



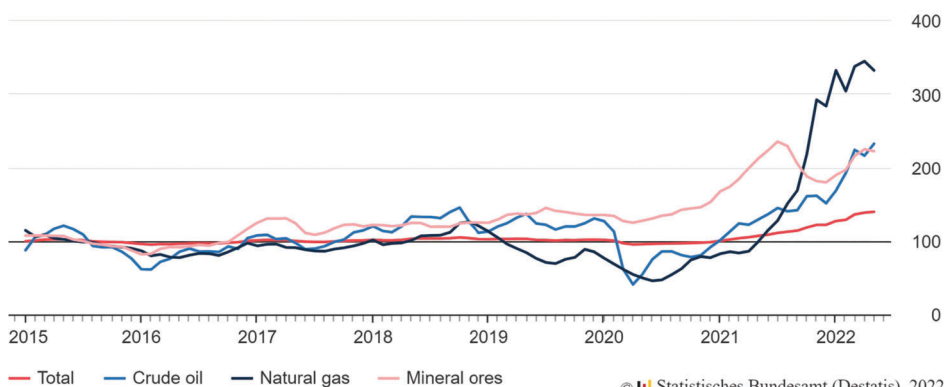
Energy price inflation may plunge German economy into recession

Investors are increasingly alarmed that soaring prices for energy imports to Germany could further escalate inflationary pressure which risks to plunge Europe's largest economy into recession. Data by the German federal statistical office (Destatis), shows prices for energy imports skyrocketed by nearly 144% in May, and are bound to rise further in June.



Index of energy and mineral import prices to Germany

2015 = 100



Energy imports overall in May were a staggering 143.8% more expensive than in May 2021, according to government statistics. "The largest influence on the year-on-year rate of the energy price increase had been natural gas with a plus of 235.6%, followed by that of crude oil with a plus of 80.2%," Destatis analysts commented.

Prices for all goods imported to Germany have risen by 30% in May, down from a record 31.7% in April – the highest rise since the first global oil price shock in 1974. Thermal coal prices also soared given that the more

carbon-intensive fuel now gets increasingly used for power generation in the face of looming gas supply shortages throughout much

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SK E&L to open office in London, ventures into European gas market

South Korea's leading gas provider SK E&S plans to open an office in London to expand into Europe's fast-changing gas market. "In the past, the European gas market had been separated from those in Asia and the United States, but it's different now (...) due to the pandemic and the Russia-Ukraine war," said SK E&S' vice chair and co-CEO, Yu Jeong-joon.

"The European, American and Asian markets influence each other, and offer opportunities and risks of arbitrage at the same time. So, without understanding Europe, we cannot be a good market participant, or a global player," Yu said in an in-house interview published on the company's website.

SK E&S is South Korea's largest privately held LNG provider and part of the conglomerate SK Group. Over the past few years is mainly focussed on Asian LNG trade and use of gas for power generation in competition to thermal coal.

Yu pointed out he still perceives natural gas as a "realistic alternative" to energy from renewables



as the world strives to meet its zero carbon emissions goals. Gas, when burnt, emits about 40% less greenhouse gas emissions than coal, but its supply chain is significantly more constraint due to the war in Ukraine and geopolitical tensions elsewhere.

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of Western Europe. Hard coal is now 333% more expensive than a month ago, while petrochemical prices increased by 105% on average and the price of crude oil by 80%, according to Destatis figures.

Gas supply warning

Germany's Federal Network Regulator (BNetzA) issued a stark warning that the country could face serious gas supply shortages from July 11 when Russia's Gazprom will start scheduled maintenance on the Nord Stream 1 gas interconnector through the Baltic Sea.

BNetzA head Klaus Müller told the state-owned TV station ARD that Russia's state-owned Gazprom could completely stop supplies through Nord Stream which would more than triple prices for German industrial and household customers. The energy regulator fears Gazprom could use the maintenance as a pretext to further reduce gas flows through Nord Stream 1 from already reduced levels.

"We cannot rule it out," Müller said, suggesting this could cause an 80% surge in gas prices which would hit Germany's energy-intensive industry hard.

The maintenance is only scheduled to last for several days and is actually an annual routine. "But this time the question arises as to whether Russia will actually turn on the gas tap again and state-owned company Gazprom has already severely curtailed its gas deliveries via Nord Stream 1," he explained.

To minimise risks in the event of a delivery stop, the German energy regulator has calculated various scenarios. "Most of the scenarios are not nice," Müller said, "and mean either too little gas at the end of winter, or a very difficult situation in autumn or winter 2022/23."

Wood and C-Capture get UK gov's funding to demonstrate low-cost CCS

Wood Plc and its partner C-Capture, developer of a chemical CO₂ removal process, have received £1.7 million in UK government funding to demonstrate low-cost CCS is feasible for hard-to-abate industries.

The funds will go towards the £2.7 million XLR8 CCS project whereby carbon capture solvent compatibility units (CCSCUs) will be deployed across Britain's cement and glass industry.

Trials with real-world flue gas

Compatibility of C-Capture's solvent-based technology will be trialled and assessed with real-world flue gas across three hard-to-abate sectors – at sites owned by project partners Hanson Cement, part of the Heidelberg Group, Bioenergy Infrastructure Group (BIG), Glass Futures and one of their member sites Pilkington UK. The aim is to demonstrate that a low-cost, carbon capture

technology is a credible solution in reducing carbon emissions.

Carbon capture is seen as a "game changer," as it uses less energy than available technology. According to C-Capture CEO Tom White this means it can significantly reduce the cost of carbon capture to a point that makes it affordable globally.

"It is also environmentally benign, well suited to the large-scale capture of CO₂ and robust enough to withstand even the most aggressive flue gases. These advantages mean it has potential to break the barriers that are preventing the widespread adoption of carbon capture and storage technology, to mitigate the impacts of climate change," he commented.

Commercial-scale CCS targeted by 2030

As for the partnership with Wood, White said the deal will allow C-Capture deploy its unique solvent across a wider variety of ap-



View into C-Capture's CCSCU testing site

plications with the aim of "demonstrating how the UK is leading the way to develop and export industrial decarbonisation technologies." To that end, engineers will conduct feasibility studies at the three UK host sites for implementation of commercial capture plants and support C-Capture to fabricate modular demonstration carbon capture plants for deployment at the host sites.

If successful, the project will be a stepping stone for both Wood and C-Capture to realise their goal of deploying commercial-scale carbon capture facilities across the three industries by 2030.

Gas to Power Journal

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Looking ahead, Yu said LNG demand is likely to continue for some time. SK E&S aims to achieve 10 million tons of LNG sup-

ply by 2025 and, as an interim stage, boost its the supply by 50% from the current level to 6 million tons as of 2023.

VW to overtake Tesla in EV sales by 2024 despite soaring battery costs

German carmaker Volkswagen (VW) is expected to overtake its US rival Tesla in terms of battery electric vehicle sales by 2024. Bloomberg Intelligence finds the profit incentive to catch up with Tesla is lacking for most traditional carmakers in the short term amid rising battery costs and a lack of scale, except for VW.

Tesla currently has a \$686 billion market cap –almost double that of all US and EU legacy automakers combined. But the German automaker VW is on track to overtake Tesla's battery electric vehicle (BEV) sales volume in 2024 as global BEV demand is set to more than double out to 2025.

Struggling with soaring battery prices

Battery prices remain critical to the cost competitiveness of BEVs and Volkswagen is investing up to €30 billion in the supply chain, including the opening of six new battery-cell plants in Europe by 2030. Swedish battery developer Northvolt starts production on premium cells for it in 2023, analysts noted, while Audi's midsize Q4 battery electric SUV already has a similar margin to its internal-combustion-engine counterpart, the Q3.

Waiting for ID.Buzz launch

Volkswagen is already the top EV manufacturer in Europe and will launch new models like the ID.Buzz later this year. The German carmaker is also seen on track to launch an IPO of its Porsche brand in 4Q.

Given the company's potential 30% BEV sales mix in 2023 and about 45% in 2025, it is significantly ahead of peers and could attract a luxury based €85 billion valuation for the IPO and, possibly, an even higher tech-oriented valuation," analysts at Bloomberg Intelligence wrote in their latest report on the global EV sector.

Carrot-and-stick approach

China's BYD ranks third for battery electric vehicle sales by 2025, far ahead of various legacy automakers which are expected to languish around the one million annual BEV sales mark. But analysts noted: "It is not



Volkswagen's ID.Buzz lined up for the launch

until later in the decade that US and Japanese automakers will be serious challengers for a top 3 spot."

"China's carrot-and-stick approach to stoking EV sales could push battery-electrics to account for 25% of all passenger vehicle purchases by 2025. Sales in China have surged since the launch of the country's new energy vehicle credit program despite erratic component supply," commented Bloomberg's senior China Automotive Industry analyst, Steve Man. ■

US grid-scale energy storage market breaks new record

The US energy storage market set a fresh record in the first quarter of 2022, with grid-scale installations totalling 2,399 MWh. According to Wood Mackenzie, these are the highest capacity additions for Q1 on record with a fourfold rise on pre-year volumes – despite ongoing procurement difficulties and project delays.

“Quarter one of 2022 was the largest first quarter on record by far for grid-scale installations, a notable milestone since installations are typically back-weighted to the second half of the year,” senior analyst Vanessa Witte said, specifying the West Coast and Southwest regions dominated for both standalone and hybrid systems.

Strongest growth in California and Oregon

"California continues to dominate the sector, with the Valley Center and Slate projects taking the top two spots for largest projects installed in Q1. We also saw more than 90 MW of storage come online outside the top

seven states, including projects in Oregon and Alaska," Witte said.

But near-term risks remain, despite significant growth: Market disruption range from the anti-dumping and countervailing duties (AD/CVD) solar tariff investigation initiated by the Department of Commerce in March lowered projections for hybrid projects significantly in 2022, and to a lesser extent in 2023, as procurement stalled.

Pause in solar tariffs makes hybrid projects more predictable

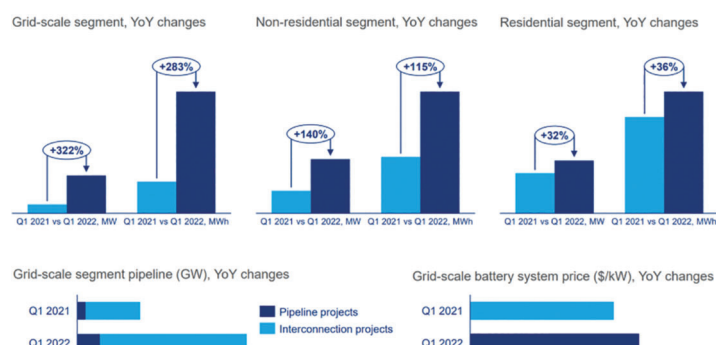
"The Biden Administration's recent decision to pause AD/CVD solar tariffs for two years restores predictability to both the solar and energy storage markets. With well over 50% of utility storage projects being paired with

Residential storage also had its strongest quarter to date with 334 MWh installed in Q1, beating the previous quarterly record of 283 MWh in Q4 of last year. "Despite challenging supply conditions continuing to suppress residential storage, the segment saw over 20,000 installations in a single quarter for the first time and we're seeing large and small installers forge new vendor partnerships to help meet rising customer demand," commented WoodMac analyst WChloe Holden.

By 2026, the residential storage segment is forecasted to grow by 5.7 GWh annually, with California's Net Energy Metering (NEM) 3.0 expected to align with the California Public Utilities Commission's December 2021 proposed decision with implementation now on a delayed timeline.

Non-residential storage is predicted to grow 1 GW annually by 2026, but the overall market forecast has been downgraded due in part to AD/CVD-related procurement delays. "A meaningful share of residential solar-plus-storage projects not yet procured are being pushed to 2023, which has impacted paired storage," Holden added.

Overall, the US energy storage market added 955 MW and 2,875 MWh across all segments in the first quarter of 2022. ■





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Heat wave sends South Korea's electricity demand soaring to fresh high

Scorching heat has sent South Korea's electricity demand to an all-time high of 71,805 MW in June, up 4.3% from a year earlier, data from the Korean Power Exchange shows. June was the first time when electricity consumption surpassed the critical 70 GW level, prompting parts of the Korean industry to re-think how they produce and consume energy in the face of high coal and LNG prices.

Hydrogen is targeted to become into the country's biggest energy source by 2050. The government has told Korea's electric utility to expand H2-based power generation, and replace all fossil fuel used by the steel and chemical industries with blue or green hydrogen.

Striving to producing cheap H2 at home New policies stipulate the design, construction and commissioning of 15 projects for producing clean hydrogen in South Korea, expanding the country's hydrogen storage and transmission infrastructure and enhancing the use of hydrogen by industries and the transport sector. To tackle transport emissions, over 2,000 hydrogen charging stations will be installed nationwide.

By 2050, some 27.9 million tons of hydrogen is meant to be produced in South Korea and on offer to local industry and power producers alike. This volume will be blue and green hydrogen, so not all completely carbon free. Blue hydrogen is made through natural gas reforming with subsequent carbon capture, while green hydrogen is produced from renewable energy sources via electrolysis.

Supporting utilities to change fuel

As for hydrogen-based power generation, the government calls on utilities to expand mixed combustion and revamp plants

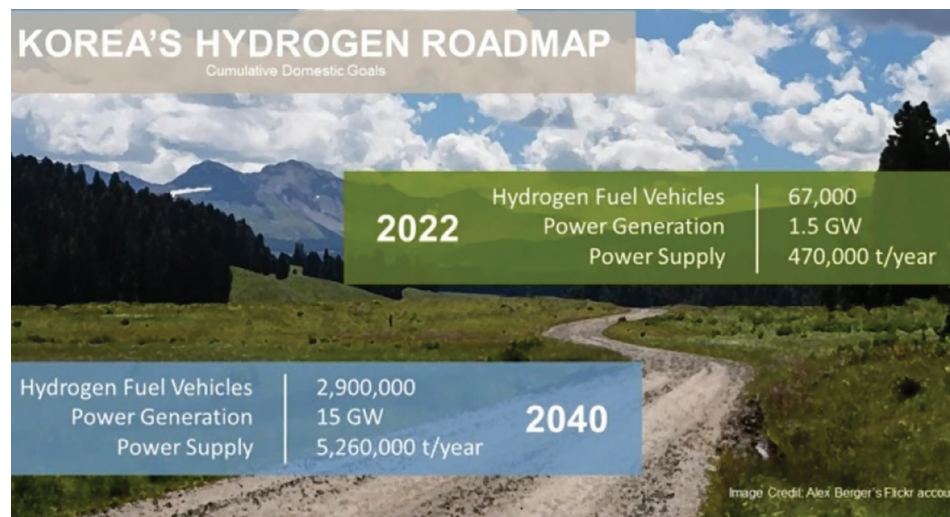
with new H2-ready gas turbines so that the amount of that type of power generation can be boosted from 3.5 Terrawatt-hours (TWh) in 2020 to nearly 288 TWh in 2050.

"Hydrogen will account for 33% and 23.8% of South Korea's energy consumption and power generation in 2050, respectively. Then, hydrogen will become its biggest energy source by beating petroleum and the economic effects of this include 567,000 new jobs and at least 200 million tons of greenhouse gas reduction," the government's plan reads.

Incentivising households buy H2-fuelled cars

Looking at the hard-to-abate transport sector, South Korea aims to increase the capacity of H2-ready vehicles to 5.26 million units by 2050. In addition, hydrogen will be applied to various means of transport, including ships, drones and trams. Fuel cost and purchase subsidies for commercial hydrogen vehicles will be raise to incentivise private households to shift to H2-ready cars.

To fuel these cars, the government aims to at least one build at least hydrogen charging station in each of South Korea's 226 cities, counties and districts by 2025 and facilitate access to hydrogen charging stations within 15 minutes of each home nationwide by 2040. ■



NEWS NUDGES

Howden and Chart intensify cooperation

Gas compression systems from Howden have been integrated into Chart's hydrogen offerings, as the two partners intensify their cooperation. The two US technology firms strive to develop cost-effective and green energy solutions and provide customers with tailored aftermarket support.

Flowserve invests in sustainability

Dallas-based Flowserve Corp has invested more than \$100 million in energy transition projects to help customers improve their energy efficiency and reduce equipment emissions and lifecycle costs. CEO Scott Rowe underlined the company's drive to diversify, decarbonise and digitalise the wider energy sector when publishing the company's 2021 Environmental, Social and Governance (ESG) Report.

Northvolt to launch premium battery cells

Swedish battery maker Northvolt is gearing up to start production on premium cells in 2023, targeting Europe's growing manufacturing base for electric vehicles. German brands like VW, Audi and BMW are rushing to build electric cars and busses to rival the products of US frontrunner Tesla, while analysts say other big players like BASF and Wacker Chemie could also profit from a growing e-mobility market in Europe.

Siemens launches net zero building

Siemens has launched Building X, a modular building suite with AI infrastructure, designed to enable net zero emissions. Build on the design principles of Siemens Xcelerator, these zero-emission buildings are meant to create value in the industrial, transport and housing sector as well as for operators of electric power grids.



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Wärtsilä engines to power Termoli plant, backed by capacity payments

Wärtsilä has been contracted to supply flexible engines for a 75 MW power plant under construction in Termoli, on Italy's Adriatic coast. Operated by the regional utility Metaenergiaproduzione, the plant is being built FATA, part of the Danieli Group. Equipment delivery is scheduled for early 2023, with a view to commissioning the plant a few months later.

Rome-headquartered utility Metaenergiaproduzione has been investing in fast-starting Wärtsilä thermal balancing plants, having ordered a total of six power units with a combined capacity of 380 MW. The aim is to maximise its opportunities in Italy's new capacity market.

Revenue from Terna's capacity market

Each plant will be on call by Terna, the national transmission system operator. The TSO Terna in early 2022 established a capacity market to balance growing volumes of intermittent renewable energy supply, but also to compensate for the upcoming retirement of large legacy coal- and gas-fired powers station.

For the latest 75 MW project in Termoli, Wärtsilä's scope of delivery includes four 50SG engines featuring high efficiency and fuel economy, plus auxiliaries, control panels, technical advisory services, the operators' interface system, and commissioning.

Engines capable to run on green fuels

The engines will be operating on natural gas but can also run on sustainable fuel like syn-



Italo Ballestrelli, FATA EPC vice president shakes hands with Marco Golinelli, Wärtsilä business dev. manager, overlooked by Stefano Avenati, FATA EPC head of sales & proposals.

thetic and carbon-neutral methane and methanol, as well as hydrogen blends.

Engines, running on sustainable fuels, are ideally placed to balance wind and solar energy in combination with large-scale energy storage. For Wärtsilä, headquartered in Helsinki, Finland, the project will be the first time it is working with FATA, part of Danieli Group, one of Italy's large construction companies for the metallurgical industry.

"FATA is developing opportunities in Italy's capacity market and from renewable sources, and Wärtsilä was the natural choice for us to realise this new project," said Italo Ballestrelli, FATA executive vice president. Italy plans to triple its solar and double its wind energy production by 2030. ■

GE helps to start up Azito Phase IV power plant in the Ivory Coast

Azito Energie – a consortium of Ivory Coasts IPS-WA, the French utility EDF and the Swiss technology firm ABB – has announced its Azito Phase IV power plant is now in full commercial operation. Situated in the Yopougon district of Abidjan, the 180 MW simple-cycle plant is powered by a GT13E2 2012 MXL2 gas turbine.

The robust GT13E2 turbine, built by GE, can reach up to 210 MW in output in simple-cycle mode at 38% efficiency. It can fast-start in 15 minutes with a ramp rate of up to 68 MW per minute, or cycle down to 10% when using its full low part-load capacity.

Commissioning of the Azito Phase IV power plant is another milestone in ensuring energy efficiency for generations to come," Luc Aye, Managing Director, Azito Energie said, specifying: "The growth of gas power generation plays a critical role in facilitating Ivory Coast's decarbonization and energy targets by delivering accessible, affordable and reliable energy across the country."

In addition to a fast-start turbine, the Azito power plant will use big data analytics to improve overall Azito's fleet performance and make smarter operational decisions using GE Digital Asset Performance Management (APM) software solution. ■

CMEC prepares to start up first unit of 1.2 GW plant in Punjab

China Machinery Engineering Corp. (CMEC) has concluded test runs of Unit-1 of an LNG-fuelled power plant (1,263 MW total capacity) near Trimmu Barrage, in Pakistan's Jangh district. An official said the company plans to bring the first 400 MW gas turbine into commercial operation on Wednesday, July 6.

At initial tests, Unit 1 – a combined-cycle power plant powered by a GE turbine – successfully went through testing and achieved 403 MWs capacity against a guarantee of 400 MWs, he noted. The unit has also been connected to Pakistan's national power grid, hence all is ready for commercial start.

CMEC the EPC contractor for the combined-cycle Unit-1 is working on behalf of Punjab Thermal Power Ltd which also signed a 12-year maintenance contract with China's Harbin Electric International to ensure smooth operations and a stable rate of return.

An equally-sized Unit-2 has already been built and is currently undergoing testing. It is slated to start commercial operations in a

month's time, in early August. In addition, the steam turbine for the Unit-3 of the overall Jangh power station has been brought to site and installed. It is expected to start commercial operations in five to six months.

Plant configured in 2x1 mode

Financial close on the overall 1,263 MW LNG-fuelled project near Trimmu Barrage was reached in April 2021. Total project cost is estimated at \$708 million, financed through 75% commercial debt from National Bank of Pakistan, Bank of Punjab, United Bank and Habib Bank.

The power station is configured in a 2x1 mode, meaning it is equipped with two gas and one steam turbines as well as two heat recovery steam generators (HRSGs) for

enhanced efficiency. It has an efficiency of 61.16% – among the highest in the world, its owner Punjab Thermal Power said who will run the plant on re-liquefied Natural Gas (R-LNG) as primary fuel though there is the option to use diesel as a backup fuel.

Once up and running, the CCGT it will help in stabilising and balancing the transmission system to ensure uninterrupted supply to Faisalabad and adjacent areas. It is the fourth mega project in the region, with the first being the 1,180 MW Bhikki power station which is running commercially successfully since mid-2018. Operated by QATPL and owned by the government of Punjab, the CCGT had been built by Harbin Electric International (HEI) and GE Power. ■

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