



Getting Asia to burn more coal could free up 50 Bcm of LNG for Europe

European gas companies struggle to source enough additional LNG to fulfil the Commission's plan of reducing Russian gas supplies by 102 bcm before year-end. Persuading Asia to use more coal could free up around 50 Bcm of LNG, analysts reckon, though it would be cheaper if EU power generators switched from gas to coal and nuclear instead.

The International Group of Liquefied Natural Gas Importers (GIIGNL) suggests it seems "challenging" to source enough additional LNG to meet the Commission's RePowerEU targets of replenishing gas stocks prior to the winter to the targeted 90% storage capacity by October 1st.

Commission President Ursula von der Leyen wants Europe to be independent from Russian gas by gradually removing at least 155 bcm of imports, with two-thirds of that reduction to be achieved before year-end. "We simply cannot rely on a supplier who explicitly threatens us," she said in reference to Russia's suggestion it will halt gas flows through the Nord Stream 1 pipeline



Tanker discharging at GATE LNG terminal

if the West imposes a ban on Russian oil.

Rush to snap up new volumes

If European buyers could snatch up all the new LNG volumes coming onstream in 2022 in the Atlantic basin, and attract additional cargoes previously routed to Asia, an increase of 32-45.5 bcm "can really happen", Sindre Knutson, vice president of gas and LNG

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Fitch more than doubles 2022 TTF gas price forecast to \$20/mcf

Fitch Ratings has more than doubled its forecast for prices at Europe's benchmark gas trading hub TTF to \$20 per thousand cubic feet (mcf), reflecting the risk of a halt in Russian supplies and the struggle of EU importers to secure alternative volumes in a tight market. Over in the US, Henry Hub prices are fairly unaffected.

Factoring in the risk that Russia's state-dominated Gazprom could cut supplies in retaliation to Western sanctions, Fitch analysts increased their prices assumption for Brent oil from \$70 to \$100 per barrel in 2022, and from \$60 to \$80 per barrel in 2023.

Steep price hikes are also assumed to occur at Europe's gas benchmark at the Dutch Title Transfer Facility. TTF gas prices could

soar from \$8/mcf to levels as high as \$20/mcf if Russia's Gazprom halts deliveries in retaliation to sanctions and Europe cannot attract enough alternative supply, analysts warned.

Oil and Gas Price Assumptions

FitchRatings

	2022		2023		2024		2025	
	Old	New	Old	New	Old	New	Old	New
Base Case								
Brent (USD/bbl)	70.0	100.0	60.0	80.0	53.0	60.0	53.0	53.0
WTI (USD/bbl)	67.0	95.0	57.0	76.0	50.0	57.0	50.0	50.0
Henry Hub (USD/mcf)	3.25	4.25	2.75	3.25	2.50	2.75	2.50	2.50
TTF/NBP (USD/mcf)	8.0	20.0	5.0	10.0	5.0	7.0	5.0	5.0

Assumptions as of March 2022.

Bbl: barrel; mcf: thousand cubic feet; NBP: National Balancing Point; TTF: Title Transfer Facility; WTI: West Texas Intermediate

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markets at Rystad Energy told Montel.

Global gas liquefaction and export capacity could rise by 22.6 million tons this year, according to GIIGNL estimates, most of which supplied by the United States. At best, Europe could secure around 12 mt of that, as most volumes are already locked into long-term supply deals to Asia.

"Persuading Asian buyers to use coal and free up LNG," could help, Wood Mackenzie advises, as would maximising

Europe's indigenous gas production and pipeline imports. "But this would only be a temporary solution to get through the summer and would leave Europe with perilously low storage volumes going into winter 2022/23 and risks demand disruptions. Winter prices next year could be higher than 2021/22," principal gas and LNG analysts Kateryna Filippenko warned.

Diverting LNG cargoes, initially destined

for Asian markets, could give hard-pressed European buyers access to about 15 bcm of extra LNG from April through October – provided enough import capacity is kept available. But how much gets diverted will hinge on Europe's willingness to play higher prices than China and the rest of Asia. Benchmark Dutch TTF gas prices have traded at a premium to their rival Asian hub, the JKM, at most days of the year. ■

EU power producers could reap €200 billion profits from high prices

Electricity producers cash in on today's high prices that are well in excess of costs for power plant operations and capital recovery. Assuming gas prices at €22 per MMBtu and CO2 prices at €90 per tonne, the International Energy Agency (IEA) expects utilities will reap excess profits of up to €200 billion in the EU in 2022.

Consumers, on the other hand, cannot do much to shelter against high gas and electricity prices except for waiting for state aid. IEA analysts estimate that spending by EU member states to cushion the impact of the energy price crisis on so-called "vulnerable consumers" already amounts to a commitment of around €55 billion.

Temporary taxes to raise rates on power generator's windfall profits could be considered, the IEA recommends. These tax receipts should then be redistributed to electricity consumers to partially offset higher energy bills. Measures to tax windfall profits have already been adopted in Italy and Romania in 2022.

Shift away from gas peakers

A major near-term push on technical inno-

vation, can over time, loosen the strong links between natural gas supply and Europe's electricity security. At the moment, gas-fuelled peaking plants are the main source flexibility.

A plethora of flexible, cost effective power sources needs to be deployed as the renewables build-out progresses. Analyst suggest enhanced grids, increased electrification and demand-side response, dispatchable low emissions generation, and various large-scale and long-term en-

ergy storage technologies alongside short-term sources of flexibility such as batteries. Low-carbon hydrogen and synthetic methane could be part of the solution – but only once demonstration plants are deployed, tested and scaled-up. ■



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In contrast, US gas prices are set to stay fairly rangebound. Prices at the bellwether Henry Hub are expected to rise from \$3.25/mcf to \$4.25/mcf as US upstream companies have enough leeway to raise production to cater for industry and power generators at home as well as rising volumes of LNG exports.

Inflation limits Europe's drive to LNG

Moderate growth in global LNG export capacity and solid demand in Asia will leave only "limited additional volumes" available for the Europe. Market tightness will send prices soaring but inflationary pressures will limit the EU Commission's plan to replace

112 bcm of Russian gas imports by end-2022 through greater LNG purchases.

Additional commitments from pipeline gas suppliers, especially Norway, helped to mitigate reduced Gazprom deliveries in the short term. Further down the curve, Europe will have to build more LNG regas and import capacity to diversify supply. The German government is supporting two LNG regas terminals in Brunsbüttel and Wilhelmshaven to come online by 2024, discussions with US LNG exporters as well as Norway and Algeria underway with a view to increasing supplies. But Fitch analysts warned that plans by the US and UK to ban or phase out Russian oil imports will increase global LNG demand, as well as prices. ■

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Germany seals LNG supply deal with Qatar in pivot from Russian gas

Germany's minister for economic affairs Robert Habeck has entered an energy partnership with Qatar, paving the way for LNG importers to fine-tune contract details. Bracing for a period without Russian gas, Berlin is considering all options – LNG but also extending the lifetime of coal- and nuclear power plants, scheduled to close this year.

Qatar LNG cargoes could soon berth and discharge at the Brunsbüttel regas terminal. The 8 billion cubic meter per year (bcm/y) project has been long in the making: First proposed in January 2017 by the Dutch Gasunie, the €450 million venture only gathered momentum after Russia's invasion into Ukraine – when Germany understood the urgency for diversifying gas imports. If all goes to plan, first LNG cargoes could be landed at Brunsbüttel in early 2024.

Feverish hunt for alternative supplies

Prior to minister Habeck's trip to Qatar, he visited Norway to pledge for more pipeline gas deliveries. His next destination is the UAE where he will seek to set up a hydrogen supply chain. The hunt for alternative energy supplies has been taken on a feverish pace, as the risk mounts that Germany will have not enough gas in storage to heat homes or supply its heavy industry next winter.

The global gas market is tense, Habeck told German radio: "Delivery volumes could certainly be increased, but the supplying countries do not have any actual interest in this. They have maximised their profits as gas prices are high amid stable upstream cost." Having faced resistance, the minister said higher supply volumes can only be agreed based on long-term offtake agreements.

Ironically, the leading Green Party politician now not only throughs his political weight behind LNG imports, a costly fossil fuel after all, but also considers extending the run-time of coal power stations. A "strategic" coal and gas power reserve is meant to be in place by the end of this summer.

Coal peaking plants stay on standby

RWE, Vattenfall, EnBW and Steag already review decommissioning timelines coal power plant, after the regular required peakload units to remain on standby. Some 26 GW of coal power capacity is currently operational in German and this could increase to 34 GW next winter by restarting plants held in reserve, in an effort to partly replace Russian gas imports.

Around half of Russian gas imports can be replaced or substituted "in the short term," equal to about 20% of Germany's annual gas demand, the energy industry association BDEW finds. Researchers conclude that, by 2027, a significant increase in energy efficiency, expansion of renewable energies and the electrification of industrial processes and heating could reduce Germany's gas demand by around one-fifth or about 200 terawatt-hours (TWh).

But if Russian gas imports were to stop completely, Germany would have to save around 290 TWh, despite the European replacement strategy. ■



Hydrogenous LOHC tech to facilitate German LNG imports

Abu Dhabi National Oil Company (ADNOC) has agreed with the Uniper to study the transport of hydrogen to Germany, using Hydrogenous' Liquid Organic Hydrogen Carrier (LOHC) technology. Joined by JERA Americas, the parties seek to scale up LOHC tech to ship hydrogen worldwide.

The UAE is developing as a leading producer of green hydrogen, thanks to its abundant and low-cost access to renewable energy sources. The national oil company ANOC aims to become one of the world's leading producers of hydrogen and its carrier fuels.

Novel way of transport

Hydrogen, especially if produced from renewable energy sources, is seen as a key fuel to decarbonise heavy industry and power generation. However, it is a very light element, which makes it difficult to transport over large distances.

Hydrogenous' LOHC technology is based on the proprietary carrier material benzyl toluene (BT). When stored within the BT, no hydrogen losses occur which allows to store large volumes for a long time. The technology is easy to handle under ambient pressure and temperatures, even in cold conditions, hence it can be integrated within the existing fuel logistics infrastructure, researchers at the Erlangen-based company explained.

The energy of hydrogen is significantly higher, when stored with BT, hence a vessel can transport about five times more energy compared to compressed hydrogen, they underlined. The raw material BT is available in large quantities and is recyclable: it can be loaded and unloaded with hydrogen many hundreds of times. "For large-scale harbour-to harbour supply chains, LOHC offers an economic alternative to ammonia or liquid hydrogen," Hydrogenous and Uniper underlined. ■



Urgently awaiting LNG

Tesla's Berlin Gigafactory helps Germany wean off fossil fuel imports

As the first Tesla cars are rolling off the production line at the new Gigafactory near Berlin, the US carmaker helps accelerate Germany's move to e-mobility in order to wean itself off fossil fuel imports. Energy minister Robert Habeck underlined: "We can not only replace [Russian] oil with different oil, but we can electrify."

Electrifying road transport is vital to decarbonise a hard-to-abate sector. The German government is hard pressed for time to enact "enormous changes" necessary to curb transports emission 40% by the end of 2030 – a vital step for the country to become climate-neutral by 2045. Support for electric cars and speed limits are under debate.

Tesla managed to build its first European e-car production hub near Berlin in just two years – despite long quarrel over the factory's impact on ground water. At full capacity, the Gigafactory is designed to produce 500,000 cars a year, more than the 450,000 battery-electric vehicles that German rival Volkswagen sold globally in 2021. It is also meant to generate 50 gigawatt hours (GWh) of battery power, surpassing all other plants in Germany.

Fast e-car uptake

Public acceptance and transition to electric

cars is gathering speed. Registrations of purely electric cars in Germany increased 83% to reach a market share 14%, while the number of new hybrid cars (including plug-ins) rose more than 40% to a total share of 29%.

The German government is now prepared to support the European Commission efforts to phase out the combustion engine for newly registered passenger cars by 2035. "The future belongs to e-mobility," as Chancellor Olaf Scholz put it.

E-mobility – "overly expensive"?

In contrast, Deutsche Bank Research warned that the German e-vehicle market has been "largely driven by regulation" and "less by market forces". Without subsidies, e-cars are "still a niche", analysts said, noting the technology is "a very expensive way of avoiding carbon emissions."



Tesla's Gigafactory-4 in Grünheide

New electric car registrations only reached a 2.6% market share in the European Union this year, but 30-50% market share would be needed by 2030 to achieve Germany's targeted CO2 limits for new car fleets, Deutsche Bank Research finds.

Car makers traditionally have a big lobby in Germany, and the industry recently announced ambitious plans to raise the share of e-cars in their product portfolio, in competition with rival electric car makers in Asia and the United States. ■

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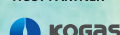
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Five EU countries revert to coal power to curb reliance on Russian gas

Italy, Germany, as well as Czechia, Romania and Bulgaria have suspended plans to phase-out coal power in order to wean of their reliance on Russian gas imports. Several Czech utilities already switched from gas back to coal, while RWE along with Vattenfall, EnBW and Steag review decommissioning timelines for coal-fired power plants in Germany.

The German regulator BNetzA has required peakload coal power units to remain on standby, if necessary, and called for the creation of strategic coal reserves. RWE confirmed it is inspecting its coal-fired power units to "remain ready" and the three other large operators are also reviewing decommissioning plans.

Some 26 GW of coal power capacity is currently operational in German and this could increase to 34 GW next winter by re-starting plants that have already been taken offline or are being held in reserve, in order to partly replace Russian gas imports. Coal imports from Russia is also meant to be reduced, and plants in Germany's capacity reserve mainly run on domestically-sourced lignite.

Italy was aiming to exit coal by 2025, but soon after Russia invaded Ukraine, Prime Minister Mario Draghi made a U-turn and announced that "the reopening of coal-fired

power plants may be necessary to fill any shortfall [in gas supply] in the immediate future".

Eastern Europe boosts coal mining

The Czech government now sees a "temporary role for coal" until alternative energy sources will be found. The aim is not to indirectly finance Russia's invasion into Ukraine by buying natural gas from Gazprom, especially since the Czech Republic used to be 90% dependent on Russian gas. Initially, all Czech coal power plants were to be phased out by 2030 in a shift towards gas-fired generation and renewables.

In Bulgaria, plans for a large new gas-fired power plants were scrapped. The government seems now is prepared to subsidise its national coal industry to provide fuel for



Open-cast mining and coal power plant at Garzweiler, Germany

power generation until two new nuclear reactors will be built and commissioned.

The Romanian government is also taking steps to increase its domestic coal production. Though no new mines are meant to re-open, the extraction capacity of existing one will be increased to source more comparatively cheap fuel at home for generating electricity. ■

Emissions rebound as world economy relies on coal to power growth

Energy-related CO₂ emissions have risen to their highest-ever level, as the global economy rebounded strongly from the pandemic and relied heavily on coal to power that growth. Fuel-by-fuel analysis by the International Energy Agency (IEA) shows that global CO₂ emissions surged 6% in 2021 to 36.3 billion tonnes, more than offsetting the pandemic-induced decline.

Combined with methane emissions, and estimates of nitrous oxide and flaring related CO₂ emissions, the IEA analysis shows that energy-related emissions worldwide have risen to their highest level ever.

Though pandemic related lockdown had curbed emissions by 5.2%, the world econ-

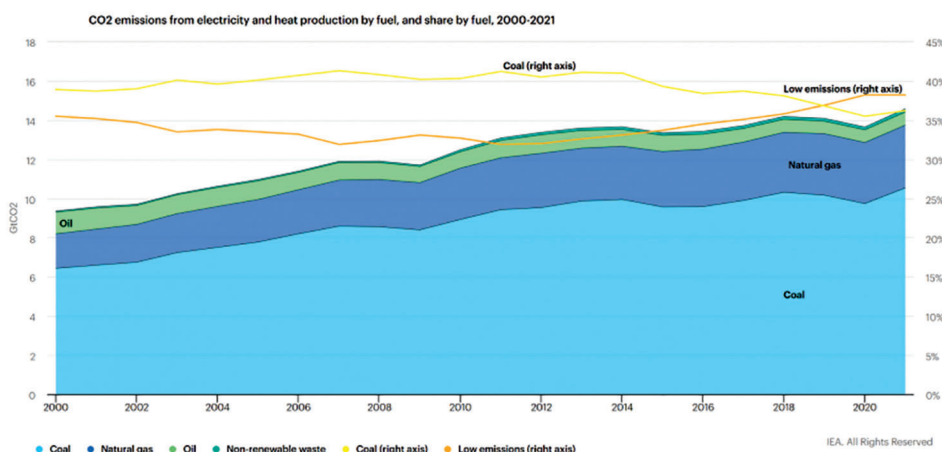
omy rebounded strongly since then driven by unprecedented fiscal and monetary stimulus and a fast – although uneven – roll-out of vaccines. The recovery in energy demand in 2021 was compounded by adverse weather which led to more coal being burnt for power generation, despite strong renewables energy contribution.

Biggest-ever rise in electricity demand

The 6.9% rise in emissions from power and heat generation in 2021 was caused by the biggest ever year-on-year increase in global electricity demand. "Rising by close to 1 400 terawatt-hours (TWh), or 5.9%, the growth in electricity demand in 2021 was more than 15 times the size of the drop in demand in 2020," analysts pointed out.

Fossil fuel, notably thermal coal, were instrumental to power the economic rebound. Dispatch of coal-fired power plants met about half of the increase in global electricity demand in 2021, boosting the share of coal in the power mix to 36%. Coal power-related emissions consequently record 10.5 Gt, which is 800 Mt above their 2020 level.

"Without supply constraints and high prices that affected China and India during certain periods of the year, global coal use for electricity generation in 2021 would have been even higher," analysts commented. ■





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Jaguar I-PACE batteries get second life for energy storage using solar PV

Jaguar Land Rover has partnered with Pramac to reuse electric vehicle batteries for stationary energy storage as the British carmaker targets Net Zero by 2039. The off-grid energy storage system is based on lithium-ion nickel-manganese-cobalt battery cells, taken from Jaguar I-PACE cars. It has capacity of up to 125 kW, charged by solar panels.

Second-life battery supply for storing excess renewable energy could exceed 200 gigawatt-hours (GWh) per year by 2030, creating a global value over \$30 billion, according to McKinsey calculations.



Jaguar I-PACE and I-TYPE 5 electric cars

Creating a circular economy

Once battery health and rechargeability rates fall below the stringent requirements of an electric car, the I-PACE batteries are given a second-life as Jaguar. Creating a circular economy, Pramac's business model directly reuses up to 85% of the vehicle battery within the energy storage unit, including modules and wiring.

Charged from solar panels, the unit is a self-contained solution that consists of a battery system linked to a bi-directional converter. Available for commercial hire, the units are fitted with Type 2 charge connections with dynamic control and rated at up to 22kW AC to allow electric vehicle charging.

With a capacity of up to 125 kWh, the off-grid battery has had more than enough

power to fully charge an all-electric SUV or – once repurposed – will power a regular family home for a week.

Audi and Hyundai make similar move

EU legislation is mandating a higher recycled content in batteries, hence several of Jaguar's rival electric car makers have made a move. Lithium-ion batteries from Audi's electric vehicles are being reused in a 4.5 MWh battery energy storage in Germany.

Japan's Hyundai, meanwhile, is working to reuse car batteries for energy storage in partnership with OCI Solar Power. First testing of these devices is scheduled for September 2020.

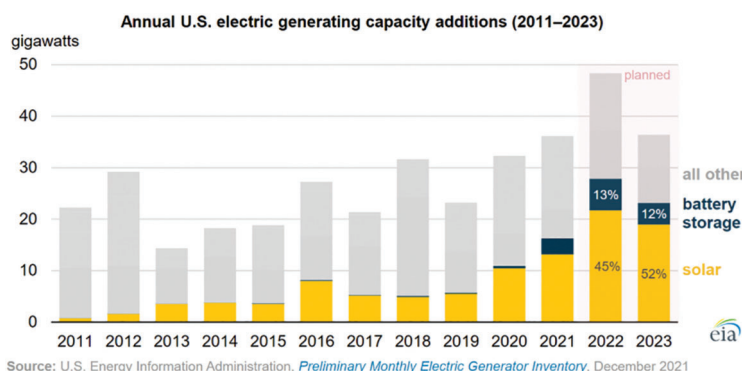
Batteries and solar PV make up 60% of US capacity additions

Developers and US power plant operators expect to add 85 GW of new capacity to the grid through to 2023 with almost two-thirds, or 51 GW, to be made up of solar power and battery storage. Tax credits and falling technology costs – especially for lithium-ion batteries – prompted a surge in new projects, often hybrid ones.

Depending on the configuration and charging sources, both solar power and battery storage units may be eligible for the solar investment tax credit (ITC), which is scheduled to phase down by 2024.

The green energy build-out is focussed on three states, where more than half of the 51 GW solar and battery storage capacity are in planning. According to the US Energy Infor-

mation Administration's (EIA) Preliminary Monthly Electric Generator Inventory, the largest share with 12 GW (23%) will be in Texas. The next largest share, 11 GW (21%), will be in California, and 4 GW (7%)



Mitsubishi to supply 10MW/60MWh energy storage to California

San Diego Gas & Electric Company (SDG&E), a regulated utility servicing 3.7 million people, has ordered a 10 MW/ 60 MWh energy storage from Mitsubishi Power for its Pala-Gomez Creek project. The battery, due operational in early 2023, will help SDG&E prevent outages at times of peak demand and ensure grid reliability while maximising the use of renewables.

The Emerald storage solution includes full turnkey design, engineering, procurement, and construction, as well as a 10-year long-term service agreement. This project is Mitsubishi's eight of this kind in California and brings total storage capacity to 280 MW / 1,140 MWh.

Striving to achieve Net Zero emissions by 2045, SDG&E is increasing its portfolio of energy storage portfolio. "These assets enhance grid reliability and operational flexibility while maximizing our use of abundant renewable energy sources in California," said the utility's director Fernando Valero.

Safe and longer operation with LFP battery

At the Pala-Gomez Creek site, the energy storage unit will repower the existing unit by employing Mitsubishi's Emerald plant controller which gathers real-time operating data to manage and supervise its dispatch. To enhance physical safety, the solution uses a lithium ion phosphate (LFP) battery. Compared with other chemistries, LFP provides longer life and superior thermal stability and chemical stability, the manufacturer pointed out.

will be situated in New York.

Battery additions up 200%

Build-out of batteries has staged staggering growth rates. In 2021, over 31 GW of mostly lithium-based batteries were added throughout the US – a 200% increased. Declining capital costs, combined with favourable economics for coupling wind and solar PV with energy storage, have spurred that rapid growth.

Over the next two years, US government analysts expect over 10 GW of battery storage capacity is planned to be added and more than 60% of this will be paired with solar facilities.



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