

Oil & Gas – Upstream & Downstream

CNOOC and Shell partner for offshore oil projects

International oil giant Royal Dutch Shell announced plans recently to partner with China National Offshore Oil Corporation (CNOOC) to begin offshore oil exploration off the coasts of both China and West Africa, according to Dow Jones Newswires. The areas off the coast of China lie between Hainan Island and Vietnam, near disputed waters of the South China Sea, though the exploration blocks themselves are entirely within undisputed Chinese waters. This marks Shell's first foray into offshore oil exploration in Chinese waters in 10 years, but CNOOC has been pushing hard to find foreign energy companies with the necessary expertise to exploit the country's offshore oil resources. The other project being pursued by Shell sits off the coast of Gabon, along the southern edge of West Africa. The company already operates out of Gabon, producing around 65,000 barrels per day from five oil fields, but CNOOC will purchase portions of two oil exploration blocks and use the technical expertise of Shell to develop them. CNOOC has been aggressive in targeting foreign expertise as of late, having recently offered to purchase Canada's Nexen Inc. for more than \$15 billion, in part to tap into its extensive unconventional oil experience.

CNPC signs Changbei PSCs amendment with Shell

China National Petroleum Corporation (CNPC) signed production sharing contracts (PSCs) amendment with Shell China for a new development phase for the Changbei gas field in China. The onshore tight gas PSC amendment represents a new phase for the development of the existing Changbei block with 1 692.5 square kilometers in the Ordos Basin, and adds scope to develop additional tight gas sands and further develop the already producing main reservoir. Subject to government approval and pending the outcome of the appraisal campaign, this additional development project could increase the current production plateau of 320 mmscf/d. Shell will continue to be the operator at Changbei. **CHINA CHEMICAL REPORTER, Aug. 6**

Successful appraisal of CNOOC's Qinguangdao 29-2

CNOOC announced on 14th Aug. that the company has recently appraised two wells in Qinguangdao 29-2 east successfully. The block is located in the central north of Bohai, with an average water depth of about 27 meters. These two successful appraisal wells expanded the reserve base of Qinguangdao 29-2. Qinguangdao 29-2E-4 drilled in the middle formation of the Qinguangdao 29-2 east structure represented a significant breakthrough by encountering 218.4 meter thick of oil pay zones, including a 133.7 meter thick single oil pay zone. This well was tested to produce approximately 6,600 barrels and 4.5 million cubic feet of natural gas per day, creating the highest capacity of clastic rocks in Bohai.

CNOOC announces two new exploration discoveries in Luda 6-2 & Lufeng15-1.

CNOOC Limited announced on 20th Aug. that the Company made two new exploration discoveries in Luda 6-2 and Lufeng 15-1. Luda 6-2 is located in the Liaodong Bay in Bohai with an average water depth of about 31 meters. The Company has successfully drilled Luda 6-2-4 and Luda 6-2-5 this year and encountered 40 and 147.6 meter thick of oil pay zones respectively. The average daily production was tested to be around 850 barrels. In addition,

Lufeng 15-1 is located in the Pearl River Mouth Basin with an average water depth of 283 meters. Lufeng 15-1-2 drilled in 2012, encountered 26.8 meter thick of oil pay zones and was tested with a daily production of around 800 barrels.

CNOOC begins extracting gas from Yacheng 13-4

CNOOC Ltd, the listed subsidiary of China National Offshore Oil Corp.(CNOOC), said recently that it had launched commercial development operations at the Yacheng 13-4 natural gas field in the South China Sea. In a statement, CNOOC Ltd said production had begun “recently” but did not give a precise date. It did say, though, that it had used existing infrastructure at the nearby Yacheng 13-1 gas field to facilitate development. Three new subsea production facilities have been built at Yacheng 13-4, the company said in its statement. The deposit is located about 72 km southwest of Sanya, a city on Hainan Island in southern China. It lies in waters that are on average 85 km deep. CNOOC Ltd holds a 100% interest in Yacheng 13-4 and acts as the operator of the field, which is classified as an independent asset.

CNOOC focuses on two fields

CNOOC is working on a scheme to exploit two shallow-water fields in the South China Sea that are not disputed by countries such as Vietnam and the Philippines. The company’s engineering house CNOOC Research Institute will wrap up basic design of the Huizhou 25-8 and Xijiang 24-1 fields by the end of October. The initial design involves building fixed platforms for both fields. The two platforms, which could be assigned for fabrication at CNOOC’s yard Offshore Oil Engineering Corporation (COOEC), are to be connected with an 18-kilometre pipeline. The development will call for 12 production wells at Huizhou 25-8 and another 10 at Xijiang 24-1. First oil is planned at the end of 2014, with peak production from the two fields estimated at 40,000 barrels per day. The Xijiang 24-1 platform will also be connected via an eight-kilometre subsea pipeline to the producing Xijiang 24-3 field. Xijiang 24-3 is currently linked with Xijiang 23-1 and Xijiang 30-2. CNOOC has been producing from the Xijiang 24-3, 30-2 and 32-1 fields since August 2010 via the floating production, storage and offloading vessel Hai Yang Shi You 115. Xijiang 24-3 and Xijiang 30-2 used to be jointly owned by CNOOC, Conoco-Phillips and Shell under a production sharing contract. The Hai Yang Shi You 115, with a processing and holding capacity of between 70,000 and 80,000 bpd, will also handle the output of the Huizhou 25-8 and Xijiang 24-1 fields. The floater, which began operating in the South China Sea in 1994, underwent a major refit at Yantai drydock and Cosco Dalian Shipyard in China in 2005. CNOOC in June drilled a sidetrack well at Xijiang 24-3 to optimise production. The well has been producing more than 3000 bpd of oil and more such sidetracks are being planned this year to further boost output.

CNPC to start work on third West-East Pipeline soon

China National Petroleum Corp. (CNPC) will soon start building a long-haul pipeline capable of moving natural gas from Central Asia to its home market in order to cover growing domestic demand. Construction work on the project, which will be known as the third West-East Pipeline (WEP-3), will start in September or October. The line will run 5,220 km, passing through 10 provinces, including Gansu, Ningxia, Shaanxi, Henan, Hubei and Hunan. It will originate in Khorghos, a town on the border between the Xinjiang autonomous

region and Kazakhstan, and terminate in the southeastern Fujian Province. Eventually, it will be extended into Guangdong Province. The conduit will have a throughput capacity of 30 billion cubic metres per year. It is scheduled for completion in late 2014 or early 2015. CNPC kicked off work in early this month on the Xinjiang section of the line, which will run 1,361 km from Khorgos to Urumqi, the regional capital. The first and second West-East Pipelines (WEP-1 and -2) were completed in 2004 and 2009 respectively. They were both built by CNPC. The WEP-3 project is part of CNPC's larger plan to expand its domestic gas pipeline network to 100,000 km by 2015.

CNPC to build Fujian ethylene plant

CNPC, the parent company of China's top oil and gas producer PetroChina, plans to build an ethylene plant in Zhangzhou of east China's Fujian province, said a local report. CNPC also would build product oil pipelines, trunk and branch pipelines of third West-to-East natural gas pipe-lines and other projects on town gas, congressed natural gas, liquefied natural gas and combined cooling, heating and power systems. **XINHUA, August 13, 2012**

PetroChina study likely to steer a course towards new build FSRU

PetroChina and Belgian vessel operator Exmar are involved in a study that could lead to the fabrication of a floating storage and regasification unit for the Chinese company. Exmar is expected to wrap up the feasibility study at the end of August, sources said. The study, which started in June, is focused on construction of a 160,000-170,000 cubic metre unit to be deployed off China. PetroChina will decide whether or not to go ahead with front-end engineering and design work following completion of the feasibility study. If the project goes ahead imported gas would be exported to shore via a subsea pipeline and connected with a trunk gas line for distribution to clients. Sources said PetroChina has not quite decided where to deploy the unit, but industry officials said the likely location could be in the South China Sea off Shenzhen in Guangdong province so that the gas will be bundled for sale to clients in southern China, including Hong Kong, for peak shaving purposes. It will be PetroChina's first attempt to build an FSRU in addition to its onshore LNG terminals.

PetroChina builds CCUS base in Jilin oilfield

China's top oil and gas producer PetroChina has built a carbon capture, utilization and storage (CCUS) base in northeast China's Jilin oilfield, said a release on the website of PetroChina's parent company CNPC on 13th Aug. The building of the base marks the success of CNPC's research program on carbondioxide flooding and storage started in the end of 2008. The establishment of the base would help realize the high efficiency development of Changshen-1 gas field and the industrial tests of carbon dioxide and flooding with Hei-59 block and Hei-79 block. The research result has recently been appraised and accepted by an expert panel in Beijing, said the release. **XINHUA, August 13, 2012**

PetroChina drills horizontal well at Tuha oilfield

China's top oil and gas producer PetroChina has successfully drilled one fishbone-shaped multilateral horizontal well at Tuha oilfield in northwest China's Xinjiang, said a release on the news portal of PetroChina's parent CNPC on 13th Aug. Named Yuping-8, the fishbone-shaped horizontal well generated 400 tonnes of crude oil in one month ending August 3, 2012, said

the release. The well has one main lateral well and four minor lateral wells with total footage at 4585 metres. **XINHUA, August 13, 2012**

Sinopec may receive nod for CTG pipelines soon

Sinopec may soon gain government approval for its two coal-to-gas pipelines, according to a report in China Securities Journal. The two pipelines will transfer natural gas, which is made out of coal (coal-to-gas), from far West China's Xinjiang to the east of the country. One pipeline, from Xinjiang to South China's Guangdong, is estimated to cost 159 billion yuan and is capable of transporting 30 billion cubic metres of natural gas each year. The other, from Xinjiang to East China's Shandong, will have an investment of 86 billion yuan and an annual transport capacity of 30 billion cubic metres. **XINHUA, August 13, 2012**

Anhui JV to build \$157 mln LNG project

Anhui Province Guowan LNG Co. Ltd. has made a preliminary decision to build a gas liquefaction plant and liquefied natural gas (LNG) refilling stations in Anhui's capital of Hefei, local media reported in early Aug. The RMB 1 billion (\$157.19 million) project will be located in Hefei's Feidong County. A consortium of domestic energy firms established Guowan in January as a joint venture (JV) to develop LNG and coal-to-gas projects. China Energy Reserve and Chemical Group Co. Ltd. holds a 48 percent interest in the JV, while state-owned Anhui Province Energy Group Co. Ltd. owns 45 percent directly and another seven percent through its subsidiary, Anhui Province Wenergy Co. Ltd.

Ningbo-Taizhou-Wenzhou fuel pipeline under construction

Construction has begun at the Ningbo-Taizhou-Wenzhou product oil pipeline in east China's Zhejiang, the fourth long-distance product oil pipeline in the province. The 430 km pipeline, an investment by China's largest oil refiner Sinopec, is designed to transport 6 million tonnes of product oil each year, according to a release on Sinopec's website. Sinopec also plans to build three product oil storage facilities in Ninghai, Linhai, and Ruian respectively and expand an existing storage facility in Wenzhou. The new storage capacity will total 322,000 cubic metres. The total investment for the pipeline and storage facilities is estimated at 2.45 billion yuan. Sinopec expects to wrap up the construction work before the end of 2014, with the trial operation scheduled for early 2015. **XINHUA, August 13, 2012**

Sinopec to build Jiangxi fuel pipelines this year

Asian top refiner Sinopec Corp. is scheduled to kick off the construction of phase II product oil pipelines in south China Jiangxi province in the third quarter, according to local authority. The second phase of the pipelines would stretch 710 kilometers with a total investment of 2.4 billion yuan. The phase-II product oil pipelines would be plugged in Jiujiang-Nanchang-Zhangshu product oil pipeline, which went into operations in 2008 with length of 240 kilometers and capacity of 3.3 million tonnes. Sinopec Jiujiang Petrochemical is expected to serve as the main source of product oil for the product oil pipelines in Jiangxi. **XINHUA, August 13, 2012**

CNPC completes research on refinery optimisation

The China National Petroleum Corp. (CNPC) on 6th Aug. announced that it had successfully completed its research program on refinery energy system optimization technology. Initiated in 2008, the research is the CNPC's first major science and technology program on energy conservation and performance enhancement, aimed at improving energy utilization and the international competitiveness of its refining business. Through production process simulation and analysis, the energy system optimization technology can provide an energy utilization optimization scheme that can help achieve energy saving and economic performance enhancement effects. The CNPC said that currently four demonstration projects and two promotion projects under the program had achieved production application effects of increasing economic returns by 317 million yuan annually, on experts' estimates. The six projects could save energy by 10 to 21.9% when the whole optimization scheme was implemented, said CNPC. **XINHUA, August 6, 2012**

Sinopec restructures its engineering services business with eye on IPOs

Sinopec is reforming its corporate structure by spinning several of its business interests into separate entities, with plans to list them on the Hong Kong Stock Exchange between 2014 and 2015. According to industry officials, the business consolidation could be completed by the end of this year. Sinopec's eight regional oil service companies, including big 4 EPC contractors and seismic survey providers, ground engineering companies and oil and gas equipment manufacturers will be restricted into a new service and engineering company. Sinopec's construction and engineering outfits have a total workforce of about 50,000. The new service entity will have a total registered capital of 4 billion yuan (US\$627.99 million). The companies involved include Sinopec's overseas service unit, Sinopec International Petroleum Service. According to Xinhua, Sinopec's revenues from the non-oil products business reached 8.26 billion yuan (US\$1.3 billion) in 2011. According to Fu Chengyu, the Chairman of Sinopec, having specialised entities listed on the equity market could better realise their value

Sinopec, Talisman reach deal

Sinopec has agreed to spend US\$1.5 billion for a 49 percent stake in Talisman Energy Inc's UK unit, gaining access to oil and natural-gas fields in the North Sea. Sinopec Group, as the Beijing-based company is known, will get interests in 51 fields covering about 1,800 square kilometers. "It's part of Sinopec Group's effort to diversify its long-term production growth potential," said Gordon Kwan, Hong Kong-based head of regional energy research at Mirae Asset Securities. The sale will help Talisman, based in Calgary, Canada, cut its capital spending in the UK by about half, "allowing us to focus on and fund growth areas within our portfolio," Chief Executive Officer John Manzoni said in a separate statement. The deal, subject to government and regulatory approvals, is expected to close by the end of this year.

Shell plans Chinese unconventional R&D centre

Royal Dutch Shell plans to build a global R&D centre for unconventional oil and gas in China, according to Lin Haoguang, chairman of Shell China, speaking to the press recently in Shanghai. It will be Shell's second R&D centre for unconventional oil and gas. The company's first such centre is located in Houston in the United States. Long before the announcement of

the R&D centre, Shell has cooperated with China's largest oil and gas producer PetroChina to explore shale gas in northwest China's Changqing oilfield. **XINHUA, August 13, 2012**

Sinopec, BASF sign MoU on Maoming isononanol plant

Sinopec and BASF have signed a Memorandum of Understanding (MOU) to further strengthen their cooperation by jointly exploring the possibility of building a world-scale isononanol (INA) plant in Maoming Hi-tech Industrial Development Zone, Guangdong, China. The final scope of the investment will be determined following the outcome of the joint feasibility study, which is expected by the end of 2012. Under the terms of the MOU, the two parties will evaluate the technical, commercial and economic viability of jointly owning and operating a world-scale facility for the production of INA under a 50-50 joint venture agreement. The agreement was signed in Shenzhen, China, by Mr. Yu Xizhi, President of Sinopec Maoming Petrochemical Company and Dr. Albert Heuser, President BASF Asia Pacific.

BASF expands automotive coatings production in China

BASF Shanghai Coatings Company Limited is investing in a new basecoat plant at the Shanghai Chemical Industry Park in Shanghai, China. The new plant will increase the company's local production capacity for basecoat by 13,500 tons per annum. The investment represents an important step to strengthen BASF's position as a leading coatings supplier to the automotive industry in China. Basecoat gives color to and determines the visual impression made by the painted car body. The new coatings plant is planned to start production in the first half of 2014. It will be designed according to the latest and most environmentally friendly manufacturing processes and technologies. BASF Shanghai Coatings Company Limited is a joint venture with 15 years of successful partnership between BASF and Shanghai Coatings Company Ltd. The joint venture is already running a production facility in the district of Minhang in Shanghai.

ChinaCoal Mengda to license Dow UNIPOL™ Polypropylene Process Technology

Inner Mongolia ChinaCoal Mengda New Energy & Chemical Industry Co., Ltd., a subsidiary of China National Coal Group Corp., has signed a license agreement with Union Carbide Chemicals & Plastics Technology LLC, a subsidiary of The Dow Chemical Company (NYSE: DOW) for its 300 KTA polypropylene plant in early Aug. ChinaCoal Mengda will license UNIPOL™ Polypropylene Process Technology from Dow Licensing & Catalysts for the polypropylene plant, part of a 500 KTA engineering plastics project. The plant is targeted to start-up in 2014 in Ordos City, Inner Mongolia, China, and produce homopolymers, random copolymers and impact copolymers.

WorleyParsons signed EPCM contract for a styrene butadiene rubber plant in Liaoning

Liaoning North Dynasol, Global Synthetic Rubber Company recently awarded a EPCM contract to WorleyParsons Tianjin office China for \$250 million development. Liaoning North Dynasol, a 50/50 joint venture between Shanxi North Xing'an and Dynasol, has recently awarded our Tianjin office in China with the EPCM (engineering, procurement and construction management) and commissioning contract for the development of its \$250 million styrene butadiene rubber manufacturing plant. The plant will be located in the hi-tech development zone of Panjin City in northeast China, and produce 100,000 tonnes a year of

synthetic rubber, which will be marketed within Asia. Shanxi North Xing'an is a subsidiary of China North Chemical Industries Group Co., Ltd. which belongs to NORINCO GROUP. It is one of China's important defence product manufacturers with advanced technologies in both defence and military-to-civilian products.

CPP to begin welding Uzbek section of TAGP next month

China Petroleum Pipeline Bureau (CPP), a subsidiary of China National Petroleum Corporation (CNPC), is going to kick off the welding of the Uzbek section of China-Central Asia gas pipeline line-C on Sep. 25, said a report by Economic Information Daily on 6th Aug. CPP received a letter of award from Asia Trans Gas Co., Ltd. (ATG) on Aug. 1, which officially allows CPP to undertake the construction of Uzbek section of China-Central Asia gas pipeline line-C project. The Uzbek section of the project would be implemented by CPP under EPC contract, The Uzbek section of China-Central Asia gas pipeline line-C will be put into operation at the end of 2013. The China-Central Asia gas pipeline line-C has a length of 526.6 kilometers within Uzbekistan with total length of 1,840 km. The line-C starts from Gedaim on the border of Turkmenistan and Uzbekistan and ended at Horgas before enter northwest China's Xinjiang. **XINHUA, August 6, 2012**

Power, New Energy (renewables)

Shell plans to invest over \$500m on China shale

Shell plans to invest over \$500 million this year drilling in shale gas and tight gas acreage in China, its chief financial officer Simon Henry said in an analyst call during its second quarter results announcement in late July. "There are several plays in our portfolio with PetroChina. We have two in Sichuan province in the south, southwest, and we have many CBM [coalbed methane] opportunities in the north... We spent around \$450 million last year. This year [we plan to spend] over \$500 million. We're drilling about... close to 20 wells this year. It's still very much in the exploration and appraisal [stage]," Henry was quoted as saying in a transcript of the call, which was out recently.

CNOOC signs US\$1.56 billion CBM contract

CNOOC Ltd has signed a 9.93 billion yuan (US\$1.56 billion) deal to explore for coal-bed methane (CBM) over the next five years with China United Coalbed Methane Corp (CUCBM). Under the agreement with CUCBM, which is equally owned by China National Offshore Oil Corp. (CNOOC), CNOOC Ltd's parent, and China National Coal Group Corp., the two companies intend to explore, develop and produce CBM for 30 years. CUCBM's acreage currently consists of 10,866 square km spread across nine provinces, including Shanxi, Shaanxi and Yunnan. The deal, which was announced on August 6, marks the latest move by Beijing to promote the development of the unconventional fuel, which is a gas extracted from coal seams. In total, the country is investing 100 billion yuan (US\$15.71 billion) in a bid to triple CBM output to 30 billion cubic metres by 2020. The first phase of exploration is expected to cost CNOOC China \$1.52 Bn, with a \$31.37m incurred in phase two in minimum costs. CNOOC China will pay for 70% of total developments costs with CUCBM funding the remaining 30%. Parent CNOOC has a 50% stake in CUCBM. CUCBM has the option to

reduce this percentage of cost payment, or increase it up to 50%. CNOOC did not specify the contract areas concerned but highlighted that CUCBM is engaged primarily with the domestic market.

China postponed its second shale gas auction again to September

China will again postpone its second tender of shale gas exploration rights, pushing the auction date to September. The MLR, administrator of the highly-anticipated auction, has delayed the process repeatedly since last year, leading some industry observers to question.

Bechtel Selected to Provide Nuclear Consulting Services to CNPEC

Bechtel has signed an agreement to provide project management consulting services to the China Nuclear Power Engineering Corporation (CNPEC), a subsidiary of the China Guangdong Nuclear Power Group (CGNPG). Bechtel will provide CNPEC with training and education to help the organization enhance its ability to manage nuclear projects. Bechtel and CGNPG have previously worked together on the Daya Bay project, one of the first commercial nuclear plants built in China using foreign technology (French PWR) and completed in 1994. "CNPEC has selected us to help the company improve processes and procedures to ensure its nuclear projects stay on time and on budget," said Greg Ashley, president of Bechtel's nuclear power business line. The agreement represents the second time in recent months that Bechtel has been selected to provide consulting services in the nuclear industry in China. In April, Bechtel announced it would provide nuclear consulting services to the China Nuclear Power Engineering Company, a subsidiary of the China National Nuclear Corporation.

Liaoning installed wind power capacity to reach 5 GW in 2012

North China's Liaoning Province is expected to see aggregate installed wind power capacity increase 9.6 percent to five gigawatts (GW) in 2012, the provincial arm of the National Development and Reform Commission (Liaoning NDRC) said recently. State-owned Liaoning Electric Power Corp. in March announced plans to deploy RMB 67 billion (\$10.57 billion) in the 2011-2015 period to update the local power grid network.

China's on-grid wind power capacity tops 52.5 GW - SGCC

China has current on-grid installed wind power capacity of 52.58 gigawatts (GW), a 16.7 percent increase from the end of last year, State Grid Corp. of China (SGCC) said in a statement in Aug. On-grid wind power capacity in the company's service area now exceeds 50.26 GW, representing an annual average grow rate of 87 percent over the past six years, said SGCC. On-grid installed wind power capacity and power output as a share of the country's total is expected to reach 13.3 percent and 5.3 percent by 2020, respectively.

Alstom boosts hydro power investment in China

Alstom, the world's third-largest power equipment maker, is boosting its investment in hydro power in China, as other renewable energy sectors such as wind and solar energy face a slowdown. Alstom Renewable Power, Alstom's division in charge of renewable power generation equipment and services, plans to establish a Global Technology Center in Tianjin, as part of a 100 million euro (\$123 million) investment to upgrade Tianjin's hydro industrial facility - the largest such plant that Alstom has in operation.

SPX joint venture to supply dry cooling systems for coal-fired power plants in China

Charlotte, N.C.-based **SPX Corp.** (NYSE: **SPW**) on July 23 said its joint venture with Shanghai Electric Group Co., Ltd. has received orders for dry cooling systems for three power plants in China totaling more than \$40 million. Shanghai Electric -SPX Engineering & Technologies Co., Ltd. (SEC-SPX) will provide air cooled condensers (ACC) to the Mengtai, Baota and Zhong Yu power plants in China. The Baota plant, in the Xinjiang Hui Autonomous Region, is a 2x350 MW **coal-fired** power plant, while the Mengtai plant, in the Inner Mongolia Autonomous Region, is a 2x330 MW coal-fired power plant. The contracts for both plants will call for SEC-SPX to supply a whole ACC island, including two 6x5 modules. The Baota and Mengtai plants are expected to be operational in the fourth quarter of 2013 and the third quarter of 2014. SEC-SPX will also provide a whole ACC island to the 1x135 MW coal-fired Zhong Yu power plant, in the Shanxi Province, including sixteen 4x4 modules. The Zhong Yu plant is expected to be fully operational by the first quarter of 2013.

Linde starts China gas plant to serve Pu Yang Steel

Linde recently launched its new gases production plant in Wu'an, one of the largest steel manufacturing hubs in North China. The total investment of this project is 500 million yuan (\$78.5 million). The new plant will run seven air separation units with an overall capacity of 63,000 Nm³/hour of oxygen provided to Pu Yang Steel, the largest steel company in the Wu'an region. As a key regional player, Pu Yang becomes the first steel company to choose to outsource their gas supply to a professional industrial gas provider. With the opening of this new plant, more local companies may start to understand the advantage of gas outsourcing solution, Linde officials said.