



EU could import 30 bcm from non-Russian sources, IEA says

The European Union could curb Russian gas imports by a third within one year by minimising offtake under take-or-pay contracts and replacing 30 bcm – out of 155 bcm of total Russian supply – with alternative sources, the International Energy Agency (IEA) reckons. Adding 35 TWh of new renewable projects in 2022 would lower gas-burn by a further 6 bcm.

In a 10-point plan, the IEA says Europe's efforts to end the reliance on Russian gas – in reaction to the war in Ukraine – can be compatible with the bloc's climate protection ambition. The geopolitical urgency of energy security has risen to the top of the agenda in the wake of the Russian President Vladimir Putin's invasion into Ukraine.

"No new contracts with Gazprom"

More than 15 bcm per year of gas import contracts with Russia's Gazprom are set to expire by the end of 2022, and contract covering close to 40 bcm/y are due to expired before 2030. The IEA



urges EU decision makers to enter "no new gas supply contracts with Gazprom" and buy alternative pipeline gas and LNG instead.

"The EU could theoretically increase near-term LNG inflows by some 60 bcm, (...) and increase non-Russian pipeline imports by up to 10 bcm from 2021," the IEA reckons. But all importers are fishing in the same pool for supply, so this would mean "exceptionally

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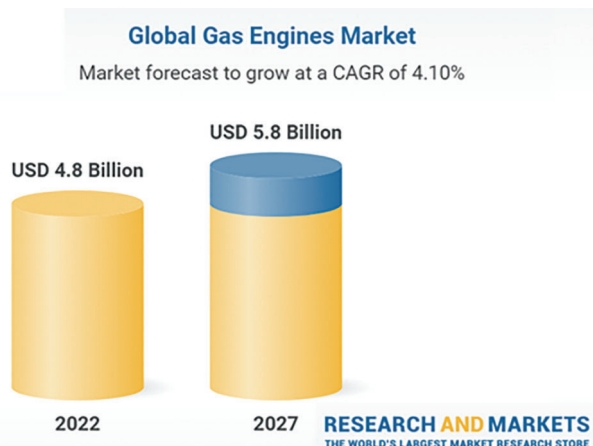
Gas engines above 15 MW see strongest growth through 2027

Demand for distributed baseload power will make gas engines with >15 MW power output reach the largest market share and push the overall engine market to \$5.8 billion by 2027. Growth rates of 4.1% over the next five years are caused by stricter emission regulations and the fast adoption of gas as a transition fuel, ResearchAndMarkets finds.

Natural gas-fuelled engines burn cleaner and with lower carbon emissions than other fuel types such as diesel or heavy fuel oil. It also emits low nitrogen oxide, sulphur dioxide, and particulate matter. Clean energy rules are hence pushing utilities in North America, Europe and China to prefer gas over coal for power generation, as well as for industrial and commercial cogeneration and mechanical drive.

However, the latest surge in global gas and LNG prices due to escalating tensions between Russia and Ukraine may well lead to short-term revival in coal generation.

In 2021, the above 15 MW segment held the



largest market share and these engines are mainly used for baseload and distributed power generation

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tight global gas markets and very high prices," analysts warn.

In 2021, the EU imported over 380 mcm per day of gas by pipeline from Russia, amounting to around 140 bcm per year – and on top of that came some 15 bcm of Russian LNG. The total 155 bcm imported from Russia accounted for around 45% of the EU's gas imports in 2021 and almost 40% of its total gas consumption.

Rush to alternative energy sources

Prices of oil and natural gas soared since Putin's invasion over fears that supply could be cut off in retaliation to Western sanctions against the war. The IEA's 10-point plan

hence recommends introducing minimum gas storage obligations, though higher injection requirements to refill storage will add to gas demand and prop up prices further.

Each national government in Europe is reassessing its energy sources and Germany was quick to suggest it could extend the planned coal power exit, possibly keep some nuclear plants running in Bavaria and accelerate the renewables energy build-out.

IEA analyst suggest Europe as a whole could source an additional of 35 TWh of electricity from new wind and solar projects starting from 2022 – over and above the EU's expected 100 TWh output increase from renewables. This move would lower

the use of gas for power generation by 6 bcm. The 10-point plan also calls for maximising generation from existing dispatchable low-emission sources – bioenergy and nuclear.

If Europe need to go faster and further, it can resolve to gas-to-coal switching: an additional 120 TWh in coal-fired generation could cut gas demand by 22 bcm in one year, according to IEA findings. Nearly a quarter of the EU's fleet of gas-fired power plants is capable of using alternative fuels – nearly all in the form of liquid fuels. Taking advantage of this capability could displace another 6 bcm of natural gas demand a year – though alternative fuel oil or hydrogen would come at a high cost. ■

China acts to ensure energy supply security at stable prices

The Chinese government has diversified energy imports and is boosting domestic oil, gas and coal production to keep prices under control. The People's Republic imports more than 70% of oil and 40% of its natural gas needs from overseas, but claims the impact of spiralling global prices would be "manageable" as it resorts to coal.

Acknowledging the risk of supply disruption after Russia's invasion of Ukraine, China's state planning body NDRC stressed the government had "conditions, ability, confidence and means to ensure a safe and reliable supply of energy."

Boosting fuel stocks and back-up power

To pre-empt supply risks, China has already diversified the sources of its oil and gas imports and rushed to import more thermal coal which fuels over 60% of the country's power plants. Going forward, the NDRC will work to amass 200 million tonnes of government-deployable coal stocks, and add more than

5 billion cubic metres (bcm) of gas storage.

Domestic coal is hoped to bridge any eventual gap in fuel supplies, hence the government approved hundreds of new coal mining projects as well as extensions of existing mines. China's domestic coal production hit a record of 4.07 billion tons last year, and is meant to grow further.

Emergency back-up power will be increased to more than 30 gigawatts (GW) in capacity as the government vows to ensure

enough electricity supply to industrial and residential customers. Tight fuel supplied had caused nationwide power shortages and rolling blackouts in 2021 that hampered industrial growth – something the government wants to avoid this year.

Renewables are meant to reduce the dependence on fossil fuel imports, hence Beijing plans to add some 450 GW of solar and wind power generation capacity in the Gobi Desert and in other arid regions. ■



Coal transport to a Chinese power station

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tion. Such rather small engines are primarily implemented in island-type configurations to supplement major power plants.

Asia Pacific is forecast to remain the largest market for gas engines through 2027, due to the region's need to replace

aging power gen infrastructure with cleaner alternatives and convert pollutive coal power units to run on natural gas or hydrogen, instead. Analysts anticipate a spike in hydrogen, ammonia and other cleaner fuels for power generation. ■

EU demand for Russian gas meant to fall two-thirds by end-2022

The European Commission wants to wean Europe off Russian fossil fuels well before 2030. The proposed plan 'REPowerEU' seeks to gradually remove at least 155 bcm of natural gas – equivalent to the volume imported from Russia in 2021. Nearly two-thirds of that reduction is meant to be achieved before year-end.

“We must become independent from Russian oil, coal and gas. We simply cannot rely on a supplier who explicitly threatens us,” Commission President Ursula von der Leyen said in reference to Russia’s suggestion it will halt gas flows through the Nord Stream 1 pipeline if the West imposes a ban on Russian oil, as proposed by the United States.

Europe, in her view, needs to act fast to mitigate the impact of rising energy prices by buying natural gas and LNG from elsewhere for next winter and accelerate the green energy transition. “The quicker we switch to renewables and hydrogen, the quicker we will be truly independent and master our energy system,” she said.

RES – cheap, clean and potentially endless

Calling for a dash into clean energy sources at lightning speed, the EU Commission first Vice-President Frans Timmermans said: “Renewable energy sources (RES) are a cheap, clean, and potentially endless source of energy and instead of funding the fossil fuel industry elsewhere, they create jobs here.”

Putin’s war in Ukraine increases the urgency to fast-track Europe’s energy transition, he stressed, pointing to renewables and hydrogen as a way for Europe to “rapidly become more independent” – as well as diversifying gas supply sources. The Commission said it was in talks with alternative suppliers in various countries, includ-

ing in the US, Norway, Qatar, Azerbaijan, Algeria, Egypt and Israel.

Need to replenish stocks early for winter

For the remaining weeks of this winter, Europe has sufficient amounts of gas, but reserves need to be replenished urgently for the upcoming winter 2022/23. “We therefore propose that by 1 October, gas storage in the EU has to be filled up to at least 90%,” explained the Commissioner for Energy, Kadri Simson. Filling levels are meant to be monitored and enforced.

Price regulation and state aid has also been discussed, as well as tax measures to protect European households and businesses against the impact of the exceptionally high prices.

Germany to spend €200bn on clean energy

Germany wants to spend over €200 billion on clean energy sources by 2026 to reduce its dependence on imported fossil fuels, especially those from Russia. Finance minister Christian Lindner announced the funds will be used to increase hydrogen production, e-car charging infrastructure and accelerate the build out of renewables which he called “freedom energies.”

Lindner promised the funding booster would pave the way to “transformation of the economy, society and the state.” However, he did not elaborate on how much of the €200 billion will be additional investment. ■



Russia threatens to halt gas supplies

Russia has threatened to halt gas supplies through the Nord Stream 1 pipeline if the West imposes a ban on Russian oil, as proposed by the US. Deputy Prime Minister Alexander Novak said “a rejection of our oil would lead to catastrophic consequences,” making oil prices more than double to \$300 a barrel with stark ramifications on global gas markets.

The total 155 bcm imported from Russia accounted for around 45% of the EU’s gas imports in 2021 and almost 40% of its total gas consumption – but the expiry of long-term gas contracts this year offers an opportunity. More than 15 bcm per year of take-or-pay gas import contracts with Russia’s Gazprom are set to expire by the end of 2022, and contract covering close to 40 bcm/y are due to expired before 2030. The International Energy Agency (IEA) urges EU decision makers to enter “no new gas supply contracts with Gazprom” and buy alternative pipeline gas and LNG instead.

Germany fast-tracks LNG terminals

Germany has decided to fast-track works on two LNG import terminals to reduce dependence on Russian pipeline gas. Chancellor Olaf Scholz said the terminals would be in Brunsbüttel and Wilhelmshaven – for the latter Uniper was asked to revive plans, shelved in 2020. Both terminals could also import hydrogen to fuel the green energy transition.

The short run, the German Chancellor wants utilities to increase the volume of gas in storage by 2 Bcm by maximising the limits of its long-term delivery contracts and through additional gas purchases on world markets. Germany’s underground storages are currently just around 30% full, holding 24 Bcm – very little leeway for ensuring stable fuel supplies to gas-fired peaking power plants. ■



Germany needs more energy storage to fully rely on RES by 2035

The German government aims to cover the country's entire electricity needs with renewable energy sources (RES) by 2035 to gain independence from Russian gas imports. But this move also requires a substantial build-out of energy storage to handle the rapid increase of fluctuating wind and solar power, critics caution.

Energy minister Robert Habeck wants to amend Germany's Renewable Energy Act (EEG), which for now aims for full renewable energy supply "before 2050", to reach up to 110 GW of on-shore wind capacity by 2030 – more than double the current capacity. Offshore wind and solar photovoltaic are both meant to be quadrupled to 30 GW and 200 GW, respectively.

Storage – the 'missing link'

The storage of inherently intermittent wind and solar power has long been called the "missing link" of the energy transition. In fact, the government admits energy storage will have to "make a greater contribution to a secure power supply," but falls short on specifying build-out requirements.

Economist Hans-Werner Sinn, a vocal critic of Germany's Energiewende policy, argues full-blown transition to intermittent renewable energies is impossible because of huge storage requirements. But economists from the German Institute for Economic Research (DIW) countered that Sinn's assumptions are unrealistic – for example, arguing that "not every single watt of renewable power must be put to use."

If Germany wants to fully rely on renewables by 2035, "this brings the role of elec-



tricity storage, and in particular battery systems, to centre stage," argues Adnan Amin, head of the International Renewable Energy Agency (IRENA). "Storage – from the batteries in solar home systems to those in electric vehicles – will be crucial to acceler-

Ansaldo signs license agreement for Dome's CO2 Battery

Ansaldo Energia has signed a license agreement to commercialise Dome Energy's energy storage technology, based on compressing and expanding CO2 in a thermodynamic cycle. The first CO2 Battery will be integrated into a gas turbine-driven combined cycle power project, due to be built from early 2023.

The storage system is based on a thermodynamic cycle which, by manipulating carbon dioxide between its gaseous and liquid phases, allows an efficient and economical energy storage based on components already available on the market. The process includes a charging mode, in which CO2 is taken from an atmospheric gasholder, the Dome,

compressed and then stored under pressure and at ambient temperature in a liquid state.

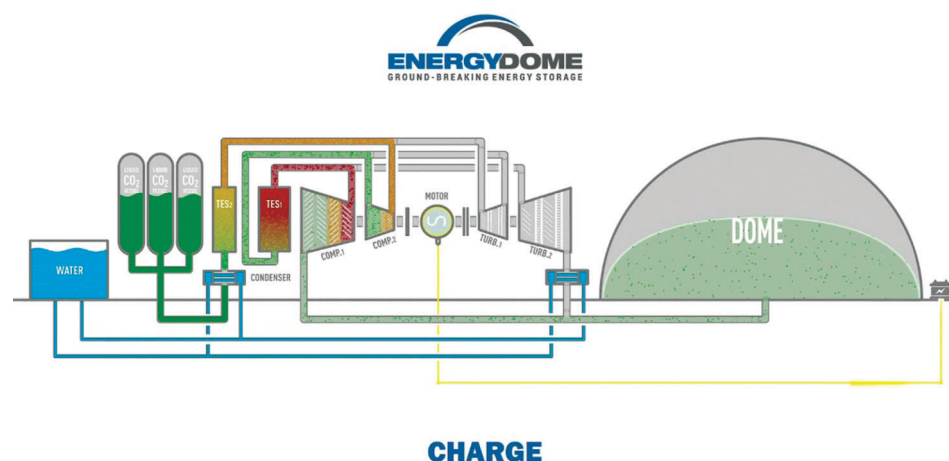
When energy needs to be released, the CO2 is evaporated and expanded in a turbine, then returned to the atmospheric gasholder, ready for the next charging cycle, without the process having any emissions into the atmosphere.

Claudio Spadacini, founder and CEO of Energy Dome claimed the company had "answer that the world desperately needs, that is, a concrete and reliable long-lasting energy storage technology."

Technical readiness confirmed

For the first so-called Energy Transition Combined Cycle (ETCC) project, the Italian manufacturer Ansaldo Energia will provide turnkey EPC, including performance guarantees, based on the Front End Engineering Design (FEED) developed by Energy Dome. Technical readiness, performance and costs of the battery has been tested and confirmed – before integrating it into the power project.

"Ansaldo GreenTech fully enters the energy transition market, with a product portfolio both in the field of energy storage (CO2 Battery) and storage coupled with combined-cycle power generation (ETCC), highly synergetic with our current production" Ansaldo GreenTech chief executive, Daniela Gentile commented on the licensing deal. ■





Li-ion battery market could reach nearly US\$10 billion globally by 2030

Growth rates of 5.9% through 2030 could help push the global market for lithium-ion phosphate batteries beyond \$9.9 billion by 2030, up from \$5.6 billion in 2020. Tesla's Models 3 and Y use such batteries but the high cost of lithium-iron phosphate remains "a restraining factor," as is the "high presence of alternatives [technologies]," ResearchandMarkets cautioned.

Lithium-iron phosphate battery is a type of battery that uses lithium-iron phosphate (LiFePO₄) as the cathode material, and a graphitic carbon electrode with a metallic backing at anode.

Tesla's Gigafactory in Berlin has been subject to much controversy. But once up and running, the US carmaker will use it to streamline and expand e-vehicle production in Europe, which inevitably drive up demand for batteries.

Li-ion vs. lead acid batteries

According to ResearchandMarkets, the "advantage of lithium-iron phosphate batteries compared to lead acid batteries is an important factor for the growth of the lithium-iron phosphate batteries market." Rising

policy support for electric cars – as more and more national government set Net Zero emission targets – also help provide growth for the lithium-iron phosphate batteries market.

Strict environmental rules in the EU has played a vital role in the development of lithium-iron phosphate batteries, notably in the automotive and industrial sectors as well as for emergency power.

In the power generation sector, rising renewable energy deployment has increased



the need for batteries to provide vital balancing energy to stabilise the grid. Analysts also pointed out that the military uses li-ion batteries for emergency power as do hospitals, data centers and some IT companies and the event industry. ■



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MAN invests up to €500 million in hydrogen production

MAN Energy Solutions has decided to spend up to €500 million to transform its subsidiary H-TEC SYSTEMS into a mass-producer of PEM electrolyzers. The technically proven PEM electrolyser can already make hydrogen at an industrial scale from renewable energy sources – the next step is to scale it up and produce it en masse.

Over the next five to ten years, green hydrogen is widely expected to become one of the most important primary energy sources as the world strives to decarbonize. Uwe Lauber, CEO of MAN Energy Solutions seeks to be ahead of this trend: "The PEM electrolysis technology is mature and has already been placed on the market successfully. The next step is therefore to scale and set up highly automated serial production – and we would like to make rapid progress with this," he explained.

Trend toward multi-GW electrolyzers

Today, green hydrogen production is mostly down in decentralized units and for local use. Over the next few years, however, larger electrolysis projects will come forward that could use the electricity of entire wind farms.

"We are increasingly expecting projects on a scale of over 100 MW and, in the medium term, are also predicting structural changes in the market for multi-gigawatt large-scale plants, which are used in particular to export hydrogen and supply industrial sectors

worldwide," said Robin von Plettenberg, the incoming CEO of H-TEC SYSTEMS and former head of turbomachinery services at MAN Energy Solutions. To handle this growth, he aims to greatly expand

the company's workforce both in Augsburg, Bavaria, and in the Braak municipality in Schleswig-Holstein.

Tapping VW's up-scaling expertise

Determined to transform H-TEC SYSTEMS into one of the world's leading players in the field of PEM electrolysis, MAN will make use of its global sales network and its direct access to the expertise of the Volkswagen Group. The German carmaker has ample experience in up-scaling and supplier-based series production.

Gunnar Kilian, VW board member, underlined the carmaker will support this move: "Only by coordinating our efforts will we achieve our shared objective of climate neutrality," he said, singling out the key role of hydrogen to decarbonise international shipping or industrial processes where direct electrification is not possible.

He hence encouraged the VW subsidiary MAN Energy Solutions to strengthen its position in power-to-X technology and synthetic fuels by investing in hydrogen production. ■



Siemens Energy wins order for world's first e-Methanol plant

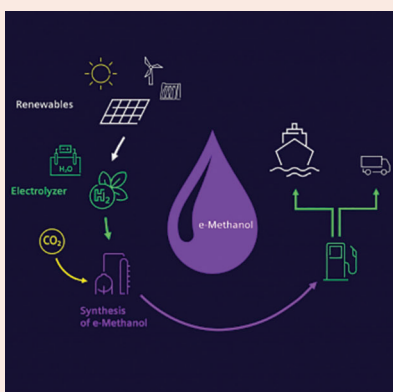
An electrolyser in the 50 MW range will be deployed by Siemens Energy to the Danish town of Kassø, where it will be powered by a nearby 300 MW solar park. Running on low-cost renewable electricity, the hydrogen plant will help produce cost effective e-Methanol for sale to the shipping line Maersk and fuel retailer Circle K.

The customer of the electrolyser is European Energy, a Danish operator of green energy projects and developer of the world's first large-scale commercial e-Methanol production facility.

Start to CO2-neutral shipping

Once in full swing, the Kassø electrolyser will ensure a steady fuel supply for Maersk's first e-Methanol driven container vessel – the starting point into CO2-neutral shipping at large. Start of commercial methanol production is planned for second half of 2023.

Global shipping accounts for around 3,050 terawatt hours (TWh) of the world's



final energy consumption – more than five times the electricity use of Germany. Fuelled mainly by bunker oil, the shipping sector emits about 1,000 million tons of CO2 per year, about 13% of global transport emissions.

The International Maritime Organization (IMO) has already committed to halve shipping sector emissions by 2050, based on 2008 levels, and pushed for use of

carbon-neutral electricity-based fuels (e-Fuels) for propulsion.

Hailing the e-Methanol project at Kassø as the first large-scale commercial Power-to-X-project of its kind in the world, Knud Erik Andersen, CEO of European Energy called the order placement a "crucial moment ... as we move forward with the decarbonization of hard-to-abate sectors such as the shipping industry." ■

Shenzhen Energy orders GE's 9HA turbine for Guangming CCGT

China's state-owned Shenzhen Energy Group has ordered three GE 9HA.01 gas turbines for its Guangming combined-cycle power project in Guangdong province. The first unit of the 2 GW plant is due operational by the end of 2023, in time to balance capacity lost by the retirement of the Guangdong Shajiao coal-fired power complex targeted in 2025.

Home to some 126 million people, Guangdong province is one of China's industrial power houses. "We ordered GE's H-Class technology as it can generate significant electrical output in a flexible and efficient way, while helping to ensure reliability of supply [for local industry] ... and align with China's national emission reduction goals," said a representative of Shenzhen Energy Group.

Pledging to have CO2 emissions peak before 2030, the government is promoting a transition from coal- to gas-fired generation. Coal-burn has fallen from 72.4% in 2005, down to 56.8% of China's power gen mix in 2020 – but the share might increase in the face of rallying global oil and gas prices.

Staying optimistic, GE Gas Power's sales manager Ma Jun said: "Gas can play a significant role in China's energy future due to its sustainability, flexibility, low capital costs, ability to integrate with carbon capture systems, and rapid deployment capabilities."

For the Guangming CCGT project, Harbin Electric will build and provide steam turbines and generators. GE and Harbin electric formed a joint venture in 2019 to build heavy duty gas turbines locally in China and deliver efficient support for installed power plants in the country. Since then, the two partners gained commercial momentum and won order for three 9HA.02 gas turbines for the Guangdong Energy's Dongguan Ningzhou power plant,

Another two 9HA.01 gas turbines were delivered to the Guangdong Huizhou power plant which will run on an up to 10% hydrogen blend right from the

get-go. GE is also providing the equipment to support the coal-to-gas transition of Huadin Tianjin's Junliangcheng power plant.

In total, GE Gas Power serves over 100 customers and more than 200 gas turbines in mainland China, with an installed power capacity of 46 GW. ■



Render of Shenzhen Energy's Guangming CCGT

ACWA Power takes FID on Red Sea multi-utilities project

ACWA Power, together with SPIC Huanghe and Saudi Tabreed Cooling, have reached financial close for \$1.302 billion senior debt for the Red Sea multi-utilities project – designed for chic, sustainable tourism. The trio will design, build, operate and transfer the utilities infrastructure that relies entirely on wind and solar for electricity, fresh water and district cooling.

The Red Sea Development Company (TRSDC), the developer of this ambitious regenerative tourism project, will procure all energy, water and cooling under a single offtake arrangement. All electricity needed for large tourism project will generated on a fully dispatchable basis by a 340 MW solar photovoltaic plant with battery energy storage system (BESS) plant for captive use, with about 1.200 GWh design capacity upon deployment.

Project finance was procured as an independent public-private partnership. TRSDC

stressed it is not investing any of its own capital and is instead committing to purchase its utilities from the consortium for the next 25 years.

Phase-1 launch in late 2022

The project includes the provision of renewable power, potable water, wastewater treatment district cooling and solid waste treatment for 16 hotels and an international airport. The size of this integrated power gen and storage system can be expanded, if and when needed. It has been designed to remain completely off-grid and powered by renewables, with phase 1 expected to launch at the end of this year.

In addition, three seawater reverse osmosis plants with a capacity of 32,500 cubic meters per day will be built to provide clean drinking water, accompanied by a waste management centre and an innovative sewage treatment plant. ■



Render of coastal villages of the Red Sea project

NEWS NUDGES

INNIO builds biogas plans in Malaysia

Austrian engine maker INNIO and Concord Group have agreed to develop four power plants across Malaysia, fuelled by palm oil wastes. The four plants, each driven by two INNIO Jenbacher biogas engines, will deliver more than 8 MW sustainable electricity to the grid while capturing methane.

DEWA ramps up Hassyan power complex

Production capacity of the Hassyan power complex in Dubai has reached 1,200 MW, Dubai Electricity and Water Authority (DEWA) confirmed. A further 600 MW will be added in the fourth quarter and another 600 MW in the third quarter of 2023 – once the plant has been fully converted from 'clean coal' to natural gas.

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