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## China digs deep for energy security

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A worker at a Sinopec facility. Photo: AFP/SCANPIX

## China digs deep for energy security

'Two deep, one unconventional and one old' strategy aims to revitalise China's upstream prospects through targeted exploration

XU YIHE Singapore

AS China encounters the limits of its shallow and medium oil and gas reservoirs, the country is turning its focus to the deeper, older layers beneath its vast onshore basins and re-exploring ageing fields as part of a strategy to secure its energy future.

The shift, driven by a pressing need to maintain energy security, marks a critical moment for the world's largest energy consumer, whose domestic oil and gas resources are increasingly difficult to explore and produce.

Faced with dwindling resources at traditional reservoirs, China has little choice but to venture into more challenging terrain and and employ advanced technology to source its domestic output.

The National Development & Reform Commission (NDRC), the body responsible for economic

planning, has called for intensified efforts in four key areas: Deep reservoirs, deepwater fields, unconventional resources and ageing oilfields.

The strategy — described as "two deep, one unconventional and one old" — aims to revitalise China's upstream prospects through targeted exploration.

For more than five decades, China's major basins — such as Songliao and Bohai Bay in the northeast, and Ordos in Inner Mongolia — have served as the backbone of the country's oil and gas production.

The prolific fields are now reaching the limit of their potential, with resource discovery rates in the Songliao basin at just 70%, and in the Bohai Bay and Ordos basins at 53% and 50%, respectively. The remaining oil and gas reserves in these areas are more dispersed, and exploration is becoming increasingly challenging.

In these mature fields, the resources that remain are primarily in the form of low-permeability, low-abundance deposits and small fault blocks. As a result, the economic viability of extraction is diminishing.

Ageing fields, such as Daqing, Shengli and Liaohe, have entered the "high water cut" stage, meaning they are now producing more water than oil, significantly raising operational costs.

Production at these fields now costs more than five times what it did when they were first developed, according to a PetroChina official, who did not want to be identified.

Moreover, 70% of reserves in

older fields are no longer amenable to secondary water drive techniques and therefore necessitate increased use of tertiary oil recovery methods which, while still beneficial, require significant capital investment.

To prolong the life of these ageing fields, Chinese energy companies are increasingly turning to advanced technologies.

Precision reservoir description, enhanced water injection methods, long-term well management, and the use of chemical and gas injection techniques are becoming central to improving recovery rates.

This approach is viewed as essential for maintaining stable production, especially in the face of dwindling yields.

In addition, pressure-boosting production and gas drainage are

being implemented to optimise output from ageing gas fields.

Despite these efforts, the limits of traditional oil and gas recovery methods are being pushed, underscoring the need for new frontiers in resource exploration.

The NDRC's focus on "deep and ultra-deep layers" signals a shift to more complex and high-risk drilling projects.

These deep and ultra-deep reservoirs, particularly those exceeding depths of 6000 metres, are rich in natural gas and light oil, offering untapped potential from onshore fields such as those in the Tarim, Sichuan and Ordos basins.

Zhu Guangyou of China National Petroleum Corporation's R&D centre, the Research Institute of Petroleum Exploration & Development, said that these deep

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layers offer some advantages over shallower reservoirs.

Their high pressure and temperature conditions foster natural gas and light oil, which are highly sought after due to their lower carbon content and higher energy output.

However, the proven rates for these deep resources remain low, as exploration and extraction methods for use in these layers are still in their infancy, he said.

Located in Xinjiang in northwest China, the Tarim basin in particular stands out as a key area for deep resource development.

More than 80% of the basin's total reserves are formed of oil and gas deposits at depths of 6000 to 10,000 metres.

While exploration in these areas is showing promising results, drilling at such depths is a slow and costly process.

The ultra-deep zones in Tarim, for example, are known for their extreme conditions: High acidity, narrow pressure windows and significant technical challenges, all of which make drilling both expensive and risky.

Despite these obstacles, the potential is immense. The Tarim oilfield produces more than 100,000 tonnes (735,000 barrels) of oil and gas equivalent per day, with more than half of this output coming from wells drilled deeper than 6000 metres.

Ultra-deep gas wells can yield up to 1 million cubic metres per day of gas — equivalent to the output of dozens, or even hundreds, of shallow wells.

This makes ultra-deep resources a key growth area for China's future energy production.

In the Tarim basin, where significant advances in geological understanding and drilling technology have already yielded some results, the discovery of vast gas zones in the Kela-Keshen and Bozi-Dabei areas, along with a billion-tonne oil-rich zone, underscore the potential of ultra-deep exploration.

However, the cost of drilling remains prohibitive, with wells requiring substantial investment and often taking years to reach the target layers.

Li Ning, an academician at the Chinese Academy of Engineering, has speculated that drilling to depths of 15,000 metres or more may one day provide answers to one of geology's most enduring questions: Whether hydrocarbons can be generated inorganically.

If this hypothesis is confirmed, it could fundamentally alter the way the world views oil and gas production, positioning these resources as an inexhaustible and renewable energy source, he said.

For China, the race to secure its energy future is as much about pushing the limits of geological knowledge and technical capability as it is about harnessing new sources of energy to power the nation's growth.

#### 中国布局深耕能源安全

随着浅层和中层油气储量接近极限,中国正将 战略重心转向广袤陆上盆地和更加深层老化的储 层,并重新勘探老化油田,以强化能源保障。

鉴于中国国内油气资源勘探与生产难度加剧, 这个全球最大能源消费国正经历一场深刻的战略调

整,其核心驱动力是确保国家能源安全。 为应对传统油藏资源日益减少,中国唯有不断 尝试更具挑战性的地质环境,借助先进技术保障国 内产能。

中国经济规划主管机构国家发改委提出应重点加强四大方向:深地、深水、非常规和老油气田。

所谓"两深一非一老"战略, 意在通过精准勘 探振兴中国上游油气开发。

五十多年来,中国的主要油气盆地,包括东北 的松辽和渤海湾盆地,以及内蒙古的鄂尔多斯盆 地,构成了国家油气生产的核心支撑。

这些高产油气田的潜力已趋近饱和,松辽盆地 的资源发现率仅为70%,渤海湾盆地和鄂尔多斯盆 地则分别为53%和50%。

这些地区的剩余油气储量分布更加零散,使得 勘探工作变得愈发困难。

这些老油田中,剩余资源主要为低渗透、低丰 度储层及小断块,导致开采的经济可行性逐渐降 低。

大庆、胜利、辽河等老油田已步入"高含水 期",即采出液中水分占比高于原油,运营成本大 幅增加。

据一位不愿透露姓名的中石油官员透露,这些 油田的当前生产成本已是初期开采时的五倍以上。

此外,老油田中约70%的储量已无法使用二次 水驱技术,因此必须更加依赖三次采油技术,尽管 仍有回收价值,但资金投入巨大。

面对老油田开发的挑战,中国能源企业正依靠 前沿技术延长其生产寿命。精准油藏分析、改进注 水、长期井管理及化学与气驱技术已成为提升采收 率的关键手段。

这种方法被视为维持稳定生产的关键,尤其是 在产量下降的情况下。此外,正在实施增压生产和 气体排水,以优化老化气田的产量。

尽管做出了这些努力,但传统油气回收方法的 极限仍在不断被突破,这凸显了资源勘探需要新的 前沿。国家发改委对"深层和超深层"的关注标志 着向更复杂、更高风险的钻井项目的转变。

这些深层和超深层油藏,特别是深度超过6000 米的油藏,富含天然气和轻质油,为塔里木、四 川和鄂尔多斯盆地等陆上油田提供了尚未开发的潜 力。

塔里木盆地的高压和高温条件有利于天然气和 轻质油的形成,由于这些油气含碳量低、能量产出 高,因此受到高度追捧。

然而,这些深层资源的探明率仍然很低,因为 这些地层的勘探和开采方法仍处于起步阶段,他 说。

塔里木盆地位于中国西北部的新疆,是深层资 源开发的关键地区。该盆地总储量的80%以上由 6000 至 10,000 米深处的石油和天然气矿藏组成。

虽然这些地区的勘探工作正在显示出良好的结 果,但在如此深度进行钻探是一个缓慢而昂贵的过 程。例如,塔里木的超深层以其极端条件而闻名: 高酸度、狭窄的压力窗口和巨大的技术挑战,所有 这些都使钻探既昂贵又危险。

尽管存在这些障碍,但潜力巨大。塔里木油田 日产油气当量超过10万吨(73.5万桶),其中一半 以上来自深度超过6000米的油井。

超深层气井日产气量可达100万立方米,相当于 数十口甚至数百口浅井的产量。这使得超深层资源 成为中国未来能源生产的重要增长领域。然而,钻 井成本仍然高昂,钻井需要大量投资,而且往往需 要数年时间才能到达目标层。

对于中国来说,确保其能源未来的竞赛不仅在 于突破地质知识和技术能力的极限,还在于利用新 能源来推动国家的发展。



CNOOC Energy Economics Institute forecast a peak in China's oil output by 2030 and natural gas production by 2040. Photo: AP/SCANPIX

# China's offshore oil and gas poised for growth

Oil output forecast to peak at close to 530 million barrels by 2030, with natural gas reaching 41 billion cubic metres by 2040

#### XU YIHE Singapore

CHINA'S annual offshore oil production is projected to peak at 72 million tonnes (almost 530 million barrels) by 2030 and maintain a plateau for roughly a decade before gradually declining, according to a recent report.

The Energy Outlook 2060 published by the CNOOC Energy Economics Institute added that this peak represents a 10% increase from 2024's 481 million barrels and a 5.9% rise from the anticipated 500 million barrels in 2025.

The offshore sector's share of total domestic oil production is set to climb steadily, with over 35% of

China's oil production expected to come from offshore sources by 2060.

Shallow-water assets will remain a vital contributor, but advancements in exploration and production technologies, enhanced infrastructure and integration of digital and automated systems are poised to make deepwater areas the primary drivers of future growth, the report said.

Deepwater oil output is forecast to reach approximately 43 million barrels by 2045.

China's offshore oil production has shown consistent growth since the 1980s, achieving key milestones such as surpassing 10 million tonnes (73.5 million barrels) in 1995, 50 million tonnes (367 million barrels) in 2015, and exceeding 60 million tonnes (441 million barrels) in 2023.

Over the past decade, the sector has achieved an annual compound growth rate of approximately 3%, according to the report.

Between 2020 and 2023, offshore oil accounted for more than 60% of China's total crude production increase, strengthening its role as the main engine of domestic growth in the oil sector. China's offshore natural gas production is expected to reach its peak at approximately 41 billion cubic metres per annum around 2040, followed by a plateau period and a gradual decline, according to the report.

The peak marks a 56% increase from 2024's 26.2 billion cubic metres and a 41% rise from the 29 Bcm forecast for 2025.

Offshore gas production is expected to remain a stable contributor, with over 10% of China's total natural gas production projected to come from offshore fields by 2060, according to the report.

#### 中国海上 油气产量 迈向 历史新高

最新报告显示,中 国海上石油年产量预计 在2030年达到峰值7200 万吨(约5.3亿桶),并 将在此后大约十年保持 平稳,随后逐步下降。

中国海油集团能 源经济研究院发布的 《2060能源展望》指 出,2030年的峰值产量 较2024年4.81亿桶增长 10%,较2025年预计的 5亿桶增长5.9%。

未来,海上石油在 国内原油总产量中的占 比将稳步提升,到2060 年预计超过35%的中国 石油产量将来自海上油 田。

报告指出,浅水油 田仍将是重要的生产来 源,但随着勘探和生产 技术的进步、基础设施 的升级以及数字化和自 动化系统的整合,深水 油田将成为未来增长的 主要动力。

预计到2045年,中 国深水石油产量将达到 约4300万桶。

自上世纪80年代以 来,中国海上石油产量 持续增长,并先后实现 重要里程碑:1995年 突破1000万吨(7350 万桶),2015年突破 5000万吨(3.67亿桶) ,2023年超过6000万吨

(4.41亿桶)。 报告显示,过去十

报音亚小,过去干 年,该行业的年均复合 增长率约为3%。

2020年至2023年 间,海上石油占中国 原油产量增量的60%以 上,持续发挥国内石 油行业的核心推动力作 用。

报告预测,中国海 上天然气年产量预计将 在2040年前后达到峰值 41亿立方米,随后进入 平台期并逐步下降。

这一峰值相比2024 年的262亿立方米增长 了56%,较2025年预 计的290亿立方米增长 41%。

报告显示,海上天 然气产量预计发挥长期 稳定作用,并预计到 2060年占中国天然气总 产量的10%以上。



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#### Technology for ultra high temperature drilling fluids in 10000-metre deep wells developed by CPET wins Gold Innovation Award at cippe2025

The 25th China International Petroleum and Petrochemical Technology and Equipment Exhibition (cippe2025) was held in Beijing as scheduled.

The organising committee selected **Technology for Ultra-High-Temperature Drilling Fluids in 10000-Metre Deep Wells** as the winner of the cippe Gold Innovation Award from nearly 2,000 exhibitors.

Technology for Ultra-High-Temperature Drilling Fluids in 10000-Metre Deep Wells is an integrated technical system with new materials, new systems, and software developed by CNPC Engineering Technology Research Institute Company Limited.

It aims to solve world-class problems such as ultra-high temperature, ultra-high pressure, and malignant leakage faced by deep and ultra deep drilling fluid technology.

This technology mainly improves the systematic evaluation level of ultra-high temperature drilling fluid, enhances the high-temperature and salt resistance of drilling fluid systems, achieves a major breakthrough from "empirical leak control" to "scientific leak control" in complex deep well formations, and promotes the development of drilling fluid automation monitoring technology.

Thus it ensures the quality of drilling fluid under increasingly complex and harsh downhole conditions, and effectively supports the efficient development of deep and ultra-deep oil and gas resources in China.

Based on Ultra High Temperature Drilling Fluid Technology and Equipment, 25 patents and two software copyrights have been authorised, 25 papers and five monographs have been published, and two technical specifications have been developed and published.

The core assets have won Chinese patent silver award and 16 provincial and ministerial awards.

The overall achievement has reached the international advanced level, with key technical indicators leading internationally. The Ultra High Temperature Drilling Fluid Technology and Equipment

team has been a leading domestic innovator. The Ultra High Temperature Drilling Fluid Technology and Equipment The Ultra High Temperature Drilling Fluid Technology team is

committed to the iterative upgrading of ultra-high temperature drilling fluid technology, continuously improving the high-temperature stability and deep formation adaptability of drilling fluid, solving problems such as insufficient ultra-high temperature resistance of evaluation methods, drilling fluid materials and systems, low scientific level of deep well malignant leakage prevention and control technology, and low level of automation in drilling fluid performance monitoring.

It has promoted the scientific transformation and new development of ultra-high temperature drilling fluid technology, and significant economic and social benefits.

This technology has been applied in 200 wells in deep and ultradeep oil and gas fields. Among them, water-based drilling fluid has supported the Shenditake-1 well, China's first scientific exploration borehole to exceed a depth of 10,000 metres, to successful drilling to 10,910 metres (with bottomhole temperature of 210 degrees Celsius), and ensured the safe construction of a batch of ultra deep wells such as the Changshen-39 well, Changshen-41 well, Jizhongsitan-1 well, and Xinzhen-1X well.

The core materials are 100% domestically produced, greatly improving the technical level of high-temperature resistant waterbased drilling fluid and the service guarantee ability of deep and ultra-deep wells.

The oil-based drilling fluid effectively solves the problems of blockages in thick salt gypsum or high-pressure saline layers, instability of the target layer wellbore, and weighing material settlement during completion, ensuring the safety of downhole operations.

It has created three records for the depth of 8098m, density of 2.58 grammes per cubic metre, and temperature of 186 egrees Celsius in the ultra-deep and complex well Keshen-21 at the Tarim Oilfield.

It has continuously set new records for application temperature indicators in Desheng-1 well (197 degrees Celsius) and Tatan-1 well (210 degrees Celsius) in the Sichuan basin.

The key technology for preventing and controlling malignant well leakage has been promoted and applied more than 40 times, effectively solving problems such as leakage and collapse coexistence and complex fractures in ultra deep layers.

The average success rate of plugging in one well has increased from less than 30% to 89.3%, and technology has assisted in improving the quality and efficiency of drilling engineering.



#### 中国石油集团工程技术研究院有限公司万米深井 超高温钻井液技术荣获cippe2025展品创新金奖

第二十五届中国国际石油石化技术装备 展览会如期在北京举行,大会评审委员会从 2000多家参展商近万种展品中评选出"万米 深井超高温钻井液技术",荣获本届"cippe 展品创新金奖"。

万米深井超高温钻井液技术是由中国石 油集团工程技术研究院有限公司研发,针对 深层超深层钻井液技术面临的超高温、超高 压、恶性漏失等世界级难题,构建的集新材 料、新体系、软件等一体化的技术体系。该 技术主要通过提升超高温钻井液系统性评价 水平,提高钻井液体系抗高温、抗盐能力, 推动深井复杂地层由"经验治漏"到"科 学治漏"的重大突破,助力钻井作业"少人 化"、"无人化"发展,保障了在井下工况 日趋复杂苛刻条件下的钻井液质量,有力支撑了我国深层超深层油气资源高效开发。

该技术已获授权专利25件,软件著作权2 项,发表论文25篇,专著5部,制订行业标准 2项,核心成果先后获中国专利银奖1项、省 部级奖16项,整体达到国际先进水平,其中 关键技术指标处于国际领先。万米深井超高 温钻井液技术研发团队也已成为国内超高温 钻井液技术创新的主导者。

万米深井超高温钻井液技术研发团队致力 于超高温钻井液技术的迭代升级,持续提升 钻井液高温稳定性和深部地层适应性,解决 了钻井液材料和体系耐超高温不足、深井恶 性井漏防治技术科学性低等难题,促进了超 高温钻井液技术科学化转型新发展。

Thursday 27 March 2025



#### cippe2025 同期活动日程安排 cippe2025 Concurrent Events Schedule

	时间 TIME	地点 VENUE	主题 EVENT TOPICS	主办公司 HOSTS
27 March	09:00-12:00	W-201 会议室 Conference Room W-201	第三届石油技术与装备院校长论坛暨第十七届国际石油天然	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 西安石油大学 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Presidents Forum of Petroleum Technology and Equipment Institutes Organizing Committee Xi'an Shiyou University
	09:00-12:00	W-103 会议室 Conference Room W-103	第三届石油技术与装备院校长论坛暨第十七届国际石油天然	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 西安石油大学 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Presidents Forum of Petroleum Technology and Equipment Institutes Organizing Committee Xi'an Shiyou University
	09:00-12:00	W-104 会议室 Conference Room W-104	第三届石油技术与装备院校长论坛暨第十七届国际石油天然 气产业大会 分论坛三:向"新"进阶 能源转型与绿色低碳发展分论坛 The Third Presidents Forum of Petroleum Technology and Equipment Institutes & The 17th International Petroleum & Natural Gas Conference Sub-Forum 3: Towards New Energy - Energy Transition, Green and Low-Carbon Development	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 西安石油大学 China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Presidents Forum of Petroleum Technology and Equipment Institutes Organizing Committee Xi'an Shiyou University
	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
	10:00-16:30	W4馆展区 W4580 Hall W4-W4580	氢能多元化应用研讨会 Seminar on Diversified Applications of Hydrogen Energy	中国能源研究会 北京振威展览有限公司 China Energy Research Society Beijing Zhenwei Exhibition Co., Ltd.
	09:45-16:30	W4馆-W4527展位 Hall W4-W4527	氢启革命: 技术创新与产业突破研讨会 Hydrogen Revolution: Seminar on Technological Innovation and Industrial Breakthrough	北京振威展览有限公司 湖南省氢能产业技术创新联合体 Beijing Zhenwei Exhibition Co., Ltd. Hunan Hydrogen Energy Industry Technology Innovation Alliance
	10:00-11:30	展馆 Exhibition Hall	cippe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
	09:20-15:40	展馆 Exhibition Hall	cippe2025企业新产品新技术推介会 cippe2025 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
	10:00-16:30	W4馆 Matching 区 W4 Matching Zone	cippe2025 采购对接会 cippe2025 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.
	10:00-12:00	二层西花园 会议室 West Garden Conference Room, 2nd Floor, W2-W3 Corridor	中加油气设备与技术交流会 Canada-China Oil & Gas Equipment & Services Forum	加拿大驻华大使馆 Embassy of Canada in Beijing
	10:00-16:00	Lucky 活动区 Lucky Zone	幸运石油人 cippe Lucky Draw - Lucky Oilman	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.
	13:00-17:00	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.
	13:00-16:30	W-105 会议室 Conference Room W-105	API标准与认证更新: 从质量管理到可持续发展 API Standards and Certification Updates: From Quality Management to Sustainable Development	美国石油协会 API Americian Petroleum Insititute (API)
	13:30-16:30	二层西花园 会议室 West Garden Conference Room, 2nd Floor, W2-W3 Corridor	哈萨克斯坦与中国在石油化工领域的合作: 趋势与机遇 Cooperation between Kazakhstan and China in the Petrochemical industry: Trends and Opportunities	哈萨克斯坦石油天然气委员会 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 Kazakhstan Oil and Gas Council «PetroCouncil» China International Petroleum & Petrochemical Technology and Equipment Exhibition (cippe) Organizing Committee Beijing Zhenwei Exhibition Co., Ltd.

## Pictures from the show













印国海油



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## Pictures from the show



















#### 9. Ocippe 25

#### Concurrent events bring more excellence to cippe2025

On 26 March, The Third Presidents Forum of Petroleum Technology and Equipment Institutes & The 17th International Petroleum & Natural Gas Conference, was grandly opened at Conference Room W201.

Today, three sub-forums will continue to be held, with themes of Challenging the Depth — Key Technologies for Oil and Gas Exploration and Development; Advancing in Digital-Digitalization, Intelligence, and High end Equipment Technology; and Towards New Energy — Energy Transition, Green and Low-Carbon Development.

Speakers from Xi'an Shiyou University, Southwest Petroleum University, China University of Petroleum, Northeast Petroleum University, Yangtze University, Sinopec Group, CNPC Safety and Environmental Protection Technology Research Institute, COSL, Xinjiang Oilfield, Zhongyuan Oilfield, Liaohe Oilfield, Changqing Oilfield, Huabei Oilfield, Yanchang Oilfield, Sinopec Matrix, BOMCO and other units will bring wonderful sharing on related topics.

Besides, cippe2025 Business Matchmaking Meeting, Canada-China Oil & Gas Equipment & Services Forum, Cooperation between Kazakhstan and China in the Petrochemical industry: Trends and Opportunities, Forum on Offshore Wind Power Equipment Industrial Chain, Seminar on Diversified Applications of Hydrogen Energy, Hydrogen Revolution: Seminar on Technological Innovation and Industrial Breakthrough, and other concurrent events will also be held, bring more excellency to cippe2025.

#### 同期活动 精彩纷呈

3月26日,由中国国际石油石化技术装备展览会 (cippe)和石油技术与装备院校长论坛组委会、西安 石油大学联合主办的第三届石油技术与装备院校长论坛 暨第十七届国际石油天然气产业大会在W201会议室盛 大开幕。以"创新引领新模式、新动能,发展新质生产 力"为主题的主论坛成功举办,反响热烈。

今日三场分论坛精彩继续,分别以: 挑战 油气勘探开发关键技术"、"向'数 化、智能化暨高端装备技术"、"向'新' 型与绿色低碳发展"为主题。

ኛ, 分别以: "向'深' 、"向'数'发展 数字 、"向'新'进阶能源转

## HBRS — propelling China's high-end energy equipment into deep-earth and subsea frontiers

In response to the national "Deep Earth Engineering" strategy, China's oil and gas exploration continues to push the boundaries towards the depth of 10,000 metres, where extreme conditions such as ultra-high temperatures, ultra-high pressures, and high-sulphur environments have imposed stricter requirements on well control equipment.

As a global leader in the production and sales of land-based blowout preventers and one of the first domestic enterprises to independently develop subsea blowout preventers, HBRS leverages four decades of R&D experience on well control equipment, and focuses on breakthroughs in core areas including intelligent BOPs, subsea emergency well containment, high-strength corrosion-resistant materials, and digitalised intelligent well control systems.

It has resolved global challenges such as ultra-high-temperature/high-pressure sealing, full-range tubular position shearing in ultra-deep wells, emergency subsea well blowout containment, corrosion resistance in high-sulphur environments, and real-time diagnostics for well control equipment.

By launching the "Deep Earth Intelligent Well Control Solution," which integrates innovations across "equipment-material-data" chains, HBRS provides full lifecycle safety assurance for 10,000-metre wells, deepwater oil and gas fields, and high-sulphur gas fields, propelling China's high-end energy equipment into deep-earth and subsea frontiers. **Booth: E1355** 

#### 华北荣盛——助力中国高端能源装备 迈向深地、深海

为响应国家"深地工程"战略,我国油气勘探持续向万米深层突破,超高温、超高压、高含硫等极端工况对井控装备提出更高要求。华北荣盛(展位号: E1355)作为全球陆地防喷器产销量领先、国内较早实现水下防喷器自主研制的企业,依托四十年井控装备研发经验,聚焦智能化防喷器、深海应急封井、高强耐蚀材料、数智化井控系统等核心领域攻关,攻克超高温高压密封、超深井管具全域位置剪切、深海井喷应急封堵、含硫油气田装备腐蚀、井控装备实时诊断等国际性难题,推出"深地智能井控解决方案",通过"装备-材料-数据"全链条创新,为万米深井、深海油气及高含硫气田开发提供全生命周期安全保障,助力中国高端能源装备迈向深地、深海。



#### Lengthon — Specialising in Petroleum Equipment



Shanghai Lengthon Petroleum Equipment Co., Ltd. was established in 2018 and specialises in petroleum equipment R&D, manufacturing, sales, technical services and maintenance service.

Lengthon has set up another new workshop in Jiangsu, covering more than 20,000 square metres. It is expected to be put into production in June 2025. Lengthon mainly develops and manufactures oil and gas drilling equipment.

The main products are conventional wellhead and tree equipment, multistage wellhead, wireline pressure control equipment and coiled tubing pressure control equipment.

Lengthon adheres to the quality policy of "quality is life, customer satisfaction, consolidation for development, continuous improvement". The company establishes and improves the quality management system and quality assurance system and has obtained API Spec Q1 and API Spec 6A product certification from American Petroleum Institute.

Lengthon has strong technical and manufacturing capabilities. The company's products have been fully recognised by a number of domestic oil and gas fields, and have been affirmed in foreign markets. **Booth: W2201** 

#### 廊盛-专业研发制造油气钻井设备

上海廊盛石油设备有限公司(展位号:W2201)成立于2018 年,是一家专业从事石油装备研发、制造、销售、工程技术服 务、售后维修的企业。廊盛在江苏省新建生产基地,占地面积 20000多平方米。

廊盛主要从事油气钻井设备的研发和制造,产品有传统井口 和采油树设备、多级密封可调节全通径井口装置、电缆压力控 制设备、连续油管压力控制设备等。

公司坚持"质量是生命,顾客满意,巩固发展,持续改进" 的质量方针,建立和完善质量管理体系和质量保证体系。



[1] 30,000 m<sup>2</sup> 目 400+ 展示面积



#### 2025成都国际石油和化工技术装备展览会

Chengdu International Petroleum & Chemical Technology and Equipment Exhibition

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2025年9月10-12日 成都世纪城新国际会展中心



20,000+

专业观众





#### 2025新疆国际石油和化工技术装备展览会

Xinjiang International Petroleum & Chemical Technology and Equipment Exhibition

2025年7月18-20日 中国·新疆国际会展中心



**500+** 品牌展商







CNOOC Ltd's Buzzard field offshore the UK.

Photo: CNOOC PETROLEUM EUROPE

### **Chinese players eye overseas asset sales**

China's top oil and gas companies are selling off underperforming assets and streamlining operations as part of ongoing restructuring

#### XU YIHE

Singapore

CHINESE state-owned oil giants PetroChina, Sinopec, CNOOC Ltd and Sinochem are accelerating asset divestments to boost profitability and enhance operational efficiency.

As part of broader restructuring efforts started in 2024, these companies have offloaded several underperforming or non-strategic assets.

The divestments mark a significant shift toward greater operational focus, with the companies targeting efficiency improvements and more profitable ventures.

Sinochem has completed the sale of its stakes in Brazil's shallow-water Peregrino and Pitangola oilfields and is negotiating the sale of its Wolfcamp shale assets in the US.

The company plans to exit upstream operations in nine countries, including Brazil, Colombia and the US, by divesting 32 oil and gas blocks in order to refocus on its downstream business, according to a recent report from China National Petroleum Corporation.

Sinopec has also shed non-core assets, such as Nigeria's Stubb Creek oilfield, sold to Savannah Energy, while PetroChina has transferred its assets in Peru and other countries to streamline its operations.

CNOOC Ltd has sold its US subsidiary, together with its upstream oil and gas assets in the US Gulf, to UK chemicals group Ineos.

The deal primarily includes non-operated interests in oil and gas projects such as the Appomattox and Stampede fields.

Reuters earlier reported that CNOOC Ltd was considering an exit from operations in the UK, Canada and the US over concerns those assets could become subject to Western sanctions because China had not condemned Russia's invasion of Ukraine.

CNOOC Ltd's former chief financial officer, Xie Weizhi, told investors when asked about his company's possible sale of North Sea assets that he would not rule out a sale if offers came in better than the assets' profitability under the company's own operation.

Geopolitical uncertainties in key regions have further complicated overseas operations.

New projects have faced significant delays, including Russia's Arctic LNG 2 project, in which China National Offshore Oil Corporation and China National Petroleum Corporation (CNPC) each hold stakes. Arctic LNG 2 was unable to launch on schedule due to sanctions.

Additionally, CNPC has encountered production delays, shutdowns and pipeline suspensions in Niger, according to the report.

In 2024, several Chinese overseas ventures — including the Niger-Benin pipeline, Arctic LNG 2 and Sudan-South Sudan oil blocks — experienced operational challenges, missed production targets and, in some cases, indefinite shutdowns.

The stability of Chinese opera-

tions in Venezuela, Iran, and Myanmar has also been undermined by Western sanctions.

Despite these challenges, resource-rich countries in the Middle East, Africa and Latin America have become increasingly receptive to foreign investment, with some offering more favourable contractual terms to Chinese companies.

Last year, China's overseas oil and gas equity production rose by 1.9% year-on-year to reach 191 million tonnes of oil equivalent (3.82 million barrels per day), including 151 million tonnes of oil and 50 billion cubic metres of gas.

This growth was driven by projects in Guyana, Brazil, the United Arab Emirates, and Iraq.

CNOOC Ltd saw a 12% increase in equity production to 34 million tonnes, largely due to the Payara project.

Upstream has reached out to PetroChina, Sinopec, CNOOC Ltd and Sinochem regarding their overseas upstream assets divestments.

#### 中国石油企业 剥离海外 资产,优化 运营结构

四大国有石油企业( 中石油、中石化、中海油 和中化)正在加快资产剥 离,以增强盈利能力,并 改善运营效率。

在2024年扩大重组范 围的情况下,这些企业已 出售了多个业绩不佳或非 核心资产,进一步聚焦运 营业务,提高运营效率并 优化盈利模式。

目前,中化已完成巴 西Peregrino和Pitangola 浅水油田的股权转让,同 时正在商谈出售美国的 Wolfcamp页岩油资产。

中国石油最新报告显 示,中化计划退出巴西、 哥伦比亚和美国等九个国 家的上游业务,拟出售 32个油气区块,重新聚 焦下游业务。

中石化也在出售部分 非核心资产,包括将尼日 利亚Stubb Creek油田出 售给Savannah Energy, 而中石油也在剥离秘鲁等 国家的资产,以优化业务 结构。

中海油将美国子公司及墨西哥湾的上游油 气资产出售给英国化工 集团INEOS,主要涉及 Appomattox和Stampede 等油气项目的非运营权 益。

路透社此前报道称, 中海油正考虑退出英国、 加拿大和美国的业务,以 规避因中国未对俄乌冲突 表态而可能面临的西方制 裁。

在谈及公司是否会出 售北海资产时,中海油前 首席财务官谢尉志向投资 者表示,如果报价高于公 司自运营资产的盈利能 力,公司不会排除出售的 选项。

部分关键地区中,地 缘政治的不确定性进一 步加剧了海外业务的复杂 性。多个新项目出现重 大延误,其中北极 LNG 2 项目受制裁影响未能按 计划启动。此外,报告指 出,尼日尔二期项目面临 生产延迟、停工及管道中 断等问题。

2024年,多个中国海 外项目遭遇运营挑战,包 括尼日尔二期、尼日尔-贝宁管道、北极 LNG 2 以及苏丹-南苏丹油田, 部分项目未能达成既定产 量目标,甚至陷入无限期 停产。



Wind turbines line the coastline of Pingtan in southern China's Fujian provonce.

# China tightens rules for offshore wind

Government tightens rules for new developments in rapidly expanding sector

#### **XU YIHE** Singapore

CHINA'S Ministry of Natural Resources (MNR) has introduced tighter regulations for offshore wind farm projects as it aims to balance the sector's rapid expansion with environmental protection.

The move also reflects growing concerns over the volume of natural resource developments in nearshore waters and mounting conflict among competing offshore sectors.

"The rapid development of offshore wind power has significantly expanded sea use, pushing nearshore resources toward saturation and intensifying conflicts between industries," the MNR said recently.

The MNR added that offshore wind projects must align with national and coastal zones designated for renewable energy or areas compatible with wind power.

Projects in zones that could jeopardise national defence, maritime safety or ecological integrity are prohibited.

The guidelines also ban devel-

opment in heavily utilised or sensitive areas, such as the central Bohai Sea, nature reserves, critical fisheries areas and key habitats such as wetlands and bird migration corridors.

These measures are aimed at preventing environmental degradation and minimising disruption to subsea communication cables and other marine infrastructure.

The MNR has also set strict technical parameters for new projects. Sites must be at least 30 kilometres offshore or in waters deeper than 30 metres.

In nearshore areas in waters exceeding 30 metres in depth, wind farms must maintain a minimum distance of 10 kilometres from the coast.

Similarly, tidal flats wider than 30 kilometres require wind farms to be sited in waters at least 10 metres deep.

The MNR also emphasised landuse efficiency, mandating that projects adhere to stringent standards for use of offshore areas relative to installed capacity.

Coastal regions are also being

urged to optimise infrastructure by consolidating transmission cable routes and using existing landing points for new projects.

The MNR said it aims to encourage innovation by supporting offshore wind developments in areas already being utilised, such as offshore oil and gas acreage and deep-sea aquaculture regions, provided they meet planning requirements and gain stakeholder consensus

To maximise resource efficiency, the MNR is promoting a "wind power+" model, integrating wind farms with complementary activities such as fish farms, offshore solar power, wave energy, hydrogen production and energy storage.

Approval procedures have also been tightened. Projects spanning over 700 hectares or crossing provincial jurisdictions now require State Council approval.

Smaller projects within provincial zones must adhere to national guidelines, and unauthorised approvals or attempts to divide large projects into smaller parts to

evade oversight are strictly prohibited.

China's offshore wind power has witnessed significant growth in 2024, with total cumulative grid-connected capacity expected to reach 45.21 gigawatts, a yearon-year increase of 21.5%, according to the China Offshore Energy Report, which is published by the **CNOOC Energy Economics Insti**tute.

Offshore wind is expected to account for 8.5% of the country's total installed power generation capacity, reflecting its growing role in China's energy transition.

Provinces such as Guangdong, Fujian and Zhejiang have fasttracked preliminary project approvals, with active bidding for products and services signalling sustained industry momentum.

However, new projects have faced delays due to the sea-use approval processes last year.

Despite these challenges, offshore wind continued to grow rapidly, with an additional 8 GW of capacity connected to the grid by the end of 2024.

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中国自然资源部出 台新规,加强对海上风 电场项目的管理, 旨在 协调行业扩张和生态保 护。

此举反映出对近海自 然资源开发规模,以及 海上产业间竞争加剧愈 发引发关注。

自然资源部表示, 海上风电的快速发展占 用了大量海域,导致近 海资源接近饱和,同时 加剧了产业间的用海矛 盾。"

自然资源部补充道, 海上风电项目需与国家 及沿海地区规定的可再 生能源开发区域保持一 致,或选址于适合风电 的海域。

海上风电项目不得 选址于可能危及国防安 全、航运安全或生态完 整性的区域。

根据相关规定,对于 利用度高或生态敏感区 域,例如渤海中部、自 然保护区、重要渔业资 源区,以及湿地和候鸟 迁徙通道等关键生境, 将禁止海上风电开发。

这些措施旨在防止生 态环境退化,同时降低 对海底通信电缆及其他 海洋设施的干扰。

自然资源部还为新建 项目设定了严格的技术 标准。风电场必须位于 离岸至少30公里或水深 超过30米的区域。

对于水深超过30米的 近岸区域,风电场与海 岸的最小距离不得少于 10公里。

同样,对于宽度超过 30公里的潮间带,风电 场选址需位于水深至少 10米的海域。

自然资源部还强调 了用海效率,要求风电 项目按照装机容量严格 遵守海域利用的严格标 准。

沿海地区也被要求优 化基础设施,通过整合 输电线路并利用现有登 陆站点来推进新项目。

自然资源部表示,通 过促进技术创新,支持 在已确权的海洋油气开 发区、深远海养殖区等 已开发利用海域建设海 上风电,但必须符合规 划并获得相关方共识。