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LNG, Iran Bargaining Chip

Demand for natural gas is growing on the global scale. Over 20 years to come, the energy mix is set to tilt towards gas.

Iran Oil 'Unsanctionable'

In the run-up to November 4, when US President Donald Trump will restore sanctions on Iran's petroleum sector, speculation is rising about the materialization of this decision.

Ministry of Petroleum Islamic Republic of Iran

Managing Editor:
Kasra Nouri
Director General of Public Relations

Editor in chief:
Parastoo Younchi

Executive Editor:
Hamid-Reza Shakeri-Rad

Graphic Designer:
Saman Goodarzi

Photo Section, PR Office, MOP:
Hassan Hosseini

Reporter:
Negar Sadeqi
Javad Asghari

Translator:
Kianoush Amiri

Coordinator:
Abbas Lotfi

Tel/Fax: (+98 21) 61626113
www.iranpetroleum.ir
iranpetroleum.pr@gmail.com

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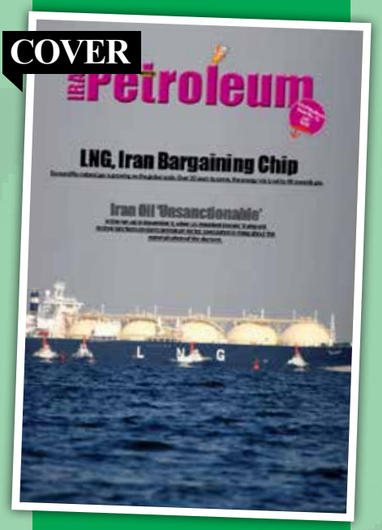

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Iran Petroleum

If you have any comments

regarding the articles in this magazine, please feel free to contact us through e-mail.
Your views are appreciated

PetroleumMinistry-PublicRelations

Thank you for reading
Iran Petroleum

iranpetroleum.pr@gmail.com

Iran Petroleum
Stops Print Edition, Goes Online

Kasra Nouri
Director General of Public Relations

"Iran Petroleum", the official English-language monthly of Iran's Ministry of Petroleum, was launched in 2012 to provide its readers with precise and authentic reports and information about policies, activities and achievements in the oil, gas, petrochemical and refining industries.

The monthly also sought to familiarize its readers with the views of petroleum industry managers through conducting interviews with a view to preparing the ground for interaction and exchange of views between actors of this industry.

In a bid to benefit from new communications tools and help safeguard the environment, "Iran Petroleum" stops its print edition and will continue to be available online.

From now onward, "Iran Petroleum" will try to provide its readers with the latest news on Iran's oil and gas and fulfill its obligation with regard to boosting interaction among Iranian managers and their counterparts from international companies in energy producing and consuming nations.

Those interested in reading about oil, gas and petrochemical industries of Iran and the world may refer to www.iranpetroeum.ir or they may receive the digital edition of the monthly via email.

Iran Petroleum still remains open to receiving suggestions and criticisms from its readers with a view to satisfying its readers.

1st EPC/D Non-Disclosure Agreement Signed

The first EPC/D non-disclosure agreement has been signed between the National Iranian South Oil Company (NISOC) and Petro Gohar Farasahel Kish Co. (PGFKC). The agreement was signed by Bijan Alipour, CEO of NISOC, and his counterpart from PGFKC. Addressing the signing ceremony, Alipour said: "This agreement is the first among contracts for the development of 28 reservoirs.

" He added that the project, which would start in September and last two years, would cost $300 million.

"Supply and installation of downhole and wellhead pumps, drilling and workover of six wells, pipelines, necessary overhaul of production units and desalting, purchase, installation and reparation of turbines constitute some provisions in this agreement," said Alipour. He said that 320,000 b/d of oil was being produced from Ahvaz production units 2, 3 and 5. The completion of project would raise oil output by 42,000 b/d and avoid a decline of 35,000 b/d. Alipour said that the 28 reservoir development projects would significantly contribute to job creation in Khuzestan Province. The National Iranian Oil Company (NIOC) has given green light for the development of 28 reservoirs within the framework of job-based contracts in oil-rich areas in southern Iran.

Turkey to Keep Buying Iran Gas

Turkey will continue importing gas from Iran despite Washington's intentions to reintroduce sanctions against Tehran, Turkish President Recep Tayyip Erdogan said. "They imposed sanctions to Iran. What happened? Did Iran collapse? When [former U.S. President Barack] Obama told us back then, I said 'I am sorry, but we are purchasing natural gas from Iran. How else will I supply natural gas if I cannot buy it?'" President Erdogan stressed. "If the U.S. does not change this attitude they should not forget they will lose a sincere and strong partner like Turkey," Hurriyet Daily News cited him as saying. The US sanctions on Iran's oil will not work as the world is dependent on the crude, a Chinese analyst said. "The nations' trade with each other is based on their bilateral interests," Wu Chenghui said, "They should not be forced by the US to avoid buying oil from Iran."

Iran Gas Transmission Capacity at 260bcm

CEO of Iran Gas Transmission Company (IGTC) Saeed Tavakoli has announced that Iran's gas transmission capacity has reached 260 bcm a year. "The most important task assigned to IGTC is to transmit natural gas, ethane, liquefied petroleum gas (LPG) and gas liquids from domestic and foreign production origins to domestic consumption destinations and export terminals and also to swap the aforesaid products," he said. Tavakoli said IGTC was ranked the first in the Middle East and the fourth in the world after the United States, Russia and Cana in terms of pipeline extension, installations and telecommunications infrastructure. The company owns more than 36,000 kilometers of pipeline, 81 compressor stations with 292 turbocompressors, 9 gas export and import terminals as well as 600 telecommunications stations.

Oil & Gas Well Drilling at 69,000m

A deputy head of the National Iranian Drilling Company (NIDC) has announced that 60,377 meters of onshore and offshore oil and gas wells were drilled during the first four months of the current calendar year (started March 21). "During the first four months of the current [calendar] year, drilling and completion of 53 wells concluded and the wells were delivered to clients," Hamid-Reza Khosh-Ayand said. He added that the wells included 25 development wells, 3 appraisal wells and 25 workover wells, noting that 31 wells were drilled in areas run by the National Iranian South Oil Company (NISOC), five wells in areas run by the Iran Offshore Oil Company (IOOC), 10 wells in development projects of the Petroleum Engineering and Development Company (PEDEC) and eight wells within the framework of agreements.

SZOGPC Gas Output at 58bcm

CEO of South Zagros Oil and Gas Production Company (SZOGPC) Gholam-Hossein Montazeri said the company produced more than 58 bcm of gas plus 20.5 million barrels of gas condensate and oil in the calendar year to March 2018. He said the products were worth equivalent of 385 million barrels of oil.

He said that the company reached its gas production at 101% and oil production at 103% in the same year. Touching on SZOGPC overhauls, Montazeri said more than 245,000 persons-hours of overhaul was carried out on the production and processing facilities as well as pipelines. Furthermore, he added, intelligent pigging was conducted on more than 150 kilometers of pipe.

"Owning to petroleum engineering initiatives and effective acidizing of seven wells, the company saw its output grow 2.5 mcm," he added.

SP Development Picks Up Speed

CEO of Pars Oil and Gas Company (POGC) Mohammad Meshkinfam has given a positive assessment of offshore and onshore development projects in the giant South Pars gas field. He said that the SP development projects would see acceleration in the coming three months. "As promised earlier, recovery from SP13, SP14 and SP22-24 would reach 3 bcf/d by the end of the current [calendar] year," said Meshkinfam. Iran's current calendar year ends on March 20, 2019. Noting that two gas sweetening trains in SP13 and one sweetening train in SP22-24 were already operational, he said that the second train of sweetening would become operational soon. Meshkinfam said the platforms for SP13, SP14 and SP24 were more than 90% ready, adding that the South Pars gas production capacity would increase by 86 mcm/d by next March. He said that one of ten platforms which Iran Marine Industrial Company (SADRA) is building has been installed while a second one is ready for load-out. "Necessary arrangements have been made for choosing contractors for load-out, transfer, installation and launch of four new platforms in South Pars," he added. Meshkinfam said Platform 14A, which had been constructed at ISOICO Yard in Bandar Abbas, was installed in May. He said that the operation of six new gas platforms would boost the South Pars gas capacity by 3 bcf/d (84 mcm/d). The installation and operation of platforms will be done based on the client's planning and in light of progress in construction, pre-commissioning and commissioning of existing platforms at SADRA Yard, as well as measures undertaken with regard to drilling and pipelines of these platforms.

SP22-24 Gas Processing Train

Meshkinfam also touched on SP14, saying: "After completion of drilling operations, installation of Platform 14B has made acceptable progress in ISOICO Yard and will become operational by the end of the [calendar] year."

Referring to trial production from two gas sweetening trains in SP13 and a train in SP22-24, he said that the second train of gas processing for SP22-24 would be ready for operation soon. Meshkinfam said that the other sweetening trains of refineries in SP13 and SP22-24 would be online by the end of the calendar year.

LNG, Iran Bargaining Chip

Demand for natural gas is growing on the global scale. Over 20 years to come, the energy mix is set to tilt towards gas. Iran, sitting atop 18% of world gas reserves but holding a meager share in global gas trading, is striving to highlight its role as a potential producer and exporter of liquefied natural gas (LNG).

Mohammad Hossein Adeli, former secretary general of Gas Exporting Countries Forum (GECF), tells Iran Petroleum that the share of gas in global energy mix would rise from the current 22% to 26% over 20 years.

Here is the full text of the interview Mr Adeli gave to Iran Petroleum:

China is expected to increase the gas share of its energy mix from 6% to 15% and India from 5% to 9% by 2030, which will benefit the gas market

Negar Sadeqi and Roya Khaleqi

Over recent years, there has been growing attention towards gas as a source of clean energy in the world. The gas share is also expected to grow in energy mixes of countries in coming years. Would you please give your assessment of gas market?

The gas market remains a growing market, i.e. it is being focused upon by many countries. Many leading consumers of gas like China and India have been seeking to increase the share of gas in their energy mix. That is why demand for gas and more generally demand for LNG was more than thought all throughout last year and in the first half of current year. Meantime, gas supply has been on the rise. In addition to traditional suppliers of gas like Russia, countries like Algeria, Qatar and the United States moved to boost their exports in 2017 and 2018. Therefore you can see that the gas market has been very dynamic over the past one year and will continue to be so with balanced supply and demand. Of course, gas supply is still expected to drop a bit after exports began from Australia, the US and Africa. Due to the predicted increase in gas supply, demand was down in early 2017; however, the upward trend in gas supply would continue.

How long will increased gas supply continue?

During the four to five years to come, the next wave of LNG export growth is expected to emerge owing to investment by Qatar. But the most important development which I believe will hit the market in coming years will pertain to China and India, which are to increase the share of gas in their energy mix. For instance, China is expected to increase the gas share of its energy mix from 6% to 15% and India from 5% to 9% by 2030, which will benefit the gas market. Therefore, the gas market will witness good conditions owning to the annual 1.8% growth up to 2040.

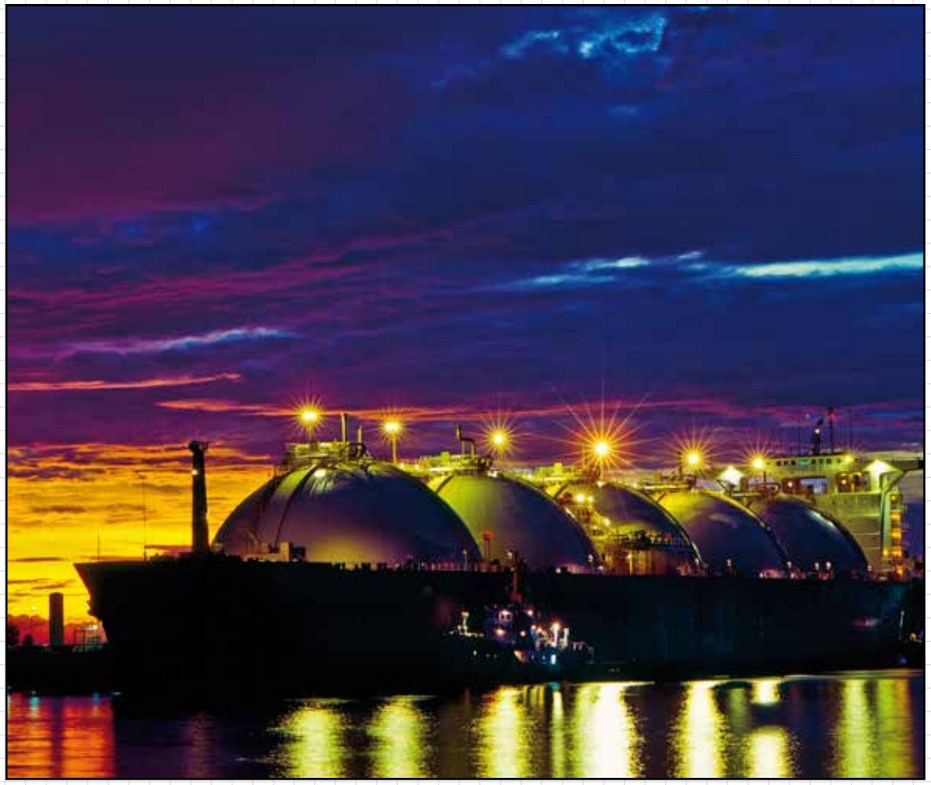
How much will LNG supply and demand reach in coming days?

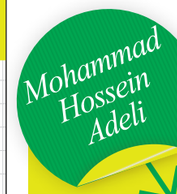
As you may know, gas supply is being carried out via pipeline or in LNG form in the world. Since talks are gathering momentum with regard to LNG exports in global markets, largely affecting analyses related to this market, I think that we will see a boost in gas exports in coming years. LNG exports currently stand at 283 million tonnes, which are expected to reach 295 million tonnes (more than 315 bcm) by end-2018. That is while the world total gas exports stand at about 1,000 bcm. LNG has currently a 30% share in the gas market with the remaining 70% going to pipeline (about 690 bcm).

Over the past one year we have seen sharp oil price fluctuations. How has it affected the gas price?

Before answering this question I have to say that oil prices have seen relative stability in the past one year with prices have increased from $45 a barrel to above $70. Estimates also show a bigger increase in oil prices. For example, there are estimates for 2018 to see a 1.9 mb/d increase in oil demand, which would be apart from the failure of some producers like Libya, Nigeria or Venezuela to enhance output. Therefore oil prices are currently thought to stand between $65 and $75 a barrel, which is a suitable price in case no geopolitical events occur.

But in response to your question, I have to say that oil and gas prices are strongly interrelated because long-term gas contracts in Asia are based on oil prices. Oil is a global and





LNG exports currently stand at 283 million tonnes, which are expected to reach 295 million tonnes (more than 315 bcm) by end-2018. That is while the world total gas exports stand at about 1,000 bcm

predictable commodity whose price is included in long-term contracts. Of course, oil-based gas prices are a bit higher than oil prices.

How much does oil-based and long-term contract gas price stand in Asia?

Oil-based gas price in Asia currently stands at $12 while long-term contracts consider gas price at $11.2. Asian prices are the highest in gas trading mainly due to the difference between spot, single-cargo transactions and their long-term nature. It is also partly related to seasonal supply and demand. The price of gas in different parts of Europe, like south Europe, north Europe and Britain, currently stands between $7.7 and $8.8. Gas is currently traded at $2.8 at the US Henry Hub. Of course this price is for domestic stock exchange in the US. If this country decides to export gas it will not be at $2. Three parameters affect the price of gas exports; namely, liquefaction or sweetening, transport and re-gasification, resulting in a $3 to $4 increase in the prices.

The price of gas in different parts of Europe, like south Europe, north Europe and Britain, currently stands between $7.7 and $8.8.

Now that the US has stepped up its rhetoric against Iran by deciding to reimpose sanctions on the country's petroleum sector, how will global gas market be affected once US sanctions have been snapped back into place?

Gas is an important alternative for all sources of energy including oil. Therefore, if anything happens to oil to increase its price, gas prices will be subsequently increased. That would happen at the same time. That means when oil prices go up within two to four months, depending on circumstances, gas price will increase. The key point is that gas prices increase as soon as oil prices climb. As far as Iran is concerned, due to the meager share of Iran in the global gas market (3%), nothing important will transpire the global gas market.

Were Iran a key player in the gas market how would US oil sanctions affect gas prices?

We have to take into consideration a variety of assumptions. For instance, we have to image if three Iran LNG, Pars LNG and Persian LNG projects had become operational Iran would have been exporting 35 to 45 million tonnes of LNG, making up 15% of world total. In such case, the Iran oil sanctions would have definitely influenced the gas market and it would have not been easily to decide about re-imposing sanctions on Iran because gas would have become an influential international parameter of strength. Although Iran's share of global gas trade stands low this pertains to pipeline gas exports. Had we been able to execute development projects in LNG exports we would have been able to export LNG to many countries in the region, which would have been an advantage and bargaining chip for Iran.

But gas exports via pipeline have also their own advantages. Shall we still put all our eggs in one basket?

Yes, that's true. Pipeline has its own advantages and I don't deny this fact. But the reason for me to prefer LNG exports to pipeline is that LNG may be carried from an origin to any spot desired by buyer. In such market, the buyer and the seller have nothing to do with political communications and transit issues.

When the issue of Iran's oil embargo is brought up, LNG sanctions are predictable. Will LNG be still advantageous to pipeline?

In such case, imposition of sanctions on Iran and elimination of Iran from the LNG market should be compensated. When you have a commodity which is slapped with sanctions the country that imposes the sanctions or people who decline to buy will have to pay for costs. I believe that sanctioning Iran's LNG would have cost high had we had a 15% share in this grading. As a result, other nations would have to pay more for Iran's sanctions, which means the power of Iran. I believe that LNG sanctions are tougher than pipeline sanctions because LNG is carried on vessels to be unloaded wherever you like.

I believe that sanctioning Iran's LNG would have cost high had we had a 15% share in this grading

Experts believe that gas will have a big share in the global fuel mix over the

coming two decades. How much will be Asia's share in this market and will Asian gas producers will become among major buyers in this import?

Within 20 years, the share of gas in the global energy mix will increase from the current 22% to 26%, which will be a big figure. Oil and coal are currently the main sources of energy in the world, but in coming years gas and renewable will together become the biggest source of energy in the world. Meantime oil and coal consumption will decline and as I said earlier China and India will account for 40% of global gas demand by 2040. Furthermore, gas consumption in South Asia will grow significantly and almost treble the current amount. The interesting event which will happen up to 2040 is that Southeast Asian nations like Vietnam and Bangladesh will see their economic growth and per capita income triple to reach East Europe levels. That would be something about $15,000 which indicates higher gas consumption.

Within 20 years, the share of gas in the global energy mix will increase from the current 22% to 26%, which will be a big figure

Given Iran's 18% share of global gas deposits, how much do you think Iran's share of global gas trading will be in 20 years?

Answering this question depends on Iran's gas export strategy in coming years. But from an expert point of view, I should say that if we intend to use gas as a strategic factor of strength in the international market we have first to put into operation the Iran LNG project and raise our share of LNG trading. We should also implement the other two LNG projects and reach a stage to bring our LNG exports to 50 million tonnes within 20 years. Then we can have a very good share in the Europe and Asia markets.

The difference between LNG and pipeline is that if the two countries in question are neighbor it would become clear that gas exports via pipeline would be much better, but if they are not neighbor and have no strategic issues the best method and possibility for circumventing political issues in gas exports would be LNG. Flexibility is high in LNG exports while we have no flexibility in pipeline. Of course it does not mean that I'm opposed to pipeline. But in my view we have now to move towards LNG for Iran's gas exports.

Given the present circumstances, do you think that Iran will continue to be attractive to LNG investors?

We need foreign partnership and investment for many of our projects and we have to make necessary international arrangements to attract foreign investment and win foreign partnership. As far as Iran's present circumstances and US sanctions against Iran are concerned I have to note that pre-JCPOA sanctions were fundamentally different from the current circumstances. Before the JCPOA, we were under sanctions legally and based on international regulations as UN Security Council resolutions required UN member states to sanction Iran, but currently we are under US sanctions which are unilateral. In other words, as of November onward we will not be under legal and official international sanctions, rather we will be only under US sanctions and a number of companies doing business with the US will support it, but no nation or European and Asian companies are required by international law to do so. It is not so that all countries that had earlier sanctioned Iran would sanction Iran anew.

Do you mean that companies with no business with the US would face no restrictions in their economic cooperation with Iran?

Yes, that's it. I reiterate that the US has walked away from the JCPOA and intends to impose sanctions against Iran. Therefore, any country willing to do business with Iran will be subjected to such sanctions. But the fact is that this US sanction does not comply with international rules and therefore countries are free to go along with the US or not. But we should not think that all companies in the world will be following US policies. Several weeks ago I attended a conference where a number of European companies with no business in the US said they would not like to cut cooperation with Iran. These companies have no interest in the US, nor do they fear American threats. Of course we should acknowledge the fact that under conditions of sanctions many foreign companies with interests in the US or fearing American threats would quit Iran, but there are companies that would stay in Iran without any fear. Now we have to make international arrangements for them to continue with their activities in Iran with peace of mind.

we should acknowledge the fact that under conditions of sanctions many foreign companies with interests in the US or fearing American threats would quit Iran

SP Output To Grow 84mcm/d

Iran's Petroleum Ministry, under President Hassan Rouhani, inaugurated 11 conventional phases of the giant South Pars gas field (12, 15, 16, 17, 18, 19, 20 and 21) without any foreign help. That raised South Pars gas output from 240 mcm/d to 570 mcm/d. Development of these phases under sanctions inflicted higher costs on Iran's petroleum industry and took more time than normal; however, it kept Iran's petroleum industry development running.

Now, Petroleum Ministry targets operation of SP 13, 22-24 and part of SP14 by next March. The pace of work in these phases shows that within seven months, South Pars would add 84 mcm/d of gas to Iran's output.

A glance at performance of Petroleum Ministry in the two administrations of President Rouhani in the South Pars development shows a 2.4-fold increase in gas production from the giant offshore reservoir over three and a half years only.

Many experts insisted that the South Pars mega project could not be developed without foreign help, but the field was developed and Iran's production level is equal to that of Qatar. The two countries jointly own South Pars.

SP12, Biggest in South Pars

SP12, which equals three standard phases, was the first one to come online under the Rouhani administration without foreign contractors' help. It came on-stream in March 2015 by Iran's Petropars. The startup of this megaproject boosted Iran's Gross National Product (GNP) by three percent. Production from SP12 earned Iran an extra $17.5 million in daily revenue.

SP12 development is supposed to produce 57 mcm/d of natural gas, 110,000 b/d of gas condensate, 600 tonnes a day of sulfur plus 10 million tonnes a year of liquefied natural gas (LNG).

On inauguration day, Minister of Petroleum Bijan Zangeneh described SP12 as the most Iranian-made phase of the supergiant gas field mainly because Iranian engineers and technicians were fully involved in its design, engineering, commodity supply, manufacturing and startup.

Platform Launch Record Smashed

One year after the inauguration of SP12, SP15 and SP16 came online in January 2016. SP15&16 was aimed at the producing 50 mcm/d of sweet gas, 80,000 b/d of gas condensate, 1 million tonnes a day of LPG, one million tonnes a day of ethane and 400 tonnes a day of sulfur. Iranian companies managed to set a new gas-out record due to their performance in SP15&16. Norway's Statoil had earlier registered a 6.5-month gas-out record, which was overruled by Iranian companies which set a five-month-and-ten-day record in SP16.

With the inauguration of SP12, SP15&16 during the first two years of the 11th administration, the South Pars gas output increased 130 mcm/d.

The development of these phases was in coincidence with the time Iran's petroleum ministry was still struggling with financial shortages and Iran's nuclear talks with six world powers had yet to be concluded. However, South Pars development and investment in the petroleum industry were never halted.

6 Phases Operational Simultaneously

Six standard phases of South Pars (SP17, 18, 19, 20 and 21) were inaugurated simultaneously in April 2017. It initially seemed impossible to inaugurate all these phases at the same time, but Iranian contractors proved their ability to do so despite all restrictions. Although the development of South Pars needs the capital and technological knowhow of foreign companies, Iranian petroleum industry will not wait for foreign companies for good.

Three and a half years into the tenure of the 11th administration, 11 phases of South Pars gas field became operational, letting Iran start recovery from 21 phases in total to reach Qatar in production from the offshore reservoir. Iran's production and refining capacity increased in South Pars from 240 mcm/d in 2013 to 570 mcm/d in April 2017. Furthermore, rich gas recovery from South Pars totaled 1.24 bcm in 2017.

SP11 Contract

In July 2017, the National Iranian Oil Company (NIOC) signed a $4.8 billion contract with a French energy major Total-led consortium comprising also China's CNPC and Iran's Petropars for the development of SP11. The contract, which was based on the newly developed IPC model, was aimed at rfeaching an output of 56 mcm/d. Under this contract, two offshore compressing platforms, whose cost will be calculated separately at $2.5 billion, will be built.

Cases of natural gas flow decline in the South Pars blocks, which would lead to a decline in gas production

in coming years, prompted the Ministry of Petroleum to attract foreign investment for the development of SP11 and use technology for the compressing platforms, each weighing 20,000 tonnes, because Iranian contractors did not possess such knowhow to build the platforms.

The Total-led consortium spent nearly $90 million on the project, and some bidding rounds were held.

However, US President Donald Trump pulled out of JCPOA which terminated sanctions imposed on the Islamic Republic. Total said it would seek waiver from the US to continue with its presence in Iran. Iran's Minister Zangeneh gave Total 60 days to make up its mind about operating the project.

As Iran Petroleum went to press, Total had yet to release an official report regarding its probable pullout from SP11.

In case Total quits, the project will go ahead under the leadership of CNPCI and if the Chinese company pulls out too, Petropars which has already developed SP12 and SP19, will continue developing the gas field.

"Development of SP11 is envisaged in two stages; first includes production of natural gas, drilling of wells, and construction of a platform to carry gas onshore. Petropars will have no problem with this part," said Mohammad Meshkinfam, CEO of Pars Oil and Gas Company (POGC).

"But," he added, "We will face some problems regarding the construction of compressing platforms whose technology does not exist in Iran."

SP11 development activities are under way and Iran has decided not to wait for foreign companies as it did not for many other phases.

The best option would be to use foreign capital and to transfer technology into the country; however, experience has shown that Iran's petroleum industry will go ahead with its development with or without foreign help. However, this trend of activity may alternate between fastness and slowness.

Six Platforms in 2018

Although the US has stepped up its threat of unlawful and unilateral sanctions against Iran's petroleum industry, the Iranian Ministry of Petroleum still prioritizes SP13, 14, 22, 23 and 24. Six more platforms of South Pars are on the POGC agenda by next March. Meshkinfam has said that South Pars gas production capacity would increase by 84 mcm/d by that time.

Given the arrangements made, installation of Platform 14B will allow gas recovery from SP14. Two gas sweetening trains of SP13 and one sweetening train of SP22-24 are currently operational and the second train of gas sweetening in SP22-24 is to come on-stream soon. That means completion of SP13 and SP22-24 by next March, which marks the turn of Iran's calendar year.

The significant role of South Pars development in the development of Iran's economic, social and political infrastructure is no secret to anyone. To highlight the significance of development of this field, it would be enough to note that with $40 a barrel of crude oil, the South Pars gas would be valued at $4,400 billion. Iran's revenue from crude oil exports and sales stand at below $80 billion even with a barrel of oil at $100.

After two decades of efforts and spending of $70 billion, development of South Pars is approaching its final stages. The development of the field has had over 85% progress and except for SP11, all other phases would have been developed over the coming one and a half years.

By imposing unlawful and unilateral sanctions against Iran's petroleum industry, the US thinks it could halt the development of this industry and impose an embargo on Iran's oil sales in the global markets. The Trump administration may not recall that even under the tough international sanctions imposed on Iran in 2010, Iran's petroleum industry pushed ahead with its development.

West Karoun Output Keeps Rising

Iran holds about 67 billion barrels of oil in place in the jointly owned oil fields in the West Karoun area. Until 2013, Iran was extracting nearly 50,000 b/d of oil from these fields which are shared with neighboring Iraq. But now Iran's output has exceeded 300,000 b/d.

In the current calendar year to March 2018, the West Karoun output is set to rise anew. Touraj Dehqani, CEO of Petroleum Engineering and Development Company (PEDEC), has said that "we welcome the presence of international companies in Iran in order to provide Iran with capital and technology", but the process of development in West Karoun would not wait for foreign companies and would go ahead. The oil fields located in West Karoun are all green fields, stretching from near the oil-rich city of Ahvaz in Khuzestan Province to Iran's border with Iraq. If the West Karoun area is shaped like a rectangle, its length stretches from the western bank of Karoun River near Jofair to Iran-Iraq border and its width stretches from Chazabeh to Darquain.

West Karoun incorporates North Azadegan, South Azadegan, North Yaran, South Yaran and Yadavaran oil fields. Prior to the time that the administration of President Hassan Rouhani took office in 2013, the oil production from the West Karoun fields had dropped to 45,000 b/d. A buyback deal had been signed with China's CNPC for the development of the giant South Azadegan. Furthermore, buyback contracts had been signed with Iranian and Chinese companies for the development of North Azadegan, Yadavaran and North Yaran. South Yaran was being developed by PEDEC. Due to National Iranian Oil Company (NIOC) restrictions resulting from tough sanctions imposed on Iran's petroleum industry, there was little hope for output hike in these fields. The Petroleum Ministry had prioritized development of these fields, dismissing any pretext for decline in output.

Financial discipline, injection of financial resources, weekly gatherings for studying implementation of projects and following up on their progress in the presence of senior Petroleum Ministry and NIOC officials came to fruition within four years. In spite of the impact of international sanctions, oil recovery from the West Karoun area soared past 300,000 b/d. In the meantime, negotiations were held with foreign companies for the second phase development of oil fields in West Karoun.

CNPCI Dismissed

In October 2009, NIOC struck a $2.5 billion buyback deal with CNPCI for the development of South Azadegan oil field. With final changes made into the master development plan (MDP), the project started in September 2012 after a revised MDP was approved. South Azadegan is set to be developed in two phases; Phase 1 eyes 320,000 b/d of oil, while Phase 2 targets 600,000 b/d of oil. The Chinese side did not honor the terms of the agreement, and NIOC had to dismiss it from the project in April 2014 after verbal and written notices. After CNPCI quit, NIOC assigned the job to 30 Iranian contractors. Three years later, they are recovering 100,000 b/d of oil from South Azadegan. By next March, this output is expected to increase by 70,000 b/d. Alongside this development project by Iranian contractors, the necessity of faster development of South Azadegan and application of modern technologies to enhance the recovery rate prompted NIOC to offer this field for development under the newly-developed Iran Petroleum Contract (IPC) by foreign contractors in partnership with domestic companies. South Azadegan holds 33 billion barrels of oil in place with a recovery rate of 5.5%, which is planned to reach 20% once the field is fully developed.

220,000 Output Hike in 3 Years

Alongside the development of South Azadegan by Iranian contractors, the pace of implementation of phase 1 development of Yadavaran by China's Sinopec, South Azadegan by CNPPC and North Yaran by Persia Oil and Gas Industries Development Company (POGIDC) increased. All the three projects were inaugurated in November 2016, and the West Karoun oil recovery capacity reached 260,000 b/d. All these fields were not producing any oil until 2013. The contract for the development of Yadavaran was signed in three phases with Sinopec. Under the buyback agreement, Yadavaran would produce 85,000 b/d of oil in Phase 1, 180,000 b/d in Phase 2 and 300,000 b/d in Phase 3. Feasibility studies conducted on the project indicated that the recovery rate from the Sarvak layer (heavy crude) was 6% and from the Fahlyan layer (light crude) was 14%. It is estimated to hold 34 billion barrels in place. North Azadegan is located 120 kilometers west of Ahvaz along the border with Iraq. The contract for its development was signed with CNPC in two phases, each of which having 75,000 b/d capacity. North Azadegan is estimated to hold 5.6 billion barrels in place. A buyback contract was signed with POGIDC for the recovery of 30,000 b/d from North Yaran, whose reserves are estimated at 1 billion barrels in place.

On the day of inauguration of the three aforesaid projects, Iran was recovering 115,000 b/d from Yadavaran, 75,000 b/d from North Azadegan and 30,000 b/d from North Yaran. The first phase recovery from Yadavaran was planned to reach 85,000 b/d, which finally reached 115,000 b/d under coordination between contractor and client.

The total investment for developing these fields was nearly $7 billion. Ali Kardor, CEO of NIOC, said at the inauguration of the three oil projects that Phase 1 of Yadavaran field had cost $3 billion, Phase 1 of North Azadegan $2.55 billion and North Yaran less than $600 million. NIOC targets 1 mb/d production in West Karoun. Minister of Petroleum Bijan Zangeneh has said that reaching such output would be possible after attracting foreign investment and enhancing the rate of recovery. PEDEC managing director Dehqani has welcomed the presence of multinational companies in Iran to provide the country with capital and technological knowhow, saying: "The process of development in West Karoun is not waiting for foreign companies and it is continuing seriously." Reaching a sustainable 1mb/d output from West Karoun in coming years would need $18 billion to $20 billion in investment. NIOC counts on foreign companies for such investment.

Agreement Talks Continue

NIOC is currently in talks with foreign companies for the second phase development of West Karoun fields. In October 2016, a heads of agreement (HOA) was signed between NIOC and POGIDC for the development of Yaran. NIOC plans to award the development of Yaran (both North and South Yaran) to POGIDC. PEDEC is currently in charge of developing South Yaran whose output has reached 10,000 b/d. Besides talks with foreign companies for the second phase development of Yadavaran field under IPC model, negotiations are under way with Sinopec for the second phase development of the field. In case an agreement is reached, the second phase development will be attached to the first phase development under buyback. As long as planning is under way for the integral development of the Azadegan field, progressive production hike from South Azadegan would be on the NIOC agenda. Once an agreement is signed for integral development, both North and South Azadegan would be given to contractor.

West Karoun fields are planned to be developed in two phases; phase 1 will see production from these fields exceed 500,000 b/d, while phase 2 would bring output to more than 1.2 mb/d.

Photo: Mojtaba Mohammadi Qoli

Ferdowsi, Mideast Biggest Heavy Crude Oil Field

More than 108 years of prospecting for hydrocarbon reservoirs in Iran have resulted in the exploration of the supergiant South Pars gas field and Azadegan oil field. Iran sits atop more than 100 oil and gas reservoirs, implying that at least one reservoir has been explored per year in Iran in the past century.

In 1966, a Swiss company explored the Ferdowsi oil field in the Persian Gulf, setting a record in the discovery of giant fields in Iran. The giant Ferdowsi oil field, which contains some gas in its Dalan and Kangan layers, is known to be the largest heavy crude oil field in the Middle East.

The Ferdowsi oil field is located west of the South Pars gas field and near the Golshan gas field. Ferdowsi is 190 kilometers from Bushehr Port and 88 kilometers away from coastline. The first oil well in Ferdowsi was spudded in the year of its discovery in order to identify heavy crude oil layers. One year later, a second well was drilled to measure the potential of its gas layers.

Based on studies conducted on the two wells, master development plan studies were carried out by Swiss Adax SA for the description of the Ferdowsi oil field whose studies signaled huge heavy crude oil there. The oil field was estimated to hold 31 billion barrels of oil in place with a production capacity of 70,000 b/d.

Due to the significance of Ferdowsi's heavy crude oil reserves, the National Iranian Oil Company (NIOC) instructed the Petroleum Engineering and Development Company (PEDEC) with 3D seismic testing, drilling two appraisal wells for a more precise assessment, and taking samples from the crude oil layers in order to submit a renewed MDP. The drilling of a third well started in April 2010 with a view to assessing the oil and gas layers of the field. Initial studies showed the existence of abundant heavy crude oil with various API gravities in the five layers, known as Bourgan, Daryan, Gadvan, Fahlyan and Sourmeh.

Ferdowsi Gas Potential in Lower Layers

NIOC ordered the second well drilling (F2) in order to examine the gas potential in the Dalan, Kangan and Faraqoun layers, which proved positive.

In 2005, Adax SA appraised the Ferdowsi field based on the first and second wells and estimated the in-place oil at 35 billion barrels with a recovery rate of 6%.

Development of Ferdowsi oil field is under way with a view to acquiring technology for heavy crude recovery in fractured carbonated reservoirs. It would also help find the most suitable method for heavy crude oil recovery.

Ferdowsi was offered for investment during a conference held in Tehran a couple of years ago to unveil the Iran Petroleum Contract (IPC), a new model of oil contract. Full development of Ferdowsi would require five to seven years; however, due to its huge oil and gas deposits and the profitability of its development, investment for the development of this field continues to be highly attractive. NIOC is envisaging buyback as the framework for the development of Ferdowsi. Due to the specialty of technology applied to the development of heavy crude oil and the necessity to use special tools, NIOC intends to offer this field to foreign companies for buyback-style development. PEDEC is currently in talks with foreign companies to provide them with necessary information on the field. The foreign parties are required to sign memorandums of understanding before receiving more data. In Phase 1, Ferdowsi would be producing 10,000 b/d, which would exceed 300,000 b/d in the next phases.

Transfer of Technology

Production of heavy crude oil and development of technologies required for transmission and refining of heavy crude have been talked about for decades all across the globe. In Iran, studies started to that effect after the discovery of oil fields containing heavy crude.

Technologies required for the production, transfer and treatment of heavy crude oil have already been developed in the world although they are being upgraded. Iran has not sit with fingers crossed. Iranian petroleum industry experts have applied various methods with regard to the production, transfer and refining of heavy crude oil on lab scale. Some of these technologies have already been applied at industrial level. NIOC expects foreign companies to contribute to the development of such oil fields as Ferdowsi in a bid to bring in technology for the development of these fields, the objective pursued seriously by the Iranian Ministry of Petroleum.

Photo: HASSAN HOSSEINI

Aghar Gas Output to Double

Sitting atop 18% of the world's proven gas reserves, Iran ranks the first in terms of holding natural gas in the world. Owing to development of gas fields in recent years, Iran's average gas production has reached 800 mcm/d, 600 mcm/d of which is consumed domestically.

The annually growing domestic consumption of natural gas and Iran's obligation to pump gas to neighboring countries including Iraq and Turkey have prompted Iran's Ministry of Petroleum to prioritize enhancing its gas production capacity.

The Iranian Central Oil Fields Company (ICOFC), which administers development of 10 gas fields in Iran, supplies more than 35% of Iran's gas. Therefore, development of ICOFC-run gas fields is of prime significance for the National Iranian Oil Company (NIOC).

ICOFC recently introduced opportunities for investment under the newly developed IPC format. Phase 2 of Aghar gas field is one of these lucrative projects for foreign investment.

Located 110 kilometers southeast of the southern city of Shiraz in Fars Province, the Aghar gas field was discovered in 1972. Thirteen of a total 16 wells drilled in this field are producing gas. Production of gas started there in 1998. Natural gas and gas condensate produced from Aghar are transmitted via two separate pipelines, measuring 90 kilometers each, to the Farashband gas refinery for treatment. This job is handled by the Zagros Oil and Gas Production Company (ZOGPC), an offshoot of ICOFC.

Since the Aghar field is among big fields after Kangan among those run by ZOGPC, Gholam-Hossein Montazeri, CEO of ZOGPC has said that development of Phase 2 of the Aghar gas field was on the agenda for increased production. That would help double the Aghar output to 40 mcm/d. Meanwhile, facilities will be established near the Farashband gas refinery in order to handle the processing of more gas.

The Aghar gas is planned to be injected into oil fields located in southern Iran, particularly Maroun. Aghar is equipped with wellhead installations, four gas gathering centers and a stream pipe which would take gas to the Farashband refinery. A gathering and separation center is also available, containing slug catcher, two-phase and three-phase separators, control room, pumping station and pig launcher and receiver. The Aghar gas field's production capacity amounts to 95.22 mcm/d of natural gas and 4,300 b/d of condensate.

The Aghar gas field's feasibility study has been completed after four years, during which the previous study models have been updated, new data has been included, petrophysical logs have been interpreted and assessed, and fractures have been modelled.

The findings of studies indicate a 40% increase in the in-place gas reserves of Aghjar with a recovery rate of more than 71%. In the natural depletion scenario, due to wellhead pressure restrictions, the final recovery will be maintained at 34.7% with a production ceiling of 22 mcm/d up to 2023, when the installation of a compressor would bring the recovery rate to 71.5%. Drilling to maintain the production ceiling and boost recovery, conducing periodical static tests, appraisal drilling, phasic increase in the PGC production of the gas field up to 30 mcm/d and optimization scenario following installation of compressor, as well as spudding six new wells to raise output to 30 mcm/d are among plans envisaged in the new studies.

Q1 Petchem Exports Produce $3bn

Iran's petrochemical exports exceeded 13 million tonnes in the first quarter of the current calendar year, generating $3.158 billion in revenue.

Twenty petrochemical plants located in the Mahshahr area produced a total of 4.599 million tones, while 16 petrochemical plants in the Assaluyeh region supplied more than 5.868 million tonnes of products in the same period.

Iran's calendar year starts on March 21.

Furthermore, the output of 20 other petrochemical plants scattered across Iran was more than 2.795 million tonnes.

The Khuzestan, Ehtemam Jam, Khorasan, Carbon Iran, Shimi Baft, Khark, Kermanshah, Nouri, Morvarid and Shiraz petrochemical plants showed the highest performance in the final month of Q1. During that month, petrochemical exports reached $962 million for exporting 1.7 million tonnes of products.

In the Pars Special Economic Energy Zone (PSEEZ), more than 2.759 million tonnes of products worth $1.636 billion were exported in the same quarter.

In terms of weight, Zagros Petrochemical Plant had the highest with 732,000 tonnes, while in terms of value; Nouri Petrochemical Plant came first with revenue of $441 million.

Polymer Project Feedstock Guaranteed

The head of the National Petrochemical Company (NPC), Reza Norouzzadeh, has announced that necessary feedstock for the Di Polymer Arya project would be supplied fully as propylene production has increased in Iran.

"There is nothing to worry about feedstock supply to this project. As this unit is under construction we feel compelled to provide feedstock from the Shazand Petrochemical Plant and soon see its inauguration by accelerating affairs," he said. He added that Iran was heavily dependent on propylene, noting that increased propylene production was on the agenda. Located in the city of Khomein in central Iran, Di Polymer Arya has a production capacity of 175,000 tonnes of polypropylene. The project, which is 62% complete now, is to undergo pre-commissioning in 2019. The facility's output capacity would rise to 300,000 tonnes in the second phase.

The project was initially estimated to cost IRR 3,500 billion, but now the figure has jumped to IRR 7,500 billion.

Hamid Kabiri, CEO of Di Polymer Ayra, said the major cause of concern was to supply feedstock.

Bandar Abbas Sulfur Granulation Unit Operational

The sulfur granulation unit of Bandar Abbas refinery has become operational with a production capacity of 250 tonnes a day, CEO of the refinery Hashem Namvar said. "The sulfur granulation unit has come on-stream in order to eliminate the harmful environmental impacts of sulfur particles in the air and reduce environmental pollution," he said. Namvar said that sulfur granules measuring 2 to 6 inches would be produced at this unit to be loaded in wholesale. He added that the way sulfur used to be supplied on the market was harmful to the environment due to particles it spread into air.

"With the startup of the granulation unit, the total sulfur in the Bandar Abbas refinery will be granulated, generating more value-added," said Namvar, adding that granulated sulfur could be supplied in packs of 50 kilograms and one tonne.

"The sulfur granulation unit comprises a 1,050-tonne storage tank to receive melted sulfur from the sulfur recovery unit, a melted sulfur transfer system, two granulation systems and a granule conveyor belt. This unit has three sulfur granule storage silos, each having 350 tonnes of capacity," he said.

SPGC Condensate Output at 650,000b/d

The South Pars Gas Complex (SPGC) is producing more than 650,000 b/d of gas condensate, its CEO Hadi Hashemzadeh has said. "Today, more than 650,000 b/d of gas condensate, over 10,000 tonnes/d of ethane, upwards of 10,000 tonnes/d of LPG and about 1,800 tonnes/d of sulfur are being produced at SPGC," he said. He added that SPGC had already steered 10 big gas refineries in the country, adding that it was ready to operate two more refineries in SP13, SP22 and SP24. Hashemzadeh said that SPGC was accounting for 70% of Iran's energy mix, owing to its key gas-based products like gas condensate. He said that the complex had sweetened more than 39 bcm of gas in the first quarter of the current calendar year (started March 21) and fed into national gas trunkline. "This output was more than 16% higher year-on-year," he added. He said that 549 mcm of natural gas had been fed into Pars Petrochemical Company in the first quarter of the year. Referring to sour gas injection into the Iran Gas Trunkline 5 (IGAT5), Hashemzadeh said that 4 bcm of gas had been injected into the trunkline in the first quarter. Over the same period, he added, 55 million barrels of gas condensate, 202,527 tonnes of granulated sulfur, 792,326 tonnes of ethane, 519,467 tonnes of propane and 287,256 tonnes of butane were produced at SPGC.

$1.2bn Gas Gathering Deals in East Karoun

The National Iranian Oil Company (NIOC) is set to sign two gas gathering agreements worth $1.2 billion in the East Karoun area, NIOC director of investment and business Majid Mostafavi said. He said the agreements would prevent the burning of over 760 mcf/d (22 mcm/d) of gas. He added that 30 associated gas gathering projects were envisaged for East Karoun. Referring to NIOC plan to combat gas flaring, Mostafavi said: "In light of the accumulation of flare gas pollution in the National Iranian South Oil Company-run areas particularly in Khuzestan Province, NIOC will soon sign separate agreements with the Persian Gulf Holding and Maroun Petrochemical Company to upgrade and renovate flare gas gathering installations of NISOC-run areas." He said the 30 gas gathering projects were mainly on small scale, adding they would be online in two years.

"With the implementation of these projects, 510 mcf/d extra feedstock would be supplied to under-construction Bidboland-2 Petrochemical Plant and 250 mcf/d to Maroun Petrochemical Plant," he said. "After gas gathering, NISOC gas liquid production will increase 38,000 b/d to provide further feedstock to the Bandar Imam Petrochemical Plant."

Mostafavi said that a total of 1.6 million tonnes a year of ethane and heavier gas compounds plus 14 million barrels of condensate would be supplied as feedstock to petrochemical units, which would be a long stride in overcoming feedstock shortages in the petrochemical sector. This amount of feedstock would be valued at $1,300 million for NIOC annually, while petrochemical products supplied by this extra feedstock is estimated to be valued at $2,600 million a year.

"These projects will also provide NIOC with about 16 mcm/d of natural gas, which could be injected into fields or serve as fuel in the country," said Mostafavi. He said that about 100 mcf/d of gas was being flared near Masjed Soleyman, adding that an agreement had been finalized with under-construction Masjed Soleyman Petrochemical Plant for gathering flare gas. "Except for West Karoun where associated petroleum gas gathering is under way within the framework of NGL 3200, the implementation of new projects will put an end to flare gas burning in Khuzestan Province," he added. Mostafavi said a gas gathering station at Parsi field became operational in March, adding that Maroun 3, Maroun 6 and Mansouri gas gathering projects would become operational by next March.

Win-Win Policy in Petchem Sector

Amid anti-Iran policy of US President Donald Trump, who is seeking to impose secondary sanctions on Tehran following his withdrawal from the 2015 historic nuclear deal, the director of investment at Iran's National Petrochemical Company (NPC) has good news.

Hossein Ali-Morad told "Iran Petroleum" that arrangements were made months before Trump's withdrawal from the deal to remove obstacles to banking transactions. He said in the interview that Iran was developing its ties with Asian and European nations based on win-win policy. The following is the full text of the interview Mr. Ali-Morad gave to "Iran Petroleum":

over the past two years and due to the JCPOA overtures, a number of MOUs were signed between the NPC or leading petrochemical holdings on one side and Asian and European companies

Marjan Tabatabaei

Let's first talk about the impact of the US's withdrawal from the JCPOA. How do you see ongoing talks with the Europeans?

Naturally foreign companies, particularly leading European firms that signed post-JCPOA, are cautious because of their shared interest with American firms. Some of them have suspended their transactions waiting for the fallout from the US's withdrawal from the JCPOA in order to be able to regulate and plan their cooperation with Iran. Therefore, the future of cooperation with foreign companies and the fate of NPC talks with foreign investors hinge on the result of ongoing negotiations between Iran's Foreign Ministry and the European Union about the JCPOA terms. We have to wait and see what would happen when the deadline set by Iran for the EU expires. We hope that this result would benefit both Iran and the European and Asian sides. The important point is that as the administrator of petrochemical industry, we are not the only side to propose cooperation with European companies, rather there are leading European firms willing to cooperate with Iran. Recently, a European company has signed the text of the agreement we had already finalized. The representative of the company insisted on meeting with me to exchange contracts. He said that the agreement was an indicator of willingness for continued cooperation with Iran to tell negotiators with the EU that a suitable solution needed to be drawn up and finalized. I deem it necessary to note here that attracting foreign investment is dependent on a variety of internal and external factors, whose resultant will decide the presence or absence of foreign investors. For instance, I can refer to the issue of compliance with international banking and non-banking regulations, know your customer (KYC), secure payment services in compliance with international relations and the Financial Action Task Force (on Money Laundering) (FATF). I see some domestic decisions like the government's recent decision to unify multi-tier foreign exchange rate as a right and suitable strategy which would help stabilize national macro economy and business environment, thereby removing a major risk to attracting foreign investment. That would positively affect international companies' decision about cooperation with Iran.

Which stage are MOUs in now?

You must know that over the past two years and due to the JCPOA overtures, a number of MOUs were signed between the NPC or leading petrochemical holdings on one side and Asian and European companies on the other, for purposes of studying grounds for cooperation and the possibility of presence of these companies in Iran's petrochemical industry in such sectors as investment, financing and supply of technologies.

At present, in light of the US's pullout from the JCPOA, these companies have slowed down and even suspended their activities in Iran and are waiting for the European governments' action to save the JCPOA and create new conditions. Of course, Chinese companies are less considerate and have expressed willingness to proceed with cooperation.

But you must keep in mind that attracting foreign investment is subject to international conditions and Iran's interactions with other nations. Many European and Asian companies were in talks for investment in Iran and transfer of technology to Iranian petrochemical companies, but this issue has been affected by political events. Now the situation has totally changed and in the aftermath of the US's pullout from the JCPOA, Iran's relations with various European and Asian nations are entering a new phase based on win-win policy. It would be wrong to conclude that the negative strategy of a country would immediately and directly affect the strategy of other countries.

I reiterate that foreign companies, particularly Asian companies, have not stepped back from Iran's lucrative petrochemical industry despite all negative propaganda spread following Washington's withdrawal from the JCPOA.

Hossein Ali-Morad

foreign companies, particularly Asian companies, have not stepped back from Iran's lucrative petrochemical industry despite all negative propaganda

Hossein Ali-Morad

Generally speaking, the sanctions you are talking about are mainly economic and more precisely target the banking sector

Given Trump's anti-Iran stance, unilateral sanctions will be imposed on Iran's petrochemical industry. Have you made any assessment to that effect?

Fortunately, the Iranian Ministry of Petroleum had set up six months ago a working group under the title of "Working Group to Study Solutions to Removing Obstacles to JCPOA and Banking Transactions". The NPC followed suit and set up its own working group. The idea was for companies and holdings to share experience in sanctions busting with a view to creating effective unity in this sector and prepare the petrochemical industry to face any new restrictions including secondary sanctions.

What solutions are envisaged?

The principal point is to use conditions and chances which had been ignored in the post-JCPOA era. For instance, the first point is to use domestic potentialities and persuading small and medium-sized European companies to cooperate with Iran's domestic industry, and finally using the capabilities of Russian and Chinese companies.

In the post-JCPOA era, we focused on European companies, particularly leading petrochemical firms which had big investment projects in the US. But everything now depends on the outcome of negotiations under way between Iranian and European parties.

How do you foresee the outcome?

During the pre-sanctions era – I mean ten years of tough and unjust pre-JCPOA sanctions – we continued with our projects through relying on our domestic capability and we were not halted. The launch of projects never stopped and we always found a solution. Generally speaking, the sanctions you are talking about are mainly economic and more precisely target the banking sector. That would affect our banking and monetary procedures more than our manufacturing. If we say that the threats we are faced with are of technological and technical nature we may not be wrong as we can turn them into a chance for the growth of domestic capabilities. Fortunately, necessary mechanisms have been worked out for the economy and the banking, particularly Central Bank transactions. Throughout [Iran's Foreign Affairs Minister] Mr. [Mohammad Javad] Zarif's negotiations, all negative and positive points will be raised, so that in case these sanctions take effect we would be able to use suitable banking approaches.

Have any new talks been held with Russia and China for alternatives?

During the last visit to Iran by Chinese president, an agreement was signed for cooperation and China's private sector investment. After that, a Chinese union of private oil and petrochemical companies signed an MOU with Iran's deputy petroleum minister and NPC managing director for the acceleration of Chinese private investment. Under the MOU, NPC will provide suitable location for investment by the Chinese party. God willing, we will see feedback in the near future. A Chinese company is strongly willing to invest in one of our country's islands, which we are following up on seriously. A high-ranking delegation and a group of their experts will travel to Iran soon so that we can finalize the basic and infrastructure issues with relevant organs and prepare the ground for the implementation of the project by that company.

So the Chinese and the Russians must have become active now.

Such dynamism existed before, particularly with the Chinese, and you must know that China is one of our target markets for petrochemical products. However, the issue of attracting investment and transfer of technology by Chinese and Russian companies tops our agenda now. Their seriousness has been proven to us. I've had talks with 40 to 50 Chinese investors, 2 to 3 of them are serious. We are following up on talks with them.

What arrangements have you made for shipping insurance?

We had similar experience during the pre-sanctions era. Through cooperation and by reliance on our own capabilities and facilities and well thought-out use of new international mechanisms, we will consider a suitable strategy.

Is there nothing to worry about as the Europeans are quitting?

I already explained about the technical and technological sections and as far as financing is concerned we believe in project fund as a good solution. Therefore, if we can either directly or indirectly engage the NPC in such projects, we will be able to create through suitable mechanisms project funds in Iranian currency and then project funds in hard currency in order to make optimal use of stray capitals which may go towards gold or housing and drive them toward petrochemical projects, in which case we may attract investment for prioritized projects.

What stage is such fund in and what would be your solution for attracting investment in case renowned companies pull out of Iran?

Preliminary steps for such fund were taken one month ago during a meeting of project managers. In the near future and owing to support from Dr [Norouzzadeh], managing director of NPC and deputy minister of petroleum, we are determined to set up a financing working group in the NPC in order to arrange activities based on changes in the international arena. The first agenda for this working group would be to establish a project fund.

Furthermore, it is evident that due to the limited financial potential of private sector investors, petrochemical project managers, as well as limited financial resources in the country; development of petrochemical industry in compliance with plans is almost impossible without foreign investment and financing through international resources. Therefore, in addition to predicting solutions like working out necessary and legal mechanisms for driving liquidity towards petrochemical industry including establishment of project funds in Iranian and hard currency with the direct or indirect participation of NPC (for instance through Persian Gulf Holding's involvement), we have to continue negotiations with European small and medium sized enterprises and with the Commonwealth of Independent States (CIS), Russia and China (which are less affected by US sanctions) and meet the financial needs of petrochemical projects.

I deem it necessary to remind

Hossein Ali-Morad

the issue of attracting investment and transfer of technology by Chinese and Russian companies tops our agenda now

two points; first and foremost, the big impact of political conditions on financing and attracting foreign investment, and second, the time-consuming process of foreign financing and direct investment. Therefore, the NPC and its Directorate of Investment adopted a three-phase financing approach to be pursued in the wake of the US's withdrawal from the JCPOA. The phases are as follows:

- Short-term financing
- Short-term financing convertible to long-term financing
- Development of long-term financing structure

In light of available instruments and given current international conditions, I personally believe that it would be impossible to jump into mid-term and long-term financing at a time the US has walked away from the JCPOA. Furthermore, we are well aware of Asian and European prime banks' agreement with and fear for the Office of Foreign Control Asset (OFAC). In other words, we know that these banks have already been fined heavily. Therefore, they stay away from Iran and become more conservative. By taking into consideration these points, it seems that we will be following up on short-term financing. In the meantime, due to the possibility of acquiring easier insurance coverage for SME manufacturers and vendors, we can directly purchase from them.

There were recently talks with Swiss Casale. Are any other companies involved in the new talks?

Both before and after the JCPOA implementation, we had several rounds of talks with Swiss Casale. They were very willing to cooperate with Iran. During the years of sanctions, Casale was among companies that did never sever ties with Iran. Within the same framework, it is still ready for cooperation with Iran. Casale is a small-sized company, but it is proprietor of technology and we have to identify such companies and to supplant top Europeans who may pull out of Iran.

How much investment is needed for petrochemical projects?

At present we have about 63 petrochemical projects which are being operated by the private sector. These projects would need about $35 billion in investment to be completed and come online. Given the accessibility to feedstock and for the purpose of development of petrochemical industry, about 38 projects have recently been proposed, which have been authorized. These projects would need more than $48 billion in investment. You may ask how such investment would be attracted. As far as the financing of these projects is concerned I have to note that in the past when the NPC was in charge of petrochemical development projects, the NPC financial resources and even NPC-branded products were considered as financial support and were acceptable to foreign banks, financial institutes and credit and insurance agencies. Therefore, to get facilities from foreign banks, financial institutes, credit and insurance agencies, there was no need for the Central Bank or Ministry of Economy guarantees as state guarantee and loans were guaranteed and repaid by the NPC. It is noteworthy that banking facilities are being repaid. We recently finished repaying six packages of facilities granted by the Japan Bank of International Cooperation (JBIC). I hope that we can unify the petrochemical industry in the country anew in order to benefit from this lever of power to witness once more development of petrochemical sector and its blossoming. After the JCPOA implementation, JBIC granted a €650 million usance, guaranteed by the Persian Gulf Holding. Our plan both before and after the US withdrawal from the JCPOA has been to acquire short-term and then mid-term financing facilities. Due to the present circumstances, our pace has slowed down. We are waiting for the outcome of talks so that we can make required planning to reach this objective.

Do you have any plans to transfer in state-of-the-art technology?

In the petrochemical technology sector, it is necessary to support domestic companies like Petrochemical Research and Technology Company (PRTC) and domestic capabilities in order to develop modern technologies needed in this sector in cooperation with foreign companies which are ready to supply necessary technology. I am sure that after implementing each new technical and technological agreement, attraction of investment at any level and using modern technologies, the path for the development of petrochemical industry would become smoother, which would give rise to some sort of interdependence between the Iranian and global economies, which would finally result in technological growth for the country. Even if leading companies decide to pull out, we will activate new mechanisms for cooperation with SMEs, which I explained in response to previous questions, for financing by foreign investors, banks and financial institutes. That would help the county benefit from domestic capabilities to make maximum use of such cooperation. Generally speaking, in light of previous talks and based on feedbacks I have got from foreign companies, I am optimistic about the results of our new strategy.

Have you received any final message from France's Total for severance of cooperation?

As a member of working group engaged in direct talks with Total's highest petrochemical official, I have not received any direct message about Total pullout. I think that they are waiting so that they would make an assessment of new conditions and our negotiations with the Europeans before regulating their strategy.

Hossein Ali-Morad

we are well aware of Asian and European prime banks' agreement with and fear for the Office of Foreign Control Asset (OFAC)

Hossein Ali-Morad

After the JCPOA implementation, JBIC granted a €650 million usance, guaranteed by the Persian Gulf Holding

Iran Petchem Targets Value Chain Completion

Completion of value chain, preventing sales of raw resources and materials and diversity in the production mix are keywords which have been heard from Iranian petrochemical industry officials in recent years as a necessity for the development of hydrocarbon industry. Generally speaking, a value chain is a set of activities that a firm operating in a specific industry performs, in order to deliver a valuable product or service for the market. The idea of the value chain is based on the process view of organizations, the idea of seeing a manufacturing (or service) organization as a system, made up of subsystems each with inputs, transformation processes and outputs.

Inputs, transformation processes, and outputs involve the acquisition and consumption of resources – money, labor, materials, equipment, buildings, land, administration and management. How value chain activities are carried out determines costs and affects profits.

In more clear terms, it is a chain covering all activities pertaining to commodity production and substance transformation, i.e. A to Z of consumer products manufacturing. Now if we apply this definition to the strategically important petrochemical industry, which is diverse in products, its significance will take up added significance. Since most petrochemical products, including polymers, constitute the raw material for downstream industries and will be used in the value chain, it may be concluded that petrochemical products are an intermediary commodity which will generate value as it goes ahead throughout the value chain. It may now be concluded that completion of value chain in the petrochemical industry would mean supply of midstream and downstream petrochemical products and supply of feedstock to petrochemical industry, which has been put forward as a government priority.

Crude oil, associated gas and such products as butane, propane and ethane need to be converted to end products in order to objectives to be realized. The petrochemical industry is a subsection of chemical industry, whose products are derived from crude oil or natural gas. The features of petrochemical industry include diversity of products and supply of feedstock to thousands of downstream plants. That would be instrumental in economic growth in terms of job creation, generation of hard currency value and independence.

Development of petrochemical industry requires projects which would help complete the value chain and supply products of higher value added to feed downstream petrochemical industry. Therefore, completion of value chain, generation of higher diversity in products and upgrading the value of petrochemical products with a focus on upgrading the role of petrochemical industry in national economic indicators was put high on the agenda of petrochemical industry. Plans made for petrochemical industry pursue a single objective, which is to prevent selling of raw materials, compete the value chain and convert basic and intermediary products to products of high value-added.

It must be taken into consideration that huge oil and gas reserves provide easily accessible feedstock to the petrochemical industry for its development in Iran. Given the advantage of feedstock, we have the chance to move towards supplying finished products instead of selling raw materials.

Over recent years, we have witnessed a variety of projects lying in such direction. Meantime, Iran's sixth five-year economic development plan has paved the ground for the balanced development of petrochemical industry and completion of value chain. Therefore, a variety of polymer products, GTPP, etc. have been envisaged for involvement in downstream projects. Based on state plans, the petrochemical production capacity is set to reach 180 million tonnes by 2025 and about 30 petrochemical projects are envisaged for this purpose under the sixth development plan.

Value Chain Completion and Value Creation

Completion of value chain in the petrochemical industry constitutes a significant strategy. Operation of new projects and building downstream units alongside them may lead to the supply of final products and subsequently higher value-added in production. In fact, Iran's petrochemical industry must be programmed so as to reduce selling raw materials in favor of completion of the value chain.

New SP Phases and Chain Completion

The petrochemical industry is the standard-bearer of value creation. Following the startup of new phases of South Pars gas field, the petrochemical industry is prioritizing maximum use of gas feedstock. To that effect, the new projects are planned with a view to completing the value chain.

Value Chain and Job Creation

Another important aspect of value chain is job creation. When downstream petrochemical projects have become operational, many opportunities would be created for job creation. That would help prepare the ground for further development.

Value Chain and Water

Completion of downstream projects in all provinces would reduce dependence on water, reduce need for investment and create more jobs. These advantages prioritize downstream petrochemical industry.

Value Chain and Neighboring Markets

Given consumer markets in neighboring countries, downstream industries could capture the bulk of these markets. To that end, the downstream petrochemical sector has the possibility of undergoing development on larger swaths of Iran's land.

Lower Investment Needs

Development of downstream petrochemical industry is significant in terms of eradicating poverty, creating jobs, generating value and completing the value chain. Compared with midstream and upstream industries, downstream industry needs lower investment with a faster investment return.

Value Chain and Role in Economy

Reza Norouzzadeh, CEO of National Petrochemical Company (NPC) said Iran's petrochemical industry could help boost economic growth once the value chain is completed and downstream industries are developed. "The more the petrochemical sector fulfills its obligations, the more value-added will be created," he said. "Under such circumstances, we will be able to create sustainable jobs and generate higher revenue within the framework of resilient economy."

Existing Capacities

Reza Mohtashamipour, director of downstream division of NPC, said there was big potential in Iran's downstream petrochemical industry. He said that Iran's installed petrochemical production capacity was three to four times the current output. "The priority in downstream industry development is not to create new capacities, rather it is to use the existing capacities," he added.

Value Chain and Profitability

Jafar Rabiei, newly-appointed CEO of Persian Gulf Petrochemical Industries Company, said due to its profitability the issue of value chain was being followed up on seriously. "One of our plans is to create value-added and profits for our stockholders. In our talks with the Ministry of Petroleum and Holdings, we have discussed cooperation in feedstock supply in addition to letting our affiliates step into completing the value chain," he added. "For that purpose, we envisage projects and we have held talks with foreign investors, including Chinese and European, to bring capital and technology into Iran for expanding this chain and supply products of higher value-added."

Advantages of Downstream Petrochemical Development

- Preventing raw materials selling, increasing nonoil exports and pursuing resilient economy
- Possibility of construction across the country to avoid industrial centralization
- Creating high value-added
- Contributing to fair distribution of wealth in Iran
- Contributing to higher national security, particularly along border areas
- Driving national economy
- Lower investment needs compared with upstream and midstream industries
- A higher rate of return on investment compared with midstream and basic industries
- Lucrative regional market
- Diversity of downstream products including plastic, tire, paint and resin, glue, compounds, detergents, etc.
- Relative advantage in terms of access to necessary raw materials
- Much lower pollution compared with other manufacturing industries

Condensate Exports Down as Domestic Use Up

Since taking office in 2013, the administration of President Hassan Rouhani has focused on putting an end on selling raw materials. This issue was followed up on seriously by Minister of Petroleum Bijan Zangeneh although international sanctions against Iran were still in place. The Bandar Abbas Gas Condensate Refinery, known as the Persian Gulf Star, is known as the symbol of initiative to end raw material selling in the fourth decade of the establishment of the Islamic Republic. The treatment facility has undergone development thanks to Iran's historic nuclear deal, formally known as the Joint Comprehensive Plan of Action (JCPOA), with six world powers to help Iran join exporters of refined petroleum products.

Even US unilateral sanctions on Iran's petroleum industry could no longer affect Iran's gas condensate exports because condensate is being used domestically now.

When the JCPOA entered into force in January 2016, Iran had 75 million barrels of condensate parked on water; imagine 37 very large crude carriers (VLCC). Now Iran is feeling comfortable even though US President Donald Trump has decided to restore sanctions on Iran.

Construction of the Bandar Abbas condensate refinery dates back to 2006. It was initially planned to come online in four years to make Iran self-sufficient in gasoline production, but this objective was not realized until 2013. The project was prioritized after the Rouhani administration took office. The first phase of the facility became operational in May 2017 and the second phase was put into operation two months later. Euro-4 gasoline production from the two phases currently stands at 24 ml/d. Iran is currently producing 650,000 b/d of condensate, half of which is used domestically. That means Iran no longer depends on foreign gasoline imports, saving the nation billions of dollars. Ali-Reza Sadeq-Abadi, CEO of National Iranian Oil Refining and Distribution Company (NIORDC), said the condensate refinery had supplied 3.7 billion liters of gasoline, 1.7 billion liters of gasoil, 500 million liters of liquefied petroleum gas and 9 billion liters of other oil products since becoming operational. He added that the operation of this refinery saved Iran $5.4 billion in hard currency.

"The Persian Gulf Star refinery is delivering 24 ml/d of Euro-5 gasoline and 6 ml/d of middle distillate products," said Sadeq-Abadi, adding that the oil products were valued at $15 million a day.

Facilitated Condensate Supply

Gas condensate consumption in Iran is not supposed to be limited to the Persian Gulf Star refinery. Under Iran's 6th Five-Year Economic Development Plan, Iran's gas condensate production, which would reach 1 mb/d, will be consumed domestically. After the Persian Gulf Star refinery, Borzouyeh Petrochemical Plant is the largest consumer of gas condensate in Iran.

Saeed Khoshroo, director of international affairs at National Iranian Oil Company (NIOC), said loading gas condensate started at Shahid Rajaei Port, destined for domestic consumption, recently.

"In order to support domestic industries and prevent selling raw materials, NIOC has in addition to supplying gas condensate from the Ilam and Khangiran fields to resume South Pars condensate supply from Bandar Abbas and then from Assaluyeh once infrastructure has been completed," he added. "Over the past month, 40,000 tonnes of South Pars gas condensate has been supplied from Bandar Abbas," he said.

Condensate Used Domestically

Amid Washington's threat of renewed sanctions on Iran, speculation is rife that Iran's gas condensate exports have dropped. But the fact of matter is that NIOC had long ago decided to provide domestic refiners with condensate.

"Gas condensate supply may increase, in case market demand grows. Furthermore, based on arrangements, the delivery of gas condensate to buyers is timed to ensure production units about feedstock supply for several months," said Khoshroo.

Noting that NIOC has taken action to ensure sustained condensate supply to small domestic refiners in recent years through the Iran Energy Exchange, he added: "In light of increased domestic supply and the impossibility of its supply from Ilam and Khangiran, NIOC has provided the necessary facilities for onshore loading of South Pars gas condensate."

Iran Oil 'Unsanctionable'

In the run-up to November 4, when US President Donald Trump will restore sanctions on Iran's petroleum sector, speculation is rising about the materialization of this decision. Despite repeated threats by US officials to reduce Iran's oil exports to zero, many experts believe that Iran's oil could not be slapped with an embargo. Iran's former National Representative to OPEC Fereidoun Barkeshli, who is now president of Vienna Energy Research Group, tells "Iran Petroleum" that the National Iranian Oil Company (NIOC) has hired the most competent marketers who have proven themselves even during the 1980-1988 imposed war. Here is the full text of the interview Mr. Barkeshli gave to "Iran Petroleum":

Roya Khaleqi

How do you assess the oil market under the current circumstances?

Prior to the 174th ministerial meeting of OPEC and the fourth meeting between OPEC and non-OPEC from July 22 to July 23, 2018 in Vienna, owing to reasonable decisions made by OPEC oil ministers to keep collective output unchanged and remove 1.8 mb/d from the market to deplete major consumers' stocks in 2016, global oil prices were steady enough and the prices were growing in harmony with growing oil demand and world economic growth. The global oil market had adapted itself to the alliance between OPEC and non-OPEC, which comprised 24 small and big oil producers. But new developments having emerged immediately after the 174th meeting perturbed the global market to some extent, causing a $1.65 decline in the North Sea Brent price.

Do you think that the oil market can eliminate Iran's oil now?

Before answering this question, I 'd like to point out that the date of November 4, when President Trump plans to enforce a ban on Iran's oil exports, subject to approval by the House of Representatives and the Senate, overlaps with the date set for midterm elections in the US. Due to a variety of challenges which Trump is faced with, he is likely to lose some of his supporters even from the Republican Party and at best he is likely to realize only part of his threats to exert pressure on Iran. Trump's defeat to [Russian President Vladimir] Putin in Finland's Helsinki has already dented his chance of success in winning seats in the Senate and the House. That would undoubtedly blunt his desired pressure on the Islamic Republic of Iran.

Now as far as Iran's oil sanctions are concerned, it may be said in a single phrase that "Iran's oil is unsanctionable". Although the US may block transfer of Iran's oil money, as it has already done, due to its control over SWIFT, it would be possible to find a solution to this problem. Fruitful negotiations are under way with the Europeans in this regard, which give cause to optimism. It should be also noted that NIOC's marketing system has the best oil marketers in the world, who have proven their competence under the toughest conditions ever since the 1980-1988 imposed war.

In the most optimistic scenario, how much oil can producers supply on the market?

Figures about genuine oil production capacity in OPEC and non-OPEC countries are among the most confidential data in the oil producing nations. We don't know the real production capacity of Saudi Arabia or Russia. For more than twenty years now, Saudi Arabia has been claiming to have capacity to produce 12 mb/d of oil, never seen so far. Even during the Saddam regime's invasion of Kuwait, which took 6 mb/d off market immediately, Saudi Arabia did not prove such capacity. Such cases in oil affairs call into question Saudi Arabia's ability to produce more than 10.5 mb/d. Therefore, an alternative to Iran's oil, i.e. Saudi Arabia, has been sidelined. Russia is facing similar conditions and it may be able to supply oil on the market by dipping into stocks of oil bought from Turkmenistan or Kazakhstan. Of course, Saudi Arabia has also stocked oil in its offshore and onshore storage facilities, which it can tap to supply oil on the market. What I want to say is that producers of conventional crude oil have more or less reached their maximum production capacity and are unable to provide any extra supply. Therefore, in my view, the 24 members of oil alliance may be able to add 1mb/d to their output. Of course it must be noted that Venezuela and Libya have seen their oil output fall by more than 1 mb/d, while Nigeria, Angola and Gabon have hit snags in production.

How much will oil demand reach in the third and fourth seasons of the current year?

The year 2018 has been and continues to be fraught with events for the oil market. The US's recent move to levy heavy tariffs on imports from China and the European Union and the latter's retaliatory measures have disturbed trade ties between industrialized nations. Therefore, it is impossible to calculate any reliable figure for the world economic growth and growth in demand for oil. Therefore, at best, demand for crude oil will increase by 1.8 to 1.9 mb/d.

To what extent can OPEC contribute to market stability now?

Through constructive and strong interaction with market players, OPEC has been instrumental in global oil market stability even under toughest conditions. OPEC owes its success to Iran and Saudi Arabia, which helped keep the market from collapse under very difficult conditions. The global oil market is indebted to OPEC services.

FOCUS

Is US sincere in claiming that it would tap its strategic petroleum stocks after imposing oil sanctions on Iran?

Dipping into strategic stocks was the idea of Henry Kissinger. It was put into practice in 1974 in reaction to Arab nations' oil boycott. The stocks may be tapped only when oil flow stops due to the outbreak of war. The US currently owns 667 million barrels of oil in its strategic stocks with Trump saying at least 35 million barrels may be consumed. That indicates the US government's fear and anxiety after restoring sanctions on Iran. The US did not dip into its strategic stocks even during George Bush's invasion of Iraq.

Removing Iran Oil from Market Challenges and Consequences

Shuaib Bahman

US President Donald Trump, who has unilaterally pulled out of the 2015 nuclear deal signed between Iran and six world powers, has threatened to reduce Iran's oil sales to zero. The main objective sought by the Trump administration is to drive down to nil Iran's oil exports in November in a bid to impose its own policies.
Iran's oil sector has already experienced embargo. But the difference is that in 2012 Iran's oil buyers enjoyed sanctions waiver after cutting their oil purchase from Iran by 20% over a six-month period. This time, the Trump administration eyes a full halt to Iran's oil exports. Such unlawful and unilateral move by the US administration will lead to the failure of the policy of eliminating Iran from global oil market.

Bankrupt Policy

Although the US government has embarked on a diplomatic charm offensive to convince buyers of Iran's oil to stop purchasing from Tehran in a bid to ratchet up unprecedented pressure on the Islamic Republic, global market rules do not follow Washington's decision. To that effect, the US administration's policy of imposing sanctions on Iran's oil will face serious challenges for a variety of reasons: Oil Price Hike: Any decline in or halt to Iran's oil exports would definitely impact global oil supply, which would in return introduce a shock to markets and drive up energy prices. In other words, any decline in or halt to Iran's oil exports would pressure oil markets to unprecedented levels since the 1973-1974 and 1979-1980 oil crises.
Oil prices will be on the receiving end of any such pressure on the market, which would definitely face strong opposition from big consumers like China and European nations.
No Suitable Alternative: Iran is currently exporting about 2.5 mb/d of oil. The US has announced it will do its utmost to minimize any disturbance in oil markets through relying on Saudi Arabia and some other Arab oil producers; however, the reality is that no country, even Saudi Arabia, would be able to offset the market prospective shortage in the short term in case Iran's oil is frozen out. First and foremost there are doubts about Saudi Arabia's alleged spare capacity of 2 mb/d. Second, even if there is such capacity the Saudis will have to win over fellow OPEC members for any increase in output. Without a consensus, it would be impossible for the Saudi government to lift its output to such extent.
Meantime, oil markets are hit by oil shortage due to war in Libya and domestic unrest in Venezuela, not to mention the drop in Angolan and Nigerian oil production. Therefore, a halt to Iran's oil exports would create a void which may not be filled easily. Even if such void is filled with the turn of time, oil prices will be struck with shock in the short and mid-term.
Consumers Independence: After the US unveiled its plot against Iran's oil, many countries including India, China, Japan and South Korea disagreed as they are among traditional buyers of Iran's oil. Under the previous round of sanctions, these countries showed their determination to keep buying Iran's oil under any circumstances. What strengthens the position of the traditional buyers of Iran's oil now is that Europe would not follow US sanctions. If the European Union's proposed package for Iran covers oil sale, Iran will continue to sell oil to Asia and Europe.
Producers' Opposition: In addition to consumers' concerns about any change in Iran's oil supply, some producers remain opposed to the US decision to impose sanctions on Iran's crude oil. Russia's Permanent Representative to the United Nations (Vienna), Ambassador Extraordinary and Plenipotentiary, Mikhail Ivanovich Ulyanov, reaffirmed his country's opposition to the imposition of unilateral sanctions on Iran, calling for Iran's sustained oil supply on markets. He made it clear that Iran's oil would stabilize global market.

Unrealistic Approach

The US initially claimed that it had no intention of granting any waiver to buyers of Iran's oil, saying it was necessary for serving national interests. But as time passed and consumers resisted US pressure, Washington had to rethink and announce that it would consider sanctions waivers for some countries. The US is expected to grant exemption to India, Japan, South Korea and China to be able to keep buying oil from Iran.
Should the US refuse to grant such exemptions, it will face opposition in its anti-Iran policy. It has become common knowledge that the US's unilateral actions against Iran have failed to win any consensus all across the globe. Even Washington's European allies disagree with these sanctions. Furthermore, buyers of Iran's oil will bow to US pressure to stop importing Iran's oil only if they receive guarantees for their energy supply, which is impossible now.
Furthermore, any oil price hike would significantly drive up energy commodity prices, including gasoline prices, in the US, which would directly impact people's everyday life. That would pose a threat to Republicans' chance of victory in the midterm elections scheduled for November 6 this year in the US. That represents a big challenge for President Trump who has sought to prove himself as a successful head of state. Should he stop targeting Iran's oil, his foreign policy will face challenges, but if he exerts pressure on Iran his party will be defeated in the mid-term elections.
While continuing to apparently impose tough sanctions on Iran's oil sector, the Trump administration is unlikely to be able to force buyers of Iran oil to cut their imports from Iran.

Petrobras Puts More Offshore Fields Up for Sale

Petrobras has initiated the non-binding phase for sales of its interests in further fields offshore Brazil.

The latest offers are 50% of the company's non-operated interest in the Tartaruga Verde field and Module III of the Espadarte field, both in deepwater in the Campos basin.

Also offered is Petrobras' entire stake in the shallow-water Baúna field in the BM-S-40 concession in the Santos basin.

At this stage, interested qualified bidders will receive instructions on the divestment process, including guidelines for the preparation and submission of non-binding proposals, and access to a virtual data room containing more information about the fields.

Aasta Hansteen Emerging as Norwegian Sea Gas Hub

Equinor and its partners plan to turn the Aasta Hansteen development facilities into a gas hub for other nearby finds in the Norwegian Sea, according to the Norwegian Petroleum Directorate's latest house magazine.

Aasta Hansteen is due to start production later this year via Norway's first spar platform. At present the cylindrical hull is in the Digernes Sound near Stord on the Norwegian west coast.

The topsides is on its way from South Korea for mating with the hull off Stord.

Mauritania Awards Shell 2 Offshore Blocks

Shell has signed two production-sharing contracts with Mauritania's government for offshore blocks C-10 and C-19, covering exploration and potential future production of hydrocarbons.

"This move represents Shell's entry into the West African Atlantic Margin exploration basin, which has significant potential," said Andy Brown, Shell's Upstream Director.

Thailand Oil Field Operational

Phase 4 development activities will start this month at the Bualuang oil field in the Gulf of Thailand with a rig arriving to drill three replacement production wells and to work over two existing wells. As a result, operator Ophir Energy expects production to rise during the second half to average more than 9,000 b/d. After the program is complete, the company plans to drill the Bualuang North prospect targeting 1-5 MMboe. If successful, the well will be tied into the existing production facilities.

Norway

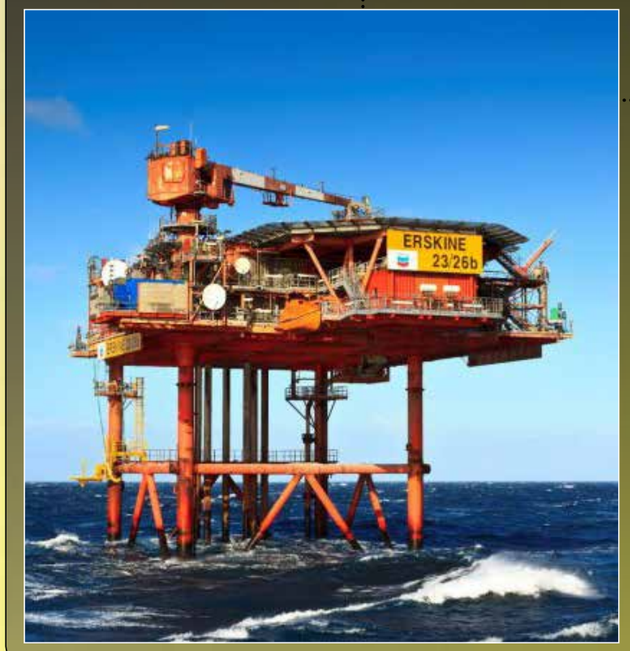
Mauritania

Thailand

Brazil

Australia

VIEW



VIEW

VIEW

Drilling Resumed in Western Australia

3---Australia Makes Big Oil Find

The Quadrant Energy/Carnarvon Petroleum partnership has confirmed a significant oil discovery in the Dorado-1 well offshore Western Australia.

Light oil was recovered from the Caley member, with a gross hydrocarbon package of 96.1 m (315 ft) and a net pay thickness of 79.6 m (261 ft) in porous and permeable sands. This followed wireline testing after the well had drilled down to around 4,044 m (13,268 ft) MD in 8-1/2-in. hole. Currently the well is still in a hydrocarbon-bearing column.

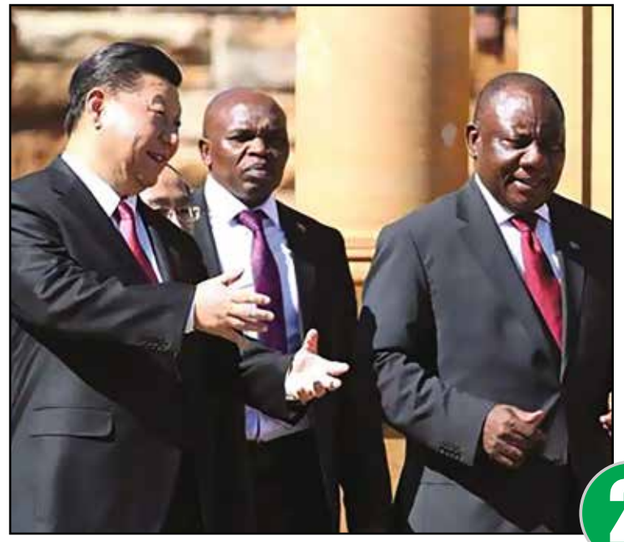
Oil Market Hits a Cyclical Pause

1

Brent crude futures prices are trading in contango for the first time in 10 months, as traders anticipate an increase in crude availability during the remainder of 2018. Brent futures are trading in contango for the four contracts closest to delivery, from September 2018 through January 2019. Hedge funds and other money managers have sold a large number of long positions in recent weeks, depressing the front-end of the curve. Portfolio managers tend to hold a majority of their positions in contracts close to expiry because that's where the liquidity is normally greatest. Just as position-building by the hedge funds spurred the rise in spot prices and calendar spreads in the second half of 2017 and first quarter of 2018, liquidation is now accelerating the correction. More fundamentally, traders have reacted to pledges of increased output and exports from Saudi Arabia, Kuwait, the United Arab Emirates and Russia. Saudi Arabia and its OPEC and non-OPEC allies have responded to pressure from the United States to counter rising prices by increasing their production. Extra barrels have been loaded in June and July, with more promised in August, ensuring increased availability in the second half of the year. Fears about slower consumption growth as a result of a strengthening dollar and the intensifying trade conflict between the United States and China are also weighing on oil prices.

Because the oil market is forward-looking, concerns about the strength of consumption growth later in 2018 and 2019 are being discounted back to lower oil prices in the near-term.

China Pledges $14.7bn Investment in South Africa



2

Chinese President Xi Jinping promised $14.7 billion of investment during a state visit to South Africa, where President Cyril Ramaphosa is on a mission to kick-start economic growth after a decade of stagnation.

The rand firmed more than one percent after Ramaphosa announced China's investment pledge, which takes the amount overseas economies have committed to invest in South Africa to $35 billion since the start of the month.

Those commitments will help ease worries about the health of the South African economy, which has performed poorly despite investor optimism when Ramaphosa replaced scandal-plagued Jacob Zuma in February. "We have agreed that we must work as partners to improve the lives of our peoples by elevating our business, commercial and trade ties," Ramaphosa told a joint news conference with Xi.

Xi said China would take "active measures" to expand imports from Africa's most industrialized economy.

Ramaphosa will host Xi and the leaders of Brazil, Russia and India at a summit of the BRICS group of emerging economies in Johannesburg later this week, where he will be looking to secure further investment pledges. Among agreements signed, Chinese banks lent a combined $2.8 billion to struggling South African state power utility Eskom and logistics company Transnet. Ramaphosa has focused on revitalising Eskom, which received an injection of $2.5 billion from China Development Bank and reported a $171 million full-year.

NEWS

Russia's Petchem Giant Prepares for IPO

Russian petrochemical company Sibur is preparing for an initial public offering (IPO) potentially worth between $2 to $3 billion and which may happen by the end of the year, financial market sources told Reuters.

One of the three financial market sources familiar with Sibur plans said that the company is looking at the possibility of an IPO in Moscow and London and may raise between $2 to $3 billion. Another of the three sources said that the company was looking to raise "a couple of billion dollars" from the deal.

Asked about a potential IPO, Sibur said in a written reply to Reuters that it is considering different "strategic options" how to finance its growth.

3

NEWS

Africa's Richest Man Eyes $4.5bn Oil Refinery

Africa's richest man, Aliko Dangote, has arranged more than $4.5 billion in debt financing for his Nigerian oil refinery project and aims to start production in early 2020, he told Reuters.

Dangote, who built his fortune in cement, is building the world's largest single oil refinery with capacity of 650,000 barrels per day (bpd) to help to reduce Nigeria's dependence on imported petroleum. Despite being a crude oil exporter, Nigeria imports the bulk of its petroleum because of a lack of domestic refining capacity.

Lenders would commit about $3.15 billion, with the World Bank's private sector arm providing $150 million, Dangote said, adding that he was investing more than 60 percent from his own cash flow.

4

NEWS

India Offers Uganda Credit to Boost Energy

India has offered Uganda a total $205 million worth of credit to help the East African country expand its electricity distribution infrastructure and invest in its agriculture sector, which employs majority of its workforce.

A statement issued in Kampala where India's prime minister Narendra Modi started a two-day visit said Modi and his host President Yoweri Museveni also discussed reform of the U.N. security council.

A loan of $141 million would be extended to Kampala to build electricity transmission lines and substations while another $64 million would spent on boosting agriculture and diary production, the statement said.

5

NEWS

Sinopec Expects Best Quarter in Years

China Petroleum and Chemical Corp expects to report its best quarter since 2013, based on Reuters calculations on a company forecast, boosted by a "favourable" downstream refining business and resurgent crude oil prices.

The state oil major and China's top refiner, usually known as Sinopec, said in a statement it expects first-half net profit to rise by 50 percent from 27.1 billion yuan ($3.98 billion) in the same period a year ago.

That would be 40.65 billion yuan, according to Reuters calculations and the highest on records back to 2013. On a quarterly basis, that would be 21.9 billion yuan, the highest for Sinopec since the third quarter 2013, records show.

6

Rosneft Suing Exxon-Led Oil Project

7

Russian oil major Rosneft's $1.4 billion lawsuit against the ExxonMobil-led Sakhalin-1 consortium relates to a row over how oil should be shared between the Sakhalin-1 concession and an adjacent Rosneft field, court papers show.

By bringing the legal action, Rosneft is taking on one of its closest foreign partners: Rosneft and ExxonMobil have multiple joint projects. But Rosneft and its powerful boss Igor Sechin have a track record of assertively fighting their corner in commercial disputes.

Rosneft filed the suit in the Sakhalin district arbitration court in Russia's far east, accusing the consortium of unjust enrichment, an allegation the consortium denied. Rosneft did not disclose the exact nature of the dispute. According to court documents reviewed by Reuters, the court asked Rosneft to present documents related to an agreement over the "cross-flows" of oil from the Northern Chayvo oilfield, controlled by Rosneft.

The Northern Chayvo field is adjacent to the concession area controlled by the Sakhalin-1 consortium. It is commonplace in the oil industry for extraction activities on one concession to influence oil flows on a neighbouring permit, because the oil lies in rock formations that straddle two or more permits.

"Since oil cross-flows can be determined by an examination, most disagreements between companies of this nature are resolved out of court by negotiation," Aton, a Russian brokerage, said in a research note.

NEWS

Algeria to Set Up Oil Trading Venture

9

Sonatrach is in talks with oil majors and trading firms to start a trading joint venture after the Algerian state energy company reached a deal this year to buy its first overseas refinery, its chief executive told Reuters. A decision on forming the venture had been expected at the end of July but could be delayed by a month, two sources said.

"The foreign firm will have small shares in the trade joint venture," Sonatrach CEO Abdelmoumen Ould Kaddour told Reuters in Algiers.

Potential partners, which have held talks with Sonatrach in recent weeks, include BP, Total, Royal Dutch Shell, Chevron, Repsol and Vitol , the world's biggest independent oil trader, the sources said. Vitol, BP and Shell declined to comment. Total, Chevron and Repsol did not immediately respond to requests for comment.

Sonatrach's expansion into refining and trading reflects a shift among national oil companies that for decades focussed on producing oil and gas, while leaving marketing to third parties.

Sonatrach's move to form a venture is one of several steps aimed at easing the burden of its hefty fuel import bill that tripled year-on-year in 2017 to a record $2.5 billion.

It signed a contract this year with Vitol to receive products in exchange for crude, the first such deal in decades, and said in May it had agreed to buy ExxonMobil's 175,000 barrel-per-day (bpd) Augusta refinery in Sicily, Italy.

Colombia to Develop New Oil Bidding Regime

8

Colombia is preparing changes to its bidding process for oil areas in an effort to increase investment and find new reserves, the head of the oil regulator said, after repeated cancellations of its latest oil round. The changes, including contracts adjusted to international crude price fluctuations and the chance for companies to propose exploration on land not yet on offer, will help attract spending and nearly double reserves to at least 10 years of consumption, Orlando Velandia of the National Hydrocarbons Agency (ANH) said. "We're looking to improve conditions for the country, to achieve competitiveness and motivate companies to make proposals about areas," Velandia said in an interview. The ANH in April postponed the deadline to receive offers for 15 onshore areas at its Sinu-San Jacinto auction until the second half of the year. It was the sixth time the round was delayed. Colombia is the third Latin American country hosting oil auctions this year, after Mexico and Brazil. Its bidding round comes after a four-year pause when low oil prices stopped many Latin American countries from offering acreage. Colombia has been awarding blocks to the highest bidder every two to three years, but bidding in the new system will privilege the first company that requests access to additional areas, Velandia said, likely improving the offers of other bidders.

"Once we evaluate the areas and they're added to the map, companies can make offers in a continual competitive process," Velandia said. Companies would no longer be required to outline planned investments or compensate the government if spending falls short, he added.

NEWS

US Refiners Boost Purchases of CPC Blend

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U.S. refiners will import a record monthly volume of crude from the Caspian region in July after snapping up the cargoes when prices reached near six-year lows, according to market sources and Thomson Reuters shipping data. The unusually large volume of crude is one of many changes in the international oil trade caused by a flood of U.S. shale oil headed overseas. Record exports of crude from the United States to Europe and Asia have pushed down the price of comparable oil, such as the crude produced near the Caspian in Kazakhstan and Russia. That oil is pumped through the CPC pipeline and loaded in the Mediterranean.

U.S. East Coast refiners, which rely on crude imports, have bought most of the 3.7 million barrels of CPC crude that will reach the United States in July, according to the Thomson Reuters data. The East Coast refiners have limited access to the oil produced in the shale fields hundreds of miles away in Texas or North Dakota. They buy additional crude from West Africa, Middle East and Europe. That is because U.S. domestic shipping rules can make it more expensive for East Coast refiners to ship crude from the Gulf coast to the northeast than it is to import oil. East Coast refiners "can get oil cheaper from the Urals than the Eagle Ford," said Kyle Cooper, a consultant for options broker Ion Energy. During May, the price of CPC Blend crude fell to a six-year discount to Dated Brent BFO-CPC, making it relatively cheaper than West African grades.

Global Oil and Asian Product Market, July

Dated Brent moved in a tight US$72-75/bbl range over the second 10 days of July. A slew of bearish events have hit the market since then and prices are on a downtrend, erasing the gains made in the run-up to the OPEC meeting held on 22 June. Although there are several push and pull factors at play, supply returns from Libya and Canada, and Saudi and Russian production increases, and the recent US stance on Iranian sanctions amid US-China trade war weigh on the market.

On the other hand, the market has become increasingly focused on the squeeze on spare capacity which has emerged with increased output and exports from the leading members of the supply accord. This will keep price support in place over the next month or two, as overall crude demand remains high, with perceptions of greater tightness driving some additional upside risk in the event of further outages.

The extent of the reshuffle in crude flows due to various political elements is still not clear. In general, the expectation is potential rerouting of at least several hundred thousand b/d of crude to weigh on the Brent complex, if it translates into a significant curtailment of Asia-bound US flows.

Asian Product Markets

Light Distillates (gasoline, naphtha)

Singapore naphtha cracks crashed to a near two-year low in June, averaging -US$2.93/bbl due to high levels of LPG substitution in steam crackers and the weakness in the gasoline market. This has been also evident in Europe, with full-range grades weighed down by a relative lack of blending demand. While refinery yield shifts towards the middle distillate pool, could help take some of the pressure of the light ends complex .

Asian naphtha cracks, meanwhile, have recently rebounded a little after the West/East arbitrage spread had come under increasing pressure over early July. Support from petrochemical players to have firmed post-maintenance season is expected , while South Korean players have continued to pick up full-range cargoes to supplement condensate splitter intake. Nevertheless, the lack of support from the gasoline blending side is also apparent in Asia with Spore 95 mogas cracks having weakened in particular.

Middle Distillates (gasoil, jet fuel)

Gas oil/diesel cracks in the EoS have been recovering over the past few days from a sharp drop in June. Asian cracks have become increasingly dependent on shorts in the West as regional demand growth has struggled to keep up with the brisk pace of last year.

Q2-2018 demand increased by 170,000 b/d y-o-y, compared to 380,000 b/d y-o-y growth in Q1-2018 and 450,000 b/d in Q4-2017. This, together with high crude intake growth and evidence of yield switching towards the gas oil/diesel pool from key markets such as South Korea, means that gas oil/diesel cracks have likely peaked for now.

Jet/kero regards have been on the rise over the last few days. Regional demand growth has remained strong with higher prices being less of a pressuring factor here compared to road fuels and with an emerging middle class in key markets providing a boost to the aviation sector. Partly on the back of this, fundamentals for jet over the next months appear notably stronger than for the gas oil/diesel side. Meanwhile, European import requirements are set to continue rising with the balance there tightening by 60,000 b/d m-o-m (15%), keeping a firm pull on arb barrels.

Fuel Oil

Singapore fuel oil cracks have staged a spectacular recovery from April's 22-month low of -US$7.7/bbl, averaging -US$2.8/bbl month-to-date. This is in line with Asia's fuel oil deficit which is estimated to widen by 36 kb/d y-o-y in July. The drop in supplies continues to outpace the fall in demand with the ongoing startup of S-Oil's 68.4 kb/cd RFCC unit.

On top of this, the largely unexpected return of Pakistan to the buyers' market tightened the market further.

Indeed, Pakistani tender data for August suggests that imports may reach 120,000 b/d. However, it is noteworthy that most of these supporting factors (Iran is the exception) will not last beyond September as peak power generation demand in the Middle East and Pakistan will have dissipated, while there will also be an uptick in incoming flows from the West given the currently favorable arb spread.

Therefore, cracks are expected to weaken beyond September, ending the year at around -$5.50 per barrel.

We see some relevant changes to the global crude slate coming up over Q3 due to sizeable increases in Saudi Arabian and Russian crude production, most of which will be medium-gravity and below. At the same time, we are seeing a slowdown in US y-o-y production growth, while China may shun US barrels. Consequently, we expect to see Asian refiners process a more fuel oil rich crude diet in the near future.

Oman Oil Initiatives

Iman Nikzad

With 5.5 billion barrels of known oil reserves in place, the Persian Gulf state of Oman is ranked the 22nd in the world and the 7th in the Middle East in terms of oil deposits. Oman, with an output of 1 mbd, is known as the 25th largest producer of crude oil in the world, and the largest non-OPEC producer in the Middle East. Like many Middle East countries, Oman depends on petrodollars to keep its economy running. According to official data, oil and gas account for more than 67% of Oman's state revenue.

Oman first started exporting oil in July 1967 at the rate of 544,000 b/d, trading each barrel for $1.42.

Oman delivers crude oil mainly to China, Thailand, South Korea and Japan. Last year, China received 78% of Oman's oil exports. Mina al Fahal is currently the only port where Oman is exporting oil, known as Oman Blend with API=32. Oman is using a two-million-barrel very large crude carrier (VLLC) for storing and loading crude oil ship-to-ship. Over the past two decades, Oman has not seen any sharp fluctuations in its oil reserves and exports.

Last year, two new oil fields were discovered in north of Oman with reserves estimated at 67 million barrels. Oman is currently applying new enhancement technologies like miscible, polymer and steam injection knowhow.

Application of new technologies has significantly reduced crude oil production costs from $9.3 to $8 a barrel. That means Oman would be earning eight to nine times its current oil revenue – good news for the tiny state's economy.

Solar Energy Helps Oil Extraction

Like many nations in the world which have turned to clean and renewable energies, Oman has decided to use solar energy for extracting and producing oil. Therefore, Oman is preparing itself to build one of the largest solar power plants in the world. This power plant will not be used for generating electricity; rather, it would be used merely for boiling water to produce oil. The Miraah solar facility is able to generate 1GW of energy to be used for oil production. Miraah comprises rows of glasses which are curved at the direction of a boiler pipe filled with water. The steam produced by this plant will be used for softening heavy crude oil in order to facilitate its pumping to the ground. Miraah is expected to save 5.6 trillion BTU of natural gas a year, which would be enough to supply energy to 209,000 households in Oman. The solar energy production capacity of Miraah will be 6,000 tonnes of steam, which would reduce gas consumption up to 80%. The steam produced in Miraah will be used in enhanced recovery from Amal West oil field.

The Miraah facility, which is spread on three square kilometers of land, has cost 4600 million.

Petroleum Development Oman (PDO), in cooperation with Glass Point, has finished the first phase of the Miraah project.

PDO plans to become more involved in management of water and renewable energies in a bid to shift its mission from an oil and gas industry regulatory company to a company regulating energy resources.

Oman Shale Oil and Gas

PDO runs more than 90% of Oman's oil reserves and operates 70% of its oil production. PDO is held at 60% by the Omani government, 34% by Royal Dutch Shell, 4% by French energy major Total and

2% by Portugal's Partex Oil and Gas. Oman's largest oil block, Block 6, is administered by PDO.

Occidental Petroleum is currently the largest foreign company in Oman and the second largest oil producer in the country. Occidental Petroleum controls Block 9 and Block 62 in the north and Mukhaizna in the south.

The Consolidated Contractors Energy Development (CCED) is in charge of Blocks 3 and 4. CEED is held by Oman (50%), Sweden's Tethys Oil (30%) and China's CNPC (20%).

Daleel Petroleum, which runs Block 5, is a joint venture 50-50 by Oman's Petropas and CNPC. Petropas runs Block 7 and Rima Cluster oil field in southern Iran.

Spain's Repsol, South Korea's KOGAS, Britain's BP, Partex, Total and Shell are other important companies involved in Oman's petroleum industry.

In addition to PDO, the Oman Oil Company (OOC) is tasked with investment in the energy sector in the country.

Oman has currently two refineries with a refining capacity of 304,000 b/d of oil. Mina al Fahl is Oman's top refinery with a capacity of 106,000 b/d. It came online in 1982. The Sohar refinery, which came online in 2006, can process 116,000 b/d of oil. The Oil Refineries and Petroleum Industries Company (ORPIC) is in charge of running these refineries. In 2016, ORPIC managed to raise the Sohar refining capacity to 198,000 b/d.

Oman also holds a 26% share in India's Bina refinery whose capacity stands at 120,000 b/d.

Oman feeds 186,000 b/d of crude oil into refineries to produce petroleum products whose amount is not too much.

Oman's pipeline network is mainly based on the delivery of crude oil to Mina al Fahl, the only oil export terminal in the country. The pipeline also feeds industrial and petrochemical plants, which are an integral part of economic development plan, as well as oil and gas dependent downstream industries in the country. PDO operates more than 1,600 kilometers of pipeline across the country. Furthermore, the Omani state has launched an export terminal to develop the Sohar refinery.

Oil Fields and Pipeline in Oman

The most important strategic oil projects which Oman intends to operate by 2021 are the 230,000-barrel Ad Duqm refinery in partnership with Kuwait Petroleum International (KPI) for $7 billion, construction of several petrochemical plants near the refinery, and building crude oil and petroleum product storage facilities with capacity of 200 million barrels in the Ras Markaz area. Under an agreement signed between PDO and KPI, the companies have each 50% of the Ad Duqm refinery. Oman and Kuwait will also supply necessary crude oil to the facility in equal shares.

This is the first investment project for an integrated refining and petrochemical project in a member state of the Gulf Cooperation Council (GCC). The aforesaid project will be also the first refinery in the GCC area to import crude oil as feedstock.

Oil analysts say the storage facilities whose capacity is more than Oman's need; constitute the most important section of the megaproject. In case other Persian Gulf states carry crude oil or petroleum products to the storage facility they would be able to reduce the tankers route five to seven days for selling their products in the Arab Sea. That would shorten time for the delivery of products to target markets and create economic incentives for buyers of refined petroleum products without having to go through the strategic Strait of Hormuz where 18.5 mb/d of oil is transited. Meantime, the strategic Ras Markaz area, which is located at the intersection of Middle East, Asia and Africa, will take up added significance. Oman intends to bring on stream the first phase of these storage facilities by 2019.

In light of huge investment made by the Persian Gulf littoral states in crude oil enhancement and refinery construction projects with a view to boosting refined petroleum product exports capacity, oil analysts believe that construction of new storage sites and loading terminals outside the Persian Gulf and the Strait of Hormuz, nearer access to consumer markets, shortened distance for oil tankers and attraction of new oil buyers have taken up added importance for these nations. Based on such viewpoint, Oman is trying its best to finish the Ad Duqm petrorefinery in order to boost exports and create a big hub for storage and export of refined petroleum products in the Ras Markaz area to reach aforesaid objectives.

RIPI Develops Drilling Additives Formulation

The pace of development in oil and gas industries unimaginably depends on drilling. Drilling is known as master key to development of hydrocarbon reservoirs. It is a global industry which has made significant advancement in every aspect. However, Iran has so far failed to catch up with other countries in terms of its development. Upon the request of the Directorate of Research and Technology of National Iranian Oil Company, RIPI was tasked with developing strategic chemical additives used in the drilling, completion and stimulation of wells. To know more about RIPI's breakthrough, "Iran Petroleum" has conducted an interview with Ebrahim Taleqani, NIOC director of research and technology. The full text of the interview is as follows:

Why did NIOC feel the necessity of taking action in the field of drilling additives and related technical knowhow?

Since several years ago, we shifted the strategy of research and technology to conducting research and practical studies. But first and foremost, universities and research centers had to become familiar with oil issues and needs during a specific period of time. Despite 100 years of background, oil production was delayed due to lack of scientific support and research maturity at universities. One of parameters for defining objectives in practical research was to meet petroleum industry needs, particularly in cases which inflicted heavy costs. One of them was mechanical equipment and chemical substances, which are currently imposing costs on the petroleum industry. Chemical substances are largely used in wells.

Our objective is to develop knowhow to manage consumption of chemicals and indigenize their domestic production. Foreign service companies cross through these layers because of having necessary knowledge and high-quality materials, but we have been harmed. In addition to the exorbitant costs of these additives, their quite low quality was one of major reasons justifying the implementation of this project.

Does it mean that the project has had economic advantages in addition to scientific, research and technological privileges?

Yes, of course! Economically speaking, tens of billions of rials has been saved in the country as it was spent on imports. This project has provided the ground for saving hard currency and creating jobs in the country.

Another aspect pertains to environmental issues. When these wastes are released they impact the environment and they need to be managed.

Another issue is the management of reservoir, particularly substances which we use during drilling for well control. For example, in order to prevent drilling mud from contacting the interior of the well these substances penetrate and when the well becomes operational the same materials block oil flow. In other words, we inflict damage on the geological layers on one hand and consequently production falls and we have to use acid anew. That would pollute the environment, disturb production and impose heavy costs. This was the problem we faced with in all wells. When all these issues were put together, RIPI which is a professional center with long background in this sector decided to embark on a project. That was the beginning of chemical additive self-sufficiency megaproject to serve the drilling industry. This project has been divided into three sections; acid and fluid, cement and drilling mud.

What potentialities and capabilities did you consider in choosing RIPI for that purpose?

This project is multi-pronged. Universities are often one-dimensional. A university may fare well in cement research and another one may have good performance in drilling mud. But the important feature of RIPI is its numerous research sections in the upstream division, which enable it to operate like specialized healthcare center or clinic for offering consultation to industry.

As far as this project is concerned, the reason why RIPI was chosen in the cement sector was that RIPI is known as a reference lab in the sector of cement and its additives. This potentiality of RIPI, like previous experiences and strategic projects envisioned by the Directorate of Research and Technology throughout the 4th national economic development

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plan, inspired the belief that RIPI was fully ready to provide services in basic sciences. Furthermore, RIPI has used the capacity of universities and centers of excellence as well as companies involved in this sector in the country.

How come we had not developed such material in the past years? Was it not necessary to do so?

Research in the petroleum industry is not even 12 years old yet. When this project started, research was 11 years old and we had to manufacture such materials; however, there was no scientific and research support. Additives are not merely a chemical. They are rather a combination of several materials, each of which having their own application. These materials interact among themselves and affect one another. They have to be placed alongside each other inside the well where temperature and pressure of soil is fluid. If no overlapping happens throughout this process, conflicting impacts will occur. Substances A and B, when used alone, are influential, but they may give no result when juxtaposed. A number of substances must be placed alongside each other. That is when knowledge makes sense. Otherwise, manufacturing a substance and its injection into well could have been done very easily at a chemical lab. Combining materials in different wells would give meaning to science and we have mastered this science in this project. Presenting a single copy of combined materials would not make sense in all wells. Our experts have sufficient skills to consider a specific combination for every well with its own special features.

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Could such achievement apply to all wells?

It may be argued that 'additives formulation design' happened in this project. Formulation design is also available, but for each well we need to have a specific combination of additives. Therefore, we will need a variety of specialties. In 2013, projects were shifted from research to practice, converting idea to product. It was a megaproject whose findings are tangible now. Regarding these products and additives, we have already left behind the lab, semi-industrial and even industrial scale and field test and received final confirmation. In this triangle of cooperation, RIPI and its research units constitute the first side of the triangle, NIOC Directorate of Research and Technology, serving as client and party to contract, as the second side, and an operational company (Directorate of Exploration, Iran Central Oil Fields Company) as the third side. They trustfully provided this well to this project for testing additives.

How many wells were tested?

The test field for the developed additives was to be conducted in three steps. For that purpose, Well No. 22 of Cheshmeh Khosh oil field, administered by Iran Central Oil Fields Company (ICOFC), was envisaged. Two field tests were conducted for two depths with different sizes of drilling bit and casing.

An outstanding feature of this project was the establishment of a "project team" rather than a traditional method of client-contractor. In this team, RIPI and NIOC were cooperating together. Of course, in legal context, they are referred to as research contractor and client. The project team was instrumental and therefore this kind of management resulted in the success of the project.

In some cases, when we did not reach any conclusion inside the well we had to return and reexamine the compounds to reenter the well. But the well had left behind that stage and we had to locate a new well or wait for the same well to return to previous conditions. Fortunately, throughout the project we were never faced with the hurdle of non-handover of a well. All necessary sides were placed alongside each other and belief in the conclusion of work brought this project to fruition. I believe that this project is now 20% complete and the remaining 80% depends on the application of what has been developed now. We have brought to existence what did not exist previously. We have transformed a scattered knowledge into a professional and cohesive one. This knowledge will prove useful when it is used regularly and our knowledge bank is upgraded to see the economic benefits of application of the achievements of this project.

What is your specific plan for upgrading the project at this stage?

We have to step into technological trading. Trading and use of these technological findings have their specific mechanisms. If researchers were merely working with materials at a time, this process becomes different on industrial scale and legal and corporate issues are brought up. Drilling technological services need to be provided from now onward.

RIPI owns license and knowledge for the project. But will it accept to become a contractor? For instance, someone is author, but a publisher too. Knowledge is developed by the author. In our own context, RIPI scientists have produced science. In an environment like a company, science should be transformed into trading and service-providing to production and exploration wells. Knowledge is not exported. It is like an IP serving the value-added of units. Each company has its own IP. IP outputs are seen in the optimal management of the product. The outputs are technological services. That needs to be done inside or outside the country throughout specific procedure and mechanism. This is one of important issues we have to deal with. At RIPI, there is potential for the materialization of legal procedures of technological trade.

Would you please explain the economic benefits of this project, particularly in terms of saving hard currency?

Economic benefits could not be compared merely with paying or not paying money. For instance, we have 10 rigs which may be able to operate as efficiently as 60 rigs in case of upgraded productivity and quick drilling. That would save us 10 rigs a year. No money has been transacted for these 10 rigs. These are hidden costs which must be taken into account.

Multiply the number of wells suffering from such problem by the purchase costs and the rental of rigs. This is how we can save on costs, which would equal several rigs per year. A criterion for measurement in the drilling industry is the number of days of drilling. For example, if drilling finishes 75 days and not 80 days as initially planned that would be important. International companies complete a well in 30 to 35 days and they drill 10 wells a year. We can do 3 to 4 wells a year. If we cannot drill five more wells it would be like not having two more rigs. Now if we examine drilling plans and take into consideration the number of wells to be drilled, we will notice that the number of drills is an indicator of how many years we have lagged behind in drilling. One option to compensate this shortcoming would be to raise the number of rigs and enhance their efficiency. For that purpose, we need to boost the pace of drilling.

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11 Championships in 14 Years

NIOC Runner-up in Kazakhstan Athletics Matches

Iran's Petroleum Ministry has made acceptable investment in sports. A variety of teams have been active in different disciplines and reached good results. One of these disciplines has been athletics. NIOC-sponsored athletics team has proven successful in recent years, winning top prizes in international competitions. Throughout its activity inside Iran, the NIOC team has won championship titles on many occasions besides winning honors at the international level.

Amir Sadeqi-Panah

In 2004, the Iranian government passed a motion on the recruitment of sport champions by ministries. After that decision, a number of national athletes were hired by NIOC. That was the kick-off of NIOC Athletics. In the same year, NIOC Athletics competed in national athletics league. An initiative also started to pick the athletic children of NIOC employees. More members joined NIOC Athletics and now 14 years after, this team has managed to win top honors.

Supporting National Champions

Over these years, NIOC Athletics has strongly supported national athletes, making efforts to allay economic concerns of national players. In light of the financial conditions of the Islamic Republic of Iran Athletics Federation, NIOC Athletics contribution has been of great help. The athletes put up by NIOC have contributed to the brilliant future of this team as they have shown a strong performance in international matches.

National Honors

A review of honors achieved by NIOC Athletics at the national level makes everything clear. Throughout 14 years of activity, this team has won 11 championship titles, which is a record. NIOC athletes finished runner-up once and came third twice. That has been unique for Iran's athletics.

International Record

NIOC Athletics has record of presence in numerous international matches. Although there are no centralized athletic matches in Asia, NIOC athletes managed to take part in international athletics matches on some occasions. Kazakhstan recently hosted an international athletics event, in which teams from 12 countries participated. NIOC Athletes finished runner-up in the Kazakhstan matches. Individually, three gold, three silver and three bronze medals were won by NIOC athletes. NIOC Athletes also won the championship title in the international matches held on the occasion of the anniversary of the 1979 Islamic Revolution.

In the past, NIOC Athletes had competed in China-Taipei, Hungary and Kazakhstan tournaments, winning titles.

Numerous National Athletes

Most NIOC athletes are national players who have made contribution to Iran's athletics. Some of them are Ali Samari in disc throw, Keyvan Qanbarzadeh in high jump, Reza Qasemi in 100 meters and 200 meters, Moslem Niadoust in 1,500 meters, Amir Moradi in 800 meters and 1,500 meters, Hossein Kayhani in 3,000 meters steeplechase, Reza Moqaddam in hammer throw and Ayoub Azakhi.

Therefore, NIOC Athletes have been supportive of Iran's national team and NIOC athletes have participated in most Asian and international matches. These athletes are expected to take part in Indonesia-hosted Asian matches, shortly.

Exclusive Interview

Interview with NIOC Athletes Coach Iraj Eyri

Our Team Is Cornerstone of Iran Athletics

NIOC Athletics owes its success to head coach Iraj Eyri. Eyri, who was a leading athlete in Iran, is now serving as the head coach of NIOC Athletics. In an interview with "Iran Petroleum", he has shared his views about NIOC Athletics as follows:

Would you please tell us about NIOC Athletics?

Your team has shown strong performance in recent years. This is the result of efforts made by a group. Thanks to support from the Petroleum Ministry and NIOC, in recent years we have had memorable days and time. Now we have grown into Iran's athletics center of excellence. We are now a major pillar of Iran's Athletics.

It seems that there are many national players in NIOC Athletics, is that right?

Yes, of course! In recent years, due to being supported by NIOC managers our club has been a major sponsor of athletics in Iran at the national level. Now you can see that most athletes hail from NIOC and improve their performance before joining national team.

A large number of NIOC Athletes members will attend Asian games in Indonesia to represent Iran. Are you optimistic about winning the championship title?

Over the past couple of years, we have proven ourselves in international matches. In the latest match we attended, we managed to win the second title in a 12-team tournament of Kazakhstan. That was a big event. I assure you that we have given prominent athletes to the national team, each of whom will be able to shine in the Indonesian athletics matches and put up Iran's flag. We are very optimistic that these

athletes would win the national athletic team valuable medals and become a source of honor and pride for our country.

Do club managers provide sufficient support for the athletes and technical staff?

Sure they do! Were it not for their support we could never achieve such success. As I mentioned we have been among the best in recent years. Through 14 years of our activity, we won the championship title 11 times, while we finished second or third three times. I feel compelled to offer my gratitude to Mr. Qouchani, current manager of NIOC Athletics, due to his relentless efforts made for this team. I am also thankful to other managers at the Petroleum Ministry and NIOC for their support for our team. I hope that we would be able to meet their expectations in the future.

Kerman, Land of Historic Wonders

Kerman is among historically important provinces in Iran. Due to myriads natural sites and tourist attractions, Kerman has long been a remarkable sight-seeing destination for both Iranian and foreign visitors. Kerman Province is home to five UNESCO-registered sites. No other province has as many UNESCO-listed sites as Kerman. Besides the provincial capital, Kerman, other cities are also home to historical monuments and natural attractions. Here is a review of tourist attractions in the cities of Rafsanjan, Anar and Babak.

Haj Aqa Ali Rafsanjan Domicile

With a built-up area of 7,000 square meters, Haj Aqa Ali Domicile is known as an architectural masterpiece in Iran. It is the biggest adobe house in the world, built in 1757 by Haj Aqa Ali Mulla Zaim. At that time the Qajar dynasty was ruling in Persia.

The monument has eight sections: bazaar (with 21 ceilings of various trigonometrical shapes), water reservoir (decorated with brick and tilework and designed to supply water to Qasem Abad village), 40-column mosque, bathroom, and ice reservoir.

Rock Village

Meymand is a rock village near the city of Babak. The cave-shaped houses of residents of this village have been built in the mountain. The village is several thousand years old. Meymand is among the first places where humanities settled in Persia. It was registered on UNESCO Cultural Heritage list in 2015.

Photo: Hassan Hosseini

Photo: Hassan Hosseini

Bayaz Village

Bayaz village is located in the north of Kerman Province, close to the city of Anar. The outstanding feature of Bayaz is cotton plants which blanket the village in white. In Arabic, Bayaz means white, referring to cotton plants. Historical monuments, aquifers and old mills, an Abbasid era caravanserai, a mosque, a water reservoir and a castle are among tourist attractions of the village.

Lake Makhrageh

Lake Makhrageh is located 32 kilometers south of Babak, stretching in a vast desert land. Among important points with this lake is that it would be possible to enjoy traveling there from one point to another while watching the reflection of sky. It may be compared with Bolivia's Salar de Uyuni, which is the world's largest salt flat.

Kerman, Arg e Anar

Photo: HASSAN HOSSEINI