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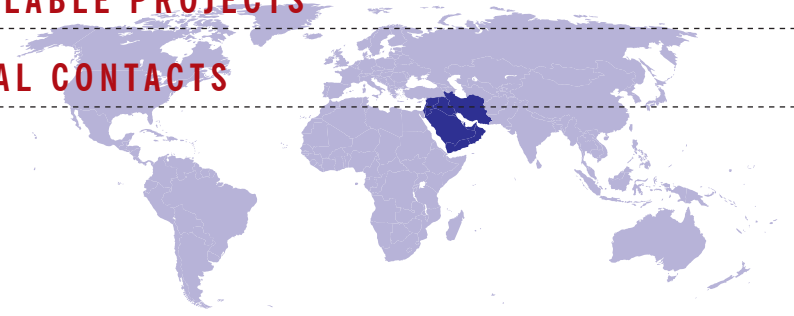
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Have a question or comment? Contact the editor – Ian Simm (ians@newsbase.com)

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# Iran: opportunity knocks

## OVERVIEW

JANUARY 16 saw the lifting of a wide range of sanctions imposed upon Iran by the European Union (EU), with the International Atomic Energy Agency (IAEA) verified that the Islamic Republic had implemented measures set out in last year's Joint Comprehensive Plan of Action (JCPOA).

Iran has been off limits to most foreign investors for nearly a decade and is home to the second and fourth largest reserves in the world of oil and gas respectively. Unsurprisingly, it is regarded as El Dorado by many international corporations, particularly those in the energy sector.

With 'Implementation Day' now behind us, international oil companies will scramble for stakes in the biggest and best projects in Iran, of which there are many.

The hydrocarbons prize is significant – 158 billion barrels of proven oil reserves and 1,200 trillion cubic feet (34 trillion cubic metres) of gas. Despite having more than a century of

experience of oil production, the Iranian energy sector is in dire need of investment and new technology. While Iran has been vocal about its abilities to increase its oil production by as much as 500,000 barrels per day immediately following the lifting of sanctions, *NewsBase* expects the actual uplift to be closer to 300,000 bpd within three-six months.

Investments made within the next 12 months will take time to filter down to the wellhead, and we foresee a more significant rise in output in around 2017/18 as current developments benefit from new technology – including from enhanced and improved oil recovery (EOR and IOR) – and increased liquidity. *NewsBase Research* estimates that undeveloped fields will add another 100,000-200,000 bpd or so by 2020.

With sanctions now being lifted, this *NewsBase Special Report* will provide insight into many of the key areas of interest for potential investors in Iran's hydrocarbons sector. ❖

## MAJOR FIELDS:

Iran's major oil fields include:

- Azadegan
- Yadavaran
- Ferdows/Mound/Zagheh
- Marun
- Ramin
- South Pars Oil Layer
- Band-E-Karkeh
- Mansour Abad
- Changoleh
- Azar
- Esfandiar
- Ahvaz
- Aghajari
- Gachsaran

## FACT BOX

The Islamic Republic of Iran has land or sea borders with 15 countries, and a population of around 78 million with a GDP per capita of US\$16,463.

Iran's proven oil and gas reserves are the fourth and second largest in the world, totalling 158 billion barrels and 34 trillion cubic metres respectively - around 10% and 15% of global totals. Roughly 60% of the country's economy is centrally planned, with more than 40 industries directly involved in the Tehran Stock Exchange.

In recent years, the Iranian rial has suffered as a result of the sanctions imposed on the country, and in early 2015 it has not traded at less than 27,000 rials to the US dollar.

Iran has been active in E&P for more than 100 years. The first successful well was Masjid Suleiman-1 in 1908. Since then, 145 fields and 297 oil and gas reservoirs have been discovered, with many having multiple pay zones thanks to the Zagros Fold and Thrust Belt in the west of the country.

Iran's current oil production is around 2.8 million bpd, down from just over 4 million bpd in 2011. Sanctions have also seen its oil exports fall to a recent average of around 1 million bpd from 2.5 million bpd in 2012.

# South Pars: the key to Iran's grand gas expansion plans

## SOUTH PARS

THE giant South Pars field remains the cornerstone of Iran's strategy to increase its natural gas production up to 1 billion cubic metres per day by 2018.

It is thus little wonder that with 'Implementation Day' for the rolling back of sanctions having now occurred, much fanfare accompanied the official inauguration of Phases 15 and 16 in southern Bushehr province by President Hassan Rouhani and Oil Minister Bijan Zanganeh in mid-January.

Prior to full completion, production in the two phases since December 2013 has totalled 15.5 billion cubic metres of gas, along with 14 million barrels of gas condensates, 3,000 tonnes of sulphur, and around 5,000 tonnes of ethane, yielding around US\$4.5 billion worth of products for Tehran.

Now completed, the daily combined production target of the phases has been raised to 56.6 million cubic metres per day – up from the original target of 51 mcm per day – 75,000 barrels per day of condensates, 400 tonnes per day of sulphur, 1.05 million tonnes per year of LPG and 1 million tpy of ethane.

This is an integral part of the overall plan for the South Pars field to generate at least 785 mcm per day by late 2017/early 2018, as it accounts for around 40% of the country's estimated 33.8 trillion cubic metres of natural gas reserves and around 60% of its gas production, in addition to having around 17 million barrels of condensate in place.

Not only would this lead to greater export revenues, but it would also reduce Iran's reliance on imports to meet its domestic power consumption needs, which currently stand at around 430 mcm per day, mainly coming from Turkmenistan.

With gas central to Iran's refining and

petrochemical plans, Tehran has been expediting the development of the non-associated gas field – a 3,700-square km sector of the 9,700-square km basin shared with Qatar (in the form of the 6,000-square km North Field). It accounts for around 40% of the country's estimated 33.8 trillion cubic metres of natural gas reserves – mostly located in the southern Fars, Bushehr and Hormozgan regions – and around 60% of its gas production.

## Phasing in

The development has been split into 24 individual phases, with 2 and 3 having gone online in 2002, and at least eleven others having commenced production since then.

As part of its grand plan to boost the output of South Pars (currently, Iran's only major offshore gas-only field in production) by 60% over the next two years, progress on the remainder is well underway, according to a statement in January by Zanganeh.

The EIA said last year that high existing production rates on both sides of the field's shared basin (Iran's South Pars section and Qatar's North field) have caused the pressure to drop in many wells, reducing flow rates, despite the North field still being the subject of a moratorium on expansion.

For its part, Qatar has sought to lay much of the blame on Iran, repeatedly saying that too much production drilling might impair recovery rates for both sides.

Given this, Qatar has offered to give Iran advice on technology and share the results of the studies on the geology of the basin, whilst on Iran's side, it has said that it wants the two countries to work together to maximise production and co-operate on development of the shared resource.❖

“ Over the last year, Rouhani has formally inaugurated several phases of the South Pars development. The field is central to Iran's plans, and will be the key to the success of the country's downstream sector.



# Yadavaran: high hopes

## YADAVARAN

THE development of the Yadavaran oil and gas field is both a cornerstone of Iran's overall hydrocarbons development strategy and a microcosm of how Iran wants its key energy fields to be developed in the future.

All the more so as, although initial studies estimated the field's oil resource at 17 billion barrels, with an EIA-estimated 3.2 billion barrels of recoverable oil reserves and 2.7 trillion cubic feet (76 billion cubic metres) of recoverable gas reserves, Hadi Nazarpour, the Yadavaran project's director for National Iranian Oil Co.'s (NIOC) subsidiary Petroleum Engineering and Development Co. (PEDEC), said in January 2015 that recent explorations have pointed to a total oil capacity of 34 billion barrels.

Yadavaran is located in the south-western province of Khuzestan and is one of the oilfields of the West Karoun oil region.

### Foreign involvement

The key reason for Iranian Oil Minister Bijan Zanganeh's recent visit to Beijing – his first since assuming his post two years ago – was to ensure that the vital role that China has played in Iran's oil and gas industry since the imposition of US, European, and UN, sanctions over the years is expanded in investment terms and extended in terms of technology employed on the ground in the country's hydrocarbons fields.

Underlining this was the announcement in April 2015 by senior Iranian officials of a landmark visit to Tehran by China's President Xi Jinping in the near future and the statement by the head of Iran-China Joint Chamber of Commerce, Assadollah Asgarowladi, in Tehran, that: "The West will not take the place of China in our market, and neither Iranian traders nor the Chinese are the least concerned about Iran's agreements with the West."

He also said that trade with China over the previous 12-month period had already hit US\$52 billion – the limit of Beijing's investment quota in Iran's hydrocarbons sector development projects for the March 2014 to March 2015 period, having been increased from US\$25 billion in December 2014 – and added that, with the start of the Sixth Five-Year Economic Development Plan starting in March 2016, Iran is determined to raise the volume of trade with China to US\$60 billion over that year, implying another imminent increase in China's investment quota into Iran's hydrocarbons sector.

This said, the relationship between Iran and China in the development of the country's hydrocarbons sector in general, and seen in Yadavaran itself, has not always been plain sailing (see: *Re-emergence puts relations under spotlight*, page 22), and Zanganeh's visit to

Beijing was also aimed, *NewsBase* understands, at remedying previous problems in this respect, and laying a mutually acceptable framework for co-operation in the sector for the future.

Having said this, Iran's plans for Yadavaran, and other oil and gas fields, are not dependent on China, with Russia already a major investor in the country, and extremely keen to become even more involved, particularly in the country's gas production and export projects, following the cancellation of the South Stream project, *NewsBase* understands from senior sources in the Russian administration.

In general terms to begin with, say the Moscow-based sources, Russia – through a variety of state-controlled international oil companies (IOCs), notably Gazprom and LUKoil – is interested in meeting any and all of the US\$30 billion of additional investment estimated by the Iranians as required to hit its target of increasing natural oil gas production up to 1 billion cubic metres per day by 2018/19, over and above the funding already committed by Moscow to complete outstanding unfinished gas projects.

These include upgrading pressure relay posts, expanding the Ilam, Fajr, Jam, and Hasheminejad gas refinery plants, and the completion of any or all of the 6th, 10th and 11th Iran Gas Trunkline (IGAT) domestic/regional pipelines.

In the case of Yadavaran, much preparatory project work has already been done by the Russians, in conjunction with Belarus, based on the work done in 2007-2009 prior to Belarus state-controlled oil and gas firm Belaruseft signing a US\$500 million initial development deal in 2009 with NaftIran Intertrade for the development of Iran's Jofeir oilfield, before the US State Department stymied the deal by imposing sanctions on the Belarussian firm in 2011.

### Contract terms

Existing buyback contracts of the sort that Sinopec signed at the end of 2007 to invest US\$2.2 billion to develop Yadavaran are also to be modified in line with the new Integrated Petroleum Contract (IPC) style, *NewsBase* understands, which augurs well for the field's development plans, in line with Iran's broader oil and gas short- and long-term output targets.

In its first phase of production, in 2013, Yadavaran – comprised of two former fields, Koushk (discovered in 2000) and Hosseinieh (discovered in 2002), and jointly owned with neighbouring Iraq (in which it is called the Sinbad field) – produced 25,000 barrels per day on the Iranian side.

This figure that has now increased to average around 54,000 bpd, with 55 wells having been drilled as of the start of January 2015, according



The following are a range of projects put out to tender by the National Iranian Gas Co. (NIGC). Start-up dates are those envisaged in the original planning.

Should you be interested in participating in these developments, please contact Hedayat Omidvar, NIGC's Head of Communication Affairs - [omidvar@nigc.ir](mailto:omidvar@nigc.ir). ❖

<b>Tank Name</b>	Yorsha	
<b>Specifications</b>	<i>Maximum Daily Injexion for storage (MCM)</i>	3
	<i>Injection Time (Months per year)</i>	8
	<i>Maximum Storage Volume annually (MCM)</i>	230
	<i>Extraction Time (Months per year)</i>	4
	<i>Maximum Periodical Extraction Possible (MCM/day)</i>	4.8
<b>Plan Implementation Cost Estimation</b>	200 billion rials (US\$7 million)	

### ***Underground natural gas storage in Shoorijeh tank 1st Phase***

<b>Execution Location</b>	Khorasan-e Razavi province
<b>Tank Type</b>	Hydrocarbon
<b>Projected Scheduled Time</b>	2010-2013
<b>Maximum daily injection for storage</b>	10 million cubic meters in the 1st phase
<b>Maximum periodical extraction possible per day</b>	20 million cubic meters in the 1st phase
<b>Investment Level</b>	2,200 billion rials (US\$77 million)

### ***Construction of gas pressure booster installations in the 8th trans-Iranian Gas Pipeline***

<b>Execution Location</b>	Fars and Esfahan Provinces
<b>Explanation</b>	Kheyrgoo, Khanj, Jahrom, Arsanjan, Safashahr, Dehshir, Nadushan, Ardestan and Kashan stations
<b>Capacity</b>	About 110 million cubic meters per day for each station
<b>Projected Scheduled Time</b>	2009-2013
<b>Investment Level</b>	8,800 billion rials (US\$310 million)