبكة اللبنانية. ويعتبر بارودي ان المطلوب من الحكومة الجديدة هو "عدم تضييع الفرصة من جديد والاستفادة من كل الفرص والامكانات لتحسين وزيادة انتاج الطاقة الكهربائية سواء عبر خط الغاز العربي والانتهاء من تنفيذ وصلة جنوب دمشق إلى الزهراني بأسرع وقت ممكن، كما هو ممكن في الخريطة المرفقة او عبر البدء بتطوير انتاج الطاقات المتجددة، خصوصا بواسطة الشمس، نظراً إلى طبيعة لبنان ومناخه الذي يمكن ان يعطي نحو 2000 ميغاواط، وما يؤمن انتاجا نظيفاً ومستداماً ويوفر على الخزينة الكثير من الاموال لبنان بحاجة اليها سواء في بناء معامل جديدة وفي تطوير شبكتي النقل والتوزيع".

Why an Electric Car Battery Is So Expensive, For Now

At Tesla Inc.’s ballyhooed Battery Day event last year, CEO Elon Musk set himself an ambitious target: to produce a $25,000 electric vehicle by 2023. Hitting that sticker price — about $15,000 cheaper than the company’s least expensive model today — is seen as critical to deliver a true, mass-market product. Getting there means finding new savings on technology — most critically the batteries that can make up a third of an EV’s cost — without compromising safety. Alongside Musk, traditional automaking giants including Toyota Motor Co. and Volkswagen AG are pouring tens of billions of dollars into the race.

1. Why are EV batteries so expensive?

Largely because of what goes in them. An EV uses the same rechargeable lithium-ion batteries that are in your laptop or mobile phone, they’re just much bigger — cells grouped in packs resembling big suitcases — to enable them to deliver far more energy. The priciest component in each battery cell is the cathode, one of the two electrodes that store and release electricity. The materials needed in cathodes to pack in more energy are often expensive: metals like cobalt, nickel, lithium and manganese. They need to be mined, processed and converted into high-purity chemical compounds.

2. How much are we talking?

At current rates and pack sizes, the average battery cost for a typical EV works out to about $6,300. Battery pack prices

have come down a lot – 89% over the past decade, according to BloombergNEF. But the industry average price of $137 per kilowatt hour (from about $1,191 in 2010) is still above the $100 threshold at which the cost should match a car with an internal-combustion engine. Costs aren't expected to keep falling as quickly, and rising raw materials prices haven't helped. Still, lithium-ion packs are on track to drop to $92 per kWh by 2024, according to BNEF forecasts, and $58 per kwh by 2030.

Greedy for Gigawatts

EVs are going to be the driving force for lithium-ion battery demand

Source: BloombergNEF Long-Term Electric Vehicle Outlook, June 2021

3. How will the batteries get cheaper?

A major focus for manufacturers is on the priciest commodities, and particularly cobalt. One option is to substitute the metal with nickel, which is cheaper and holds more energy. Doing so requires safety adjustments, however, as cobalt's advantage is that it doesn't overheat or catch fire easily. Another move has been to use alternatives that don't contain cobalt at all, like low-cost lithium iron phosphate cells, once derided for poorer performance but winning a revival as design changes deliver improvements. Simplifying battery pack design, and using a standard product for a range of vehicles – rather than a pack tailored to each model – will deliver additional savings.

4. What about fire risks?

Lithium-ion batteries, whether used in grid-sized storage

facilities, cars or devices like smartphones, can catch fire if they've been manufactured poorly, damaged in an accident, or the software that runs them hasn't been designed properly. Incidents remain rare, but garner huge scrutiny in what remains a developing sector. A decision in August by General Motors Co. to carry out a $1.8 billion recall of more than 100,000 Chevrolet Bolt models as a result of battery defects underscored the seriousness. Blazes or overheating incidents this year also impacted major energy storage projects in Australia and California. And the fires aren't easy to extinguish; it took firefighters four hours and took more than 30,000 gallons (113,560 liters) of water to douse a Tesla Model S after a fatal crash in Texas. Tesla insists that incidents involving electric models garner undue attention. According to its 2020 Impact Report, cars with internal-combustion engines (ICE) catch fire at a "vastly" higher rate. From 2012 to 2020 there was about one Tesla fire for every 205 million miles (330 million kilometers) traveled, compared to a fire every 19 million miles for ICE vehicles, the EV pioneer said.

5. Who are the biggest manufacturers?

Asia dominates manufacturing of lithium-ion cells, accounting for more than 80% of existing capacity. The Chinese company Contemporary Amperex Technology Co. Ltd. (CATL) shipped the highest volume in 2020, capturing almost a quarter of the market. By September this year it had extended its lead to 30%, followed by South Korea-based LG Energy Solution and Japan's Panasonic Corp. Tesla and Panasonic's joint venture is the biggest battery producer in the U.S. Emerging producers include Northvolt AB in Sweden, founded by former Tesla executives, and Gotion High-tech Co. in China.

6. Are the batteries all the same?

They have the same basic components: two electrodes – a

cathode and an anode — and an electrolyte that helps shuttle the charge between them. But there are differences in the materials used, and that's key to the amount of energy they hold. Grid-storage systems or vehicles traveling short distances can use cheaper and less powerful cathode chemistry that combines lithium, iron and phosphate. For higher-performance vehicles, automakers favor more energy-dense materials, such as lithium-nickel-manganese-cobalt oxide or lithium-nickel-cobalt-aluminum oxide. Further refinements are seeking to improve range — how far a vehicle can travel before recharging — as well as charging speed.

7. So China's in pole position?

Yes, in almost every aspect. China is responsible for about 80% of the chemical refining that converts lithium, cobalt and other raw materials into battery ingredients, though the metals themselves are largely mined in Australia, the Democratic Republic of Congo and Chile. China also dominates processing capacity across four key battery components (cathodes, anodes, electrolyte solutions and separators), with more than half of the world's commissioned capacity for each, BNEF data shows. The nation faces a challenge when it comes to advanced semiconductor design and software, components that are increasingly important as cars become more intelligent. Less than 5% of automotive chips are made in China, according to the China Association of Automobile Manufacturers.

8. Is cost the only hurdle?

There's still an issue with driving range. While the most-expensive EVs can travel 400 miles or more before a top up, consumers considering mainstream models remain anxious about how often they'll need to recharge. Automakers and governments have become directly involved in the roll-out of public recharging infrastructure for drivers on the road. However, most recharging is expected to take place at home, and that

means another cost for consumers. While the average price of a home-charging kit has fallen 18% since 2017 to about $650, some top-of-the-line bi-directional chargers (which let you send energy from the vehicle to the home or grid), cost more than $6,000. Installation costs in the U.S. can run from as little as $400 to more than $3,300.

9. What's around the corner?

Most keenly anticipated is the arrival of solid-state batteries, which promise a huge performance upgrade by replacing the flammable liquids that enable charging and discharging with ceramic, glass or polymers. QuantumScape Corp. says it has innovations in that field to increase a car's range by as much as 50% and the technology could be deployed in vehicles at dealerships as soon as 2026. Another industry focus is modifying anodes — typically made using graphite — to add more silicon, or by using lithium metal. That would likely make it viable to power smaller aircraft. Storing renewable power with utility-scale batteries for days or weeks, rather than hours at present, is also a key challenge. Form Energy Inc. is developing iron-air batteries that it says could enable entirely carbon-free grids. CATL and others are also working on plans to substitute lithium, or combine it with, far cheaper sodium-ion technology for some niche applications.

The Reference Shelf

- Electric vehicle sales should increase sharply in the next few years and account for 16% of regular car sales by 2025, BNEF forecasts.
- These are the Nobel Prize winning scientists who pioneered the lithium-ion battery.
- Bloomberg News examines how the U.S. is falling behind as the EV battery soars.
- More QuickTakes on the road to driverless cars, the

broader trend toward electrification, greener hydrogen and electric airplanes.

- Bloomberg Opinion's Anjani Trivedi explains how new power packs will require new supply chains.
- Bill Gates discusses the electrification of transportation in this blog post.
- A TOPLive Q&A with Carnegie Mellon University professor Venkat Viswanathan on the future of batteries.

— With assistance by Chunying Zhang

Energy crunch deepening as US warns Europe isn't doing enough

Europe's energy crunch is deepening, with gas and power prices hitting fresh records after the US warned the continent isn't doing enough to prepare for what could be potentially a dire winter.

With about a month to go before the start of the heating season, Europe doesn't have enough natural gas in storage sites and isn't building inventories fast enough either. Amos Hochstein, the US State Department's envoy for energy security, said on Friday he was worried about supplies this winter.

Energy demand is rebounding across the world as economies reopen and people return to the office. Gas stockpiles in Europe are already at the lowest level in more than a decade for this time of year, pushing up the cost of producing electricity. The rally in European energy prices is just a

taste of what’s to come for other commodities, Goldman Sachs Group Inc said in a report.

“European energy pricing dynamics offer a glimpse of what is in store for other commodity markets, with widening deficits and depleting inventories leading to elevated price volatility,” said Goldman analysts including Jeff Currie. For European gas, “demand destruction is the only option to rebalance markets,” they said.

Europe is struggling to boost supplies, with flows from No 2 supplier Norway currently limited due to maintenance. Top seller Russia is “is coming off an extended period of inexplicably low supply” at a time when US deliveries of liquefied natural gas can’t be increased further, Hochstein said.

“I worry because I don’t think we should ever be in a position knowing that if it’s a cold winter, there’s not enough supply,” he told reporters during a visit to Warsaw. Benchmark European gas futures traded in the Netherlands exceeded €60 a megawatt-hour, climbing as much as 4.6% to a new record. The UK contract for next-month surged as much as 4.3% to 151.79 pence a therm.

Soaring gas prices are fuelling a rally in electricity. German power futures for next year, a benchmark for Europe, surged to a record €99.25 a megawatt-hour, while the equivalent French contract reached an all-time high of €102.75 a megawatt-hour on the European Energy Exchange.

Short-term prices are also gaining, with low wind power across most of Europe boosting costs. A bigger requirement from more expensive fossil-fuelled plants to meet demand has lifted the German day-ahead contract to the highest since 2007 and the UK equivalent above 200 pounds for the fourth time in two weeks.

“If supply were to disappoint further and winter weather turns out colder than normal, European gas and power prices may have to rise further to ration demand and thus curb energy-intensive industrial production,” Goldman said.

Environmental threats are the ‘greatest challenge to human rights’: UN

The UN rights chief has said the “triple planetary crises” of climate change, pollution, and nature loss represented the biggest threat to human rights globally, at the opening yesterday of a month-long session set to prioritise environmental issues.

“The interlinked crises of pollution, climate change and biodiversity act as threat multipliers, amplifying conflicts, tensions and structural inequalities, and forcing people into increasingly vulnerable situations,” Michelle Bachelet told the opening of the 48th session of the UN Human Rights Council in Geneva.

“As these environmental threats intensify, they will constitute the single greatest challenge to human rights of our era,” she added.

The former Chilean president said the threats were already “directly and severely impacting a broad range of rights, including the rights to adequate food, water, education, housing, health, development, and even life itself”.

She said environmental damage usually hurt the poorest people and nations the most, as they often have the least capacity to respond.

Bachelet referred to recent “extreme and murderous” climate events such as floods in Germany and California’s wildfires.

She also said drought was potentially forcing millions of people into misery, hunger and displacement.

Bachelet said that addressing the environmental crisis was “a

humanitarian imperative, a human rights imperative, a peace-building imperative and a development imperative. It is also doable".

She said spending to revive economies in the wake of the coronavirus (Covid-19) pandemic could be focused on environmentally-friendly projects, but "this is a shift that unfortunately is not being consistently and robustly undertaken".

She also said that countries had "consistently failed to fund and implement" commitments made under the Paris climate accords.

"We must set the bar higher – indeed, our common future depends on it," she added.

Her remarks come at the opening session of the September 13 to October 8 session of the Human Rights Council, where climate change themes were expected to be central, alongside debates on alleged rights violations in Afghanistan, Myanmar, and Tigray, Ethiopia.

In the same speech, she voiced alarm at attacks on indigenous people in Brazil by illegal miners in the Amazon.

Geneva-based diplomats told Reuters that two new resolutions on the environment were expected, including one that would create a new Special Rapporteur on Climate Change and another that would create a new right to a safe, clean, healthy and sustainable environment.

Yesterday Germany's Foreign Minister Heiko Maas voiced support for the first idea, which has not yet been formally submitted in draft form.

"Climate change affects virtually all human rights," he said.

Marc Limon of the Universal Rights Group think-tank said the Council's recognition of the right to a healthy environment would be "good news".

"It would empower individuals to protect the environment and fight climate change," he said.

During her address, Bachelet said that at the 12-day COP26 climate talks in Glasgow, set to begin on October 31, her office would push for more ambitious, rights-based

commitments.
She added that in many regions, environmental human rights defenders were threatened, harassed and killed, often with complete impunity.
She said economic shifts triggered by the Covid-19 pandemic had apparently prompted increased exploitation of mineral resources, forests and land, with indigenous peoples particularly at risk.
“In Brazil, I am alarmed by recent attacks against members of the Yanomami and Munduruku peoples by illegal miners in the Amazon,” she said.
In her opening global update, Bachelet touched on the human rights situations in several countries, including Chad, the Central African Republic, Haiti, India, Mali and Tunisia.
On China, she said no progress had been made in her years-long efforts to seek “meaningful access” to Xinjiang.
“In the meantime, my office is finalising its assessment of the available information on allegations of serious human rights violations in that region, with a view to making it public,” she said.
Rights groups believe at least 1mn Uyghurs and other mostly Muslim minorities have been incarcerated in camps in the northwestern region, where China is also accused of forcibly sterilising women and imposing forced labour.
Beijing has strongly denied the allegations and says training programmes, work schemes and better education have helped stamp out extremism in the region.
Decisions made by the Council’s 47 members are not legally binding but carry political weight.

The Reality of Climate Financial Risk

Those who argue that climate change has little to do with macroprudential risk management are offering a counsel of despair. If the 2008 global financial crisis revealed anything, it is that regulation matters, even if it isn't always politically popular or easily optimized.

LAUSANNE, SWITZERLAND – In a recent commentary, John H. Cochrane, a senior fellow at the Hoover Institution, argues that "climate financial risk" is a fallacy. His eye-catching premise is that climate change doesn't pose a threat to the global financial system, because it – and the phase-out of fossil fuels that is needed to address it – are developments that everyone already knows are underway. He sees climate-related financial regulation as a Trojan horse for an otherwise unpopular political agenda.

We disagree. For starters, one should acknowledge the context in which regulation emerges. With respect to climate policy, the Intergovernmental Panel on Climate Change has set the stage with its sixth assessment report, which concludes with a high degree of certainty that the Earth's climate is changing, and that human activities are the cause. Ecologist William Ripple, the co-author of another recent study of planetary "vital signs," goes further: "There is growing evidence we are getting close to or have already gone beyond tipping points associated with important parts of the Earth system."

Unlike the 2008 global financial crisis – when banks that took excessive risks were bailed out, and global financial regulation was overhauled in light of our new understanding about interdependent financial markets – unmitigated climate change will lead to a crisis with irreversible outcomes.

The question, as Cochrane puts it, is whether climate-related financial regulation can do anything to help us avoid such outcomes. Although the answer is complex and currently incomplete, we would argue that it can. Financial regulation to mitigate climate risk is indeed worth pursuing, because the stakes are too high to let the perfect become the enemy of the good.

Consider some of the arguments about systemic financial risk and extreme climate events. First, we are told that the risk of "stranded assets" – particularly fossil-fuel assets – will become a fact of life, to be borne only by investors. Here, Cochrane points out, correctly, that fossil-fuel investments have always been risky. But can we reasonably say that the prevalence of this energy source should be left to market players alone, or that only investors will bear the costs?

Though per capita fossil-fuel consumption in countries such as the United States and the United Kingdom has declined since 1990, total consumption has grown dramatically elsewhere, rising by 50% globally over the last 40 years. In 2020, China and India were the planet's two largest coal-energy producers, relying on coal for 61% and 71% of their electricity, respectively. Their economies, and those of many other developing countries, simply would not sustain a precipitous reduction in fossil-fuel energy.

Cochrane also suggests that there is no scientifically validated possibility that extreme climate events will cause systemic financial crises over the next decade, and that regulators are therefore stymied from assessing the risks on financial institutions' balance sheets over a five- or ten-year horizon. But the sheer scale of the challenge should make us reconsider the temporal dimensions of regulation.

If temperature increases are to be kept within 2° Celsius of pre-industrial levels this century, about 80% of all coal, one-third of all oil, and half of all gas reserves must be

left unburned. All of the Arctic's oil and the remainder of Canada's oil sands – the world's largest deposit of crude oil – must be left in the ground, starting almost immediately.

Finally, it is said that the technocratic regulation of climate investments cannot protect us against un-modeled tipping points. But this view simply ignores the extensive literature in climate economics. In this field, the work of Nobel laureate economist William Nordhaus is widely referenced. His Dynamic Integrated Climate-Economy (DICE) model has influenced many scientists' and economists' own modeling of tipping points, and the US government already relies on these "integrated assessment models" to formulate policy and calculate the "social cost of carbon."

This interdependency between economics, policy, politics, public opinion, and regulation should be familiar from the crash of 2008. The dangerous over-leveraging that generated that crisis was an open secret; but those in a position, politically and culturally, to do something about it were willing to deny the systemic risk it posed. One can find the same denialism in the climate debate. According to the Center for American Progress, 139 members of the current US Congress (109 representatives and 30 senators; a majority of the Republican caucus) "have made recent statements casting doubt on the clear, established scientific consensus that the world is warming – and that human activity is to blame."

Cochrane makes an eloquent case for why policymakers should focus on creating coherent, scientifically valid policy responses to climate change and financial systemic risk separately, rather than pursuing climate financial regulation. But this isn't an either/or choice. We need both kinds of policies, and we need coordination between the two domains.

We therefore should welcome the approach being taken by US Secretary of the Treasury Janet Yellen's Financial Stability Oversight Council, which has brought together leading

regulators and tasked them with preventing a repeat of the 2008 Wall Street meltdown. Yellen has said she will use this multi-regulator body as her principal tool to assess climate risks and develop the disclosure policies needed to shift to a low-carbon economy.

Counterintuitive though it may be, climate-related financial regulation could usher in a new form of political accountability, by putting governments and individuals (elected and unelected) on the hook for their decisions. Such accountability was notably absent before and during the 2008 crisis. With political will, serious thinking about regulating climate financial risk could open up a fruitful debate for similar action on all neglected policy fronts.

Surging wind industry faces its own green dilemma: landfills

Siemens launches first recyclable wind turbine blade

- **Anti-wind groups use dumping of blades as rallying issue**
- **Industry calls for EU landfill ban**

Wind turbines have become a vital source of global green energy but their makers increasingly face an environmental conundrum of their own: how to recycle them.

The European Union’s share of electricity from wind power has grown from less than 1% in 2000, when the continent began to curb planet-heating fossil fuels, to more than 16% today.

As the first wave of windmills reach the end of their lives, tens of thousands of blades are being stacked and buried in

landfill sites where they will take centuries to decompose.
Spanish turbine maker Siemens Gamesa this week launched what it called a “game changer” – the first recyclable blades, which use a technology that allows their carbon and glass fibres to be reused in products like screen monitors or car parts.
“We have reached a major milestone in a society that puts care for the environment at its heart,” said Andreas Nauen, chief executive of Siemens Gamesa, which expects the blades to become the industry standard.
Europe is the world’s second largest producer of wind-generated electricity, making up about 30% of the global capacity, compared to China’s 39%, according to the Global Wind Energy Council, an industry trade association.
Wind Europe, a Brussels-based trade association which promotes the use of wind power in Europe, expects 52,000 blades a year to need disposal by 2030, up from about 1,000 today.
“The public want to be reassured that wind energy is fully sustainable and fully circular,” said WindEurope’s chief executive, Giles Dickson, describing Siemens Gamesa’s new recyclable blade as a “significant breakthrough”.
While wind turbine blades are not especially toxic, the resulting landfill, if improperly handled, may contribute to dangerous environmental impacts, including the pollution of land and waterways.
All forms of energy have some environmental cost but renewables, almost by definition, cause less damage to the planet, said Martin Gerhardt, Siemens Gamesa’s offshore wind chief.
“If you look at oil wells and the spills or if you consider methane leaks, compared to the fossil industries, wind is the lesser problem,” he said.
Wind power is one of the cleanest forms of energy, with a carbon footprint 99% lower than coal and 75% less than solar, according to a study by Bernstein Research, a US-based research and brokerage firm.
Its emissions come mainly from the production of iron and

steel used in turbines and concrete for windmill foundations.
If these were mitigated by techniques such as carbon capture and storage – where carbon dioxide is buried underground – "you'd be able to cut out the carbon footprint completely," said Deepa Venkateswaran, the study's author.
The growing mountains of waste created by old blades has become a rallying point for groups opposed to wind turbines, which they also say are noisy and spoil the countryside.
But landfill is likely to remain the preferred disposal option because it is the cheapest, said Eric Waeyenbergh, advocacy manager at Geocycle, a sustainable waste management firm.
"If you just throw it in the landfill, this is the cheapest price you can have when you're dismantling the windmill. And that's a problem because there's no mandatory recycling or recovery obligation," he said.
Geocycle and WindEurope are lobbying for landfills to be banned across Europe where only four countries – Austria, Germany, the Netherlands and Finland – have outlawed the landfilling of composite materials, such as wind turbine blades.
Geocycle co-runs a cement kiln in Germany, with building industry giant Lafarge, which is partly fuelled by burning thousands of tonnes of old wind turbines, which create less carbon dioxide than fossil fuels.
Recyclable blades can also be ground up for use in products such as rearview car mirrors and insulation panels, or heat-treated to create materials for roof light panels and gutters.
However, industry groups say these techniques are not currently available at commercial scale or at a price that would make them viable alternatives to landfill.
David Romero Vindel, co-founder of Reciclalia, which cuts and shreds turbine blades for recycling as carbon fibre yarn and fabric, said a landfill ban would help his firm.
"We need the EU to push the sector in this direction of recycling," he said.
Vivian Loonela, a spokeswoman for the European Commission said it will review its landfill policies in 2024.

“The recycling of (windmill) composite fraction remains a challenge due to the low value of the recycled product and the relatively small amount of waste (produced), which does not stimulate the recycling markets,” she said.
– Thomson Reuters Foundation

How U.S. Presidents Use the Strategic Petroleum Reserve

As U.S. president, Joe Biden can tap the nation’s emergency oil stockpile to make up for supply shortages – be they disruptions to crude flows such as in Louisiana this week after Hurricane Ida, or price spikes caused by geopolitical instability in the Middle East. The tool at his disposal is the Strategic Petroleum Reserve, set up in the aftermath of the Arab oil embargo in the 1970s as a national energy safety net. It’s the world’s largest supply of emergency crude, stored in deep and heavily guarded underground salt caverns along the U.S. Gulf Coast.

1. How much oil is in reserve?

The reserve stood at 621.3 million barrels as of Aug. 20, enough to replace more than half a year’s worth of U.S. crude net imports. Current inventory is about 87% of its maximum authorized storage capacity.

2. In what circumstances can presidents release stockpiled oil?

It’s pretty much the president’s prerogative. But the 1975 law that established the reserve says a president can order a full

drawdown in the event of a “severe energy supply interruption” that threatens national security or the economy. A limited drawdown (up to 30 million barrels) can be ordered in the event of “a domestic or international energy supply shortage of significant scope or duration.”

3. Have presidents tapped the reserve before?

Yes. In 2011, President Barack Obama released 30 million barrels as part of a joint effort with other nations to counter supply disruptions from Libya. In 2005, President George W. Bush released 11 million barrels in the wake of Hurricane Katrina. And in 1991, under President George H.W. Bush, 17 million barrels were released during the first Gulf War. Test releases take place from time to time, as well as limited releases in the form of swaps. In 2017, the Energy Department authorized the release of 5 million barrels to Gulf Coast refineries when Hurricane Harvey wreaked havoc on the region. Such arrangements are designed to address short-term emergency needs, and the crude is repaid, in kind, at a future date.

4. What’s happening in the wake of Hurricane Ida?

Exxon Mobil Corp. is starting its huge Baton Rouge refinery and needs a large amount of crude to process, and fast. Major disruptions to nearby pipelines and production facilities in the wake of the storm have spurred the oil giant to ask for up to 1.5 million barrels of oil from the reserve to temporarily replace its usual supply sources. The Department of Energy is encouraging refiners to prioritize making products such as gasoline, which is badly needed in the area for cars and generators.

5. What does a release entail?

The maximum drawdown capability is 4.4 million barrels a day, according to the Energy Department’s website, and it takes 13 days for SPR oil to reach the open market after a presidential

decision. But the mere announcement that the SPR is being deployed could have an immediate, if short-lived, effect on oil prices.

6. What’s the outlook for the U.S. stockpile?

The domestic shale boom has allowed the U.S. to join the ranks of the world’s biggest oil producers, lending weight to arguments that the emergency reserve is past its sell-by date. But in recent months shale production has stalled, demand has increased and imports have also gone up. In the past the reserve has been used to pay government bills ranging from roads to deficit reduction and drugs, and current plans are for the stockpile to be cut almost in half over several years. But periodic use of the reserve after natural disasters may be the most effective rebuttal to the case for doing away with it.

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