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AT THE SHOW

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China charts course for energy sustainability

Resilience is key to long-term vision that emphasises security and stability for nation. **Pages 2&3**

中国开启能源可持续发展新征程，韧性是长期发展愿景的关键，强调国家能源安全和稳定供应 **P2&3**

Photo: COOEC

Rise in investments fuels China's CBM push

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US LNG pause threatens China with shortfall

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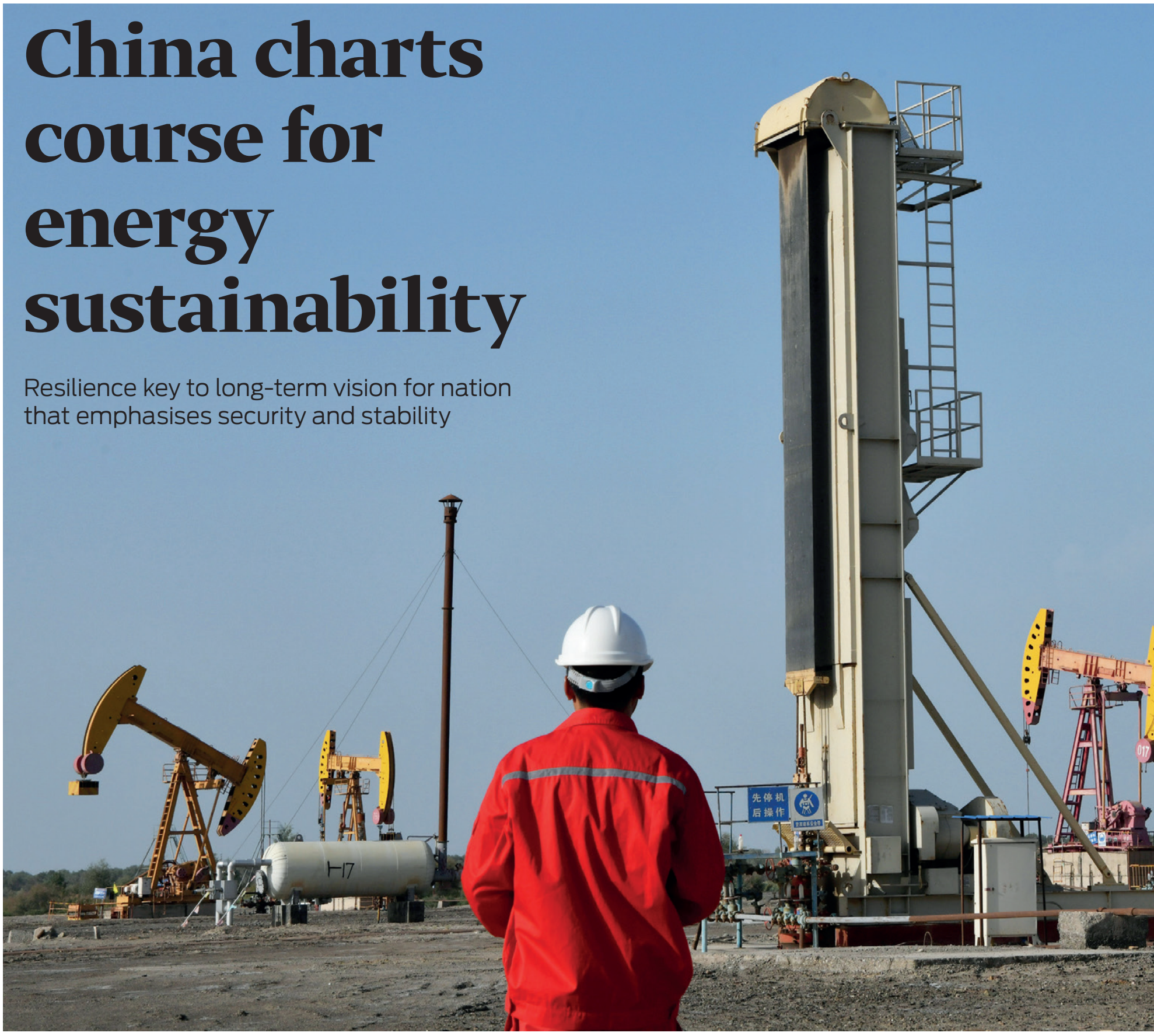
China charts course for energy sustainability

Resilience key to long-term vision for nation that emphasises security and stability



XU YIHE
Singapore

ESTABLISHING a new energy system is an unavoidable but crucial step in China's ongoing energy transition as the country looks to balance energy security concerns with its ambitious net-zero goals.

The sheer scale of China's energy system magnifies the challenges inherent in charting a path forward.

Zhang Hualin, PetroChina's assistant general manager, emphasises the necessity of prioritising a new development strategy rooted in energy security, strategically aligning with low-carbon development goals and enabled by the digital revolution.

Central to the envisioned new energy system is the concept of multi-energy complementation and integrated development, Zhang says.

This approach leverages a novel system integrating centralised and distributed energy systems, he says, adding that collaboration in research and development of digital technologies is urged to foster mutual support and co-operation among diverse energy networks.

Beijing's energy industry currently reflects a delicate interplay of economic resilience, clean energy aspirations and domestic oil production challenges.

As the post-pandemic global economic recovery continues, China's steady resurgence is propelling shifts in energy consumption patterns.

Energy security remains a paramount concern, with the National Energy Administration stressing the need to anchor it in domestic energy resources.

The strategy involves committing to stability through progress, adopting a phased development approach, striving to enhance energy production and supply reliability, and continually improving energy resource security capabilities.

In 2023, China's primary energy consumption reached an estimated 5.67 billion tonnes of coal equivalent, a 4.7% year-on-year increase, underscoring the nation's robust economic rebound.

However, the growth of China's total primary energy production only saw a marginal 2.9% increase, to 4.8 billion tonnes of coal equivalent.

A significant part of the increase was due to the rise of low-carbon energy, with the proportion of renewables and other "clean" energy sources in the mix reaching 26.3% in 2023.

National Energy Administration data show that the cumulative installed capacity of renewable energy reached 1.45 billion kilowatts by the end of 2023, accounting for more than half of the country's total installed power generation capacity.

The power generation capacity by renewables last year hit 3 trillion kilowatt hours, constituting roughly 1% of the nation's electricity consumption. The combined installed capacity of wind and solar power is expected to exceed 1 billion kilowatts, the agency says.

The rise in renewable energy consumption will take a toll on fossil fuel demand. In China's net zero scenario, demand for oil is projected to peak at between 5.7 billion and 5.9 billion barrels per annum by 2030, then dwindle to 1.6 billion barrels per annum by 2060. According to Wu Mouyuan, vice president of the Economics & Technology Research Institute at China National Petroleum Corporation, the petrochemical sector will contribute to 30% of the country's oil demand by 2030, increasing to 66% by 2060.

The anticipated decline in oil demand is attributed to decreased need for transportation fuels, even though natural gas demand is expected to peak at 605.9 billion cubic metres in 2040.

Wu says carbon capture, utilisation, and storage will play a key role in China's emissions-reduction efforts and that to achieve its net zero by 2060 goals, the country will need to use the technology to cut emissions by between 1.4 billion and 2.1 billion tonnes per annum.

Hydrogen consumption in

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In production: A worker at a Chinese oilfield operation
Photo: REUTERS/ SCANPIX

China exceeded 36 million tonnes in 2023, he says, making the country the world's largest producer and consumer for the 13th consecutive year.

Despite making strides in adopting clean energy, China's rebound in energy consumption is creating a persistent upward trend in energy-related carbon dioxide emissions, projected to reach 10.9 billion tonnes in 2023, marking a 3.8% increase, according to a report published by China National Offshore Oil Corporation.

China's thirst for oil reached unprecedented levels in 2023, with record-high oil consumption and crude imports.

Transportation oil, a key driver, led to an 8.9% year-on-year surge in crude oil consumption to approximately 5.67 billion barrels of oil.

Domestic crude production grew steadily, reaching 4.16 million barrels per day, mostly from offshore endeavours, including significant contributions from the Bohai Oilfield. China's national oil companies have reported sporadic hydrocarbon discoveries, but monetising the reserves will take time and requires new technology.

PetroChina's significant oil discovery in the Ordos basin last year represents a breakthrough, with confirmed reserves exceeding 735 million barrels.

The company has built up a production capacity of 3700 barrels per day of crude at the Longdong prospect in the Changqing oilfield, enabling Changqing to become China's largest oilfield, with annual hydrocarbon production reaching around 478 million barrels of oil equivalent.

China's annual crude oil imports of around 4.1 billion barrels last year reveal a foreign dependence rate of approximately 72.7%.

In a geopolitical landscape marked by shifting alliances, Russia plays a pivotal role, contributing to more than 18% of China's crude oil import portfolio. China's natural gas imports grew to 165.7 Bcm in 2023, with foreign sources climbing to 42.6% of the total.

Liquefied natural gas imports hit 98.5 Bcm (71.36 million tonnes) in 2023, a 12.5% year-on-year surge. The nation has also bolstered its gas infrastructure and is now up to 29 LNG receiving stations with a total capacity of 120 million tonnes per annum.

Last year China augmented its gas storage capacity by 551 million cubic metres, reaching a total of 12.762 Bcm.

The country has established 22 underground gas storage tank farms, collectively boasting capacity of around 22 Bcm, roughly 5.6% of overall domestic natural gas consumption in 2023.

China's pursuit of a new energy system is not only a transformational imperative but a strategic one that aligns with the country's national priorities and global environmental aspirations.

中国制定能源可持续发展路线

中国希望权衡能源安全问题与远大的净零排放目标，在方兴未艾的能源转型过程中，构建新型能源体系是不容回避的关键一环。

中国的能源体系规模庞大，规划发展路线面临更为艰巨的挑战。

中国石油集团总经理助理张华林强调，必须优先考虑新的发展战略，要以能源安全为基础，与低碳发展目标保持战略一致，在数字革命的推动下得以实现。

张华林表示，新型能源体系的核心应该遵从多能源互补、综合发展的理念。

他指出，新的体系将融合集中式能源体系和分布式能源体系，此外，必须在数字技术研发领域通力协作，以促进不同能源网络之间的相互支持与合作。

经济韧性、使用清洁能源的意愿和国内石油生产挑战之间存在着微妙的关系，当前中国的能源产业就反映了这一点。

随着新冠疫情后全球经济持续复苏，中国经济的平稳恢复正在推动能源消费模式的转变。

能源安全仍然是至关重要的问题，国家能源局强调需要立足于国内的能源资源禀赋。

能源安全战略包括致力于稳中求进，采取阶段性发展方针，努力提高能源生产和供应的可靠性，不断提升能源资源的保障能力。

2023年，中国一次能源消费总量预计达到 56.7 亿吨标准煤，同比增长4.7%，体现出中国经济强劲反弹的趋势。

然而，中国的一次能源生产总量仅为 48 亿吨标准煤，同比小幅增长 2.9%。

这一增幅背后的主要原因是低碳能源的兴起，2023年，可再生能源和其他清洁能源的比例将达到 26.3%。

据国家能源局数据，截至2023年底，中国可再生能源总装机达4.5亿千瓦，占全国发电总装机比重超过50%。

2023年中国可再生能源总发电量超过3万亿千瓦时，约占全国用电量的1%。国家能源局表示，全国风光总装机预计将突破 10 亿千瓦。

可再生能源消费的增长将影响化石燃料的需求。在中国零碳图景下，到2030年，石油需求将达到每年57至59亿桶的峰值，到2060年降至每年16亿桶。

中国石油天然气集团有限公司经济技术研究院副院长吴谋远认为，到2030年，石化用油占比将增至30%，到2060年达到66%，运输燃料需求减少，因此石油需求预期下降。此外，天然气需求将在2040年达到 6,059 亿立方米的峰值。

吴谋远表示，碳捕集、利用和封存技术将成为碳减排的重要手段，要实现2060年的净零排放目标，中国每年需要捕集并封存14至21亿吨的二氧化碳。

他表示，2023年，中国的氢气需求量将超过3,600万吨，中国已连续13年成为全球最大的氢气生产国和消费国。

中国海洋石油有限公司发布的一份报告显示，尽管中国在清洁能源应用方面已取得长足进步，但能源消费持续增长，因能源消耗产生的碳排放量仍呈增长趋势，预计2023年将达109亿吨，增幅3.8%。

2023年，中国石油需求量创下历史最高纪录，石油消费量和原油进口量均创历史新高。

交通用油推升石油需求，原油消费量达56.7亿桶，同比增长 8.9%。

国内原油产量稳步增长，日均产量达416万桶，其中大部分来自海上作业，渤海油田已成为第一大原油生产基地。

Pulling ahead: A man rows a boat on a river at Taiyuan, in Shanxi. The province is a major location for China's CBM drive
Photo: REUTERS/SCANPIX

Rise in investments fuels China's CBM push

Nation boosted 2023 coalbed methane output by 21% to 11.8 Bcm

XU YIHE
Singapore

CHINA has substantially boosted its investments in coalbed methane (CBM) exploration and production, resulting in significant growth in both the production and reserves of this unconventional energy source.

Zhang Xing, deputy director of the general department of the National Energy Administration, said that China last year allocated 13 billion yuan ($1.8 billion) to CBM exploration and production.

A significant portion of this investment, amounting to 10 billion yuan, was dedicated to production and development, while 3 billion yuan was earmarked for exploration.

The tangible impact of this increased investment is evident in the 21% year-on-year growth of China's CBM production, which last year reached 11.8 billion cubic metres.

CBM now accounts for 5% of the country's total natural gas supply, with a significant proportion originating from central China's Shanxi province.

The robust investment in exploration and production has facilitated a substantial growth in CBM reserves, with an impressive reserves increase of 290 Bcm alongside a boost in production capacity of 3 Bcm in the past year.

Among the 2023 successes is the discovery made by offshore operator CNOOC Ltd at the Shenfu play in the Ordos basin.

The SM2-33-CH1 well encountered 16.5 metres of coal seam gas at a depth of approximately 2011 metres, and produced approximately 19,000 cubic metres per day of CBM during post-fracturing operations.

In-place reserves at Shenfu exceed 110 Bcm, making it China's first deep CBM field of this magnitude.

This achievement builds on CNOOC Ltd's prior success at the Linxing field in Shanxi province, discovered in 2021, which currently holds 101 Bcm of CBM reserves in an area of 728 square kilometres.

The Linxing field hosts over a dozen well pads with up to 600 wells, contributing more than 5 million cubic metres per day of CBM.

Drill pad: The Mabi coalbed methane play in China's Shanxi province
Photo: AAG

Zhang said that major players in the industry, such as PetroChina, have intensified research and development endeavours to enhance drilling efficiency, employing tactics like extreme volume fracturing and full-cycle integrated gas production.

At the Daji Block in Shanxi province, operated by PetroChina, the average daily output per well of the 32 pilot test wells exceeded 50,000 cubic metres throughout the year.

Zhang attributes this boom in reserves and production in part to various government policies, including value-added tax refunds and preferential income tax rates.

投资增加推动中国煤层气产业蓬勃发展

中国大幅增加了对煤层气勘探和生产活动的投资，推动这一非常规能源的产量和储量显著提升。

国家能源局综合司副司长张星表示，中国去年为煤层气勘探和生产活动投入的总额为130亿元人民币（18 亿美元）。

这些资金绝大部分用于生产与开发，共花费 100 亿元，剩余 30 亿元用于勘探。

去年，中国煤层气产量达 118 亿立方米，同比增长 21%，加大投资的效果非常明显。

煤层气目前占全国天然气供应总量的 5%，其中很大一部分来自于中原地区的山西省。

对勘探和生产的大力投资大幅提升了煤层气储量，过去一年，煤层气储量增加了 2,900 亿立方米，产能也提高了 30 亿立方米。

中国海洋石油有限公司 (CNOOC Ltd) 在鄂尔多斯盆地的神府深煤层发现了煤层气，这也是中国在 2023 年的一大重大发现。

经勘探发现，井 SM2–33–CH1 目的煤层厚度16.5米，埋藏深度约2011米，经压裂作业后测试日产量约1.9 万立方米。

神府深煤层大气田的地质储量超 1,100 亿立方米，是中国首个千亿方深煤层大气田。

中国海洋石油有限公司于 2021 年发现了山西临兴气田，目前在728平方公里的区域内拥有 1,010 亿立方米的煤层气储量。

临兴气田拥有十几个井场，井的数量多达600口，煤层气日产量超过 500 万立方米。

他将储量和产量的增加部分归因于各种政府政策，包括增值税退税和优惠所得税率。

cippe 北京石油展

MONDAY 25 MARCH 2024

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cippe2024 kicks off in Beijing

The 24th China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe2024), one of world's leading events for the oil and gas industry, launches today at the New China International Exhibition Centre in Beijing.

With up to 120,000 square metres of exhibition space, cippe2024 gathers about 2000 exhibitors from 65 countries and regions.

The exhibition covers the entire oil and gas industry chain, including petroleum, petrochemical, natural gas, pipeline, offshore engineering, city gas, shale gas, trenchless, explosion-proof electric, safety protection, automation & instrumentation and other relevant sectors, as well as the hydrogen energy industry.

The event also provides a high-quality and efficient platform for technical exchange and trade cooperation.

Well-known overseas and domestic enterprises will be present at this grand gathering, including ExxonMobil, Rosneft, Gazprom, Transneft, Saudi Aramco, Petronas, Lukoil, Tatneft, KazMunayGas, Caterpillar, NOV, Schlumberger, Baker Hughes, GE, Cameron, Honeywell, Philips, Schneider, Dow, Rockwell, Cummins, Emerson, Kongsberg, DuPont, AkzoNobel, API, 3M, E+H, MTU, ARIEL, KSB, TE Connectivity, Atlas Copco, Forum, Huisman, Eaton, Altra, Allison, CNPC, SINOPEC, CNOOC, PipeChina, Sinochem, CSSC, CASC, CASIC, CRRC, Yanchang Petroleum, Honghua, Jereh, Kerui, Sany, XCMG, RG Petro-Machinery, CITIC Heavy Industries, Weichai, Anton, Dong Fang Xian Ke, Shanghai Shenkai, BESTEBIT, PetroKH, Haimo Technologies, Petro-king, XBSY, Yuchai, Baowu, Daye Special Steel, Hilong Group, GN Solids Control, Guoxing Huijin, Rutong, Grand Oilfield, OKTECH.

The third energy revolution is undergoing a transition to low carbon and carbon-free energy from fossil fuels,and at cippe2024, an exhibition area for hydrogen energy is set up in Hall W4, with hundreds of well-known enterprises bringing their hydrogen energy products and technologies.

More than 100 forums and seminars will be held concurrently during cippe2024, including The Second Presidents Forum of Petroleum Technology and Equipment Institutes & The 16th International Petroleum & Natural Gas Conference, theme forums on hydrogen energy, offshore wind power, pipelines, trenchless, natural gas and city gas, a series of international sessions on Russia, Argentina, Pakistan and other countries under the themes of Business Matchmaking Meeting and International Oil & Gas Promotion Conference, and also several themed technical seminars, etc.

Academicians and experts, industry elites, stakeholders will discuss the development trends and investment opportunities of global oil, gas and energy industry.

Welcome to cippe2024, where you can explore more opportunities from March 25 to 27.

cippe2024 is one of the world's leading events for the oil and gas industry

Photo: cippe

cippe2024北京石油展今日盛大开幕

3月25日，一年一度的世界石油天然气大会——第二十四届中国国际石油石化技术装备展览会（cippe2024）在北京·中国国际展览中心（新馆）开幕。

第三次能源革命大时代开启，高碳能源向低碳、无碳能源演变，能源产业迎来黄金时代。本次展会聚焦油气全产业链，总展览面积达12万平方米，同期举办天然气、油气管道、燃气、氢能、非开挖、海工装备、海洋石油、页岩气、防爆电气、安全防护、自动化仪器仪表等行业相关展会。展会现场，埃克森美孚、俄油、俄气、俄罗斯国家石油管道运输公司、沙特阿美、马来西亚国家石油公司、俄罗斯卢克石油公司、俄罗斯鞑靼石油公司、哈萨克斯坦国家石油天然气公司、卡特彼勒、国民油井、斯伦贝谢、贝克休斯、GE、卡麦龙、霍尼韦尔、飞利浦、施耐德、陶氏化学、罗克韦尔、康明斯、艾默生、康士伯、杜邦、AkzoNobel、API、3M、E+H、MTU、ARIEL、KSB、泰科、Atlas Copco、Forum、豪氏威马、伊顿、奥创、艾里逊、中国石油装备展团、中石化、中海油、国家管网、中国中化、中国船舶集团、中国航天、航天科工、中国中车、延长石油、宏华、杰瑞、科瑞、三一集团、徐工集团、南阳二机、中信重工、潍柴、安东石油、东方先科、上海神开、百施特、中油科昊、海默科技、百勤油服、西部石油、玉柴、宝武钢铁、大冶特钢、海隆石油、冠能固控、国兴汇金、如通股份、格瑞迪斯、海洋王等国内外知名企业将齐聚盛会，行业尖端的新产品新技术将同台竞技。

cippe2024 Satellite events

同期展会

CING
第十四届北京国际天然气技术装备展览会

CIPE
第二十四届北京国际石油天然气管道与储运技术装备展览会

北京海工展
第十四届北京国际海洋工程技术与装备展览会

ciooe
第二十四届北京国际海洋石油天然气展览会

cisge
第十四届北京国际页岩气技术与装备展览会

GAS
2024北京国际燃气应用与技术装备展览会

HEIE 国际氢能展
北京国际氢能技术装备展览会

No-Dig CITTE
2024北京国际地下工程建设及非开挖技术装备展览会

Expec
第二十四届北京国际防爆电气技术设备展览会

cieca
北京国际石油和化工自动化技术装备及仪器仪表展览会

cipse
北京国际石油和化工安全防护技术及设备展览会

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cippe2024 同期活动日程安排
cippe2024 Concurrent Events Schedule

	时间 TIME	地点 VENUE	主题 EVENT TOPICS	主讲企业 SPEAKER
25 March	09:45-11:50	W-201会议室 Conference Room W-201	第二十四届中国国际石油石化技术装备展览会 & 第二届石油技术与装备院校长论坛暨第十六届国际石油天然气产业大会开幕式 Opening Ceremony of cippe2024 & The Second Presidents Forum of Petroleum Technology and Equipment Institutes & The 16th International Petroleum & Natural Gas Conference	中国国际石油石化技术装备展览会 (cippe) 组委会 石油技术与装备院校长论坛暨国际石油天然气产业大会组委会 西南石油大学 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Presidents Forum of Petroleum Technology and Equipment Institutes Organizing Committee Southwest Petroleum University
	13:30-16:30	W-201会议室 Conference Room W-201	第二届石油技术与装备院校长论坛暨第十六届国际石油天然气产业大会 The Second Presidents Forum of Petroleum Technology and Equipment Institutes & The 16th International Petroleum & Natural Gas Conference	中国国际石油石化技术装备展览会(cippe) 组委会 石油技术与装备院校长论坛暨国际石油天然气产业大会组委会 西南石油大学 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Presidents Forum of Petroleum Technology and Equipment Institutes Organizing Committee Southwest Petroleum University
	09:30-16:30	W4馆展区W4580 Hall W4-W4580	全球氢能产业大会 全球首届可再生能源及绿氢绿氨绿醇装备论坛 Global Hydrogen Industry Conference The First Global Forum on Renewables and Green Hydrogen, Green Ammonia, and Green Methanol Equipment	中国智慧能源产业联盟 北京振威展览有限公司 China Smart Energy Industry Alliance Beijing Zhenwei Exhibition Co., Ltd.
	10:00-16:30	二层东花园会议室 East Garden Conference Room, 2nd Floor, E2-E3 Corridor	2024北京国际管道技术交流会 暨特殊管材在油气领域的应用研讨会 2024 Beijing International Pipeline Technology Exchange Conference and Seminar on the Application of Special Pipes in Oil and Gas Field	北京国际石油天然气管道与储运技术装备展览会组委会 北京振威展览有限公司 CIPE Organizing Committee Beijing Zhenwei Exhibition Co., Ltd.
	13:30-16:30	二层西花园会议室 West Garden Conference Room, 2nd Floor, W2-W3 Corridor	cippe 2024国际石油天然气推介会 中巴经济走廊和巴基斯坦贸易和投资机会 俄罗斯联邦鞑靼斯坦共和国油气潜力推介专场 cippe2024 International Oil & Gas Promotion Conference CPEC and Trade & Investment Opportunities in Pakistan Presentation of the oil and gas potential of the Republic of Tatarstan of the Russian Federation	中国国际石油石化技术装备展览会 (cippe) 组委会 北京振威展览有限公司 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Beijing Zhenwei Exhibition Co., Ltd.
	09:20-15:40	展馆 Exhibition Hall	cippe 2024企业新产品新技术推介会 cippe2024 Enterprise New Product and New Technology Promotion Conference	中国国际石油石化技术装备展览会 (cippe) 组委会 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee
	09:30-16:30	展馆 Exhibition Hall	探馆直播 cippe Discoveries Livestream	中国国际石油石化技术装备展览会 (cippe) 组委会 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee
	09:30-16:30	W4馆 Hall W4	探馆直播 HEIE Discoveries Livestream	北京国际氢能技术装备展览会 (HEIE) 组委会 Beijing International Hydrogen Technology & Equipment Exhibition (HEIE) Organizing Committee
	10:00-16:30	W2馆 Matching 区 W2501 W2 Matching Zone W2501	cippe 2024 采购对接会 中俄阀门行业交流会 中国–阿根廷石油天然气对接会 cippe2024 Business Matchmaking Meeting China-Russia Valve Industry Exchange Meeting Argentina-China Oil and Gas Business Matchmaking Meeting	中国国际石油石化技术装备展览会 (cippe) 组委会 北京振威展览有限公司 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Beijing Zhenwei Exhibition Co., Ltd
	10:00-16:30	W4馆 Lucky 区 W4266 W4 Lucky Zone W4266	鲤跃龙门 cippe Lucky Draw - Liyue Longmen	中国国际石油石化技术装备展览会 (cippe) 组委会 北京振威展览有限公司 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Beijing Zhenwei Exhibition Co., Ltd.
	13:00-14:00	W-104会议室 Conference Room W-104	创新技术在高性能钻机上的应用 Innovative Technology Applied in High Performance Drilling Rig	北京捷杰西科技股份有限公司 Beijing JJC Technology Co., Ltd.
	14:00-15:00	W-104会议室 Conference Room W-104	防爆产品国际认证解析和转证 Analysis and Translation of Global Explosion Protection Certification	德国莱茵TÜV TÜV Rheinland

注：以上活动日程或有调整，以展会现场公布为准。 Note: The final agenda will be announced by the Organizing Committee on-site

cippe2024 同期活动日程安排
cippe2024 Concurrent Events Schedule

	时间 TIME	地点 VENUE	主题 EVENT TOPICS	主讲企业 SPEAKER
26 March	09:00-12:00	E-201会议室 Conference Room E-201	防爆论坛 Explosion-proof Forum	国家防爆检验中心 National Explosion-proof Inspection Center
	09:00-12:00	W-201会议室 Conference Room W-201	第二届石油技术与装备院校长论坛暨第十六届国际石油天然气产业大会 分论坛一：深地、深水和油气勘探开发关键技术 The Second Presidents Forum of Petroleum Technology and Equipment Institutes & The 16th International Petroleum & Natural Gas Conference Sub-Forum 1: Key Technologies for Exploration and Production of Deep Ground, Deep Water Oil and Gas	中国国际石油石化技术装备展览会 (cippe) 组委会 石油技术与装备院校长论坛暨国际石油天然气产业大会组委会 西南石油大学 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Presidents Forum of Petroleum Technology and Equipment Institutes Organizing Committee Southwest Petroleum University
	09:00-12:00	W-103会议室 Conference Room W-103	第二届石油技术与装备院校长论坛暨第十六届国际石油天然气产业大会 分论坛二：石油天然气工具、仪器、装备和新能源技术 The Second Presidents Forum of Petroleum Technology and Equipment Institutes & The 16th International Petroleum & Natural Gas Conference Sub-forum 2: Technologies on Oil and Gas Tools, Instruments, Equipment, and New Energy	中国国际石油石化技术装备展览会 (cippe) 组委会 石油技术与装备院校长论坛暨国际石油天然气产业大会组委会 西南石油大学 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Presidents Forum of Petroleum Technology and Equipment Institutes Organizing Committee Southwest Petroleum University
	09:00-12:00	W-104会议室 Conference Room W-104	第二届石油技术与装备院校长论坛暨第十六届国际石油天然气产业大会 分论坛三：自动化、数字化暨智能化信息技术 The Second Presidents Forum of Petroleum Technology and Equipment Institutes & The 16th International Petroleum & Natural Gas Conference Sub-forum 3: Automation, Digitization, and Intelligent Information Technology	中国国际石油石化技术装备展览会 (cippe) 组委会 石油技术与装备院校长论坛暨国际石油天然气产业大会组委会 西南石油大学 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Presidents Forum of Petroleum Technology and Equipment Institutes Organizing Committee Southwest Petroleum University
	09:00-16:00	W-102会议室 Conference Room W-102	天然气与燃气产业发展论坛 压缩机技术创新与应用发展大会 Natural Gas and Gas Industry Development Forum Compressor Technology Innovation and Application Development Conference	北京振威展览有限公司 Beijing Zhenwei Exhibition Co., Ltd.
	09:20-15:40	展馆 Exhibition Hall	cippe 2024企业新产品新技术推介会 cippe2024 Enterprise New Product and New Technology Promotion Conference	中国国际石油石化技术装备展览会 (cippe) 组委会 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee
	09:30-16:30	展馆 Exhibition Hall	探馆直播 cippe Discoveries Livestream	中国国际石油石化技术装备展览会 (cippe) 组委会 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee
	09:30-16:30	W4 馆展区 W4580 Hall W4-W4580	巴西氢能专场活动 国际绿色能源及装备合作高级别论坛 Brazil Session on Hydrogen High-level Forum on International Cooperation on Green Energy and Equipment	中国智慧能源产业联盟 北京振威展览有限公司 China Smart Energy Industry Alliance Beijing Zhenwei Exhibition Co., Ltd.
	13:00-17:00	二层东花园会议室 East Garden Conference Room, 2nd Floor, E2-E3 Corridor	CITTE 2024中国（北京）国际非开挖发展交流论坛 CITTE 2024 China (Beijing) International Trenchless Development Exchange Forum	中欧联合非开挖技术研究中心 北京国际地下工程建设及非开挖技术装备展览会组委会 北京振威展览有限公司 China Europe Joint Trenchless Technology Research Center CITTE Organizing Committee Beijing Zhenwei Exhibition Co., Ltd
	13:00-17:00	W-201会议室 Conference Room W-201	海上风电装备产业链发展论坛 Forum on Offshore Wind Power Equipment Industrial Chain	中国船舶工业行业协会 北京振威展览有限公司 China Association of the National Shipbuilding Industry (CANSI) Beijing Zhenwei Exhibition Co., Ltd.
	10:00-16:30	W2馆 Matching 区 W2501 W2 Matching Zone W2501	cippe 2024采购对接会 cippe2024 Business Matchmaking Meeting	中国国际石油石化技术装备展览会 (cippe) 组委会 北京振威展览有限公司 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Beijing Zhenwei Exhibition Co., Ltd.
	10:00-16:30	W4馆 Lucky 区 W4266 W4 Lucky Zone W4266	鲤跃龙门 cippe Lucky Draw - Liyue Longmen	中国国际石油石化技术装备展览会 (cippe) 组委会 北京振威展览有限公司 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Beijing Zhenwei Exhibition Co., Ltd.
	13:00-16:30	W-105会议室 Conference Room W-105	API 标准与认证更新研讨会 API Standards and Certification Updates	美国石油学会 API Americian Petroleum Insititute (API)

注：以上活动日程或有调整，以展会现场公布为准。 Note: The final agenda will be announced by the Organizing Committee on-site

Shenkai supports China's deep and ultra deep oil and gas E&P

To guarantee the national energy security strategy, China's oil and gas sector has made continuous improvements in storage and production.

The development of deep and ultra-deep wells has become the main focus for major oil and gas discoveries in China, and the depth of scientific exploration wells has advanced towards 10,000 metres.

With new drilling depth records continuing to be achieved, China's oil exploration and development sector has once again demonstrated the country's strength and determination to the world.

For 30 years, Shenkai has insisted on the dual driving forces of market-leading and innovation-leading advantages in petroleum equipment.

By focusing on such key areas as well control equipment, remote control equipment, special rubber, wellhead equipment, comprehensive mud logging, digital logging, measurement and control while drilling and etc, it has made breakthroughs in a series of world-class challenges, including ultra-high pressure and ultra-high temperature wells, the difficulty and time consumption of core extraction brought by deep wells, ultra-deep wells, and extra-deep wells, and has launched its "deep earth engineering" system solutions, providing support for China's deep and ultra-deep oil and gas exploration and development.

In 2023, multiple deep oil and gas development projects used Shenkai's oil and gas equipment.

In February, Shenkai's BOP control system, comprehensive mud logging unit and other products assisted the successful completion of the drilling of PetroChina's Pengshen-6 well, the deepest vertical well in Asia, with a depth of 9026 metres.

In June, Shenkai's 140MPa BOP arrived at the Southwest gas field to assist the drilling company in overcoming the challenges of high pressure bottom layers.

In July, Shenkai's engineering service team provided logging services for an ultra-deep well in Tarim, with a design depth of 9213 metres.

In September, Shenkai's TMWD system successfully completed measurement while drilling at a depth of 6842 metres after overcoming adverse effects such as high temperature and high vibration in the Fuling block.

Shenkai's high-temperature and high-pressure direct-push logging system has been successfully applied in ultra-deep wells multiple times, with well depth of entry being refreshed to 9316 metres.

In Penglai, Fuman, and Shunbei, Shenkai is contributing to China's petroleum industry.

Booth: E1230

上海神开——为中国深层、超深层油气勘探开发保驾护航

为保障国家能源安全战略，中国油气开发不断增储上产，深层、超深层井的开发已经成为我国油气重大发现的主阵地，科探井的深度已经向着万米迈进。上海神开始终坚持市场引领、创新引领的双引擎驱动，充分利用在石油装备领域三十年积累的技术优势，集中在井控设备、远控设备、特种橡胶、井口设备、综合录井、数字测井、随钻测控等关键领域技术攻关，突破深井、超深井、特深井带来的超高压力、超高温度、取岩芯难度大耗时长等一系列世界级难题，推出"深地工程"系统解决方案，为中国深层、超深层油气勘探开发保驾护航。

MOON-TECH provides smart green energy system solution

Moon-Tech's strategy focuses on the development of cooling and heating technologies and expanding the energy-saving and environmental protection industries.

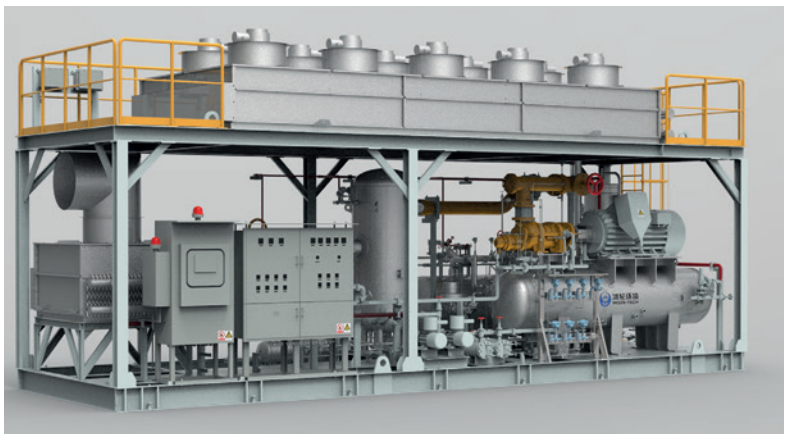
We provide users in the power and chemical industries with optimal temperature and pressure conditions in a low-carbon way.

Based on its R&D and manufacturing platform, the company actively cultivates cutting-edge technology development capability, enhances the core competitiveness of products and improves the system integration service capability.

Moon-Tech's main products are screw, centrifugal and absorption compressors and auxiliary equipment, providing users with chemical process cooling, process gas compression, waste heat recovery, clean emissions, waste treatment and other services.

At cippe2024, the company will focus on the needs of customers in the oil and gas sector, with gas booster liquefaction integrated solutions and oilfield heat pump products for heating tracing, and also for oil refining and chemical industry users with the provision of process cooling, gas compression, heat transfer technology, waste heat and pressure recovery and industrial heat management and other integrated solutions.

Guided by the six main low-carbon industries, Moon-Tech actively responds to national policies, practices green and low-carbon development concepts, promotes the intensive and sustainable development of the energy and chemical industries with system integration services, and contributes to the green transformation for the energy and chemical industries in terms of energy saving, emissions reduction and carbon reduction. **Booth: E3640**



冰轮环境——智慧绿色能源系统解决方案服务商

冰轮环境以冷热同步发展、积极拓展节能环保产业为发展战略，用更为低碳的方式，为能源化工行业用户提供最佳温度及压力条件。公司基于完善的研发制造平台，积极培育前沿技术开发能力，提升产品核心竞争力，提高系统集成服务能力，不断促进我国能源化工产业的集约、绿色可持续发展。主要产品为螺杆式、离心式、吸收式压缩机组及配套附属设备，为用户提供化工工艺冷却、工艺气体压缩、余热回收利用、洁净排放、污废处理等服务。本次展会将围绕油气板块客户需求，展示在工艺气体增压液化综合解决方案和油田伴热用热泵产品为主。展位号：E3640

cippe 北京石油展 | cippe conference Beijing

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cippe石油展产业领袖国际交流会

International Petroleum Industry Leadership Meeting

第二届石油技术与装备院校长论坛暨第十六届国际石油天然气产业大会

The Second Presidents Forum of Petroleum Technology and Equipment Institutes &
The 16th International Petroleum & Natural Gas Conference

全球创新驱动 能源科技新潮

Global Innovation Drives the Future of New Energy Technology

2024年3月25–26日 March 25–26, 2024

W201会议室 Conference Room W201

BOMCO: an integral oil and gas equipment company

BOMCO is a wholly owned subsidiary of CNPC. With more than 80 years' history, it has developed into an integral oil and gas equipment company with research & development, manufacturing, assembly, marketing and services.

Adhering to the principle of "Shoulder Our Responsibility to the Customer's Satisfaction", BOMCO provides clients with equipment and service of excellent value and strives to build a domestically leading and internationally first-class supplier of the R&D, manufacturing, assembly and service for oil and gas drilling and production equipment.

With leading technological strengths in R&D and manufacturing for China's oil and gas drilling and production equipment industry, the Chinese government has designated BOMCO R&D Centre as the National Oil and Gas Equipment Engineering Technology Research Center.

BOMCO is also the sole company in this industry with two national standardisation offices for drilling rig and offshore drilling and production equipment.

BOMCO has achieved 130 government technological awards and 1301 patents, among which 232 are patents for invention and two were awarded by the USA, ranking the company first among China's oil equipment manufacturer.

BOMCO has set up a quality control system in accordance with ISO 9001 and API Spec Q1. The company was the first API approved manufacturer in China in 1982, holding the most API certificates in the world.

BOMCO has established a global marketing and service network to cover the Middle East, America, Africa, Europe and Asia, which enables a fast response for global marketing, service, procurement and delivery. **Booth: E1300**

宝石机械——综合性油气装备企业

宝石机械是中国石油天然气集团有限公司的全资子公司，经过80余年的发展历程，已经成为集研发、制造、集成、销售、服务为一体的综合性油气装备企业。始终恪守“把责任留给自己，把满意留给用户”的经营理念，宝石机械致力于为客户提供能够创造卓越价值的装备与服务，锚定国内领先、国际一流的油气钻采装备研发制造集成服务商目标奋力前行。展位号：E1300

XBSY looks forward to greeting you

Founded in 1999, Chengdu West Petroleum Equipment Co Ltd (XBSY) is a national high-tech enterprise integrating scientific research, manufacturing, sales and service.

For more than 20 years, XBSY has been committed to providing customers with more sophisticated, safer and more competitive integrated solutions in oil drilling, oilfield environmental protection, fine mineral processing, etc.

At present, it is the largest manufacturer of oil drilling solid control equipment and environmental protection equipment in China.

The company drafted the SY/T5612-2007 and SY/T5612-2018 oil solid control industry standards, and has 96 patents, including 22 invention patents.

XBSY is a national enterprise with intellectual property advantages and a provincial enterprise technology centre in Sichuan Province,

The company has a complete scientific research and development system and a first-class scientific R&D team. Its research and development of the combination of petroleum equipment control and intelligent digitization is at a high level in the industry.

XBSY's main products include shale shakers, drilling fluid cleaners, desanders, desilters, degassers, drilling fluid centrifuges, sand pumps, shear pumps, agitators, dryers and other oil drilling solid control equipment. It also provides water-based cuttings treatment systems, oil-based cuttings treatment systems, sludge treatment systems, mud cooling systems, barite recovery systems, drilling fluid circulation systems, fine beneficiation equipment, screens and consumables, etc.

The company has obtained DNV, ABS, CCS and other certifications. XBSY is the main supplier of solid control equipment for CNPC and Sinopec overseas drilling rigs, and the main supplier of offshore solid control equipment for CNOOC and COSL.

Its products cover more than 40 countries and regions around the world. **Booth E1214**

西部石油诚邀您莅临E1214展位

成都西部石油装备股份有限公司是一家集科研、制造、销售、服务为一体的国家级高新技术企业。公司成立于1999年，20多年来，始终致力在石油钻井、油田环保、精细选矿等领域为客户提供更为精良、更为安全和更具市场竞争力的一体化解决方案，是目前中国规模最大，品类最齐全的石油钻井固控装备及油田环保设备制造商，是SY/T5612–2007和SY/T5612–2018两版石油固控行业标准的起草厂家，拥有各项专利96项，其中发明专利22项，是国家知识产权优势企业，是四川省省级企业技术中心，具有完整的科研开发体系及同行业一流水平的科技研发团队，其石油装备控制与智能化数字化结合研发在行业具备较高的水平。

ENN Power: ubiquitous energy solution based on gas turbines

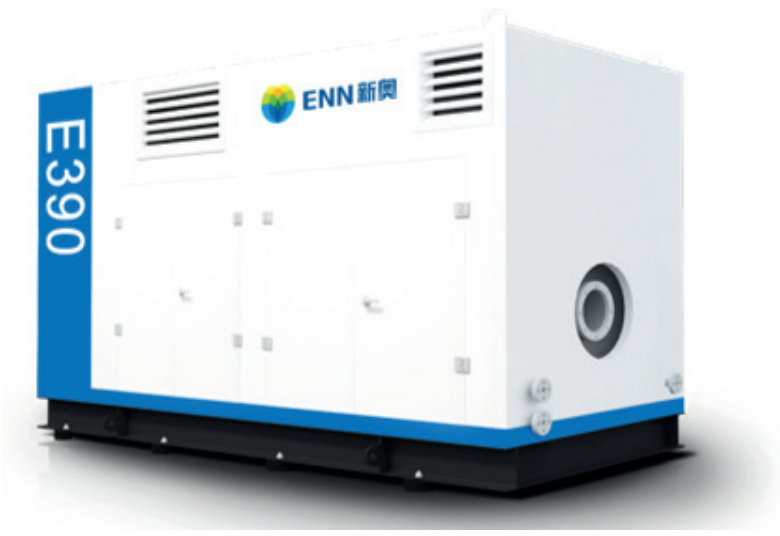
ENN Energy Power Technology (Shanghai) Co. Ltd. is a high-tech innovative company founded in 2013, affiliated to ENN Group.

As a professional core energy equipment manufacturer and solution provider of distributed energy system, ENN Power focuses on the R&D and industrialisation of micro and small gas turbines.

The micro and small gas turbines developed by ENN Power, ranging from 100 kilowatt-level to megawatt-level, and have completely independent intellectual property rights.

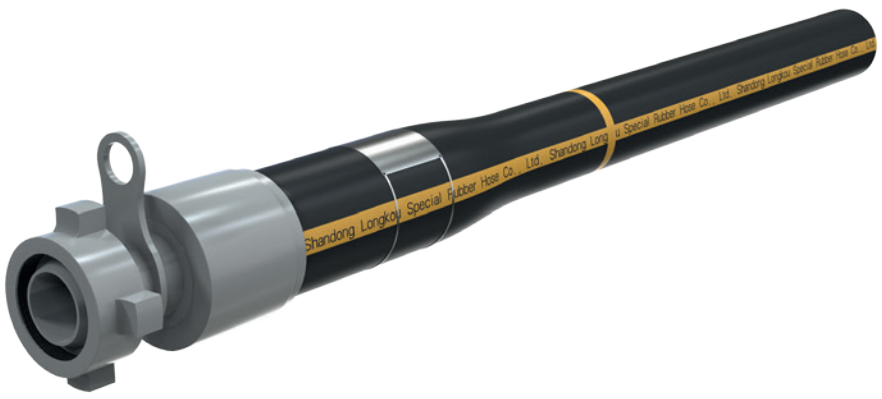
At present, ENN Power's distributed energy supply solution has been applied in many sectors, such as oil exploitation, metallurgy, ceramics, paper making, and textile, creating good benefits for customers and helping enterprises achieve low-carbon and green development.

ENN Power has obtained international CE certification, Det Norske Veritas (DNV) performance certification, and nearly a hundred patent authorisations, which is at the leading level of domestic industry. **Booth: W2260**



新奥动力——基于燃气轮机的泛能解决方案供应商

新奥动力是新奥集团旗下专注于微、小型燃气轮机研发及产业化的高科技创新型企业。公司研发的微、小型燃气轮机具有完全自主知识产权，产品系列覆盖百千瓦级到兆瓦级，在上海、河北廊坊建有两大智能制造基地，用于系列化燃气轮机的研发和批量生产。展位号：W2260



High pressure fluid transferring solutions for oil drilling - Flexible Hose

Established in 1993, Shandong Longkou Special Rubber Hose Co. Ltd. specialises in researching and manufacturing its Rotary/Vibrator/Mud Hose/Cement Hose, Flexible choke and Kill Hose, Frac Hose and BOP Hose.

Based on the swaged coupling, it launched the Bonded coupling construction to satisfy the more complicated working conditions of the offshore oil drilling industry.

Both constructions are widely accepted and used in oil drilling operations all over the world, but have significant differences.

Bonded coupling has prominent advantages in technical performance, especially in transfer-ring efficiency, service life and safety.

Frac hose, using in transferring fracturing fluid, has characteristics including high abrasion resistance, high pressure, longer service life, excellent field handling and so on.

Booth: W1345

石油钻井领域高压流体输送解决方案——柔性胶管

山东龙口特种胶管有限公司（展位号：W1345）成立于1993年，始终致力于研发和生产水龙带、减震胶管、泥浆胶管、固井胶管、柔性节流压井胶管、井控胶管和海洋输送胶管。已经取得了美国石油协会API Spec 7K、API Spec 16C和API Spec 16D认证及ISO9001：2015和API Spec Q1质量管理体系认证。

瑞丰石油诚邀您莅临E3601展位

成立于1998年的瑞丰石油，二十五年来一直致力于打造一流专业化完井技术服务公司，在国内外油气完井技术领域不断开拓创新，追求技术发展，已成长为一家集技术研发、生产加工和现场服务于一体的专业化公司，长期为中石油、中石化、中海油及国外油气公司、油服公司提供产品和服务。瑞丰完井技术服务遍布海内外。瑞丰石油在多处设有基地，25年来累计施工完井井次达8000余井次，是国内最早在海洋石油现场提供防砂充填技术的公司，也是国内少有的同时提供上部、下部完井产品和现场服务的专业化公司。

Ruifeng Petrotech Invites You to Visit Booth E3601

Founded in 1998, Ruifeng Petrotech has grown into a first-class professional completion technology service company over 25 years, through developing and innovating in the oilfield completion technology sector on the Chinese mainland and international market.

The company focuses on technological development, and has grown into a professional company integrating research and development, and manufacturing as well as on-site services.

It is one of the strategic partners for completion products and services providers for CNPC, Sinopec, CNOOC and some international oil service companies.

Ruifeng carries out completion technical services all over the world and has established operation bases in its main operation areas.

In 25 years the company has completed more then 8000 wells, and was the first native company to provide gravel pack operations.

It is now able to provide upper and lower completion products and services.

Ruifeng has completed the first Open Hole gravel pack that is over 1000 metres long.

It is also the shunt screen provider for the first 1500-metre deepwater project in China.

Ruifeng completion products include gravel pack tools, water injection tools, subsurface safety valves, ESP packers, production packers, fracture tool systems, and HPHT completion tool systems etc.

The company's HPHT products are available in 350°F (177°C) and 350°F (10,000 to 15,000 psi) retrievable packers and 400°F (204°C) permanent packers.

Booth E3601

US President Joe Biden Photo: AP/SCANPIX

US LNG pause threatens China with shortfall

Move may prompt purchasers to withdraw from US market to mitigate supply vulnerabilities

XU YIHE
Singapore

US President Joe Biden's recent decision to temporarily suspend approval of new liquefied natural gas export projects could strip China's LNG supply portfolio of as much as almost 10 million tonnes per annum and force Chinese buyers to turn to the spot market to fill the short-term deficit, according to market analysts.

In the longer term, the temporary halt could prompt Chinese buyers to shift away from the US market as they seek to minimise supply risks, analysts say.

In 2022 and 2023, seven Chinese companies — ENN, China Gas, Guangzhou Development Group (GDG), Zhejiang Energy, PetroChina, Foran, and Hong Kong and China Gas — signed 10 purchase and sales contracts totalling 9.6 million tpa with US LNG suppliers.

These Chinese companies, with the exception of PetroChina, are considered second-tier LNG players in China, primarily being town-gas suppliers with LNG import facilities.

The six projects involved in these agreements — Lake Charles LNG, Mexico Pacific LNG, CP2, Corpus Christi, Sabine Pass Expansion and Delfin — either lack export licences or require reapplication between 2024 and 2026, therefore coming under the category of projects affected by Biden's suspension.

A PetroChina official told Upstream that the US President's decision is likely a pre-election move to appeal to environmentalist voters and that a return to previous policies could be expected after the election.

The official expressed confidence in the projects and believed that Biden's policy would, at most, delay their completion, without significantly impacting them.

A Shanghai-based LNG trader said that Biden's decision might lead to Chinese buyers relying more on the spot market over the next few years, which could briefly affect spot prices. However, she emphasised that the long-term impact would be limited, "because we are facing a long market".

Another trader mentioned that Biden's decision would prompt a re-evaluation of US LNG resources and a more cautious approach to signing contracts. Xi Nan, a senior vice president with consultant Rystad Energy's market research, said that that while Biden's decision might delay the final investment decisions for several projects, the short-term impact would be minimal. However, over the long term, this decision could push Chinese buyers to sign long-term agreements with other LNG suppliers.

A third trader pointed out that, for individual companies, US LNG has been advantageous due to pricing mechanisms. Failure to deliver these resources as scheduled could affect companies' resource pools, costs and the operational efficiency of supporting infrastructure.

In 2022, PetroChina signed a sales and purchase agreement (SPA) with Cheniere to supply 1.8 million tpa of LNG for 25 years from 2026, with 900,000 tpa expected from the Corpus Christi Stage 3 Project.

A PetroChina LNG trading official stated that Biden's decision would likely have minimal impact on its LNG supply, given the relatively small volume from the US compared to their total overseas portfolio. Also in 2022, China's town-gas player in Guangdong province GDG agreed with US-based company Mexico Pacific to buy 2 million tpa of LNG for a 20-year period from the Mexican project.

The contract volume comprises 1 million tpa of LNG each from the first and second phases of Mexico Pacific's LNG project. The contract will take effect on the condition that Mexico Pacific's LNG facility completes financing arrangements and commences construction.

A GDG official claimed to be less concerned about the impact of Biden's decision, basing his argument on the point that volumes would be coming from Mexico.

"It depends on how the United States defines the policy for exporting pipeline gas to Mexico as in [the] MPL (Mexico Pacific) project situation," he told Upstream.

The US is already one of China's largest LNG suppliers, with Chinese buyers last year purchasing 3.14 million tonnes from the US, accounting for 4.4% of the nation's 2023 total imported volumes of 71.32 million tonnes.

美国暂停LNG设施审批，中国进口承压

市场分析师表示，美国总统拜登近期决定暂停审批新的液化天然气出口项目，可能导致中国液化天然气供应每年减少近1,000万吨，迫使中国买家转而求购于现货市场以填补短期缺口。

分析师指出，从长远来看，美国暂停审批LNG设施可能会促使中国买家转移至美国市场之外的其他市场，以设法降低供应风险。

2022 – 2023 年，新奥能源控股有限公司(ENN)、中国燃气控股有限公司(China Gas)、广州发展集团股份有限公司 (GDG)、浙江省能源集团有限公司 (Zhejiang Energy)、中国石油集团、佛燃能源集团股份有限公司(Foran)和香港中华煤气有限公司(Hong Kong and China Gas) 七家中国公司与美国液化天然气供应商签订了 10 份购销合同，总计 960 万吨/年。

除中国石油外，这些公司均被视为中国液化天然气企业的第二梯队，拥有液化天然气进口设施，主要为城镇供应燃气。

这些协议共涉及六个项目，包括莱克查尔斯液化天然气项目、墨西哥太平洋公司 (Mexico Pacific)液化天然气项目、CP2项目、科珀斯克里斯蒂(Corpus Christi)项目、萨宾帕斯(Sabine Pass) 液化扩建项目和德尔芬 (Delfin)项目。一些项目缺少出口许可证，一些则需要在 2024 年至 2026 年期间重新申请，由此受到了暂停审批的影响。

中国石油的一位管理人员向Upstream表示，美国总统拜登之所以做此决定，可能是为了在大选前争取环保主义选民的投票，预计大选后将恢复此前的政策。

这位管理人员对这些项目充满信心，并认为拜登的政策最多只能造成项目完工时间推迟，而不会产生重大影响。

一位上海的液化天然气贸易人士表示，拜登的决定可能会导致中国买家在未来几年内更加依赖现货市场，这可能会短暂地影响现货价格，但她强调，长期影响将是有限的，"因为我们如今面对的是一个长期市场"。

Nguyen steering Wison's drive to decarbonise


Photo: WISON

Chief technology officer at Chinese floating production specialist sees promise in cleaner FPSO and FLNG operations

XU YIHE
Singapore

AS chief technology officer, Xuan Chi Nguyen is steering China's Wison Offshore & Marine through the challenges of decarbonising its floating production systems and propelling the company towards a greener and more sustainable future through innovation and collaboration.

Nguyen, who goes by the name Damien, has amassed a wealth of experience in roles at SBM Offshore, Samsung Engineering and Samsung Heavy Industries.

He says the industry now faces challenges posed by a discerning financing community attuned to the nuances of environmental, social and governance (ESG) ratings.

He advocates for the provision of "quality options" to clients and project developers — solutions that not only reduce emissions significantly but also maintain the economic viability of floating production, storage and offloading and floating liquefied natural gas projects.

"By quality options, I mean affordable options that significantly reduce the emissions of our FPSO and FLNG [units] without making the project uneconomical," he says.

Nguyen tells Upstream that a seismic shift in the industry took place from 2015 to 2022, when international oil companies divested a colossal $268 billion in assets, resulting in their largest emissions reduction to date.

The imperative, he insists, is for the industry to articulate a clear decarbonisation ambition that aligns with the urgency to transform FPSO and FLNG projects, given the current emission rate of 0.3 tonnes of carbon dioxide for every tonne of LNG produced.

Wison has set formidable targets in response, aiming for a 15% to 20% reduction in emissions for its second-generation FLNG products by 2024 and an ambitious 80% reduction by 2050 to meet the world's carbon-neutral ambitions, he says.

To achieve the initial 15% to 20%, Wison will explore technologies such as combined cycle, gas turbine air inlet chilling, and high-efficiency liquefaction cycles.

These need to be complemented by tapping into a diverse array of technologies, including deep seawater caisson, thermal oil heating, fugitive emission prevention, heat integration, optimised gas processing, direct seawater cooling, reduced trip and flaring, and closed flare, he says.

Nguyen envisions a future where carbon-neutral floaters become a reality, employing technologies such as carbon capture, high voltage electrical swivel and power from shore.

Achieving these targets requires collaboration with technology suppliers and regulators, and the creation of markets for low-emission FPSO and FLNG, he says.

Nguyen sees a dynamic outlook for LNG, as the fuel has the advantage of being available from many areas all over the world and not dependent on the geography of a specific pipeline.

Thermal power from natural gas can be tapped to provide a baseload for the grid and to compensate for renewable energy intermittency. "This is why we see a promising future for the LNG, along with the renewable energy," he says.

The spotlight then shifts to the emergence of combined-cycle power generation as a leading technology to reduce fuel consumption on FPSO and FLNG projects.

Nguyen acknowledges its growing prominence — even though there are few floating production systems currently employing it — but cautions against viewing it as a silver bullet, highlighting the need for meticulous monitoring to ensure its effectiveness.

Fortunately, a suite of complementary technologies has the potential to meet clients' ambitious emission-reduction goals.

Wison developed combined-cycle solutions for a power barge and floating storage and regasification platform (FSRP) several years ago.

Currently, the company is working on a more compact and marinised version for the next generation of FPSO and FLNG projects.

Wison is also spearheading greenhouse gas-reduction solutions for specific projects, all contributing to the next generation of FPSO and FLNG products set for release in 2024.

Collaboration among government bodies, regulators, clients, engineering contractors and suppliers early in project development is crucial, Nguyen says: "This is what Wison is committed to do."

Wison this year reached agreements with several strategic suppliers to develop the low-emission solutions that it aims to offer clients in 2024. This collaboration is seen as pivotal to creating both the market and solutions that align with the Paris Agreement goals to reduce emissions and limit global temperature increases to below 2 degrees Celsius, he says.

Examples include a recent collaboration agreement with US-based Baker Hughes aimed at establishing a foundation for future endeavours in FLNG vessels and onshore LNG applications, and an agreement with Delfin Midstream for the development of FLNG vessels in the US.

Further expanding its international footprint, Wison has entered into an arrangement with Malaysia's Genting Oil & Gas that focuses on acquiring long-lead equipment, following a completed front-end engineering and design project for an FLNG vessel destined for the Kasuri field off the coast of West Papua, Indonesia, anticipated to have liquefaction capacity of 1.2 million tonnes per annum.

Additionally, the company has been contracted to build an FLNG vessel destined for Eni's Congo LNG project offshore Congo-Brazzaville, with an envisioned production capacity of 2.4 million tpa.

Past triumphs include the delivery of a 600,000 tpa FLNG vessel for Belgian contractor Exmar in 2017, marking a significant milestone in the company's legacy.

Since then, the call for decarbonisation technologies has grown much louder, and Wison, with Nguyen in a crucial role, is answering it.

Xuan Chi（Damien）Nguyen带领惠生清洁能源迈向脱碳未来

作为惠生清洁能源首席技术官，Xuan Chi Nguyen（阮春志）正带领公司应对浮式生产系统的各种脱碳挑战，并通过创新与合作推动公司迈向更加环保及可持续的未来。

Nguyen先生曾任职于SBM Offshore公司、三星工程有限公司和三星重工，拥有丰富的业务经验。

他表示，高瞻远瞩的投资者对环境、社会责任和公司治理评级明察秋毫，能源行业必须积极应对这一挑战。

他主张为客户和项目开发公司提供“优质方案”，不仅要能够大幅减少排放，还要能够保障浮式生产储卸（FPSO）以及浮式液化天然气（FLNG）项目的经济效益。

他指出：“就优质方案而言，需要能够大幅减少FPSO和FLNG装置的排放量，同时又不会使项目失去经济效益，而且价格合理。”

Nguyen先生向Upstream表示，2015–2022年期间，能源行业发生了剧变，国际石油公司剥离高达2,680亿美元的巨额资产，减排量创下历史新高。

他强调，由于目前每生产1吨液化天然气就会排放0.3吨二氧化碳，因此能源行业的当务之急是明确提出脱碳目标，积极推进 FPSO和FLNG 项目的转型。

为此，惠生制定了宏大的目标：到2024年，集团第二代 FLNG 装置的排放量将减少15% – 20%；到2050年，排放量将减少80%，为实现全球碳中和目标作出贡献。

为实现减排15%–20%的宏伟目标，惠生将探索联合循环、燃气轮机进气冷却和高效液化循环等技术。

他表示，公司还需要结合使用其它各类技术，比如深海沉箱、热油加热、逸散排放预防、热集成、优化气体处理、直接海水冷却、减少行程和燃烧以及封闭式信号灯等。