



Heat wave and lower spot LNG prices push up gas-burn in India

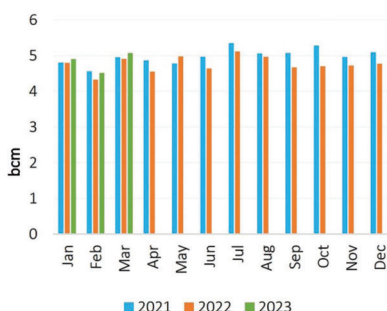
Scorching temperatures and lower spot LNG prices have prompted a jump in gas-burn for power generation and LNG imports in India, with most cargoes sourced from Qatar, Mozambique and the US, the Gas Exporting Countries Forum (GECF) finds. Bracing for electricity shortfalls during May and June, the Indian Power Ministry mandated that gas peaking plants run at full capacity.

As early as mid-April, six cities in India's north and eastern regions recorded temperatures above 44°C, which boosted demand for air-conditioning and propelled up the share of natural gas in the country's power generation mix. Another heat wave spell hit Northwest India this week, with temperatures soaring above 45°C and regional utilities prepare for sizzling summer conditions.

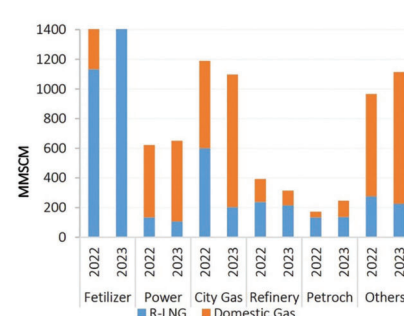
Softening spot LNG prices in recent months support the jump in imported cargoes as India's total gas consumption had already risen 3.3% year-on-year to 14.5 bcm in the first quarter, according to GECF figures. To pre-empt fuel shortages and blackouts, the Indian Ministry of Power introduced a set of emergency rules to ensure that gas peaking plants can operate at full capacity.

A staggering number of 31 gas-fired power station with a com-

Gas consumption in India



India's gas consumption by sector



Source: GECF Secretariat based on data from India's PPAC

bined 24.9 GW capacity have for long been stranded or run at sub-optimal levels due to a lack of fuel. To avoid blackouts during a crunch period from mid-April to the end of May, India's power ministry procured 4 GW of electricity from gas-fired power stations through a tender. But to operate 12.5 GW of existing gas generating capacity as peaking plants, the government would have to revise its gas allocation strategy.

Power producer are prone to substantially increase their gas demand during the summer season. Back in March, the fertilizer in-

continued on page 2

South Africa grants Karpowership access to three ports for 20 years

Turkey's Karpowership has been granted access to the three South African ports of Durban, Ngqura and Saldanha Bay for a period of 20 years as the government strives to source emergency power to end the country's energy crisis. Barge-based floating gas-to-power plants are aimed to generate 1,220 MW of electricity and distribute it through the national grid.

As Africa's most industrialised country has seen its GDP plunge as interruptions in electricity supply often last for over 10 hours in a single day. To mitigate blackout risks, South Africa would need an estimated 4-6 GW installed power generation capacity but investors in new gas-fuelled plants are holding back due to chronic fuel shortages and frequent electricity theft.

Floating fast-ramp power barges, running on LNG or low-sulphur heavy fuel oil, could now help wean off some of the worst shortfalls in electricity supply. The transport minister, Sindiwe Chikunga, reiterated the approval for access but stressed South Africa's Transnet National Ports Authority will oversee the safety measures for



Khan-class Powerships can generate 470 MW on a single vessel

operating the Karpowerships.

Long time coming

The projects have been long in the making: Back in December 2019, the energy ministry issued a

continued on page 2

AGENDA

PRICES

TTF gas prices could track lower amid lacklustre demand from industry **2**

MARKETS

High LNG price and fast export capacity builds could curb US gas-burn **3**

Europe needs to slash gas demand by 55 Bcm to pre-empt supply risk **3**

CLEAN FUELS

NEOM takes FID on \$8.4bn green H2 plant to produce ammonia at scale **5**

PROJECTS

China's HGGT supplies gas turbines for Novatek's Arctic LNG 2 project **6**

TAQA explores investing over \$3bn in Uzbekistan's power sector **6**

Continued from page 1, top story

dustry had the dominant share (33%) of gas consumption by sector, followed by city gas (22%), power generation (13%), refining (6%), and the petrochemical sector (5%). Analysts noted the fertiliser sector's rebound from the pandemic was helped by falling spot LNG prices during the first quarter.

China's gas demand rebounds

Meanwhile, lifted lockdowns in China sparked a swift economic recovery and subsequent rise in energy use. According to the CNPC Research Institute, the country's gas demand is expected to expand by 19 bcm

in 2023, a 5.1% increase from 2022, reaching 386.5 bcm. In the first quarter already, gas consumption – including LNG, pipeline gas imports and domestic production – increased 2% year-on-year to reach 97.2 bcm.

LNG imports to China continued to recover through April and saw the highest year-on-year rise since September 2021, the GEFC noted. Gas-burn for power generation was up 10% yoy as total electricity production increased by 2.7% yoy to reach 758 TWh. Coal-burn also increased by 10% yoy and remained the dominant fuel in the power mix with a share of 63%, followed by

renewables (20%), hydro (9%), nuclear (5%), and gas (3%).

The rebound in gas consumption in China, combined with "opportunistic buying in India due to lower spot LNG prices" contributed to the 5%, or 1.05 million tons yoy increase in the Asia Pacific's LNG imports to reach 20.5 million tons in April.

India, China, Thailand and Pakistan accounted for the bulk of incremental increase in LNG imports and offset weaker demand from Japan, GEFC analyst concluded, anticipating tighter supply balances and firmer spot LNG prices in the upcoming summer season. ■

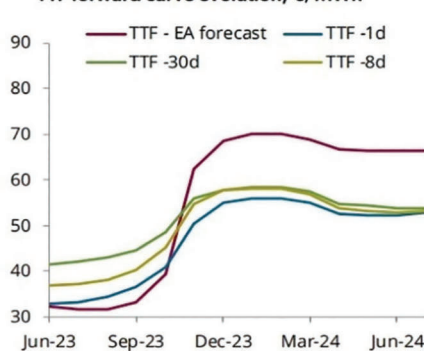
TTF gas prices could track lower amid lacklustre demand from industry

Analysts at Energy Aspects forecast balance-of-summer gas prices at Europe's benchmark hub TTF at €32/MWh and warn prices could fall further amid a lack of industrial demand response to the low prices and brisk LNG flows to Europe. Storage is on track to be filled early this summer, which poses significant downward risk to late-Q3 gas prices.

Falling wholesale prices had been expected to translate more quickly into higher industrial gas consumption across Western Europe. But a slump in new orders for machinery, equipment and chemical products from outside the EU appears to have slowed economic activity.

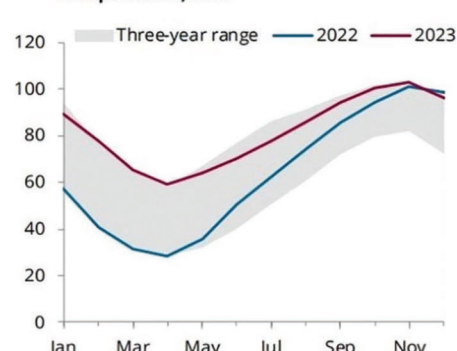
"It may be that factory managers have kept their facilities offline even with lower gas prices as they make their decisions on permanently shutting," analysts commented. An alternative explanation for the unexpected lower gas demand would be a "much higher level of efficiency gains," albeit unlikely, or a slower pass-through of lower wholesale gas prices into industrial tariffs which would mean many factories still have to pay high second quarter 2022 prices.

TTF forward curve evolution, €/MWh



Source: CME, Energy Aspects

Europe stocks, bcm



Source: GIE, system operators, Energy Aspects

More demand destruction

Analysts hence upscaled the amount of permanent, no longer price-responsive demand destruction they expect to take place over the balance of 2023. "We have 2% of the 2017–21 average demand permanently lost over the first half of this year, 4% over the third quarter, 6% over the fourth quarter of 2023 and 8% there-

after," they disclosed.

Ample injection into gas storage, averaging 294 million cubic metres per day in the first two weeks of May, put Europe on track to hit stocks of 100 bcm by 31 August and completely fill the around 107.1 bcm of working gas capacity by 27 September. Analysts warn Europe might struggle to absorb gas supplies by late summer. ■

Gas to Power Journal

Publisher
Stuart Fryer

Editor
Anja Karl
Tel: +44 (0)7733 684 682
anja@gastopowerjournal.com

Advertising
David Jeffries
Tel: +44 (0)7973 642 086
djeffries@lngjournal.com

New Business & Databases
Stephan Venter
Tel: +44 (0) 207 017 3407
venter@gastopowerjournal.com

Subscriptions
Margarita Tokere
Tel: +33 (0)7 67 62 58 77
margarita@gastopowerjournal.com

Layout & Production
Vivian Chee
Tel: +44 (0) 208 995 5540
chee@btconnect.com

Continued from page 1

tender for 2,000 MW of emergency power generation of which Karpowership received the largest share. In its proposal, the Turkish company informed the ministry on "what is possible, where and how we would look to do it," sales director Patrick O'Driscoll said at the time.

In June 2021, however, the Turkish company had to halt three projects in South Africa after environmental permits were refused as it allegedly did not comply with public participation rules. The department of forestry and fisheries had also refused a permit.

"The applicant had proposed to locate the three projects at the ports of Richards Bay,

Ngqura and Saldanha to generate electricity from natural gas to be sent through transmission lines to substations linking to the national grid," the ministry said at the time, adding: "The powerships were to be assembled off-site and be delivered fully equipped and functional to the different ports."

It remains to be seen how quickly Karadeniz Group will now move to deploy the three gas-fuelled power barges to their respective locations. Gas-fuelled power is seen as the fastest and most cost-effective pathway to decarbonisation given that today coal-fired plants still account for over 84% of South Africa's total CO2 emissions. ■

High LNG price and fast export capacity builds could curb US gas-burn

Faster development of US LNG terminals in response to higher prices could cause a 12% plunge in gas-burn for power generation to as little as 18.6 Bcf/d in the years through 2050, government analysts project. This adds to the effect of renewables growth which is set to curb gas-burn by more than a third from 2022-levels at 32.3 Bcf/d.

Gas-burn of US electric utilities is "most sensitive" to changes in the natural gas spot price, resulting from varying LNG exports, analysts said when modelling these effects based on their Annual Energy Outlook (AEO2023). While fast builds of lique-

faction terminals and low LNG prices would push up gas-burn by 8% compared to the Reference Case, high prices would lower gas-burn by way more than 10%.

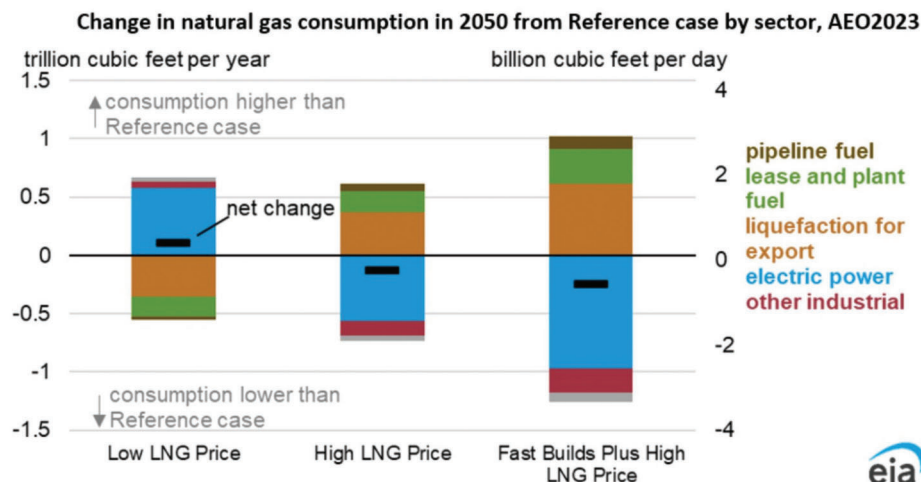
Wind and solar power – thanks to their rapidly falling capital costs – would replace most of the decline in natural gas-fired gen-

eration due to increased LNG exports, analysts noted, though coal and nuclear power would rise slightly as well.

Henry Hub spot price forecast to nearly double

Come December, the monthly average Henry Hub price is forecast to reach at least \$3.71/MMBtu, the US Energy Information Administration (EIA) said earlier. Gas prices are recovering as LNG exports are seen to rise from a first-quarter average of 11.6 Bcf/d to 12.2 Bcf/d this summer, while gas consumed for power generation is likely to average 38 Bcf/d this summer – the second most on record behind last year.

Dry gas production, meanwhile, is anticipated to fall from recent highs to average 100.4 Bcf/d this summer. Notwithstanding falling dry gas production and growing demand, the EIA expects prices to stay much lower than last year, hovering around \$2.91/MMBtu for the year – more than half of the 2022 average of \$6.42/MMBtu. ■



Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)



Europe needs to slash gas demand by 55 Bcm to pre-empt supply risk

McKinsey finds Europe has almost exhausted efficiency savings, so it needs to reduce gas demand by at least 55 Bcm this year to avoid supply shortages. A halt in Russian piped gas deliveries would leave Europe short of 25 Bcm, Asia could soak up 35 Bcm of LNG and a harsh winter would boost demand by 15 Bcm, analysts reckon.

Energy saving measures and efficiency increases can no longer achieve a great deal, according to McKinsey findings: 57% of polled EU manufacturers said they would not be able to further reduce gas consumption while maintaining output over the next two years. Enforcing further gas rationing measures could hence substantially harm the EU economy.

EU member states have agreed to extend last year's target for 15% in gas saving compared to the 2017-2022 average, equalling about 60 bcm, until March 2024. But analysts warn even if Europe meets this

target and improves energy efficiency across buildings and industry, volatile gas prices and potential supply disruptions still pose a risk to many economic sectors.

Industry advised to turn to gas substitutes

Turning natural gas substitutes like biomethane could hedge industrial gas consumers against potential supply disruptions, while higher gas prices could boost the business case for longer-term fuel switching or electrification. Responsive and flexible demand could allow businesses to cut gas procurement costs and stay competitive.

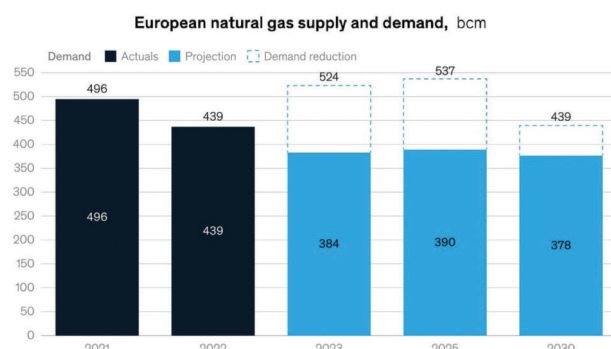
"Our analysis shows there is little bandwidth to further reduce Europe's gas demand without substantial economic damage. If the EU achieves all its gas-savings measures this could see a 24% reduction in consumption yet more competition from Asia could reduce

Europe's supply by an even greater amount," said Namit Sharma, senior partner at McKinsey. To mitigate these risks, businesses are advised to manage demand and invest in natural gas substitutes or storage.

Price spike would only marginally lower gas-burn

Less gas-burn in the power sector could be key to drive down Europe's gas demand reduction in the near term. As gas-fired power generation determines the marginal price on the merit order curve for power plant dispatch, nearly tripling the gas price from €70 to €200 per megawatt-hour (MWh) would likely only decrease gas-burn by 8% but increase electricity prices by 70%, according to McKinsey modelling.

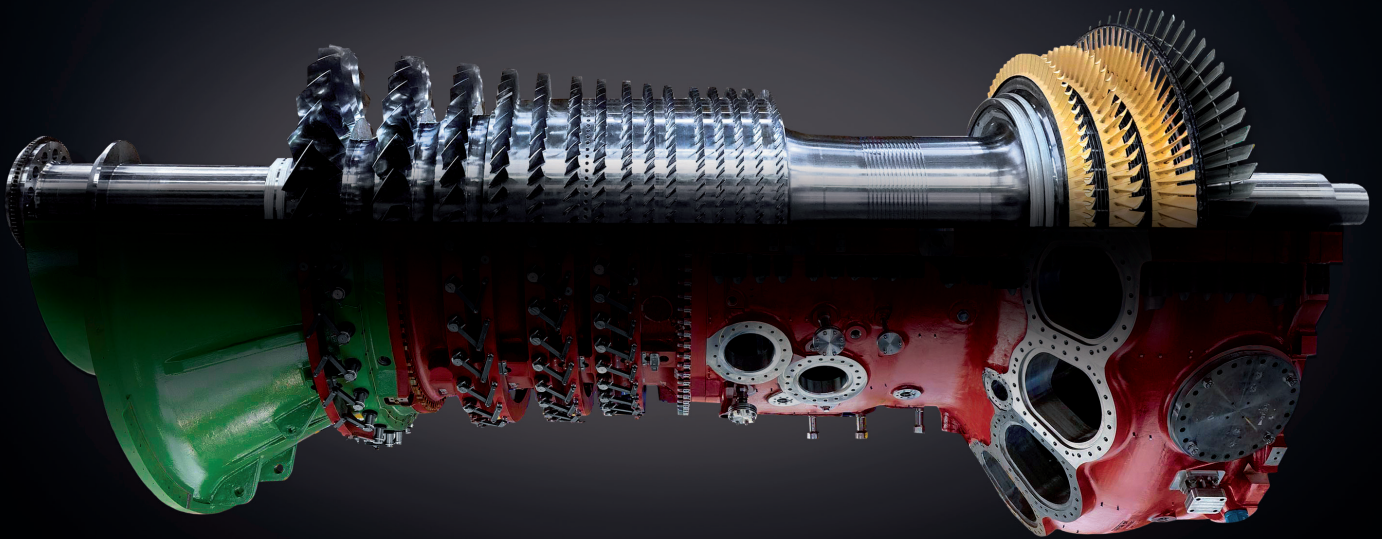
To swiftly slash reliance on gas as a baseload power source, analysts expect that various EU countries may need to delay the planned phaseout of coal-fired power generation, extend the lifetime of nuclear plants and accelerate the build-out of renewable power sources. ■



— ITALIAN ENERGY —

BRIGHTER FUTURE

pete room



Ansaldo Energia's GT36 gas turbine is the top of the range for performance and power in our portfolio. With our products and solutions, from EPC to service, from digital twin to remote monitoring, Ansaldo Energia is ready to face the challenges of the energy transition towards a cleaner and more sustainable future.

ansaldo | energia

NEOM takes FID on \$8.4bn green H2 plant to produce ammonia at scale

Saudi Arabia's NEOM Green Hydrogen, a joint venture between ACWA Power, Air Products and NEOM, has reached financial close on a \$8.4 billion green hydrogen plant to produce ammonia at scale in 2026. The \$8.4 billion project received \$6.1 billion in non-recourse loans backed by a 30-year off-take agreement of all green ammonia to be produced.

Debt financing deals were sealed 23 local, regional, and international banks, and investment firms, developers said which also had their project certified by S&P Global as adhering to green loan principles.

Banks were pleased about the venture's exclusive 30-year off-take agreement with Air Products for all the green ammonia produced by NEOM Green Hydrogen Company (NGHC) which guarantees a safe rate of return.

Start-up slated for late 2026

The plant is currently being built at Oxagon, in Saudi Arabia's NEOM city, with Air Products as the nominated contractor and system integrator for the entire facility.

Once operational, it will produce 600

tonnes per day of clean hydrogen by electrolysis using ThyssenKrupp technology; production of nitrogen by air separation using Air Products technology; and production of up to 1.2 million tonnes per year of green ammonia.

Air Products to offtake full production

Seifi Ghasemi, CEO of Air Products stressed the company is the "exclusive off-taker and will absorb the full production volume of the green hydrogen produced in the form of green ammonia at the NGHC facility." Exporting green ammonia supports the decarbonisation of heavy-duty transport and industrial sectors and will save the world about five million tonnes of CO₂ per year, he added.

As the primary EPC contractor, Air Products is progressing with engineering and has already awarded all major sub-contracts for the project. Land preparation is also complete, construction is well underway, and the joint venture team is in place and actively executing to get the project into operation by the end of 2026. ■



Sembcorp's CHP at Banyan

Sembcorp builds H2-ready power plant at Jurong

Singapore-based Sembcorp Industries will start construction of a new multi-utilities centre on Jurong Island in the second half of this year that will supply electricity, steam, firewater and demineralised water to customers. The centre will cost an estimated S\$900 million (US\$668.2m) to develop and is due fully operational in early 2026, including a 600 MW hydrogen-ready power plant.

Financing for the multi-utilities centre will come from internal cash resources and bank borrowing, Sembcorp Industries said, adding turnkey contract for developing the plant was awarded to Jurong Engineering and Mitsubishi Power.

Sembcorp is already running two co-generation plants at Sakra and Banyan, on Jurong Islands, which together produce 1,219 MW of electricity and 1,100 tonnes per hour of process steam for the nearby industry. In February, Sembcorp Industries opened a utility-scale energy storage with 285 MWh capacity on Jurong Island that can meet the electricity needs of around 24,000 four-room households for one day, in a single discharge. ■

Carlton Power & Schroders develop green hydrogen projects in the UK

UK independent energy infrastructure developer Carlton Power and specialist investor Schroders Greencoat have partnered on the construction and operation of green hydrogen production schemes in the UK. The duo aims to build a project portfolio of 500 MW by 2030, with first projects intended to be Trafford in Greater Manchester, Barrow-in-Furness in Cumbria and Langage, near Plymouth.

The 200MW Trafford green hydrogen project is part of a low carbon energy park that also includes Li-ion battery energy storage and a liquid air storage plant together with Highview. The 30 MW Barrow scheme will supply hydrogen to Kimberly-Clark's manufacturing facility at Barrow-in-Furness. The 10 MW Langage hydrogen hub, meanwhile, will supply clean-burning fuel to two mining companies: Imerys and Sibelco.

The three schemes, all originated by Carlton Power, were shortlisted in March for financial support from the government's Net Zero Hydrogen Fund. Schroders Greencoat and Carlton Power committed to initially

spend £200 million from funds managed by Schroders Greencoat with the aim of getting the three projects into commercial operation in 2025.

Come December, Carlton Power hopes to sign final government funding agreements for its initial three projects as the company plans to submit further project applications in the Hydrogen Allocation Round 2 (HAR2). The latter projects are due operational in 2026, each of them meant to help decarbonise local industries and manufacturers as well as local transport operators. ■



Render of Barrow hydrogen plant near Kimberly-Clark's factory

China's HGGT supplies gas turbines for Novatek's Arctic LNG 2 project

Harbin Guanghan Gas Turbine (HGGT), part of China Shipbuilding Industry, is expected to supply equipment for the first two units of Novatek's Arctic LNG 2 plant. The project was left without turbines for gas liquefaction and electricity supply after the US oil service company Baker Hughes exited it last year in reaction to Russia's invasion of Ukraine.

With this move, the Chinese state-dominated turbine maker would fill the technology gap left by the withdrawal of western companies from Russia's energy projects. Sanctions had left Novatek with just four out of 20 ordered gas turbines to operate all three liquefaction units of Arctic LNG 2. Supply of Chinese-built turbines could now allow Novatek to start production as planned by the end of this year.

The first of three liquefaction trains, assembled on a floating gravity-based structure, will be towed from the Belokamenka construction yard near Murmansk to the Gydan peninsula in the coming month. Each of the three trains has a liquefaction capac-

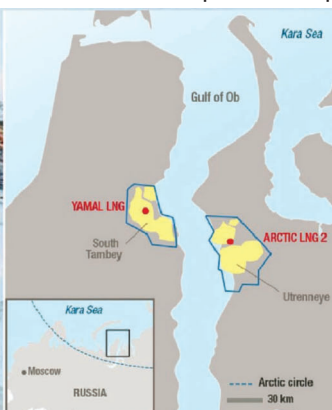
ity of 6.6 million tons per annum (mtpa).

Each train requires about 150 MW of power generation and given that completion of the third train will take another two years, this gives Novatek enough time to test the Chinese turbine. Russia's largest independent gas producer earlier intended to charter floating Karpowerships but it reportedly could not agree on contract terms with the Turkish Karadeniz Holding.

According to the Russian newspaper Kommersant, the turbines now ordered from Harbin Guanghan are adapted of Ukrainian equipment from the 1980s and are hence unlikely to have the same efficiency as modern western turbines. "Long-term reliable operation of prototypes in the

conditions of the Gulf of Ob will be a serious risk," the Kommersant warns.

Offtakers in the EU bought a record 8.93 million tons of LNG from Russian in the year to April,



SaskPower to build new gas power plant as part of C\$1.15bn capex

Canada's regional utility SaskPower plans to make capital expenditure of C\$1.15 billion (US\$850 million) to grow and modernise its electricity system during the 2023/24 fiscal year. Planned investment includes C\$505 million in growth projects, notably gas-fired assets such as the 370 MW Aspen power station and the 360 MW Great Plains power station due operational in 2024.

The funds for growth projects are also meant to cover ongoing refurbishment at the E.B. Campbell and Coteau Creek plans as well as the expansion of the Ermine/Yellowhead power station as well as grid upgrades.



Works at Great Plains power station

mostly from Novatek's Yamal LNG export plant, and Europe is eyeing significant volumes from Arctic LNG as well – rivalling Chinese buyers.

Shareholders in the Arctic LNG 2 venture are Novatek (60%), the French major TotalEnergies (10%), China's CNPC and CNOOC (10% each), as well as a Japanese consortium of Mitsui and JOGMEC (10%).

TAQA explores investing over \$3bn in Uzbekistan's power sector

Abu Dhabi National Energy Company (TAQA) has agreed with the government of Uzbekistan to develop a 1.5 GW combined-cycle power plant as part of wider plans to invest over \$3 billion into the country's energy sector. The greenfield CCGT will be built near the 1.7 GW Talimarjan power complex where TAQA plans to privatise of two gas-fired units.

The public private partnership will cover the design, financing, engineering, procurement, commissioning, testing, ownership and operation of the combined-cycle power plant by TAQA.



Talimarjan consists of an 800 MW and two 450 MW CCGT units

Beyond this initial 1 GW project, TAQA said it is looking at opportunities to invest in existing and further greenfield gas-fired power generation plants with more than 3 GW capacity combined, along with electricity transmission and distribution infrastructure in Uzbekistan.

A strategic framework as well as an implementation agreement were signed by Uzbekistan's deputy energy minister Azim Akhmedkhadjaev, the deputy minister of investment, industry and trade, Sarvar Khamidov, as well as by TAQA's Group CEO Jasim Husain Thabet.

At the signing ceremony, Thabet said

TAQA will leverage its extensive global expertise to help modernise Uzbekistan's network and generation sector capabilities. "Working closely with the country's leading ministerial agencies will allow us to expand our international portfolio, [and is] strengthening our position as a global utilities leader," he noted.

At the same ceremony, Masdar – a joint venture owned by TAQA, ADNOC and Mubadala – signed a joint development agreement with Uzbekistan to develop over 2 GW of solar and wind projects and 500 MWh of battery energy storage at multiple sites across the country.

LNG Journal Subscription Package

Your LNG Journal subscription includes broad coverage of LNG across the globe – from trade and shipments through to LNG prices, plus in-depth technical coverage. With over 20 years of LNG reporting experience, we remain the market leading source of information for decision makers in the LNG industry.

LNG Daily News

Delivered to your inbox and online



LNG Journal

The flagship LNG monthly



LNG Unlimited

Your weekly summary of LNG news



LNG Market Tracker

Weekly empirical insight into the LNG market



LNG North America

Bi-monthly report on LNG in the US, Canada



LNG Fuelling

In-depth look at LNG as a fuel



LNG Shipping News

Bi-weekly coverage of LNG shipping



LNG China

Bi-monthly review of LNG in China



LNG Monthly Markets

Key developments in LNG markets



Gas to Power Journal

Peakload Power and Energy Storage



Subscription Contacts

For new subscriptions or general subscription queries please contact:

Stephan Venter

venter@lngjournal.com

+44 207 017 3407

To renew an existing subscription or to upgrade your package, please contact:

Gabi Weck

gabi@lngjournal.com

Sign up now for an Online Subscription at only US\$1190; €920 or £830

Discount options are available for multi-users

Contact us for more information or to arrange a free trial