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WORLD GAS INTELLIGENCE®

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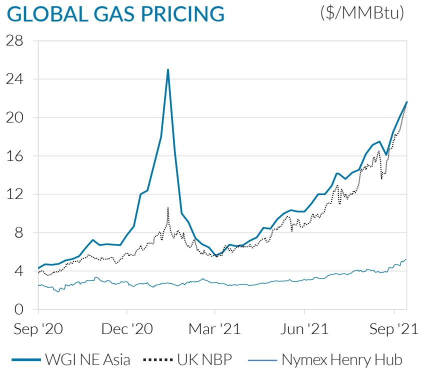
GLOBAL GAS PRICING ($/MMBtu)



VIEWPOINT

UK Coal Conundrum

UK Prime Minister Boris Johnson has said he wants crucial UN climate talks in Glasgow in November to consign "coal to history." Leading G7 economies are in agreement, and the UK hopes to use its global clout to get countries like China and India on board.

But the push could cause some red faces back home. The UK has pledged to end coal-fired generation by October 2024, but coal burn has increased this year as lower wind levels have left renewables struggling to keep up. Nuclear generation has also been down. Gas has been the main beneficiary, but soaring prices prompted the UK to fire up an old coal power plant last week.

Coal formed part of the UK electricity mix for 34 days in a row from Jun. 25 to Jul. 28, according to figures from transmission system operator National Grid. By the end of July, coal had been burned on 150 days this year, compared to 93 days in the same period of 2020. On Sep. 13, coal accounted for nearly 3% of the mix, up from an average of 1.8% over the past year and 1.5% over the past month. Gas made up over 50%, versus an average of 40% over the past year. Wind, solar and hydro accounted for just 11% — against a 23% annual average — with wind making up 8%, against 18% over the past year.

Potentially more embarrassing, the government is still deciding whether to give the go-ahead to the first deep coal mine in England in decades. Critics like Friends of the Earth say that would undermine the UK's "moral authority" in trying to persuade China and India to cut dependence on coal. After a series of flip-flops, Communities Secretary Robert Jenrick has ordered a public inquiry whose recommendations may not be known until after the climate talks.

Flagging wind output and record-high gas prices have been causing problems across Europe, helping drive electricity prices to new highs. In addition to steep coal and carbon prices, gas has been lifted by competition with Asia for LNG cargoes and little growth in Russian piped gas exports. With less than a month to go before the official end of the injection season, European gas stocks are well below the five-year average at 70% full. But UK inventories have grown rapidly over the past month and are now almost 90% full, versus 86% full this time last year.

Lower indigenous gas production isn't helping. In the Netherlands, output from Groningen — once Europe's largest onshore gas field — has been steadily reduced. UK output has also fallen 28% year-to-date, driven by maintenance and new project delays. Total production for January-August was 17 billion cubic meters, down from 24 Bcm in the same period of 2020, consultancy Wood Mackenzie says. It predicts recovery over the rest of the year, but expects 2021 overall production of 27 Bcm, versus 34 Bcm in 2019 and 35 Bcm in 2020. Since an already-tight UK winter balance is premised on this supply recovery, any disruptions will put the system under significant strain — leading to potentially higher coal burn, which as Woodmac says would be "an unwelcome distraction" in Glasgow.

MARKET DYNAMICS

Nervous EU Politicians Keep Eye on Power

Skyrocketing power prices are creating massive headaches for politicians across Europe. Electricity bills had already been rising to pay for charges including renewable subsidies and grid upgrades. Consumers now face a fresh set of increases to compensate suppliers for rising gas, coal and carbon prices. Ironically — in light of Europe's push for carbon neutrality — this more expensive electricity is dirtier. High gas prices have spurred generators with mixed portfolios to switch back to coal and lignite as it's comparatively cheaper to generate power from coal, despite the record cost of EU carbon emissions allowances.

Natural gas prices have soared as the market has become tighter, while carbon prices have increased on the back of stricter EU cap-and-trade rules. Power prices have also been inflated by relatively high coal prices, and low output of wind, solar and hydropower in some markets.

High prices can become an election issue if they bite too hard and for too long. With the Northern Hemisphere now facing a winter where electricity looks set to remain expensive unless gas becomes a lot cheaper — which seems unlikely — it's little wonder that European politicians are talking about intervention.

In major LNG importer Spain, policymakers have proposed a shock measure to make the country's four main generators, Iberdrola, Endesa, Naturgy and EDP, auction off some generation volumes to small players in the retail sector and industrial customers. They also plan to limit generator profits, cap gas prices and cut taxes in a bid to lower prices for end-users.

Other EU countries may follow suit and intervene if power prices become politically unsustainable. The fear is they could fuel inflation and hamper economic recovery in states still struggling to recover from Covid-19.

Spanish officials hope the auction price will be lower than wholesale electricity prices, which hit a new record high last week. They settled above €152 ($179) per megawatt hour for baseload day-ahead supply — three times higher than normal for this time of year — heavily influenced by natural gas, the marginal price setter in the country.

Day-ahead baseload power prices in Germany, France, Belgium, Austria and the Netherlands hit nearly €140/MWh last week. They were even higher in Portugal and Italy, approaching the levels seen in Spain. This is roughly three times higher than normal.

Prices of other commodities are also soaring. Gas prices on the Dutch TTF hub, Europe's de facto benchmark, hit €56.58/MWh ($19.92 per million Btu) last week, up from $4.42/MMBtu a year ago, and the forward monthly curve is priced near this level until April 2022. Prices on Italy's PSV have jumped from $5.09/MMBtu to $19.13/MMBtu over the same period, and on Germany's THE from $4.65/MMBtu to $19.45/MMBtu. There have been similar increases in other Northwest European gas markets, including the UK. Benchmark API2 coal futures prices were meanwhile trading at nearly $169 per ton last week versus $59.40/ton this time last year.

Prompt gas prices will likely remain high in coming weeks as European buyers scramble to refill depleted inventories before the Northern Hemisphere winter. Prices could then stay high if winter is long and cold, seasonal wind patterns are weaker than normal — as they have been for much of the year — LNG continues heading to higher-priced Asian markets and there are further delays starting up Russia's Nord Stream 2 pipeline.

EU carbon prices hit a record €62 ($73) per credit last week, up from €28 a year ago. This isn't stopping generators from using coal, as it is cheaper than gas. But the elevated prices are hurting EU states like Poland that rely heavily on coal. Utility PGE said last week it expected a shortfall of 600 million carbon emissions allowances by 2030 due to a "structural deficit" caused by dependence on coal power. At current prices, it would have to pay €40 billion to buy the allowances on the open market, cutting the amount available for energy transition measures.

Jason Eden, London

POLICY

Panama Goes Greener With Gas

Gas is key to Panama's plans to become even greener over the next few decades, Energy Secretary Jorge Rivera Staff tells Energy Intelligence. The country, a major transit route for LNG, container and dry bulk shipping, ranks as carbon negative, meaning it absorbs more carbon than it emits. But it is highly vulnerable to climate change as a result of rising sea levels and dependence on hydropower. And as it looks to avert the worst impacts, gas will play a much bigger role in power generation, Rivera Staff said in an exclusive interview.

"We think natural gas is our energy transition fuel. Historically, around 20%-25% of our electricity production comes from bunker, from diesel and a little bit of coal, so we want to replace that with maybe 20% of natural gas. In the near future, we will have more renewables coming to our matrix but the natural gas that will be there will be security and in a clean way," Rivera Staff said in a virtual meeting from Panama City.

Gas will also support plans to become a regional energy hub. "Panama continues to aspire to becoming the regional energy hub in Latin America for hydrocarbons, hydrogen, LNG, liquefied petroleum gas and electricity, given its connections with Central America and Mexico, and efforts to finally connect with Colombia and the rest of South America," he said. "Panama is a natural hub for this ... and the main resource for our country is our strategic geographic position."

Panama imported around 220,000 tons of LNG last year, almost all from the US, according to the GIIGNL LNG importers' group. It began importing the superchilled fuel in mid-2018 for its first integrated LNG-to-power plant, the 370 megawatt Costa Norte developed by AES Panama and local investor Inversiones Bahia.

Imports are set to increase, particularly from the US, amid plans to build more gas-fired power stations. Construction of the 670 MW Generadora Gatun plant could start in November. Partners AES Panama and InterEnergy Group will invest nearly $1 billion, Rivera Staff said. The project, near the port of Colon, will generate over 3,000 direct jobs and thousands of indirect jobs in its construction phase, and could open in 2024. It is expected to import LNG via the same 1.5 million ton per year floating storage and regasification unit as Costa Norte, near the Caribbean entrance to the Panama Canal.

Environmental permitting continues on a second import terminal, the 2.6 million ton/yr Sinolam LNG, linked to another 441 MW gas plant. The project would consist of a floating storage unit and onshore regasification facilities and could open in 2022, GIIGNL says.

Gas could also replace coal. Rivera Staff said the government is in talks with a copper mining company to convert a 300 MW coal plant to use "cleaner sources," and is shutting down a coal-fired station in which it owns 49%.

Gas made up around 10% of the country's 3,902 MW of installed power capacity last year, renewables 59% — hydropower 46% — and diesel and fuel oil 31%.

But under an energy transition road map rolled out earlier this year, gas' role is set to grow.

Under the Business as Usual scenario, it is expected to account for 21% of installed capacity by 2024 and 27% by 2050, while diesel and fuel oil drop to 15% by 2024 and 13% by midcentury.

Under the more aggressive Energy Transition Agenda scenario, gas would make up 26% by 2024 and 30% by 2050. Diesel and fuel oil fall to 14% by 2024 and 12% by 2050.

Despite its political stability and dollarized economy, Panama was hit badly by the pandemic. Its economy contracted almost 18% last year, although it is expected to grow around 10% in 2021. Energy transition investment is vital to post-pandemic recovery. "With all these changes happening in Latin America," Rivera Staff said, "we see Panama as a haven for investments and we are betting strong on that."

Pietro Pitts, Houston

ENERGY TRANSITION

Russia's Hydrogen Strategy Shifts East

With Asia a more promising market for Russian hydrogen than Europe, look for more hydrogen projects to be built in Russia's far east. The region could become home to a "powerful industrial cluster for the production of green hydrogen and ammonia," President Vladimir Putin told the Far Eastern Economic Forum in Vladivostok this month.

As more Asian oil and gas importers set decarbonization targets, Russia wants to grab as big a share of the long-term market for hydrogen and ammonia as it can. Shorter term, it is promoting LNG and petrochemicals projects as a way of monetizing as much of its vast gas reserves as possible before demand crumbles under transition pressures.

The government development concept envisages at least three hydrogen clusters — in northwestern Russia targeting Europe, in the east targeting Asia and in the Arctic targeting both. Gazprom, the country's biggest gas producer, appears unenthusiastic. It would prefer to stick to what it knows — piping gas through existing infrastructure to Europe, where hydrogen would be manufactured close to consumption centers.

Europe appears to be betting on indigenous production of "green" hydrogen — produced from renewables — while Asia is more likely looking to imports. That's why Russia should aim to become a leading hydrogen exporter to Asia, according to Anton Moskvin, vice president for marketing and business development at Rosatom Overseas, a subsidiary of state nuclear corporation Rosatom. It is planning a 30,000 ton per year hydrogen production project as part of a hydrogen cluster on Sakhalin Island.

The Sakhalin region, also home to Gazprom's Sakhalin-2 LNG project, leads Russia in terms of decarbonization. It intends to launch a pilot carbon trading project next year and become carbon neutral in 2025. The country as a whole has yet to set a net-zero goal. The hydrogen cluster will test and develop various technologies, support the country's export ambitions and promote hydrogen as a fuel for domestic transport, including railroads.

Rosatom plans to wrap up a feasibility study on the project by the end of the year. Being developed with France's Air Liquide, it could eventually produce 100,000 tons/yr of hydrogen that could potentially be exported to Asia in the form of ammonia. Production should start by 2024, and exports to Japan, South Korea and other Asian markets in 2025. Rosatom plans to produce "blue" hydrogen from natural gas with carbon capture and storage, regarding green as too costly. Gazprom might provide the gas, last week signing a cooperation agreement with Rosatom and the Sakhalin region government.

Ammonia is seen as a promising green bunker fuel in Asia, potentially competing with LNG. So is methanol, which is why petrochemicals companies in eastern Russia are analyzing sales prospects. Khimproyekt, developer of the 445 billion ruble ($6.1 billion) Nakhodka fertilizer plant, has already opened talks with large consumers, CEO Nikolai Sabitov said in Vladivostok. Construction of the first phase will start this month. It will produce 1.8 million tons/yr of methanol. The second phase will produce 3 million tons/yr of urea.

LNG champion Novatek could emerge as the driving force behind the Arctic hydrogen cluster, targeting Asia, specifically Japan. It signed a memorandum of cooperation with Japan's Ministry of Economy, Trade and Industry and a cooperation agreement with Japan Bank for International Cooperation on the forum sidelines, both focused on hydrogen and ammonia. Novatek wants to produce "blue" ammonia at its planned Obsky gas chemical complex in the Arctic, which replaced the troubled Obsky LNG project. The first phase is expected to produce 2.5 million tons/yr of ammonia, and the second will either double ammonia output or produce methanol, CEO Leonid Mikhelson said. He expects a final investment decision next year.

Vitaly Sokolov, Moscow

HORIZON

Groningen Set to Offer Little Relief to Gas-Short Europe

European gas traders are not expecting the Dutch government to raise the production quota for the Groningen field to ease market tightness that has pushed day-ahead prices in Northwest Europe above $20 per million Btu.

The economic affairs ministry in the Netherlands has provisionally set the cap at 3.9 billion cubic meters (380 million cubic feet per day) for the 12 months starting October — expected to be the field's last year of normal operation — with the proviso that Groningen continues to act as backup in the event of high demand or exceptional circumstances going forward.

Asked whether output might be increased to bolster European supply, a ministry spokesman told Energy Intelligence a final decision will be communicated to parliament on Oct. 1.

A spokeswoman for Dutch gas grid operator Gasunie Transport Services (GTS) says the company is awaiting the decision, but for the time being assumes the quota won't rise. The head of a trading desk at a German utility does not believe the annual quota will increase either, but expects a temporary rise because of forecasts of colder weather. A gas trader with a European major believes regulatory constraints likely rule out an increase, adding that the extended price rally suggests other traders think the same.

Groningen, once Europe's largest onshore gas field, is set to close after government-mandated production cuts failed to stop earthquakes in the northern Netherlands. In 2013, before the cuts, output was around 54 Bcm. Between October 2020 and July 2021, it totaled 6.9 Bcm, down from 8.12 Bcm a year earlier, data from field operator Nam shows.

Unlike the ministry, Nam, a joint venture between Royal Dutch Shell and Exxon Mobil, does not want the field acting as a backup and wants to shutter it sooner. The role is "undesirable and unnecessary," particularly as the ministry's security of supply assessments are "too conservative" and there are alternatives, Nam Director Johan Atema said in July.

The joint venture reckons the field could close as soon as the Zuidbroek nitrogen plant starts up next year. The plant will convert high-calorific value gas imported from Norway and Russia into the low-calorific gas traditionally produced by Groningen and consumed across the region. GTS says the €500 million ($590 million) plant is expected to be ready next April, but the start could be pushed back to July.

Other Dutch authorities are eyeing a later closure. Regulators at the State Supervision of Mines (SSM) say the Grijpskerk and Norg gas storage facilities need to be used "optimally" for the phaseout to work. The watchdog believes the field could close permanently as early as the third quarter of 2023. GTS says full closure looks impossible before the third quarter of 2024 if there are delays converting Grijpskerk to store high-calorific gas or if domestic demand does not decline.The field is also an important source of low-calorific gas for Germany, Belgium and France. The SSM says the closure's precise date hinges on Belgium's conversion to high-calorific gas. The Dutch economics minister said Belgium reckons low-calorific gas users can be switched by the end of 2024, rather than 2029, as first planned.

Conversions in Germany and France are progressing rapidly, according to an L-Gas Market Conversion Review published in February. Belgium imported 4.14 Bcm of low-calorific gas from the Netherlands in the 12 months to September 2020, France 3.6 Bcm and Germany 14.4 Bcm. By the 2029/30 gas year, France and Belgium should be importing zero low-calorific Dutch gas and Germany 300 million cubic meters, the report says.

High-calorific gas imports into the Netherlands rose eight-fold to 17.33 Bcm between the gas year ended September 2018 and September 2020. The report finds there is sufficient transport capacity to manage supply disruptions in an average year due to extra LNG supply potential, new European import routes and lower gas demand in France and the UK. A planned increase in German-Dutch border capacity also increases supply flexibility.

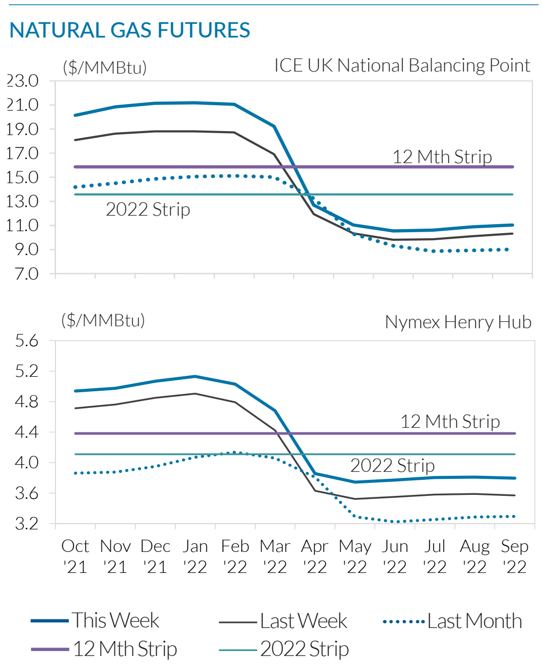
Jaime Concha, Copenhagen

MARKET INSIGHT

Asian LNG Prices March Steadily Upward Into Winter

Conflicting reports on how soon Russian gas might start flowing to Germany through the Nord Stream 2 pipeline are keeping European traders on tenterhooks. But Asian traders do not expect the opening to halt the relentless rise in Asian spot prices as market fundamentals remain unchanged.

European and Asian spot prices nosedived in mid-August after a data error suggested the pipeline taps had opened. The month-ahead contract on the Dutch TTF hub, Europe's de facto benchmark, fell from €47.95 per megawatt hour ($16.48 per million Btu) on Aug. 16 to €40.40/MWh on Aug. 19. In turn, the Japan Korea Marker sank from $17.83/MMBtu on Aug. 18 to $16.55/MMBtu the following day, although has since more than bounced back to nearly $22/MMBtu.



A trader said at the time that "Nord Stream 2 seems to be holding the cards to how this winter market will play out." But other traders believe the collapse was driven by sentiment. While they expect more of the same when the Russian shipments start, they don't think it will last.

"Fundamentally speaking we are still short, even if or when Nord Stream 2 comes on line. There will be some dips just because news like that shakes the market. But honestly, I think it should not come off that much," an Asian trader says. "The correction would be short-lived as fundamentals remain unchanged," adds another.

"The impact of Nord Stream 2 is really going to depend on how much gas is going to flow from Russia. I do not think there is a consensus on extra capacity being equal to extra production, as Russia will be constrained on the extent of gas that is available to flow," a third trader says. He adds that Nord Stream 2 "does not change the overall picture that Europe is short of gas over the winter." The company has said it plans to begin flows in October, but several traders do not think Nord Stream 2 will enter service soon.

Japan Retakes Top Importer Spot

Northeast Asian LNG imports jumped in July by 18% year on year to 17.5 million tons, and were up from 17 million tons in June, driven mainly by Japan and China. Japan overtook China as No. 1 buyer with imports of 6.1 million tons in July, 8% higher month on month and 2.5% higher year on year. The rise is attributed to stronger summer demand and the easing of Covid-19 restrictions.

China imported 5.6 million tons, a 15% drop from June, but 13% more than in July 2020. China was the biggest importer in the first half of the year, bringing in 39.7 million tons to Japan's 38.9 million tons. South Korea imported 4 million tons in July, 28% higher month on month and a massive 70% increase from July 2020. Taiwan's imports were stable at 1.6 million tons in July and June, 13% more than in July 2020.

In India, imports rose to 2.1 million tons in June from 1.9 million tons in May. While that was down slightly on June 2020's 2.2 million tons, 9% month-on-month growth was mostly due to the easing of strict Covid-19 restrictions and warmer summer weather.

In Southeast Asia, Singapore's imports rose by 36% month on month to 387,000 tons in July and were 4% higher year on year. Thailand's intake dropped year on year by 17% to 490,000 tons. Malaysia's fell by 42% year on year to 121,000 tons.

Marc Roussot, Singapore, Yousra Samaha, Dubai

SPOT LNG

Prices Reach New Pre-Winter Highs in Asia and Europe

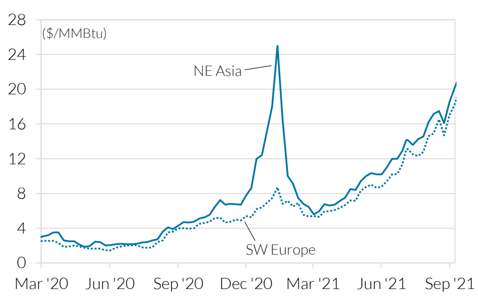
Northeast Asian spot LNG prices jumped $1.45 to $21.60 per million Btu, according to World Gas Intelligence assessments for deliveries four to eight weeks ahead. Spot prices in Southwest Europe were assessed $1.75 higher at $20/MMBtu. The UK National Balancing Point (NBP) day-ahead price was assessed $2.86 higher at $21.32/MMBtu, while the ICE October front-month contract leapt $2.66 to $21.21/MMBtu. Netbacks for Mideast sellers in Asia were about $1.60/MMBtu higher than in Southwest Europe, while UK/Belgian netbacks were almost 45¢ lower than in Asia.

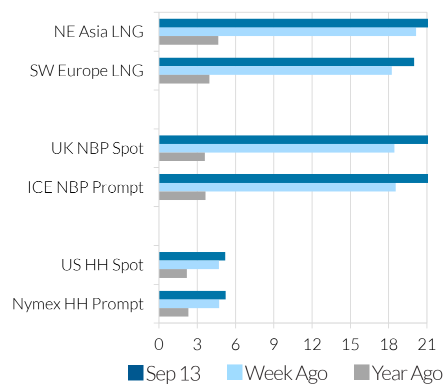
INDICATIVE NATURAL GAS PRICES

($/MMBtu)	Sep 13	Week Ago	Year Ago
NE Asia LNG	21.60	20.15	4.65
SW Europe LNG	20.00	18.25	3.95
UK NBP Spot	21.32	18.46	3.59
ICE NBP Prompt	21.21	18.55	3.65
US HH Spot	5.19	4.69	2.18
Nymex HH Prompt	5.23	4.71	2.31

Source: WGI assessments of spot prices for LNG in NE Asia and SW Europe and for day-ahead gas in the UK. NGW spot assessment for US. All prices are for Mon Sep 13. Note: Dates may vary due to public holidays and availability.

INDICATIVE LNG PRICES





Asian prices have risen for nine weeks in a row, pushing many buyers to the sidelines. Over the past seven days, US supply uncertainty created by Tropical Storm Nicholas, problems at Petronas' Malaysia LNG and soaring European gas prices have all stoked bulls. "All eyes are on Nicholas," a trader says. As of press time, the storm had passed Cheniere's Corpus Christi LNG and was heading toward Freeport LNG packing winds of 100-120 kilometers per hour (62-75 miles per hour). Both facilities, which are significant suppliers to Asia, were understood to be operating as normal.

Extreme weather is also causing anxiety in Northeast Asia, where Typhoon Chanthu could disrupt LNG imports into South Korea and Japan. Chanthu has passed Shanghai and is now approaching South Korea and Japan with winds of 100-150 km/h.

Against this backdrop, only a few buyers are in the market. In Thailand, state-run Egat is believed to be seeking a cargo for late October. A tender is expected to be released soon. In India, Gail wants two cargoes with delivery on Nov. 7-13 to Dabhol and on Dec. 26-28 to Dahej.

Beyond the assessment window, state-owned Pakistan LNG is seeking eight cargoes for December-January delivery. The first is for delivery on Dec. 6-7 and the last on Jan. 29-30, according to Pakistan LNG.

On the sell side, Petronas may issue a late-December tender, while Pertamina awarded late-October and early-November cargoes from Bontang. The October f.o.b. cargo was sold at the Japan Korea Marker October plus $1/MMBtu.

PNG LNG is selling an Oct. 19-20 loading cargo on an f.o.b. or d.e.s. basis, with delivery from Oct. 28-Nov. 6 to North Asia. Australia Pacific LNG likely awarded an October-loading f.o.b. cargo in the low to mid-$19/MMBtu. Brunei may not have awarded its Oct. 6-9 delivery cargo to North Asia.

Spot prices also soared in Southwest Europe, spiking on a Sep. 13 announcement from German energy regulators that it will take four months to complete certification of Russia's Nord Stream 2 gas pipeline to Europe. Gazprom had said it would flow 5.6 billion cubic meters through the pipe this year, although it could reroute the shipments.

A broker notes no major changes to fundamentals. "Winter will likely bring more drawdowns on gas in storage." But he added that mild Asian weather could see gas diverted to Europe.

Spanish reloads continue, with some shifting into October. A reload originally scheduled out of Mugardos later this month is now set for Oct. 1, according to Spanish grid operator Enagas' latest schedule.

A cargo reloaded from Barcelona on Sep. 9-10 was for PetroChina, a Spanish LNG shipbroker says. Another left Huelva earlier this month. The charter market remains a bit slack, the broker says, but activity may pick up soon. No other reloads are scheduled this month. In addition to the Mugardos reload, another is planned from Cartagena in October.

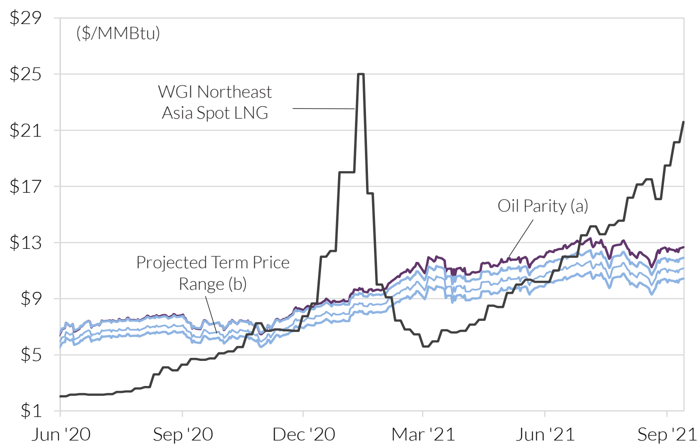
Looking much further ahead, Greek's Gastrade announced on Sep. 10 that a final investment decision on a second 5.5 Bcm/yr LNG import terminal at Alexandroupolis in Greece was due by year's end. It would start up by end-2023.

Marc Roussot, Singapore, Yousra Samaha, Dubai, Tom Pepper, London

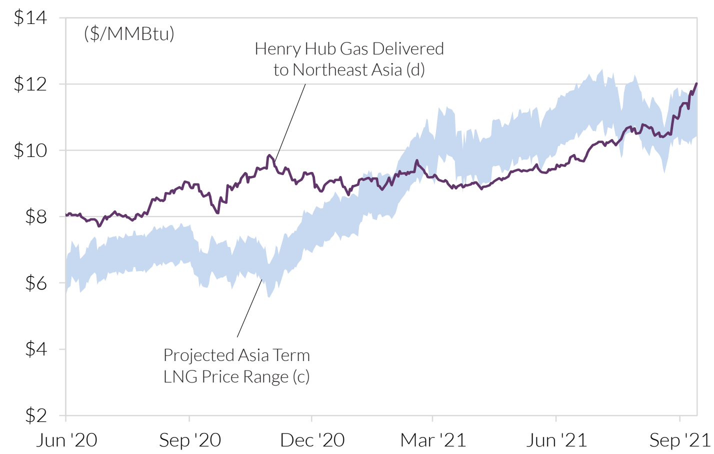
WORLD GAS INTELLIGENCE LNG ANALYTICS

The following graphs provide weekly comparative insights into key LNG market relationships over the previous 12 months, with particular emphasis on the price of competing supplies in Asia and key inter-market price spreads.

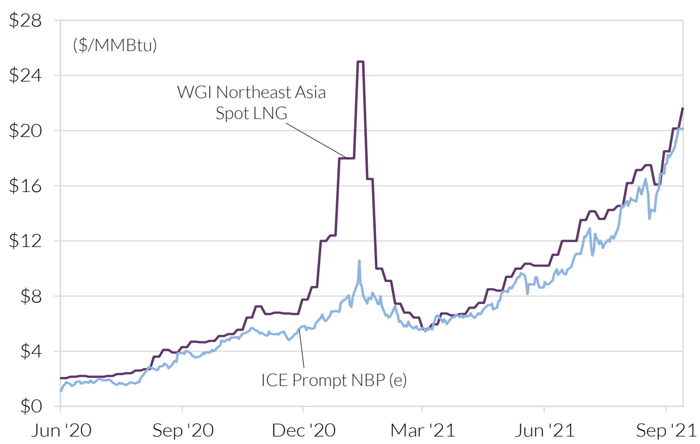
NORTHEAST ASIA SPOT LNG VERSUS ASIA TERM LNG



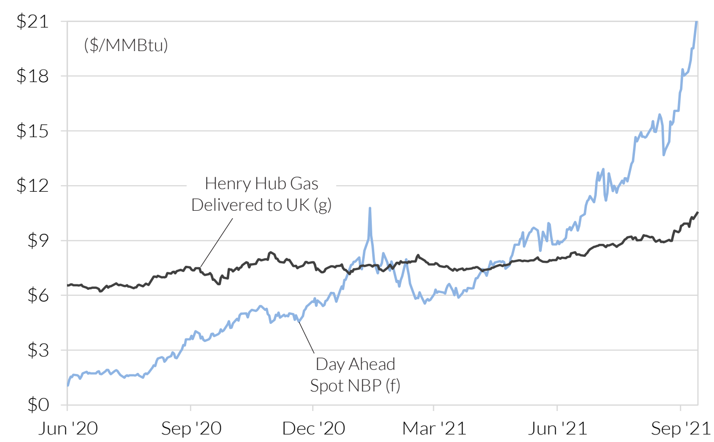
HENRY HUB NE ASIA VERSUS ASIA TERM LNG



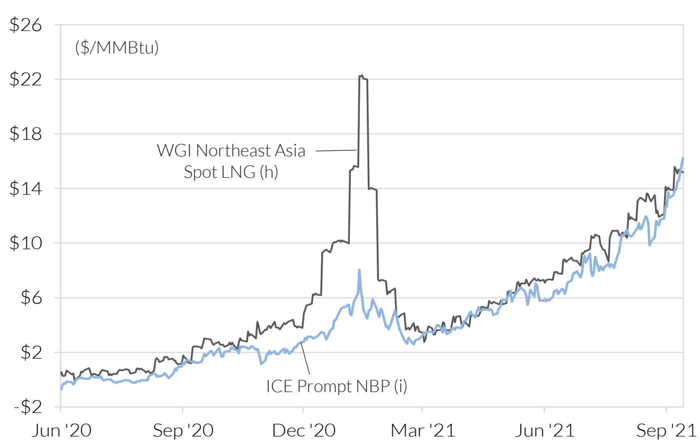
NBP VERSUS NORTHEAST ASIA SPOT LNG



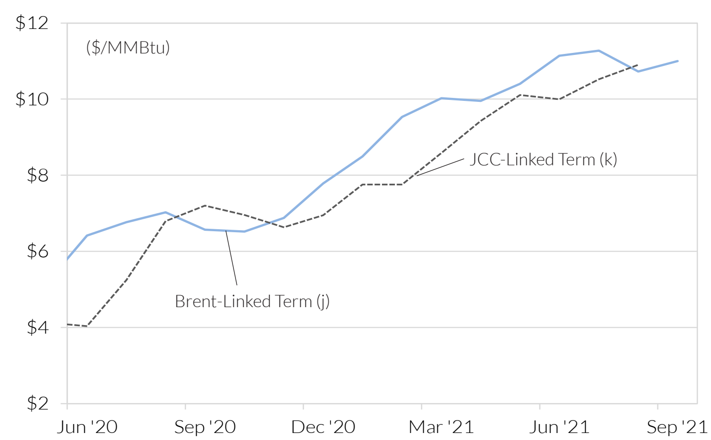
HENRY HUB GAS DELIVERED TO UK VERSUS NBP



REGIONAL PRICE DIFFERENTIALS TO NYMEX HENRY HUB PROMPT



TERM JCC VERSUS TERM BRENT



(a) Oil parity - 17.24% of Brent-Linked Asian Term. (b) Estimated low, middle, and high cases for contract terms: 13.5% of Brent+$0.50, 14.5% of Brent+$0.50, and 14.85% of Brent+$1.00, respectively. (c) Brent-Linked Asian Term LNG, high and low cases. (d) Per Cheniere formula: 115% Henry Hub plus $3.50 for liquefaction and $2.50 for shipping. (e) ICE prompt NBP converted from pence/therm to US$/MMBtu. (f) Thomson Reuters Day Ahead NBP converted from pence/therm to US$/MMBtu. (g) Per Cheniere formula: 115% of Henry Hub plus $3.50 for liquefaction and $1.00 for shipping (h) Northeast Asia Spot vs Nymex Henry Hub Prompt. (i) Day Ahead UK NBP vs Nymex Henry Hub Prompt. (j) Term prices based on current month average against mid-case formula for delivery 3 months later; (k) JCC is Monthly Japan Crude Cocktail Price reported by Japan's Ministry of Finance.

WORLD GAS INTELLIGENCE LNG ANALYTICS

ASIA LNG MARKETS (PRICES IN $/MMBTU, VOLUMES IN '000 TONS)

To Japan/From	Prices Jul'21	Prices YTD	Prices Jul'20	Volume Jul'21	Volume YTD
Australia	9.47	8.54	7.76	2,192.71	15,406.63
Brunei	10.22	8.06	5.44	324.73	2,632.85
Egypt	-	15.54	-	-	64.70
Equatorial Guinea	-	12.85	-	-	204.52
France	-	24.71	-	-	15.23
Indonesia	10.05	8.98	6.87	190.77	1,092.19
Malaysia	9.19	7.68	6.09	928.49	6,376.22
Nigeria	-	8.61	6.11	-	556.38
Oman	9.40	8.81	9.16	188.03	1,201.13
Papua New Guinea	10.02	9.22	6.61	294.78	2,053.06
Peru	-	8.35	-	-	533.85
Qatar	9.45	8.13	6.33	640.29	5,146.25
Russia	9.85	8.05	7.07	760.63	4,210.99
Thailand	-	16.83	-	-	60.65
United Arab Emirates	10.86	7.55	4.05	57.67	719.73
United States	10.69	10.26	9.31	610.86	4,805.27
Avg./Total	**9.69**	**8.56**	**7.28**	**6,188.96**	**45,079.63**

To China/From	Prices Jul'21	Prices YTD	Prices Jul'20	Volume Jul'21	Volume YTD
Algeria	-	7.66	-	-	184.06
Angola	-	9.35	-	-	432.11
Australia	9.06	7.55	7.36	2,070.62	17,755.37
Belgium	-	9.09	-	-	74.07
Brunei	10.65	7.87	7.00	90.08	414.21
Cameroon	-	13.01	3.42	-	64.32
Canada	-	9.15	-	-	0.54
Egypt	10.71	7.96	-	130.85	941.72
Equatorial Guinea	10.43	8.44	-	61.24	261.25
Indonesia	8.49	7.27	2.99	309.02	3,052.73
Malaysia	7.80	7.56	4.92	421.60	5,078.94
Netherlands	-	9.76	-	-	64.08
Nigeria	10.95	9.04	5.98	269.52	1,023.30
Oman	10.35	8.48	-	74.32	1,305.67
Papua New Guinea	9.61	8.85	5.22	223.25	1,820.69
Peru	-	7.72	-	-	198.19
Philippines	-	8.17	-	-	55.12
Qatar	10.35	8.02	6.58	855.57	5,319.99
Russia	10.20	8.39	6.95	348.74	2,178.16
Singapore	-	10.74	-	-	58.97
Thailand	-	11.64	-	-	0.04
Trinidad and Tobago	-	8.73	-	-	123.34
United Arab Emirates	10.92	8.56	-	61.68	243.23
United States	10.23	9.18	5.85	755.26	4,597.80
Avg./Total	**9.58**	**7.97**	**6.49**	**5,671.76**	**45,247.88**

To Taiwan/From	Prices Jul'21	Prices YTD	Prices Jul'20	Volume Jul'21	Volume YTD
Australia	10.34	8.76	4.74	558.09	3,466.94
Belgium	-	8.59	-	-	66.30
Brunei	-	-	-	-	-
Cameroon	-	13.80	-	-	199.48
Egypt	-	18.25	-	-	61.69
Indonesia	10.55	8.62	2.06	173.99	645.09
Malaysia	12.15	8.53	3.98	0.02	188.24
Nigeria	-	8.13	2.54	-	363.54
Oman	8.09	8.80	-	67.90	259.10
Papua New Guinea	9.59	8.25	4.64	172.08	807.90
Qatar	6.61	5.67	3.78	380.77	3,071.83
Russia	8.82	7.49	5.46	197.99	831.79
Trinidad and Tobago	-	5.39	-	-	52.80
United Arab Emirates	-	-	3.54	-	-
United States	10.84	9.04	2.14	68.65	1,036.06
Avg./Total	**9.15**	**7.89**	**4.08**	**1,619.49**	**11,050.76**

To S.Korea/From	Prices Jul'21	Prices YTD	Prices Jul'20	Volume Jul'21	Volume YTD
Angola	-	7.00	-	-	127.76
Australia	9.78	9.38	6.31	936.08	5,081.71
Belgium	-	-	9.13	-	-
Brunei	-	7.06	2.28	-	196.82
Cameroon	9.92	9.95	-	71.64	137.02
Egypt	-	8.47	-	-	129.76
Equatorial Guinea	9.77	9.77	-	62.27	62.27
Indonesia	5.87	6.78	6.89	187.35	1,264.32
Malaysia	9.26	6.94	5.59	301.62	2,587.75
Netherlands	-	7.20	-	-	112.15
Nigeria	-	11.75	-	-	393.63
Oman	10.34	8.50	8.89	478.88	2,742.97
Papua New Guinea	-	8.53	7.23	-	10.38
Peru	9.73	9.07	6.74	149.79	870.23
Qatar	9.98	8.69	10.43	878.19	6,908.37
Russia	-	7.28	7.64	-	1,364.79
Singapore	-	-	-	-	-
United Arab Emirates	-	12.56	-	-	183.35
United States	9.34	9.65	6.14	977.99	5,103.91
Avg./Total	**9.56**	**8.72**	**7.33**	**4,043.80**	**27,277.17**

Total All Northeast Asia Buyers/From	Prices Jul'21	Prices YTD	Prices Jul'20	Volume Jul'21	Volume YTD
Algeria	-	7.66	-	-	184.06
Angola	-	8.81	-	-	559.88
Australia	9.46	8.24	7.33	5,757.50	41,710.65
Belgium	-	8.85	9.13	-	140.37
Brunei	10.31	7.98	5.14	414.82	3,243.89
Cameroon	9.92	12.35	3.42	71.64	400.82
Canada	-	9.15	-	-	0.54
Egypt	10.71	8.96	-	130.85	1,197.88
Equatorial Guinea	10.10	10.30	-	123.51	528.03
France	-	24.71	-	-	15.23
Indonesia	8.68	7.62	5.89	861.12	6,054.32
Malaysia	8.85	7.51	5.42	1,651.73	14,231.14
Netherlands	-	8.13	-	-	176.23
Nigeria	10.95	9.25	5.55	269.52	2,336.86
Oman	9.93	8.58	8.99	809.13	5,508.86
Papua New Guinea	9.78	8.91	5.68	690.10	4,692.03
Peru	9.73	8.67	6.74	149.79	1,602.25
Philippines	-	8.17	-	-	55.12
Qatar	9.50	7.92	6.66	2,754.82	20,446.43
Russia	9.79	7.96	6.69	1,307.36	8,585.73
Singapore	-	10.74	-	-	58.97
Thailand	-	16.83	-	-	60.69
Trinidad and Tobago	-	7.73	-	-	176.14
United Arab Emirates	10.89	8.57	3.79	119.35	1,146.32
United States	10.00	9.66	6.90	2,412.76	15,543.04
Avg./Total	**9.57**	**8.33**	**6.72**	**17,524.00**	**128,655.48**

To Singapore/From	Prices Jul'21	Prices YTD	Prices Jul'20	Volume Jul'21	Volume YTD
Angola	-	-	-	-	-
Australia	10.53	9.47	5.59	310.05	1,303.32
Brunei	-	-	2.41	-	-
Egypt	-	7.95	-	-	185.00
Equatorial Guinea	-	7.01	-	-	82.84
France	-	16.34	-	-	0.07
Indonesia	-	9.89	-	-	64.78
Malaysia	-	-	2.81	-	-
Nigeria	0.01	0.01	-	8.47	8.47
Oman	-	5.72	-	-	11.55
Philippines	-	6.44	-	-	4.40
Qatar	-	7.59	2.16	-	154.12
Russia	7.99	7.99	-	68.87	68.87
South Korea	-	17.94	-	-	0.13
United States	-	6.73	2.56	-	342.68
Avg./Total	**9.85**	**8.61**	**4.12**	**387.39**	**2,226.22**

To Thailand/From	Prices Jul'21	Prices YTD	Prices Jul'20	Volume Jul'21	Volume YTD
Angola	7.72	7.72	-	133.70	133.70
Australia	-	8.66	7.28	-	205.45
Brunei	-	5.42	-	-	59.45
Cameroon	-	-	1.91	-	-
Equatorial Guinea	-	6.10	-	-	135.75
Indonesia	-	-	-	-	-
Malaysia	7.46	6.47	7.28	117.14	469.19
Nigeria	7.42	6.20	-	58.73	457.97
Oman	-	6.46	6.66	-	62.25
Papua New Guinea	-	-	-	-	-
Qatar	10.31	8.03	5.64	180.84	1,766.29
Trinidad and Tobago	-	6.06	-	-	177.52
United States	-	7.00	-	-	206.70
Avg./Total	**8.58**	**7.34**	**5.90**	**490.41**	**3,674.27**

To India/From	Prices Jun'21	Prices YTD	Prices Jun'20	Volume Jun'21	Volume YTD
Algeria	-	-	-	-	-
Angola	7.42	8.94	4.80	66.69	477.35
Australia	-	4.79	-	-	313.04
Belgium	12.15	12.15	5.77	68.52	68.52
Brunei	-	-	3.10	-	-
Cameroon	-	5.82	-	-	205.10
Egypt	6.66	6.77	-	64.52	783.77
Equatorial Guinea	9.33	7.11	2.07	70.09	212.09
France	-	10.82	8.17	-	131.24
Nigeria	6.96	6.50	6.53	118.18	576.92
Oman	8.78	7.52	3.69	68.04	586.61
Qatar	9.04	7.78	4.05	624.62	4,945.71
Russia	-	-	-	-	-
Spain	-	5.00	-	-	22.98
Trinidad and Tobago	6.55	6.57	6.15	76.72	143.67
United Arab Emirates	7.55	6.43	3.68	317.38	1,957.63
United States	6.65	8.17	8.65	645.84	2,005.39
Avg./Total	**7.86**	**7.46**	**4.97**	**2,120.61**	**12,430.02**

To Malaysia/From	Prices May'21	Prices YTD	Prices May'20	Volume May'21	Volume YTD
Australia	7.82	7.60	11.58	121.15	598.33
Brunei	-	-	-	-	-
Nigeria	-	5.47	-	-	64.81
Singapore	-	-	-	-	-
Avg./Total	**7.82**	**7.39**	**11.58**	**121.15**	**663.14**

Official statistics, companies. Both Japanese and Korean prices are c.i.f., before regasification. Yen exchange rate to the dollar was 109.02 for Apr 2021, 108.71 for Mar 2021, 105.35 for Feb 2021, 107.58 for 2021, and 106.77 for 2020