



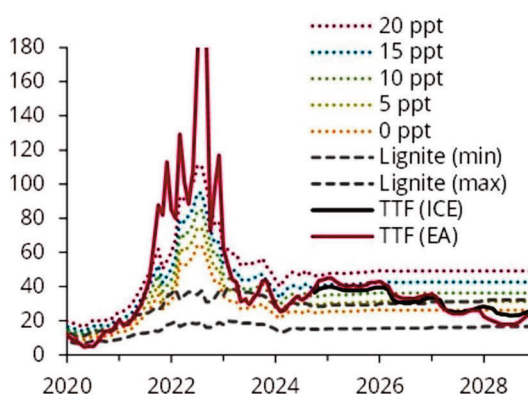
Egypt's LNG import forecast revised higher, may lower Europe's gas-burn

Forecasts for Egypt's LNG imports have been revised higher by the London-based consultancy Energy Aspects, potentially lowering Europe's availability to import the super-chilled fuel and burn it to generate electricity this autumn.

Analysts are bullish on TTF winter prices, calling them "slightly undervalued" as they started to rebound towards €39/MWh.

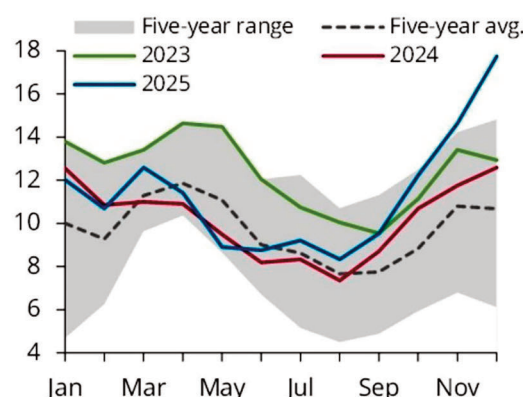
"We have lifted our forecast for Egyptian net LNG imports to 2.4 million tons (Mt), or 3.3 billion cubic metres (bcm) this winter, having lowered our Egyptian production forecast, and we expect Egypt to tender for 1.2 Mt of additional winter LNG supply (16–17 cargoes) on top of the 20 it is already seeking for delivery in Q4-24 to offset faltering production," analysts write in a market note. Energy Aspects consequently tightened their winter 2024–25

TTF vs coal-gas fuel-switch triggers, €/MWh



Source: Bloomberg, LSEG, CME, ECB, Energy Aspects

European LNG receipts, bcm



Source: Vortexa, system operators, Energy Aspects

European gas balance, arguing more cargo deliveries to Egypt would lower the availability of LNG in the Atlantic basin.

Cautiously bullish on prices

Higher prices than the current market consensus are deemed "necessary" to keep Europe's physical gas market in balance across the winter. "If actual TTF prices stay where are traded at the curve, this would draw end-March 2025 lower by an additional 2 bcm

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Egypt's LNG tender fully awarded

The Egyptian General Petroleum Corp (EGPC) awarded the country's second largest LNG tender late last week for 20 cargoes. The prices agreed ranged between TTF plus \$1.5 per MMBtu and \$1.6 per MMBtu, sources told S&P Global, which included extended payment terms, allowing for a 180-day delay in payment, accounting for around 50-60 cents per MMBtu of the total cost.

Pricing without the extended payment terms was reported to be between TTF, plus 90 cents per MMBtu and \$1.2 per MMBtu. For standard 3.5 TBtu cargoes, the purchase would cost Egypt around \$45 mill per cargo, or \$907 million in total, sources said.

Most of the cargoes were awarded on a floating price on a TTF basis given the competitive nature of the offered TTF premiums. More than 15 companies participated in the tender.

Aramco, Glencore, Gunvor, Total, BP, Hartree, BB Energy, and Shell were awarded the cargoes, according to multiple market participants. Aramco was said to have won the greatest number of cargoes, around six to seven, with the others winning between one to three cargoes.



The 20 cargoes will be split across three months – seven deliveries in October, six in November, and seven in December. Of these, 17 are scheduled for delivery to the FSRU 'Hoegh Galleon' moored at the Ain Sukhna import terminal, while the remaining three will be delivered to Jordan's Aqaba terminal, with one cargo to be delivered each month.

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versus the base case of 43.8 bcm, which is already 19.8 bcm lower y/y," Energy Aspects reckons.

Near-curve gas prices at the Dutch Title Transfer Facility (TTF) have retreated somewhat over the past days, but analysts believe this price volatility reflects changes in paper positioning rather than a shift in European gas fundamentals.

"Our quant paper balance indicates that several CTA trading strategies flipped from long to short on 4 September," they explained, pointing to a "follow-on trade from trend-following funds could further pressure near-curve prices in the coming sessions – but we also see some risk that short strategies flip to long if prices rise above €38/MWh."

TTF prices around €40/MWh are required to commit sufficient gas to storage to fill end-October stocks above the EU's mandated 90 bcm aggregate storage target on November 1 (including a typical UK storage fill). To this ends, natural gas needs to be priced less competitively versus coal in Europe's power sector and versus liquids in Asia. ■

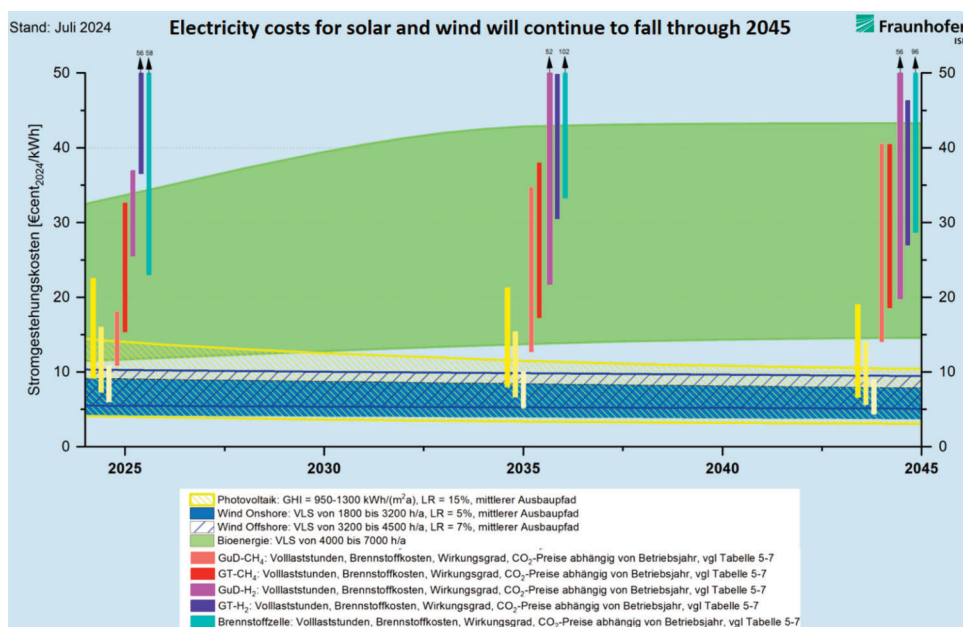
Clean energy has become cheaper in Germany than fossil-fuelled power

Research by the Fraunhofer Institute shows that renewable energy sources can produce electricity at a lower cost than coal or natural gas, even when combined with energy storage. Comparing the average generation cost per kWh of electricity in Germany shows that solar PV and onshore wind are cheapest with a cost of 4.1 to 9.2 cent per kilowatt-hour (kWh).

The wide range results from the high cost differences for battery systems (400 to 1000 €/kWh) in combination with the cost differences for PV systems and the different levels of solar radiation at the plant location.

"These calculations show that the large-scale projects currently underway in Germany, which combine open-space PV systems, wind farms and stationary battery storage systems, are good investments," said Dr. Christoph Kost, head of the Energy System Analysis Department at Fraunhofer ISE. "The combination enables grid capacities to be better utilized."

Come 2045, the electricity generation costs for small PV roof systems will be between 4.9 and 10.4 cents per kilowatt (c/kWh) hour and between 3.1 and 5.0 c/kWh for PV open space systems.



By comparison, new-built wind turbines in 2045 could produce electricity onshore at a cost of between 3.7 and 7.9 c/kWh.

Fossil power still necessary, despite higher costs

Adding battery storage or dispatchable gas-fired plants is necessary as a backup in systems with a high share of renewables, and hence a high degree of fluctuating power supply. However, electricity generation costs for flexible technologies – notably gas peak-

ers – are substantially higher than those for wind and solar. For a hydrogen-fuelled gas and steam turbine power plant, built in 2030, for instance, the study shows 23.6 - 43.3 c/kWh in highly flexible operation.

"We need them [H2-ready gas peakers] as an important addition. However, their operation will be limited to the bare minimum," says Paul Müller, scientist at Fraunhofer ISE and responsible for this part of the study. He considers 1000 to 2000 operating hours in 2045 to be "realistic." ■



These calculations show that the large-scale projects currently underway in Germany, which combine open-space PV systems, wind farms and stationary battery storage systems, are good investments



- Dr. Christoph Kost, head of the Energy System Analysis Department at Fraunhofer

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JERA considers investing in LNG-fuelled power plant in Vietnam

Japan's largest utility JERA is considering to invest in a gas power project in Vietnam and potentially ship fuel to the plant under a long-term LNG contract. The project is part of Vietnam's energy transition, with power plants running on domestic gas or imported LNG forecast to make up 37.33 GW, or nearly 25% of total installed capacity by 2030.

“The government of Vietnam really wants to expand LNG infrastructure instead of coal ... but it is not so easy,” JERA Asia's chief executive Izumi Kai told reporters. “We are now trying to collaborate with a local partner and also trying to

discuss [the project] with the Vietnam government.”

Kai singled out the government's aspirations to set up several LNG-fuelled power plants within a challenging time-frame: Envisaged are 15 LNG-fuelled power plants are meant to be built by 2035 with a combined

capacity of over 22 GW – over 14% of Vietnam's current overall power gen mix.

If realised, the additional LNG-fuelled plants would tilt Vietnam's power mix substantially towards cleaner-burning natural gas which currently accounts for 9% of installed capacity, against 29% for coal-fired power plants.



View of Cai Mep LNG terminal

Cai Mep LNG terminal nears commissioning

Timely LNG supply is of the essence to fuel the additional capacity. Singapore-based AG&P LNG and Vietnamese oil trader Hai Linh Company strive to get Cai Mep, Vietnam's second LNG terminal, into operation and have lined up a commissioning cargo for delivery in October.

Considering developers received the import licence in August it may prove challenging to complete commissioning in the next three months. AG&P LNG CEO Karthik Sathyamoorthy vowed developer would be “working on accelerating the commissioning [and] look to lock the commissioning cargo in October for end-October to mid-November delivery.”

EVN gets green light for 1.5 GW Quang Trach II power plant in Vietnam

Electricité du Vietnam (EVN) has received government approval to develop and build the LNG-fuelled Quang Trach II power unit in central Vietnam. The 2 x 750 MW plant will be powered by mixed-cycle gas turbine technology and comes at an estimated cost of around 52,500 billion Vietnamese Dong (US\$2.13 billion).

Initially, the Quang Trach project was designed as a coal-fired power plant with a capacity of 1.2 GW – but developers opted to run Unit II on regasified LNG instead. This fuel conversion has been approved as it is in line with Vietnam's National Energy Development Strategy to 2030.

Build-out of LNG and power infrastructure

Over the past few years, Vietnam suffered several brief power shortages that affected industrial production and state-owned PetroVietnam hence seeks to ramp up its flexible power generation capacity. Two LNG import and regas terminal are part of a wider plan comprising 13 gas-fired power plants with a combined capacity of 22.4 MW that are envisaged to be built by 2030.

Financing for one project – the Nhon Trach 3 & 4 LNG-fuelled power units (750

MW each) – has been agreed in April when PetroVietnam Power signed a \$300 million short-term loan from Citibank and ING. Talks with the two lenders are ongoing for a \$600 million long-term loan.

The Nhon Trach CCGTs, with 750 MW each, are under construction in close vicinity to the Thi Vai LNG terminal, with unit 3 is due to start generating electricity from November this year and unit 4 from May 2025. To fuel the power plants, PetroViet-

nam Gas said it has signed eight LNG sales and purchase agreement with “some large suppliers.” One of these SPA is understood to be with Qatargas.



Quang Trach I, completed in 2017

ExxonMobil and Mitsubishi advance world's largest H2 project

US oil giant ExxonMobil has agreed to Mitsubishi participating equity in its large-scale hydrogen project in Bayton, Texas, which will produce virtually carbon-free hydrogen and low-carbon ammonia. Mitsubishi wants to offtake ammonia and ship it to its Namikata terminal as the clean fuel already gets co-fired in some Japanese fossil power stations.

Contingent on supportive policies and regulatory permits, the Exxon-led facility in Texas could become world's largest of its kind, capable of producing up to 1 billion cubic feet (bcf) daily of low-carbon hydrogen – with 98% of CO₂ removed – and more than 1 million tons of low-carbon ammonia per year.

A final investment decision (FID) is expected in 2025 with anticipated start-up in 2029.



Render of ExxonMobil's facility in Bayton, Texas

ExxonMobil wants to provide US customers with a reliable source of low-carbon H₂ and NH₃. Demand for low carbon fuels continues to build up in North America, Dan Ammann President of ExxonMobil Low Carbon Solutions noted, adding: "We look forward to furthering our leadership position, alongside Mitsubishi Corp, to advance low-carbon hydrogen and ammonia globally, helping the world achieve a lower emission future."

Converted Namikata terminal to become Japan's NH₃ hub

Mitsubishi specified it aims to convert part of its liquefied petroleum gas (LPG) terminal at Namikata into an ammonia terminal for trans-shipment which will then deliver the NH₃ to power generators as well as the automobile and chemical sector in the Shikoku and Chugoku regions in Japan. The con-



Namikata terminal will be converted into an NH₃

verted Namikata terminal is meant to handle around 1 million tons per year (mtpa) of low-carbon ammonia by 2030.

"We are also working with Idemitsu Kosan, which is developing an ammonia hub near ours and intends to participate in ExxonMobil's hydrogen facility with us. Together, we will accelerate the hard-to-abate sectors' transition to clean energy," said Masaru Saito Group CEO of Mitsubishi's Environmental Energy Group. ■

Supportive policies make American utilities explore H₂ co-firing

More stringent emissions rules make operators of a handful US gas-fired power station explore how to integrate hydrogen into their fuel streams. At 10 power stations, operators either test hydrogen co-firing at existing plants, upgrade turbines to combust a natural gas/hydrogen blend or build new plants in a H₂-ready manner.

Two utilities are retrofitting plants and upgrade existing turbines so that they can also run on clean-burning hydrogen:

- Duke Energy said it plans to upgrade the 74 MW DeBary simple-cycle peaking power plant in Florida to generate electricity solely from hydrogen.
- The Los Angeles Department of Water and Power (LADWP) is considering upgrading Units 1 and 2 of its Scattergood Generation Station to give it the capability to cofire 30% hydrogen by December 2029, possibly increasing to 100% hydrogen when it is feasible to do so.

Several operators of gas power plants have successfully tested using fuel blends of between 5% and 44% hydrogen per volume:

- The Long Ridge Energy Generation Project in Ohio is a 485-MW combined-cycle power plant that burned a blend that included 5% hydrogen by volume in March 2022.

- In June 2022, Georgia Power's Jack McDonough power plant cofired a fuel blend that included up to 20% hydrogen in one of its 233-MW natural gas turbines. According to Georgia Power, the test released 7% fewer CO₂ emissions compared with burning natural gas alone.

- Already back in September 2022, the New York Power Authority's Brentwood power plant co-fired a blend of natural gas starting at 5% and reaching 44% hydrogen by volume in its 47-MW peaking unit. According to the New York Power Authority, the process reduced CO₂ by approximately 14% when hydrogen made up 35% of the natural gas stream.

- The Upper Michigan Energy Resources Company in March 2023, conducted a test at its A.J. Mihm Generating station using 25% hydrogen in one of the station's three 18.8-MW reciprocating internal combustion engines.

- Constellation Energy's Hillabee Energy Center, a combined-cycle natural gas turbine plant in Alabama, in May 2023 tested a blend of up to 38% hydrogen.

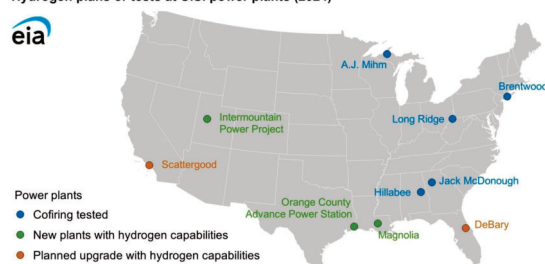
Three combined-cycles gas turbine (CCGT) power plants, currently under construction, will be built hydrogen-ready:

- The municipal-owned Intermountain Power Agency is building a new 840-MW combined-cycle natural gas turbine plant at its facility in Utah to replace an existing 1,800-MW coal-fired plant. LADWP, which has the major stake in the combined-cycle power plant at the Intermountain site, stated that the new plant will be able to combust a mixture of 30% hydrogen and 70% natural gas.

- In Louisiana, Kindle Energy is building the 678-MW Magnolia Power Plant, which it expects to enter service sometime in 2025. Kindle Energy says the plant could cofire up to 50% hydrogen.

- Similarly, in Texas, Entergy is building the 1,158-MW Orange County Advance Power Station, which it expects to begin operating by midyear 2026. Trade press reports indicate that this plant could cofire up to 30% hydrogen. ■

Hydrogen plans or tests at U.S. power plants (2024)



Data source: U.S. Energy Information Administration, *Electric Power Monthly*, and company statements

PPL gets \$72m in DOE funding for clean energy project in Louisville

PPL Corp has executed an award to get \$72 million in federal funding from the U.S. Department of Energy's (DOE) Office of Clean Energy Demonstrations (OCED) to capture carbon emissions at the Cane Run combined-cycle gas power station in Louisville, Kentucky. The first tranche of funding – \$4.9 million – has been paid to begin Phase 1 activities.

The carbon capture project comes at a cost of over \$100 million and will be carried out at 943 MW Cane Run station, jointly owned and operated by PPL subsidiaries Kentucky Utilities and Louisville Gas and Electric Company.

The aim is to capture a portion of the CO₂ from the power station's flue gas using heat-integrated CO₂ capture technology. Project partners expect to capture more than 95% of the carbon emissions from up to 20 MW of the plant's 691 MW generating capacity, or up to 67,000 metric tons of CO₂ per year.

If proven successful the project could be scaled up and the technology adopted elsewhere. PPL hence sees the Cane Run

demonstration project as "an important step in assessing the future viability of utility-scale carbon capture technology on natural gas units." Current plans include the captured CO₂ being purified and beneficially reused in its entirety by a nearby industrial customer.

Collaborators on the project include Siemens Energy, manufacturers of the Cane Run 7 Generating Station,

American Welding & Gas. Vogt Power, and Koch Modular Process Systems, which will support the design, fabrication and construction of the carbon capture unit. ■



DOE NETL team at Cane Run power station



'Trust deficit' towards CCS undermines Net Zero goal; Worley warns

Global energy services provider Worley and researchers at Princeton University found the US public has a much lower level of trust in Carbon Capture and Storage (CCS) projects than the industry believes, which hampers technology adoption. "Building durable trust is imperative to speed up final investment decisions (FID) and project delivery," stressed Worley's group director Sustainability, Sue Brown.

Even within the industry, professionals show high levels of scepticism towards information from other CCS companies (64%), regulators (59%), and environmental organizations (57%).

"We are strong CCS advocates, but this research indicates that unless participants build durable trust with each other, its potential to deliver a critical means of cutting carbon emissions in the US will be more precarious. And this challenge reaches beyond CCS," Brown commented on the findings.

Though trust among the industry is important, "the relationships between asset

developers, governments, financiers and civil society are considered by experts to have the most impact on the pace at which projects can be delivered," she pointed out. Worley Group director CCUS Gary LeMaire added that for meeting Net Zero targets, the rate at which carbon capture utilisation and storage is currently develop would have to accelerate by at least 100-fold between now and 2050.

Acceptance for proposed CCS projects and sites can be increased by timely dissemination of information, which was shown to decrease perceived risks, and increase perceived benefits. Early, authentic engagement with host communities and other

stakeholders will help underpin the trust needed to accelerate deployment, explained Chris Greig, senior research scientist at the Andlinger Center for Energy & the Environ-

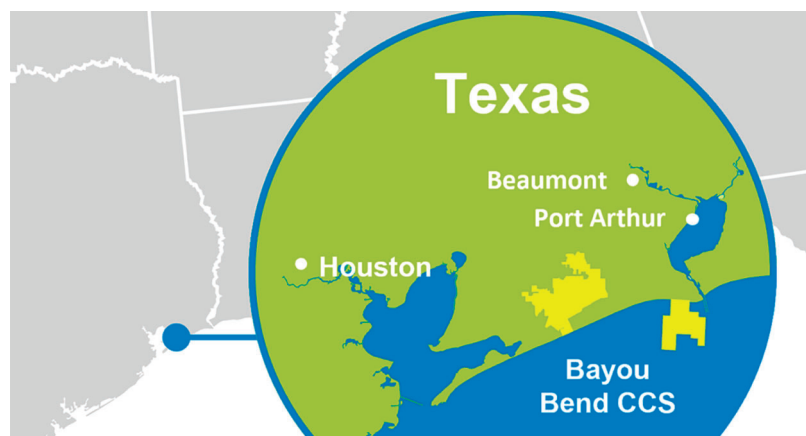
ment at Princeton University, and co-author of 'Net zero at the speed of trust,' the fourth FATR paper.

Bayou Bend CCS project

This May, Chevron, together with joint venture partners Equinor and TotalEnergies, selected Worley to design and evaluate carbon dioxide gathering, handling and sequestration facilities for the Bayou Bend CCS project in southeast Texas. The venture includes a CO₂ storage footprint of nearly 140,000 acres of pore space.

The Gulf Coast has one of the heaviest concentrations of CO₂ emissions in the US, making this project pivotal in enabling hard-to-abate industries, such as refining, cement, steel, chemicals, and manufacturing. Carbon sequestration along the Gulf Coast is hence vital to reduce the country's overall emissions and mitigate health hazards for American citizens.

Similar projects are underway in Asia where INPEX is studying how to support JERA in separating and capturing the latter's energy-related CO₂ emissions in Japan and transporting it to Australia for storage. The quest for a CCS value-chain will draw on INPEX's efforts to capture carbon at multiple projects Down Under, including the Ichthys LNG terminal which it operates. ■



Worley supports the Bayou Bend CCS project

Clock is ticking in the runup to WGC2025

The runup of the World Gas Conference 2025 is underway, with IGU President Li Yalan hosting a one-year countdown event at China National Convention Center in Beijing. The triennial event will be the first-ever World Gas Conference to be held in China.

Anticipated are over 30,000 participants from over 70 countries and regions across various gas and energy sectors, including policymakers, business leaders, customers, NGOs, media, and financial professionals. Over 500 speakers will address delegates across a 4-day programme, under the theme 'Energising a Sustainable Future.'

"This prestigious conference and exhibition promises to ignite excitement, passion, and anticipation. We look forward to bringing together leaders to discuss critical issues, make connections, and pave the way for a sustainable future," said Madam Li, the first Chinese and female President in IGU's history.

At the countdown event, experts stressed

natural gas will continue to play a crucial role in future energy systems – while integrating gas and renewables is vital for accelerating the low-carbon transformation. Another key issue is the need to strengthen methane emission control.

The line-up of speakers for the WGC2025 includes: Dai Houliang of China National Petroleum Corp and PetroChina, Saad Sherida Al-Kabbi of Qatar and QatarEnergy, Li Yalan of the IGU, FU Chengyu of China International Council for Promotion of Multi-national Corporations, Michael Lewis of Uniper, Sun Xiansheng of the International Society for Energy Transition Studies (ISETS), Andrea Stegher of SNAM and the IGU, Li Junfeng of the China Energy Research Society (CERS) and the National

Center for Climate Change Strategy and International Cooperation (NCSC), Sarah Bairstow of Mexico Pacific and Huang Weiwei of the Chinese Academy of Engineering.

Prominent event sponsors are CNPC, SINOPEC and CNOOC.

Over 300 energy-related companies will showcase their products and services at the China National Convention Center Phase 2, providing a platform to discuss critical issues and make new connections.

With the Call for Abstracts underway, attendees from across the world are invited to speak in Beijing and be at the forefront of the global gas conversation.

Registration is open, so delegates can secure their pass by visiting: www.wgc2025.com



IGU President Madam Li Yalan will chair the World Gas Conference 2025

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