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IRAN

OIL & GAS REPORT

INCLUDES 10-YEAR FORECASTS TO 2026



Iran Oil & Gas Report Q2 2017

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BMI Industry View

BMI View: Gas production and consumption will continue to grow in 2017 due to new phases of South Pars increasing gas availability. Oil production and exports will increase around 230,000b/d in 2017, roughly reaching pre-sanctions levels. Refined fuels exports will rise following the start up of the first phase of the Persian Gulf Star refinery.

Table: Headline Forecasts (Iran 2015-2021)

	2015	2016e	2017f	2018f	2019f	2020f	2021f
Crude, NGPL & other liquids prod, 000b/d	3,300.8	3,653.6	3,915.7	3,937.6	3,955.9	4,030.6	4,072.6
Refined products production, 000b/d	1,676.0	1,618.3	1,722.0	1,833.5	1,900.5	1,913.8	1,927.2
Refined products consumption & ethanol, 000b/d	1,544.4	1,505.4	1,554.5	1,614.7	1,652.4	1,687.1	1,712.4
Dry natural gas production, bcm	192.5	218.2	237.8	242.5	243.7	245.0	246.2
Dry natural gas consumption, bcm	191.2	214.2	228.5	233.3	234.5	235.7	237.3
Brent, USD/bbl	53.60	45.13	57.00	60.00	64.00	67.00	70.00

f = BMI forecast. Source: BMI, EIA, OPEC, JODI

Latest Updates And Key Forecasts

- NIOC has pre-qualified 29 international oil companies to participate in upcoming tenders for oil and gas fields. European majors **Total**, **Shell** and **Eni** are involved alongside Chinese, Russia and India national oil companies.
- The status and terms of the IPC, a critical piece of attracting foreign investment, are still yet to be published.
- Indian companies are reportedly close to a deal to develop the Farzad B gas field.
- French, Russian and Chinese companies are interested in South Pars phase 11.
- Oil and condensate production averaged around 3.5mn b/d in 2016.
- Oil and condensate exports averaged around 2.0mn b/d in 2016.
- Phases 17, 18, 19, 20 and 21 of South Pars are due to be fully installed and commissioned by March 2017, supporting further gas production growth.
- Gas exports to Iraq are expected to rise via two pipelines in to the Diyala and Basra regions.
- Gas imports from Turkmenistan have been halted since January 1 2017 due to payment issues.

- The distillation unit at the first phase of the Persian Gulf Star facility was launched in October and the first naphtha consignment has been shipped. The 120,000b/d phase of the facility is due to begin commercial operations in March 2017.
- **Sinopec** is due to undertake a major upgrade at the Arak refinery to improve efficiency and refining depth.
- Refined fuels consumption remains muted as Euro-IV standard fuels are increasingly being rolled out across major cities - improving fuel efficiency.

SWOT

Oil & Gas SWOT

SWOT Analysis

Strengths

- Iran has the world's fourth largest proven oil reserves (after Saudi Arabia, Venezuela and Canada) and second-largest proven gas reserves (behind Russia).
- Lifting costs are low, particularly at the onshore oil fields.
- Located in strategic geographical position for oil, gas and refined products exports, lying between Asia and Europe.
- The new Iran Petroleum Contract structure, while still risk-service, could be among the most attractive in the Middle East.

Weaknesses

- Substantial caution surrounding US sanctions related to human rights and terrorism will inhibit USD banking transactions.
- Low recovery rates from onshore fields.
- Given the underinvestment while under sanctions, the oil and gas industry is in need of substantial capital to improve its reliability and efficiency.
- Domestic oil and gas service and equipment companies lack advanced technological knowhow.

Opportunities

- Iran has outlined 50 oil and gas projects under the IPC for international investment, with substantial production potential for both oil and gas.
- Widespread deployment of enhanced oil recovery techniques could significantly boost output, considering the country's low recovery rate of between 20-30%.
- The LNG and petrochemical sectors, offer tremendous potential given the gas and condensates production potential of the South Pars field.
- There is substantial room for domestic natural gas consumption growth.

SWOT Analysis - Continued

Threats

- Uncertainty surrounding US foreign policy towards Iran and potential implications for sanctions.
 - Hardliners continue to maintain substantial influence over the oil and gas sector, which may limit the attractiveness or extent of new contracts.
 - International companies will be reluctant to commit to the post-sanctions Iranian market, given many lost billions when sanctions were implemented.
 - Low oil prices are substantially curbing the budgets of mid-sized international companies sought for smaller field developments.
 - The risks of internal political instability or war within the broader region are ever-present.
-

Industry Forecast

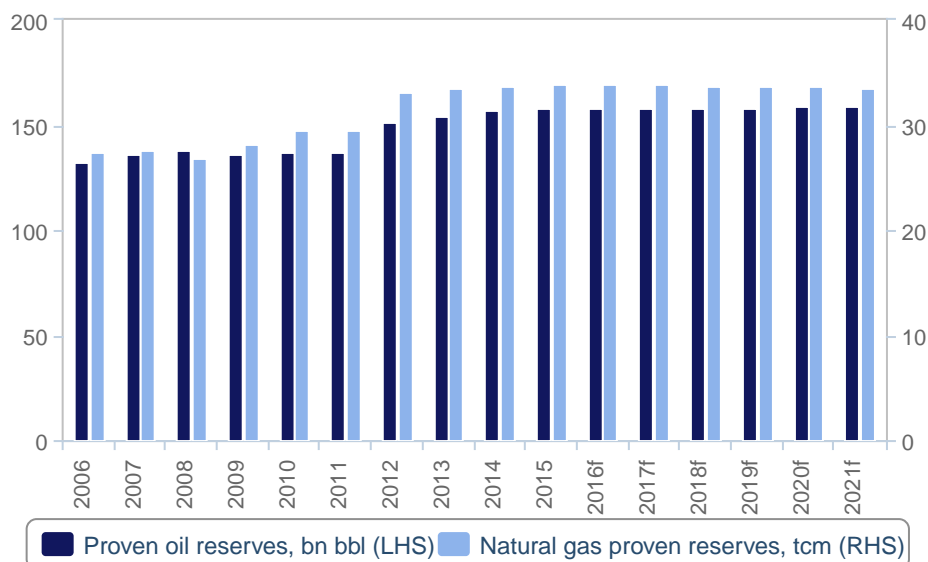
Upstream Exploration

BMI View: Exploration in Iran will remain limited given the extensive amount of proven unproduced resource. The main focus will be on improving the understanding of existing fields.

- Total has signed a heads of agreement for the development of South Pars phase 11.
- DNO has signed an MoU to study the Changuleh oil field.
- NIOC has secured an MoU with PTTEP for preliminary studies on the Changuleh, Balal and Dalpari oil fields.
- Malaysia's Petronas will undertake studies on the South Azadegan and Cheshmeh oil fields.
- Gazprom Neft is due to conduct a development study on the Changuleh and Cheshmeh-Khosh oil fields.
- Schlumberger has signed an MoU for studies on the Shadegan, Parsi and Rag-e-Sefid oil fields.
- Shell agreed a memorandum to assess the Azadegan, Yadavaran and Kish fields.
- NIOC is due to resume exploration activities at the Moghan oil field.

Substantial Undeveloped Oil & Gas Reserves

Oil & Gas Reserves



f = BMI forecast. Source: EIA, BMI

Structural Trends

In the post-sanctions period, Iran has aggressively embarked on signing memorandums with international oil companies to conduct studies on major oil fields. Since late 2016, Iran has signed over seven memorandums with major companies including Shell, Total, Schlumberger and Petronas. Interestingly, studies for the same field have been awarded to multiple companies, such as the Azadegan field for which both Shell and Petronas have been offered studies. The Changuleh field has also been opened to study by DNO, PTTEP and Gazprom Neft.

It remains unclear whether just one or all of the MoUs signed for fields will be allowed to progress. This could be a sign that Iran is trying to drive competition to secure the best possible results from the studies, but also that the country is hedging its bets depending on uncertainty surrounding US foreign policy and sanctions.

Oil

Iranian oil and gas resources are largely well known, just underdeveloped, hence the large number of MoUs agreed to more extensively study the resource and production potential. Iran holds the fourth-largest oil reserves in the world, behind only Venezuela, Saudi Arabia and Canada. Onshore fields comprise more than 70% of total reserves and over 80% of onshore reserves are located in the Khuzestan basin, in south-western Iran, near the border with Iraq.

According to the EIA, more than 50% of Iran's onshore oil reserves are confined within just five giant fields, of which the Marun field - estimated to hold 22bn bbl - the Ahwaz field (18bn bbl) and the Aghajari field (17bn bbl) are the largest. Most of the remaining undeveloped proven oil resources are located in the offshore Persian Gulf, and amount to around 100mn bbl. The focus of oil exploration and development will be on these areas, once the Iran Petroleum Contract (IPC) approved by the government and released.

The Iranian section of the Caspian Sea is thought to be highly prospective. In 2012, Iran announced an oil discovery in its portion of the Caspian Sea. Fars news reported the discovery could have more than 10bn bbl of potential crude. A significant find (about 2bn bbl of recoverable oil) made by **ConocoPhillips** in the Kazakh portion of the Caspian Sea, in addition to producing fields between Azerbaijan and Turkmenistan have proven the potential of the area. Nevertheless, the cost of offshore exploration and the ongoing maritime border disputes between Iran, Azerbaijan and Turkmenistan will prevent development projects until resolved.

Despite large oil reserves, we note that producing Iranian oil fields are very mature. While reserves are high, years of international sanctions, crude export restrictions and the lack of access to capital and technology to develop more challenging fields, has prevented Iran from maximising production at its largest fields. Approximately 60% of Iran's crude oil production comes from oil fields that were discovered before the nationalisation of the oil industry over 60 years ago. As a result, new foreign investment into Iran will also result in greater investment into exploring the geology of existing fields to better understand the full resource potential and optimise production plans. This will offer substantial upside to reserves estimates.

Under the IPC, there are 29 oil fields on offer of which 21 are offshore and eight onshore. A further 17 have already been developed and will tender for improved recovery, while the remaining 12 are known, but undeveloped.

Gas

Similar to oil, the vast majority of Iran's gas resources are also well known. Iran holds the second-largest gas reserves in the world, estimated at 33.6trn cubic metres (tcm). Reserves are predominantly from offshore non-associated fields (62% of total reserves). The giant South Pars/North Field gas structure, spread across Iran and Qatar, accounts for about two thirds of Iran's total proven reserves. Onshore gas reserves are found in both associated (19%) and non-associated (19%) fields. Other large natural gas fields include the Kish, North Pars, Tabnak, Forouz, Kangan and Ferdowsi fields.

There is still substantial potential in existing gas resources, negating the need for major exploration programmes. Similarly to the oil sector, international sanctions have limited Iran's ability to access sufficient capital and technology to develop its enormous reserves, and to push with further exploration. Weak oil prices are also straining government revenues and the budget towards oil and gas exploration and development. This is also the case for producing fields with insufficient investment towards field maintenance.

Under the IPC 21 natural gas projects are due to be offered. 8 will be offshore, while 13 will be onshore. The offshore projects are all existing but undeveloped gas fields, while the onshore fields are also largely undeveloped.

Upstream Projects

Table: New Projects Expected To Be Offered Post-Sanctions

	Border Oil Fields	Border Gas Fields	Other Oil Fields	Other Gas Fields
1	S. Azadegan Ph 1 15	S. Pars Ph 11 23	Mansuri Ph 2 37	Dey
2	N. Azadegan Ph 2 16	Salman Ph 1 24	Band-e-Karkheh 38	Sefidzakhor-Halegan
3	Yadavaran Ph 2 17	Salman Ph 2 25	Jofayr 39	Sefidbaghoun
4	Reshadat 18	Farzad A 26	Somar 40	Aghar Ph 2
5	Foroozan 19	Farzad B 27	Danan Ph 2 41	Farashband: Refining Facilities
6	S. Pars Oil Layer Ph 1 20	Reshadat 28	Darquain Ph 3 42	Varavi: Boosting Gas Pressure Stations
7	Arvand 21	Dalan Kangan At Balal 29	Susangerd 43	Kangan: Boosting Gas Pressure Stations
8	Dehloran Ph 2 22	Arash 30	Sepehr 44	Nar: Boosting Gas Pressure Stations
9	Peydar Gharb		Cheshmeh Khosh 45	Homa: Boosting Gas Pressure Stations
10	Aban Ph 2		Resalat 46	Behregansar Gas Layer
11	Sohrab		Abuzar 47	Tangebijar Ph 2
12	Changouleh		Doroud 48	Kish Ph 3 3D Seismic
13	Esfandiar Ph 1		Norouz 49	Kish Ph 1
14	Arash		Zagheh 36	

Source: Iran Oil Ministry

Upstream Production - Oil

BMI View: Crude oil and condensate production averaged 3.5mn b/d in 2016, a 350,000b/d increase on 2015. In 2017 we expect further gains of around 260,000b/d. Long-term upside remains dependent on the success of the new IPC.

Latest Updates

- Iranian crude production stabilised over the summer months with output at around 3.5mn b/d, though reportedly increased to near 4.0mn b/d at the end of 2016.
- 2016 exports averaged 2.0mn b/d.
- Production from the Yadavaran field has reached 115,000b/d.

- A 30-60,000b/d increase is planned for the Salman and Foruzan fields.
- 29 international companies have been prequalified to take part in Iran's upstream tender under the IPC.
- The IPC has yet to be officially released.

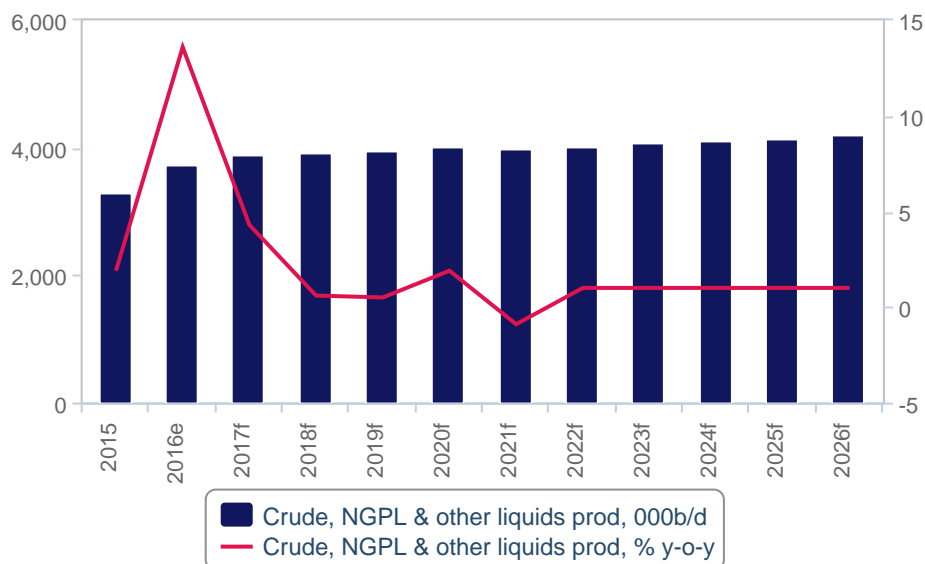
Structural Trends

Iranian oil production comes from 34 fields, of which 22 are onshore and 12 offshore. The country's largest producing field is the onshore Ahwaz-Asmari field, located in the Khuzestan province, with a production capacity of about 750,000b/d. This is followed by the Amrun and Gachsaran fields. The three fields are located in the Khuzestan province.

In 2016, output averaged 3.5mn b/d, an increase of around 350,000b/d on pre-sanctions levels. Production towards the end of the year was reportedly over 3.9mn b/d, indicating higher output for 2017. We forecast average crude and condensate production in 2017 of 3.76mn b/d.

Oil Production Forecast

(2015-2026)



f = BMI forecast. Source: BMI, EIA, IEA, OPEC

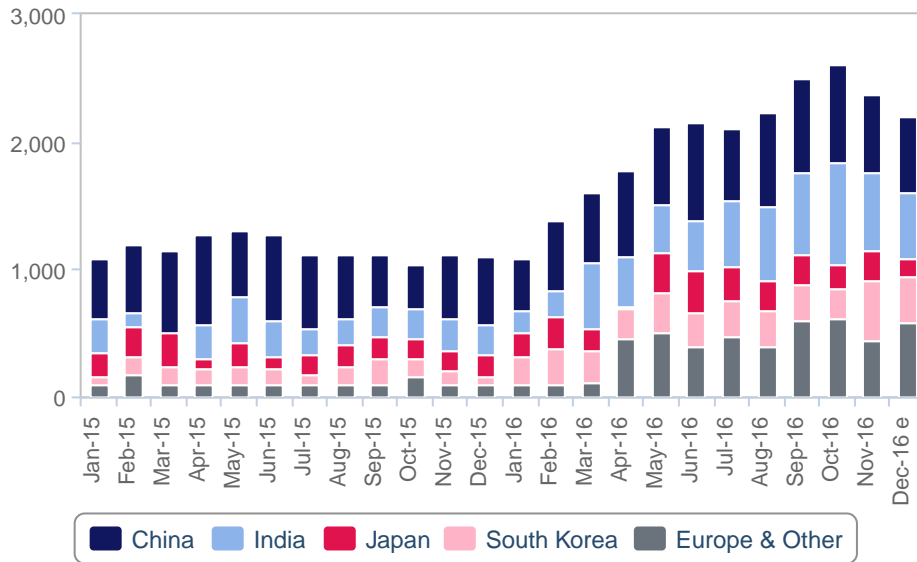
Oil Upside Tapering Off

According to official OPEC secondary source data, Iran produced an average of 3.5mn barrels of crude and condensate in 2016. Data from countries importing Iranian crude oil indicates exports averaged 2.0mn b/d over the same period. Gas for oil substitution in the domestic power sector has been key to freeing up more oil, while new oil production capacity - from the Yadavaran (85,000b/d) and North Azedegan (75,000b/d) fields, as well as condensate volumes from new phases of South Pars (~60,000b/d) has added around 220,000b/d of capacity to increase output further.

We expect an average annual increase of 260,000b/d of oil and condensate in 2017, with production rising to 3.76mn b/d. We expect output to stabilise near current levels and meet the OPEC agreed production quota of 3.797mn b/d.

Europe Key To Maintain Exports

Iran Crude Exports By Destination (000b/d)



Source: Customs Data, Shipping Data, BMI

We remain conservative with our long-term forecasts for Iran given unknowns regarding the state of existing fields and infrastructure under sanction. Following the initial gains, production will stagnate under our current scenario, with new NIOC-led developments sufficient to cover natural declines.

We also remain cautious on investor interest in new oil contracts, which has still not been officially launched. While the structures are more attractive than the previous buy-back contracts, the risks surrounding the political environment and with committing large capex sums to major projects over the long-term remain high. As such, we expect smaller companies willing to take higher risk to be among the first to invest in Iran. 29 companies have pre-qualified for the IPC tenders though these European majors Shell, Eni and Total.

We have factored in some increases in oil production from potential new contracts post 2020, though note the nature of this is highly speculative given the uncertainties with contracts and development timeframes. Iran is targeting 5.7mn b/d of production capacity by March 2021, which, while we believe is possible given the below-ground potential, will not be achieved. We note a considerable upside risk to our long-term outlook for Iranian oil production (post-2020).

Still Awaiting IPC

The Iranian Petroleum Contract has the potential to transform Iranian production, though delays to its official release are cause for concern. The contract was initially planned for November 2015 and has been repeatedly delayed, largely by hardliner oppositions to relinquishing too much control over the oil sector. The long-term outlook will therefore depend on oil price, political stability, the uptake of new contracts and related negotiation, the ease of doing business and efficient banking. We see upside risk from the following areas:

- **New Wells, IOR, EOR - Boosting Production At Existing Fields:** Iran's producing oil fields are mature, with over 60% of oil production coming from oil fields first developed over 60 years ago. Decades of underinvestment, lack of access to key technology and restrictions to finance, have resulted in particularly low recovery rates at existing fields of between 20-30%. New wells at existing fields and the increased application of improved oil recovery (IOR) and enhanced oil recovery (EOR) methods will be a priority for the government as a way to boost production from the field developments offered to foreign investors. This provides upside risk to our oil production and export forecast from 2018 onwards.
- **New Field Developments - Upside Risk From 2020:** New fields will need to be developed for the country to significantly boost its production capacity beyond pre-sanction levels. Iran is targeting 5.7mn b/d of production capacity by 2021. This provides substantial upside risks to our production forecast from around 2020, given a three to four year negotiation, engineering and development timeframe. While it is impossible to pin-point quantities, Iran's large oil reserves could in theory allow additional upside production risk of 1-3mn b/d by 2025. A number of fields could provide a large increase to Iran's long-term crude oil production capacity, with border field developments looking to take priority (*see below*).

These could attract the most interest given joint development with neighbouring countries decreases the risk working purely with Iran.

Table: New Oil Projects On Offer

Border Oil Fields	Other Oil Fields & Expansion Projects
S. Azadegan Ph 1	Mansuri Ph 2
N. Azadegan Ph 2	Band-e-Karkheh
Yadavaran Ph 2	Jofayr
Reshadat	Somar
Foroozan	Danan Ph 2
S. Pars Oil Layer Ph 1	Darquain Ph 3
Arvand	Susangerd
Dehloran Ph 2	Sepehr
Peydar Gharb	Cheshmeh Khosh
Aban Ph 2	Resalat
Sohrab	Abuzar
Changouleh	Doroud
Esfandiar Ph 1	Norouz
Arash	Zagheh

Source: Iran Oil Ministry

Upside Risk Depends On Contract Terms

We note that the interest by international oil companies (IOCs) will depend on the attractiveness of the new oil contracts. New contract structures have been proposed, which will be more favourable than the previous buy-back model. While the full extent of the contract scope is unclear and hardliner pressure may have diluted some of the terms, the following is expected:

- Agreements will remain risk service contracts.
- They will allow for full cost recovery.
- Fee-per-barrel will be linked to the oil price and complexity of each project.
- There will be one contract for both oil and gas developments.
- The contract term will be extended up to 25 years, inclusive of exploration and production periods.

Uncertainty surrounds the possibility of snap-back sanctions should Iran or the US deviate from commitments under the agreement. The Trump administration may cause more political challenges while the Iranian presidential election in May 2017 adds risk to the escalation of differences. Uncertainty could cause a slower uptake in contracts and IOC interest.

Table: Oil Production (Iran 2015-2020)

	2015	2016e	2017f	2018f	2019f	2020f
Crude, NGPL & other liquids prod, 000b/d	3,300.8	3,748.1	3,909.3	3,931.2	3,949.5	4,024.1
Crude, NGPL & other liquids prod, % y-o-y	1.9	13.6	4.3	0.6	0.5	1.9

f = BMI forecast. Source: EIA, IEA, DOE, National Sources, BMI

Table: Oil Production (Iran 2021-2026)

	2021f	2022f	2023f	2024f	2025f	2026f
Crude, NGPL & other liquids prod, 000b/d	3,989.8	4,031.4	4,073.4	4,115.9	4,158.9	4,202.3
Crude, NGPL & other liquids prod, % y-o-y	-0.9	1.0	1.0	1.0	1.0	1.0

f = BMI forecast. Source: EIA, IEA, DOE, National Sources, BMI

Upstream Production - Gas

***BMI View:** Gas production will rise in 2017 as new phases 17, 18, 19, 20 and 21 of South Pars reach production plateau. Long-term upside depends on the interest of foreign investment in gas projects and the creation of new sources of demand and export infrastructure.*

Latest Updates

- South Pars phase 17, 18 and 19 are operating at half capacity, approximately 20bcm. Production could increase to around 40bcm depending on demand.
- The platform for phase 20, satellite platforms of phases 17 and 18, and platforms A and B of phase 14, are all due to be installed by the end of 2016.
- Gas processing capacity has reached 260bcm, according to **National Iranian Gas Company**.
- More than 20 gas projects are due to be offered for foreign investment: Indian companies have shown interest in the Farzad B project; while Total, Russian and Chinese companies are interested in South Pars phase 11.
- Majors have indicated more interest in Iran's gas potential rather than oil.

Structural Trends

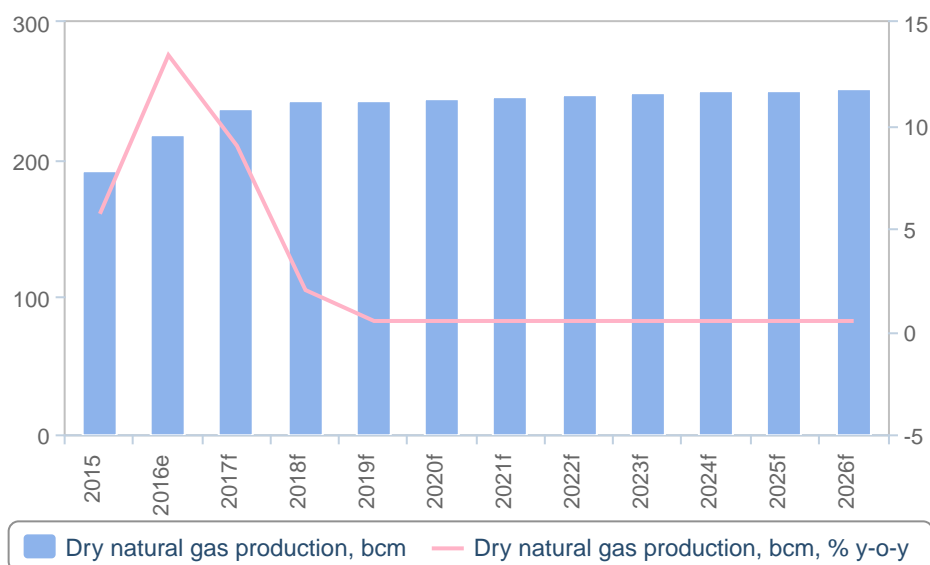
Gas production reached 192bn cubic metres (bcm) in 2015 and we see this rising to 218bcm in 2016 and 237bcm in 2017. According to NIGC, Iran has now the capacity to process as much as 260bcm of gas. From 2017 our forecast takes into account the start of phases 17, 18, 19, 20 and 21 of South Pars. Currently all of these phases are producing, though not at full capacity. Full commissioning of all phases is expected before the new Iranian year in March. Combined, phases 17-19 added over 40bcm of new gas production capacity in 2016, and full commissioning will allow for further production upside of 20bcm. Phase 20 of South Pars is also reporting good progress with the loading of the platform in November, and hook up expected in early 2017. Phase 21 is also reportedly producing at 9.8bcm.

Beyond these major project completions we remain cautious, but see strong upside risk to gas production, depending on:

- The speed and scope of the return of international oil companies (IOCs) to the Iranian energy sector
- The potential development of South Pars Phases 11, 13, 14, 22, 23 and 24
- New gas field developments under the IPC such as Farzad and Kish.
- The construction of the required gas export infrastructure

Gas Production Forecast

(2015-2026)



f = BMI forecast; Source: BMI, EIA, IEA, OPEC

The removal of sanctions is accelerating progress on Iranian-led developments of delayed and unfinished phases of South Pars as access to new funding supports projects. This will enable the country to increase production at producing phases and to bring online new phases currently under development.

Substantial Upside Risk To Post-2020 Production

Considering Iran has the second largest gas reserves in the world, the country has the potential to become one of the largest gas producers globally. The removal of sanctions will open more than 20 natural gas projects up to international investment. We have not yet included these in our forecast given uncertainty in international interest, but see strong upside to production post 2020 depending on the level of uptake. A number of phases of South Pars are yet to be developed and could add considerable production capacity over the forecast.

- South Pars Phases:** Phases 11, 13, 14 and 22-24 have not yet been taken into account in our forecasts. The timing of these phases remains uncertain and could depend on foreign interest. South Pars Phase 11 is on the list of gas projects expected to be offered by the Oil Ministry. Together, the ramp-up to full capacity of remaining phases could add a cumulative 102bcm of additional gas production capacity.

Table: South Pars Project Phases

Phase	Natural Gas Production Rate (mcm/d)	Condensates Production Rate (b/d)	Start-Up
1	28	40,000	2004
2 + 3	56	80,000	2002
4 + 5	56	80,000	2004
6 + 7 + 8	109	156,000	2009
9 + 10	56	80,000	2011
11	56	80,000	na
12	84	120,000	2015
13	56	80,000	na
14	56	77,000	na
15 + 16	56	80,000	2016
17 + 18	56	80,000	2016
19	56	77,000	2017
20 + 21	56	75,000	2017
22 + 23 + 24	56	77,000	na

na = not available. Source: EIA, Pars Oil and Gas Company, Industry Research

- **Other Fields:** Apart from South Pars, Iran has several mega-fields waiting to be developed, of which Kish (2tcm of recoverable reserves), North Pars (1.4tcm), Golshan (1.1tcm), Lavan (1.8tcm), Forouz B (700bcm), Ferdowsi (308bcm) and Khayyam (204bcm) pose immense upside risk to Iran's gas production forecast, with additional upside risk of several hundred bcm. Kish, Farzad A and B are all on the list of proposed new fields developments under the IPC.

Table: Gas Projects Proposed Under The IPC

Border Gas Fields	Gas Fields
S. Pars Ph 11	Dey
Salman Ph 1	Sefidzakhor-Halegan
Salman Ph 2	Sefidbaghoun
Farzad A	Aghar Ph 2
Farzad B	Farashband: Refining Facilities
Reshadat	Varavi: Boosting Gas Pressure Stations
Dalan Kangan At Balal	Kangan: Boosting Gas Pressure Stations
Arash	Nar: Boosting Gas Pressure Stations

Gas Projects Proposed Under The IPC - Continued**Border Gas Fields****Gas Fields**

Homa: Boosting Gas Pressure Stations

Behregansar Gas Layer

Tangebjar Ph 2

Kish Ph 3 3D Seismic

Kish Ph 1

Source: Iranian Ministry of Oil

We are not including these fields within our gas production forecast at the time of writing because:

- The IPC, which will need to be finalised to push these projects forward, remains elusive.
- Developing these fields will take significant capital and time. It is still too early to determine which projects will be pushed forward and when.
- IOCs interest in developing these fields is remains uncertain. As with oil, foreign companies' interest in developing these fields will depend on the attractiveness of the contracts and willingness to commit substantial capital expenditure in a high risk environment.
- The build-up of the necessary processing, transport and export infrastructure for the gas will also prohibit developments. Much of the gas to be produced from these new fields will be geared towards exports, requiring substantial investment and a long-term commitment to Iran. A build up of trust and guarantee of long-term political stability will be essential.

In a best-case scenario, one or two of these fields could come online in the early 2020s. A large production ramp-up from most new fields will however most likely materialise outside of our 10-year forecast period.

Table: Gas Production (Iran 2015-2020)

	2015	2016e	2017f	2018f	2019f	2020f
Dry natural gas production, bcm	192.5	218.2	237.8	242.5	243.7	245.0
Dry natural gas production, bcm, % y-o-y	5.7	13.4	9.0	2.0	0.5	0.5
Dry natural gas production, % of domestic consumption	100.6	101.9	105.7	104.7	104.2	103.7

e/f = BMI estimate/forecast. Source: BMI, EIA, IEA, DOE, National Sources

Table: Gas Production (Iran 2021-2026)

	2021f	2022f	2023f	2024f	2025f	2026f
Dry natural gas production, bcm	246.2	247.4	248.7	249.9	251.1	252.4
Dry natural gas production, bcm, % y-o-y	0.5	0.5	0.5	0.5	0.5	0.5
Dry natural gas production, % of domestic consumption	103.2	102.6	102.1	101.6	101.1	100.6

f = BMI forecast. Source: National sources, BMI

Refining

***BMI View:** The phased completion of the Persian Gulf Star refinery will reduce Iran's fuels import needs from March, with Iran switching to a net gasoline exporter. Refinery developments will focus on upgrades over greenfield projects.*

Latest Updates

- The first phase of the Persian Gulf Star refinery is in commissioning with the first naphtha consignment having been shipped. Full commercial operation of the 120,000b/d phase is expected by March 2017.
- The subsequent two 120,000b/d phases of the Persian Gulf Star refinery are due to come on four and eight months after phase 1. Products will be to Euro-IV standard.
- NIOC is finalising a USD1.2bn contract with Sinopec to upgrade the Abadan refinery to produce Euro-V standard gasoline and diesel, while reducing fuel oil output.
- Pre-commissioning of the new gasoline unit at the Bandar Abbas refinery is complete, increasing gasoline output three fold to 27.5mn b/d.
- USD14bn has been allocated by the government to support the upgrade of the refining sector, and in particular the larger refineries at Isfahan, Tehran and Tabriz.

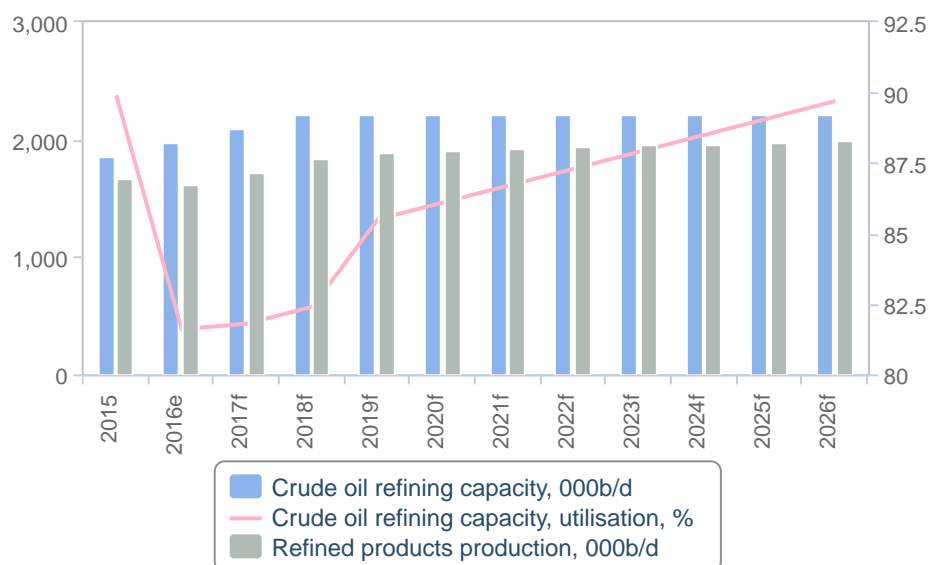
Structural Trends

Currently, Iran has seven large refineries of 100,000b/d+ (including the first phase of the Persian Gulf Star refinery), and a number of smaller facilities of less than 60,000b/d each. While refining capacity estimates vary wildly due to the lack of reliable data, we estimate combined capacity, stands at 1.984mn b/d. All refineries are operated by the **National Iranian Oil Refining and Distribution Company (NIORDC)**, a **National Iranian Oil Company (NIOC)** subsidiary.

Refinery output figures for 2016 indicate that refined fuel production will be around 3.5% lower in 2016 than 2015. While products prices remain cheap on the global market, Iran has been accelerating modernisation programmes, specifically in regards to gasoline output. The government has outlined USD14bn to support the development of the sector. Upgrades at the Bandar Abbas refinery, the commissioning of the first phase of the Persian Gulf Star facility, will support a substantial increase in output in 2017. Subsequent phases of the Persian Gulf Star facility as well as efficiency improvements across the Iranian refining sector, will increase capacity and improve product output.

Refining Capacity Forecast

(2015-2026)



f = BMI forecast. Source: EIA, JODI, BMI

Table: Major Iranian Refineries

Refinery	Crude distillation capacity (000 b/d)
Abadan	400
Isfahan	375
Bandar Abbas	330
Arak	260
Tehran	250
Persian Gulf Star Ph 1	120
Tabriz	110
Lavan Island	60
Shiraz	58
Kermanshah	21
	1,984

Source: NIORDC

Gasoline Boost From Persian Gulf Star

Iran has traditionally been a net refined fuel exporter, though the country has generally been a net gasoline importer. Given the constraints of sanctions on the Iranian budget, since 2012 the country has focused on maximising gasoline production to become self-sufficient.

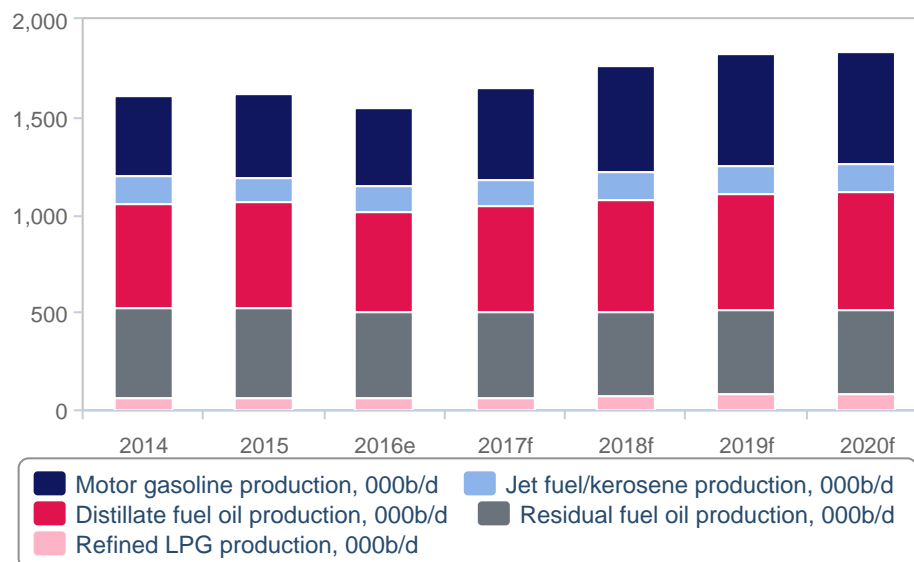
Key to meeting this target will be the completion of the Persian Gulf Star refinery, which is due to be operating commercially by March 2017. The refinery will have a 360,000b/d capacity, though is being constructed in three 120,000b/d phases. The subsequent two phases of the facility are planned to follow four and eight months after phase one respectively.

The facility has been specifically designed to process natural gas condensate - which will be derived from the new South Pars phases coming online in 2016 - into fuels. Gasoline and high octane gasoline will be the target product with 62% of capacity (226,000b/d), 24% (88,000b/d) will be diesel and 12% (45,000b/d) jet fuel and LPG.

The Gulf Star refinery will see Iran's refining capacity increase to 2.2mn b/d by 2018. More importantly, once fully operational, the facility will make Iran self-sufficient in gasoline production.

Gulf Star To Boost Gasoline Output

Iran - Refined Fuels Production (000b/d)



f = BMI forecast. Source: JODI, BMI

Modernisation Over New Capacity

There are several other proposals for new refinery expansions and greenfield refineries, though other than the Persian Gulf Star, none are included in our forecast. Given the Gulf Star is forecast to make Iran self-sufficient in refined fuels, and the international fuels market outlook indicates supplied healthy supply, we do not expect investment into new greenfield oil refining capacity.

Iran's existing facilities will however target foreign investment to improve efficiencies and upgrade fuels standards to Euro-4 and above. Saipem has reportedly signed an MoU to upgrade the Pars Shiraz and Tabriz refineries, Korean companies are reportedly interested in upgrading the Isfahan refinery, while a Japanese consortium is looking at modernising Bandar Abbas. The government has allocated as much as USD14bn to support these projects. NIOC is also finalising a USD1.2bn contract with Sinopec to upgrade the Abadan refinery to produce Euro-V standard gasoline and diesel, while reducing fuel oil output. We expect this trend to result in more efficient fuels production and the production of cleaner burning fuels.

Table: Modernisation Projects

Refinery	Plan	Companies Linked
Pars Shiraz	Upgrade	MoU with Saipem
Tabriz	Upgrade	MoU with Saipem, JX Nippon Oil & Energy
Lavan	Boost Gasoline Production	-
Isfahan	Residue FCC upgrade	Korean Consortium
Bandar Abbas	Modernisation Feasibility	Chiyoda, Mitsui

Source: BMI, news reports

Table: Refining Capacity And Refined Products Production (Iran 2015-2020)

	2015	2016e	2017f	2018f	2019f	2020f
Crude oil refining capacity, 000b/d	1,864.0	1,984.0	2,104.0	2,224.0	2,224.0	2,224.0
Crude oil refining capacity, % y-o-y	1.6	6.4	6.0	5.7	0.0	0.0
Crude oil refining capacity, utilisation, %	89.9	81.6	81.8	82.4	85.5	86.1
Refined products production, 000b/d	1,676.0	1,618.3	1,722.0	1,833.5	1,900.5	1,913.8
Refined products production, % y-o-y	0.5	-3.4	6.4	6.5	3.7	0.7
Refined products production & ethanol, 000b/d	1,676.0	1,618.3	1,722.0	1,833.5	1,900.5	1,913.8
Refined products production & ethanol, % y-o-y	0.5	-3.4	6.4	6.5	3.7	0.7

e/f = BMI estimate/forecast. Source: National sources, BMI

Table: Refining Capacity And Refined Products Production (Iran 2021-2026)

	2021f	2022f	2023f	2024f	2025f	2026f
Crude oil refining capacity, 000b/d	2,224.0	2,224.0	2,224.0	2,224.0	2,224.0	2,224.0
Crude oil refining capacity, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude oil refining capacity, utilisation, %	86.7	87.3	87.9	88.5	89.1	89.7
Refined products production, 000b/d	1,927.2	1,940.6	1,954.2	1,967.9	1,981.7	1,995.6
Refined products production, % y-o-y	0.7	0.7	0.7	0.7	0.7	0.7
Refined products production & ethanol, 000b/d	1,927.2	1,940.6	1,954.2	1,967.9	1,981.7	1,995.6
Refined products production & ethanol, % y-o-y	0.7	0.7	0.7	0.7	0.7	0.7

e/f = BMI estimate/forecast. Source: BMI, NIORDC, JODI

Refined Fuels Consumption

BMI View: *Fuels consumption fell for a fourth straight year in 2016, but is expected to grow in 2017.*

Anticipated improvements in economic growth will drive more consistent increases in demand over the next ten years.

Latest Updates

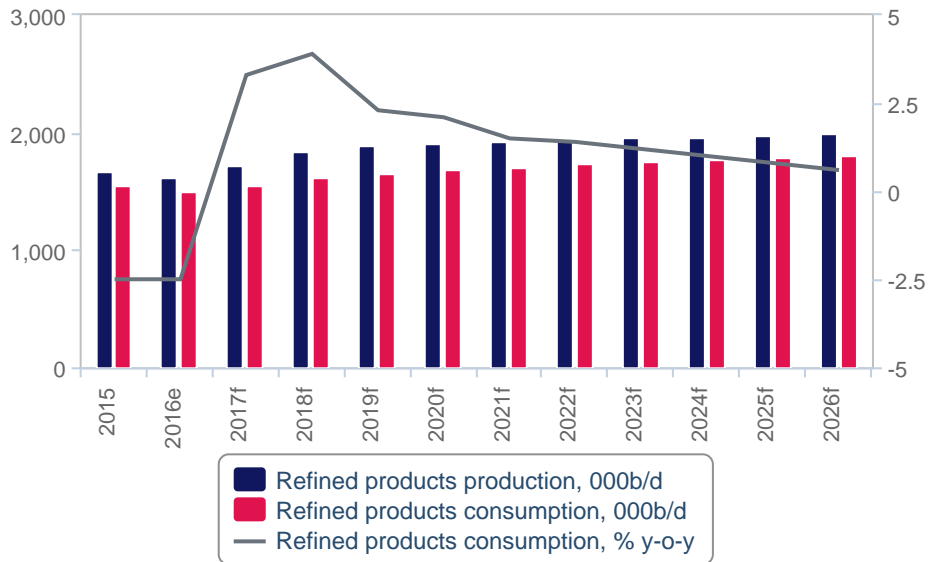
- Iranian refined fuels consumption averaged 1.505mn b/d in 2016, down 2.5% on 2015.
- Diesel consumption fell 8.3%, and gasoline consumption was 2.5% lower in 2016.
- Diesel consumption will increase as industrial activity and construction growth accelerate.
- Iran is increasing supply of Euro-IV standard fuels, particularly in the larger cities.
- Iran's Fuel Conservation Organization is planning to spend USD16bn on energy efficiency projects to reduce fuels

Structural Trends

Iran is targeting the complete removal of all energy subsidies in 2017, though it remains unclear how prices will be structured and whether the government will be willing to do this in an election year. After taking power in 2013, President Rouhani introduced steep changes to the generous fuels subsidy system. Currently, eligible drivers are limited to 60 litres of fuel per month at subsidised prices, but must pay near market prices for any remaining fuel needs. This drove a 10.5% fall in fuels consumption in 2014, a 2.5% drop in 2015 and a 2.5% drop in 2016. Gasoline prices in Iran are now closer to global market prices, though diesel remains substantially subsidised.

Refined Products Production And Consumption Forecast

(2015-2026)



e/f = BMI estimate/forecast. Source: BMI, EIA, JODI

Demand for gasoline and diesel will return to an uptrend, though strengthening oil prices could impact domestic prices and demand for fuels. The removal of sanctions in January 2016 has facilitated increased gasoline imports to meet pent up demand, though we consumption fell in 2016 as the economy continues to transition from sanctions. We expect a return to demand growth in 2017, with more capital inflows supporting an improved outlook for the Iranian economy and consumers. In particular we see growing demand for distillates from the construction and industrial sectors and gasoline from consumers.

Fuel Subsidy Changes

Sanctions on the energy sector stemmed Iranian government income, forcing a revision of the fuels subsidy programme and driving three rounds of subsidy cuts:

- **Phase 1:** Iran initiated the first phase of subsidy reform at the end of 2010, decreasing subsidies on energy prices.
- **Phase 2:** Was implemented at the end of April 2014, with fuel subsidy reductions on gasoline, diesel and compressed natural gas (CNG). The cost of gasoline has increased from IRR4,000 (USD0.16) per litre to

IRR7,000 (USD0.27) per litre, an increase of 75%, while gasoline sold outside quotas rose to IRR10,000 (USD0.39) per litre.

- **Phase 3:** Iran proceeded with a third wave of subsidy cuts in May 2015, raising gasoline prices to IRR10,000 (USD0.35) per litre, up from IRR7,000.

Gasoline pump prices in Iran are currently around USD0.40/litre, while diesel prices remained more heavily discounted at USD0.10/litre.

Table: Approximate Gasoline & Diesel Costs

	Iranian Domestic Price	Approximate Global Market Price	Average Global Pump Price
Gasoline, USD/litre	0.40	0.41	1.02
Diesel, USD/litre	0.10	0.58	0.91

Note: Accurate as of February 2017. Source: Globalpetrolprices.com, Bloomberg

Subsidy Cuts Unlikely Before Elections

Lower oil prices have exacerbated fiscal challenges in Iran and will likely keep pressure on the government to maintain its direction of reform towards market pricing structures - a trend we are seeing accelerate in other Gulf States as petroleum revenues are low.

That said, inflation in Iran has been high, impacting consumer spending. Subsidy cuts are unpopular and with the May 2017 election approaching we do not expect further subsidy cuts to be enacted. That said, we believe further subsidy cuts will still be critical in decreasing the budget deficit over the longer term. While the increase in oil exports forecast over 2017 will temper the negative effects of subsidies, lower oil prices will still strain the fiscal budget.

We expect fuels consumption growth to return from 2017 as the economic outlook improves. That said, higher prices and efficiency drives will moderate the pace of growth over the longer term. A recently launched initiative by the Fuel Conservation Organization is specifically targeting cost savings from reducing fuel consumption, which will work to curb consumption over the longer term. Up to USD16.3bn has been budgeted to:

- Improve boiler efficiency in buildings
- Replace large freight vehicles over 35 years old (~65,000)

- Replace diesel buses with new CNG vehicles (~17,000)
- Replace old taxis/vans with new CNG vehicles (~140,000)
- Boost rail transport

Given these factors, despite better economic growth, our forecasts do not see Iran consuming more fuel than in 2012 until 2026, with growth tapering thereafter.

Table: Refined Products Consumption (Iran 2015-2020)

	2015	2016e	2017f	2018f	2019f	2020f
Refined products consumption, 000b/d	1,544.4	1,505.4	1,554.5	1,614.7	1,652.4	1,687.1
Refined products consumption, % y-o-y	-2.5	-2.5	3.3	3.9	2.3	2.1

e/f = BMI estimate/forecast. Source: BMI, EIA, JODI

Table: Refined Products Consumption (Iran 2021-2026)

	2021f	2022f	2023f	2024f	2025f	2026f
Refined products consumption, 000b/d	1,712.4	1,736.4	1,757.2	1,774.8	1,789.0	1,799.7
Refined products consumption, % y-o-y	1.5	1.4	1.2	1.0	0.8	0.6

f = BMI forecast. Source: National sources, BMI

Gas Consumption

BMI View: New South Pars phases are increasing the availability of natural gas, meeting pent-up demand and substituting oil products in power generation. Over the longer term, better economic growth and efforts to boost natural gas use over oil will support greater residential and industrial demand.

Latest Updates

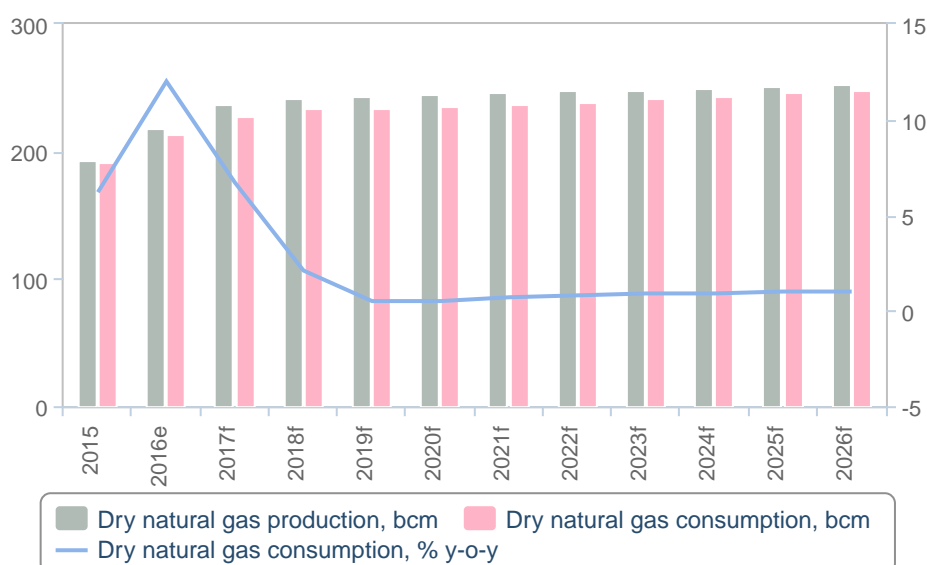
- Gas processing capacity has reached 260bcm according to National Iranian Gas Company.
- Phases 17, 18 and of South Pars will have spare capacity to meet a further 20bcm of demand.
- Phases 14, 20 and 21 will reportedly be commissioned by March 2017.
- Build out of pipeline infrastructure from IGAT 6, 9 & 11 will enable greater consumption of gas in undersupplied areas of Iran.

Structural Trends

As a result of gas subsidies and a switch in the domestic energy mix from oil to gas, domestic gas consumption in Iran has seen a rapid rise. Between 2010 and 2016, domestic consumption increased 40% from 152bcm to 214bcm. We estimate consumption will increase a further 6.7% in 2017 and 2.1% in 2018, as a result of greater gas availability and gas for oil substitution in power generation.

Gas Production and Consumption Forecast

(2015-2026)



elf = BMI estimate/forecast. Source: BMI, EIA, IEA, OPEC

We forecast gas consumption to continue growing as new phases of the South Pars field increase availability of gas for the domestic market. With approximately 260bcm of gas production capacity operational, Iran has the flexibility to increased output by over 45bcm if needed.

The main uses of gas in Iran are:

- ReInjection, which will increase as Iran looks to step up oil exports and curb declines at mature fields over the coming years. Estimates calculate around 25-30bcm of gas is re-injected every year to maintain reservoir pressure at mature oil fields. This has likely supported the increase in oil exports.
- Power Generation - since new gas availability in early 2016 oil products burnt at power stations have been substituted with gas, reducing direct crude burn and domestic fuel oil and diesel consumption. This switch also facilitated the ramp-up in Iranian crude exports.

- Residential and industrial use currently accounts for around 34% of total gas consumption, a figure expected to grow over the medium term as the Iranian economy recovers after years of sanctions. New pipelines (IGAT6, 9 & 11) are being planned to increase supply to Tehran, the northeast and the northwest of the country.

We see substantial upside to consumption over the long term, particularly if Iran is able to effectively implement its plans build out midstream capacity and introduce more compressed natural gas vehicles.

Table: Gas Consumption (Iran 2015-2020)

	2015	2016e	2017f	2018f	2019f	2020f
Dry natural gas consumption, bcm	191.2	214.2	228.5	233.3	234.5	235.7
Dry natural gas consumption, % y-o-y	6.2	12.0	6.7	2.1	0.5	0.5

e/f = BMI estimate/forecast. Source: BMI, EIA, DOE

Table: Gas Consumption (Iran 2021-2026)

	2021f	2022f	2023f	2024f	2025f	2026f
Dry natural gas consumption, bcm	237.3	239.2	241.4	243.5	246.0	248.4
Dry natural gas consumption, % y-o-y	0.7	0.8	0.9	0.9	1.0	1.0

f = BMI forecast. Source: BMI, EIA, DOE

Trade - Oil

***BMI View:** In 2017, average annual crude exports will increase by 230,000b/d as Iran stabilises oil trade. Iran will have the capacity to export some fuels once the Persian Gulf Star refinery starts up early 2017.*

Crude Oil Trade Forecast

Latest Updates

- According to data from importing countries, Iranian oil exports averaged 2.01mn b/d in over 2016, an increase of over 800,000b/d y-o-y.
- China, India and South Korea remain the major importers of Iranian crude, with Japan, Turkey and European countries accepting new volumes.
- South Pars condensate production from phases 17, 18, 19, 20 and 21 is boosting the volumes of condensate for export.

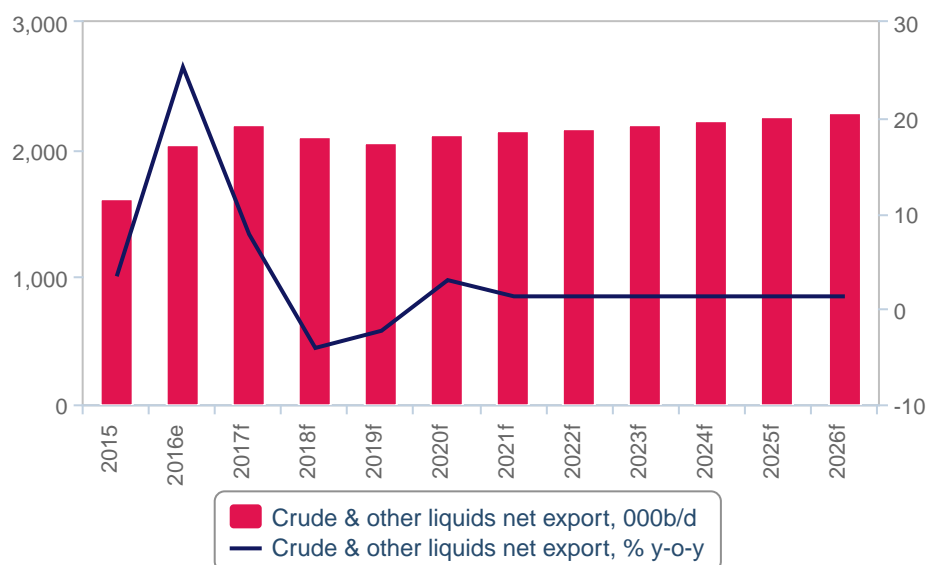
Structural Trends

Crude Export Outlook

We forecast crude and condensate production to rise by an average of 230,000b/d in 2017. We do not expect exports to consistently average much higher than 2.3mn b/d, with a draw down in floating storage having supported export levels in late 2016. Long-term upside to exports will depend on the speed and scope of the return of international oil companies (IOCs) to the Iranian energy sector, and the funds the government is willing to allocate to upstream expansion.

Crude Oil Net Exports Forecast

(2015-2026)



f = BMI forecast; Source: BMI, EIA, OPEC

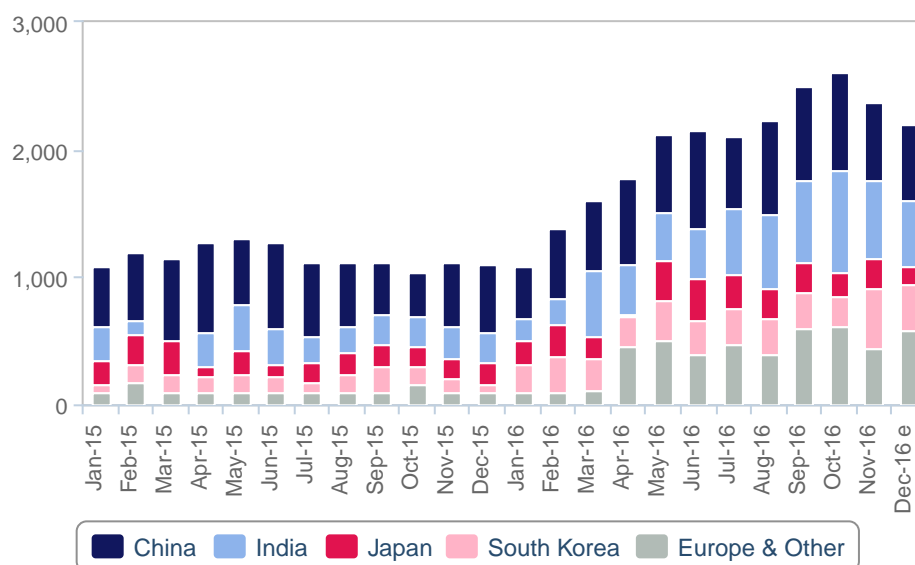
We assume all new crude oil production increases will be earmarked for exports, with domestic refining consumption satisfied and new refining demand at the Persian Gulf Star being met by South Pars condensate. Short-term growth in Iranian oil production and subsequently export capacity is strongly linked to gas projects through new capacity to re-inject gas in mature fields, the substitution of oil for gas in power generation, as well as condensate production.

The start-up of South Pars phases 17, 18, 19, 20 and 21 over 2016 and early 2017 adding between 75,000 and 80,000b/d of condensate per phase. More than 300,000b/d of condensate may be being exported, however the start up of the Persian Gulf Star refinery will eat into this at a rate of 120,000b/d per phase. This is likely to weigh on exports from March 2017 when phase I is commercially operational, and again later in 2017/2018 when phases II and III start up.

China, India, Japan and South Korea are Iran's current large volume crude buyers. Since May 2016, exports to Europe have substantially increased as Iran gradually re-establishes its pre-sanctions position.

Europe Key To Maintaining Exports

Iran Crude Exports By Destination (000b/d)



f = BMI forecast. Source: Customs & Shipping Data

Table: Crude Oil Net Exports (Iran 2015-2021)

	2015	2016e	2017f	2018f	2019f	2020f	2021f
Crude & other liquids net export, 000b/d	1,624.8	2,035.3	2,193.6	2,104.1	2,055.4	2,116.8	2,145.4
Crude & other liquids net export, % y-o-y	3.4	25.3	7.8	-4.1	-2.3	3.0	1.3
Crude & other liquids net export, USDbn	29.5	30.3	43.2	43.8	45.8	49.4	52.5

e/f = BMI estimate/forecast. Source: EIA, OPEC, JODI, BMI

Table: Crude Oil Net Exports (Iran 2021-2026)

	2021f	2022f	2023f	2024f	2025f	2026f
Crude & other liquids net export, 000b/d	2,145.4	2,174.3	2,203.6	2,233.3	2,263.3	2,293.7
Crude & other liquids net export, % y-o-y	1.3	1.3	1.3	1.3	1.3	1.3
Crude & other liquids net export, USDbn	52.5	54.8	57.1	58.7	59.5	60.3

f = BMI forecast. Source: EIA, OPEC, JODI, BMI

Refined Products Trade Forecast

Latest Updates

- Iran will be self-sufficient in all refined fuels from mid-2017, though will still import more specialised products.
- New capacity at the Persian Gulf Star refinery will make Iran a net exporter of gasoline for the first time in over 60 years.

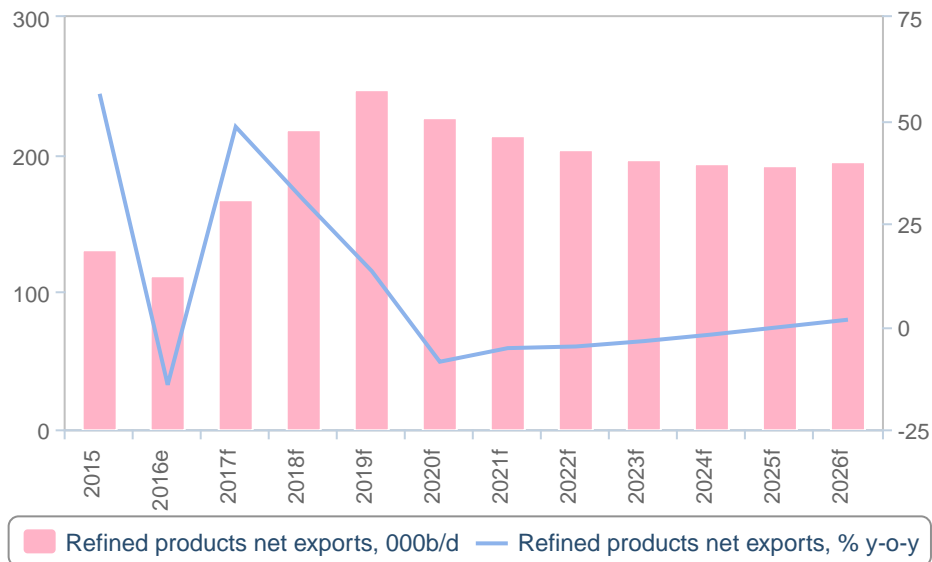
Structural Trends

Refined Fuels Trade Outlook

Iran was a net refined fuels importer, though a mixture of falling fuels consumption as a result of sanctions induced recession and subsidy cuts, Iran became a net fuels exporter in 2014. Refining sector upgrades will help strengthen this trend over the coming quarters, with more efficient operations expected to increase output.

Refined Products Net Exports Forecast

(2015-2026)

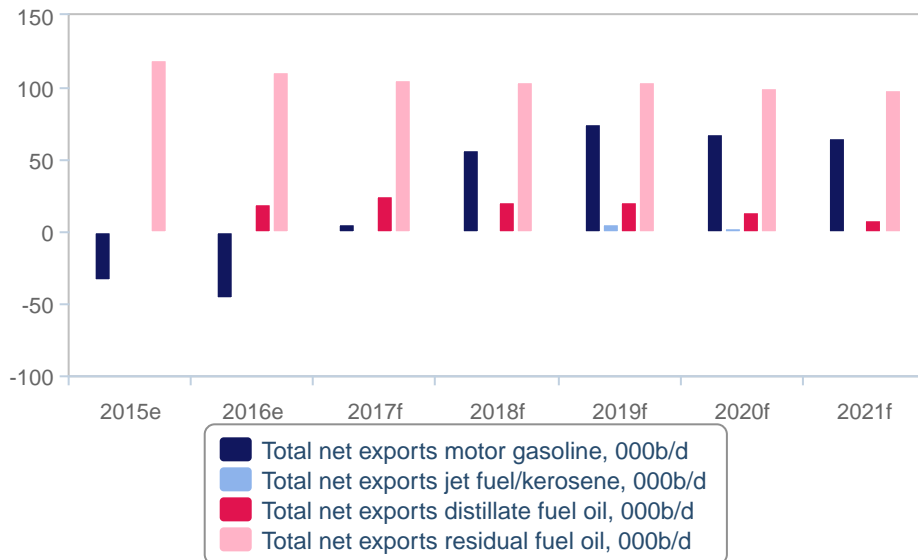


f = BMI forecast. Source: EIA, OPEC, JODI, BMI

We forecast Iran will be self-sufficient in all refined fuels once the Persian Gulf Star refinery starts up in early 2017. Due to the growing surplus of residual fuel Iran had some capacity for exports over this time, albeit in low grade products. Upgrade and modernisation programmes are increasingly adding processing depth, such as the new FCC at the Bandar Abbas facility.

Iran Turns Net Exporter

Net Exports By Fuel (000b/d)



e/f = BMI estimate/forecast. Source: BMI, JODI

We expect the fuels trade surplus to increase in 2018 and 2019. Firstly, power generators are switching to natural gas use as new production from South Pars allow more gas and less oil use. Distillate and residual fuels will therefore be in greater availability to export. Secondly, the phased start up of the Persian Gulf Star refinery is due begin in early 2017. This will substantially increase domestic gasoline production, eradicating Iran's need for gasoline imports, possibly from as early as mid-2017. It will also increase diesel availability for export. The second and third phase of the refinery along with upgrades at existing facilities, will ensure refined products production meets domestic demand over the remainder of the forecast. Upgrades to improve the complexity across Iran's refining sector will also result in a greater volume of higher end-production, which are in greater demand. Over the longer term, a push for more natural gas vehicles may also free up more fuels for export.

Table: Refined Fuels Net Exports (Iran 2015-2020)

	2015	2016e	2017f	2018f	2019f	2020f
Refined products net exports, 000b/d	131.6	112.8	167.5	218.7	248.1	226.7
Refined products net exports, % y-o-y	56.4	-14.2	48.4	30.6	13.4	-8.6
Refined products net exports, USDbn	2.1	1.7	3.4	4.9	5.7	5.2

e/f = BMI estimate/forecast. Source: JODI, BMI

Table: Refined Fuels Net Exports (Iran 2021-2026)

	2021f	2022f	2023f	2024f	2025f	2026f
Refined products net exports, 000b/d	214.8	204.3	197.0	193.1	192.7	195.8
Refined products net exports, % y-o-y	-5.3	-4.9	-3.6	-2.0	-0.2	1.6
Refined products net exports, USDbn	5.3	5.0	4.8	4.7	4.7	4.8

f = BMI forecast. Source: JODI, BMI

Trade - Gas (Pipeline And LNG)

***BMI View:** Large-scale gas exports from Iran will take at least five years to materialise. Such an increase depends on a significant ramp-up in production and the build-up of the necessary export infrastructure.*

Latest Updates

- Turkmenistan halted all gas exports to Iran on Jan 1 2017 due to a build up of arrears.
- Iran has begun exporting as much as 4mn cubic metres of gas per day to Iraq.
- Progress is being made with the pre-front end engineering design (FEED) for a subsea pipeline to Oman, with **KOGAS** linked to its construction
- The IGAT-9 pipeline, extending to Turkey, is expected to be offered for foreign participation, with Russian companies showing interest.

Structural Trends

Gas Trade Outlook

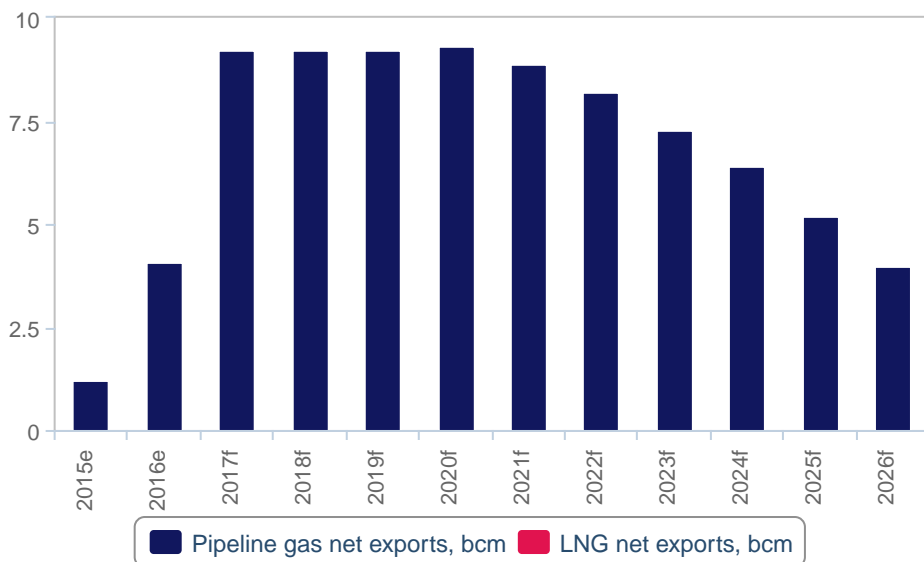
Iran trades small amounts of natural gas at the regional level by pipeline and is a small net exporter of natural gas. The majority of gas imports into Iran arrive from Turkmenistan (~6bcm), though since January

1 2017, exports have been stopped due to a disagreement over payments. The majority of Iran's exports are sent to Turkey (~9bcm). The country notably relies on gas imports during the winter months when residential demand peaks due to the cold weather.

With the start-up of new South Pars phases over 2016/17 Iran will reduce its need for gas imports, enabling it to have greater export capacity. Iraq and Turkey are expected to be the main benefactors of this, with Turkmenistan losing out. However, pipeline build out to undersupplied areas of the country will be essential achieving this. In April, Iran reported it had begun injecting the pipeline planned to supply the Diyala region of Iraq and Baghdad, at volumes of around 4mn cubic metres per day.

Gas Net Exports Forecast

(2015-2026)



e/f = BMI estimate/forecast; Source: BMI, EIA, OPEC

Limited Gas Export Capacity Over Coming Next Years

We have adjusted our Iranian gas production outlook to take into account production from new phases of South Pars over 2016/17. However, we only see a marginal increase in Iran's gas net exports, as we expect the majority of additional production over the coming few years will be consumed domestically. Our

current forecast assumes a small amount of exports to Iraq on top of around 9bcm to Turkey, and a large reduction in imports from Turkmenistan

Depending on the stability in Iraq, its ability to pay, and the connection of a new pipeline in Basra, export to Iraq could grow substantially. The full extent of this is not factored into our forecast. In the long term, net exports will also be highly dependent on the level of investment that goes into the country's gas sector - particularly LNG - following the lifting of sanctions.

Strong Upside Risk To Exports Past 2020

We note strong upside risk to net gas exports past 2020, based on two conditions:

- **Notable Production Ramp-Up Past 2019:** Our gas production forecast currently takes into account the ramp-up in South Pars phases 12, 15, 16, 17, 18 and 19 in 2016. We are also forecasting output from phases 20 and 21 from 2017. However, we do not yet include development of other South Pars phases or other field developments within our forecast. Given the size of the resources left undeveloped, production growth will hinge on the speed and scope of the return of the international oil companies (IOCs) to the Iranian energy sector and the pace of prospective gas developments.
- **Pipeline Infrastructure:** In addition to an increase in gas production, the build-up of the necessary gas export infrastructure to neighbouring countries will have to be concretised before Iran's gas net exports can rise substantially. Iran has pipeline gas export capacity of 13bcm to Turkey, of which about 9bcm is already in use, offering little spare pipeline capacity. Iran also has small export capacity to Armenia, Azerbaijan and Iraq. Completing the connection with Pakistan (on the Pakistan side) and building a new pipeline into Basra, could provide a substantial outlet for gas in the coming years.

Regional Gas Exports Within Our Forecast Period

We expect three pipeline projects can materialise over our forecast period, reinforcing our expectation that much of Iran's gas exports over the period will be to regional players.

- **Iraq:** The country is suffering from chronic power shortages despite having sufficient gas-fired power generation capacity. Securing adequate gas feedstock through imports is vital for Iraq's power sector, providing a good export market for Iranian gas. A 10-year gas agreement was signed between Iran and Iraq in July 2013, which stipulates Iran will deliver up to 9.1bcm of gas via pipeline Iraq. Pipeline construction is reportedly complete, with gas injection beginning in April 2016. A second pipeline to the Basra region is also being laid, with similar volumes potentially exported.
- **Oman:** The pre-FEED for a subsea pipeline connecting Iran to Oman is well underway. The pipeline would make use of Oman's LNG export facility, freeing up gas produced in Oman for domestic use. If the full FEED process begins, a pipeline could be in place by 2019 at the earliest. **KOGAS** has been identified as a possible constructor of the subsea pipeline.
- **Pakistan:** Pakistan is facing chronic energy shortages that have disrupted industrial production and ignited popular discontent. Pakistan is hoping to begin gas imports from Iran via the Iran-Pakistan Pipeline (IP Pipeline). While Pakistan is facing financial difficulties building its side, we believe the

lifting of sanctions on Iran may drive the completion of this project. Once completed, the pipeline will support gas inflows of 8bcm per year to Pakistan.

LNG Prospects

While we expect Iran could become a significant regional gas exporter over the second half of our forecast period, it will need to tap major gas consumption markets. In our view LNG will be crucial to achieving this and getting Iranian gas into Europe and Asia.

We do not believe a pipeline option to Europe makes sense. Iran would need to significantly upgrade and build new pipeline capacity for its gas to reach Europe. Furthermore, in order to develop such a project in a viable manner, it would likely need the entire capacity of any expansion of the Trans Anatolian Pipeline (TANAP) - proposed to increase from 16bcm to 31bcm by 2026. The TAP pipeline, which will enter Europe, has an option to expand by 10bcm; however, this is subject to EU third energy package rules allowing only 50% of pipeline capacity to one company.

In our view, Europe does not have a sufficient gas demand profile to support a project of sufficient volume to support exports, nor does it have the capacity to accept large volumes of gas. LNG would remain a more viable and flexible option to significantly increase Iranian gas exports.

According to **National Iranian Gas Export Company**, two LNG projects embarked upon prior to sanctions - Pars and Persian - are at 50% completion. We believe there will be strong IOC interest in LNG in Iran, given the low cost of gas production. That said, we do not expect IOCs to move quickly with such projects given reduced capex budgets, high up-front costs and the high risks involved in long-term projects in Iran. A floating LNG project is also under discussion to fast-track exports of associated gas from the Forouzan field.

Table: Gas Net Exports (Iran 2015-2020)

	2015e	2016e	2017f	2018f	2019f	2020f
Dry natural gas net exports, bcm	1.2	4.1	9.2	9.2	9.2	9.3
Dry natural gas net exports, % y-o-y	-39.3	229.9	127.8	-0.5	0.5	0.5
Dry natural gas net exports, USDbn	0.3	0.8	2.5	2.6	2.8	3.0
Pipeline gas net exports, bcm	1.2	4.1	9.2	9.2	9.2	9.3
Pipeline gas net exports, % y-o-y	-39.3	229.9	127.8	-0.5	0.5	0.5
Pipeline gas net exports, % of total	100.0	100.0	100.0	100.0	100.0	100.0

Gas Net Exports (Iran 2015-2020) - Continued

	2015e	2016e	2017f	2018f	2019f	2020f
LNG net exports, bcm	0.0	0.0	0.0	0.0	0.0	0.0
LNG net exports, % of total gas exports	0.0	0.0	0.0	0.0	0.0	0.0

e/f = BMI estimate/forecast. Source: National sources, BMI

Table: Gas Net Exports (Iran 2021-2026)

	2021f	2022f	2023f	2024f	2025f	2026f
Dry natural gas net exports, bcm	8.9	8.2	7.3	6.4	5.2	4.0
Dry natural gas net exports, % y-o-y	-4.6	-7.5	-11.2	-12.8	-18.7	-23.3
Dry natural gas net exports, USDbn	3.0	2.8	2.6	2.3	1.9	1.4
Pipeline gas net exports, bcm	8.9	8.2	7.3	6.4	5.2	4.0
Pipeline gas net exports, % y-o-y	-4.6	-7.5	-11.2	-12.8	-18.7	-23.3
Pipeline gas net exports, % of total	100.0	100.0	100.0	100.0	100.0	100.0
LNG net exports, bcm	0.0	0.0	0.0	0.0	0.0	0.0
LNG net exports, % of total gas exports	0.0	0.0	0.0	0.0	0.0	0.0

f = BMI forecast. Source: EIA, OPEC, IEA, BMI

Industry Risk/Reward Index

Middle East - Oil & Gas Risk/Reward Index

BMI View: *The Middle East region performs strongly upstream, due to a large and low-cost reserves base as well as a strong production growth outlook. It has also been among those regions least impacted by the current industry downturn, with a number of key producers scaling up activities to benefit from widespread services cost deflation. The above-ground environment remains challenging due to heavy state dominance in the sector and unattractive licensing regimes and the prospects for improvement here are low and will continue to drag on the region's risk profile over the coming years.*

The main themes from our overall Middle East Oil & Gas Risk/Reward Index (RRI) are:

- The Middle East outperforms every other region in our Upstream Oil & Gas RRI, supported by a substantial resource base and strong production profile. Middle Eastern producers are among those least affected by the fall in oil prices, due to the region's lower production cost structures.
- Despite vast proven reserves, Saudi Arabia and Kuwait continue to rank poorly in our Upstream Index. This is the result of the closed nature of both countries' oil and gas sectors, and the lack of opportunities for foreign investors.
- UAE and Qatar rank at the top of the index, supported by a sizeable reserves base and favourable above-ground environment.
- Iran's showing in the index saw strong improvements in 2016, following the lifting of international sanctions. Further gains are expected in the coming quarters.
- The Middle East performs poorly in our Downstream Index, due to the high level of state involvement and limited room for non-state competitors.

Table: Middle East Oil & Gas Risk/Reward Index

	Upstream R/R Ratings	Downstream R/R Ratings	Oil & Gas R/R Ratings	Rank
UAE	66.1	48.9	57.5	1
Qatar	65.1	42.1	53.6	2
Oman	60.6	44.9	52.7	3
Iraq	64.0	29.7	46.9	4
Saudi Arabia	45.9	45.8	45.8	5
Bahrain	51.8	39.2	45.5	6
Iran	50.0	39.9	45.0	7
Kuwait	47.2	36.3	41.8	8
Yemen	43.2	26.3	34.7	9

Middle East Oil & Gas Risk/Reward Index - Continued

	Upstream R/R Ratings	Downstream R/R Ratings	Oil & Gas R/R Ratings	Rank
Average	54.9	39.2	47.1	

Note: Scores out of 100, with 100 the best. Source: BMI

Upstream: Index Resilient In Lower Price Environment

Table: Middle East Upstream Oil & Gas Risk/Reward Index

	Upstream Industry Rewards	Upstream Country Rewards	Upstream Rewards	Upstream Industry Risks	Upstream Country Risks	Upstream Risks	Upstream RRI	Rank
UAE	62.5	75.0	65.6	70.0	62.2	67.3	66.1	1
Qatar	62.5	85.0	68.1	55.0	63.5	58.0	65.1	2
Iraq	81.3	65.0	77.2	40.0	21.1	33.4	64.0	3
Oman	53.8	65.0	56.6	85.0	54.3	74.2	61.9	4
Bahrain	35.0	65.0	42.5	80.0	61.0	73.4	51.8	5
Iran	68.8	27.5	58.4	25.0	34.2	28.2	49.4	6
Kuwait	75.0	5.0	57.5	5.0	57.1	23.2	47.2	7
Saudi Arabia	72.5	10.0	56.9	5.0	48.8	20.3	45.9	8
Yemen	36.3	59.0	41.9	50.0	20.2	39.6	41.2	9
Average	60.8	50.7	58.3	46.1	46.9	46.4	54.7	-

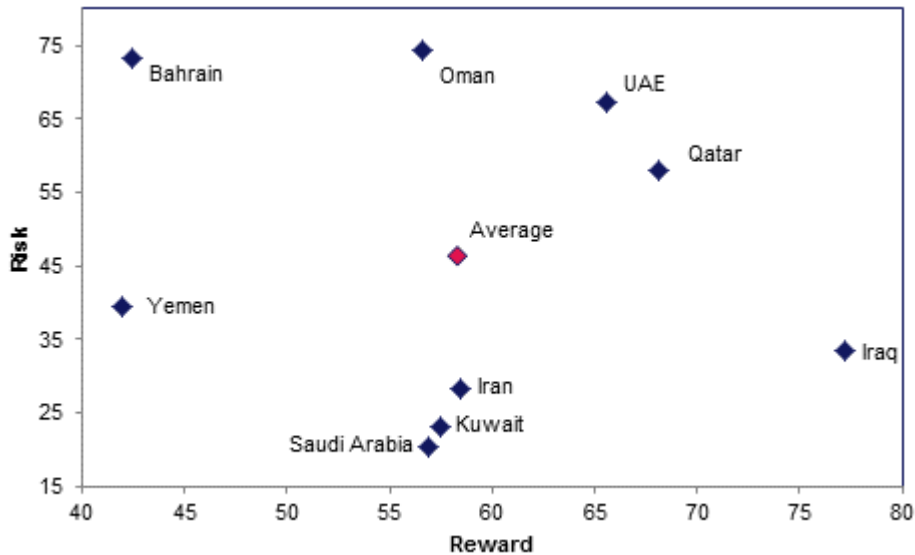
Note: Scores out of 100, with 100 the best. Source: BMI

The Middle East outperforms in our Upstream RRI. The outperformance is largely due to high Industry Rewards scores, which reflect the size of the Middle East's reserves base, and a strong production growth trajectory. The above-ground environment is significantly less favourable, due to stringent licensing terms, widespread corruption and a high level of state involvement.

The oil and gas sector in the Middle East is among those least vulnerable to a period of sustained lower oil prices, given the dominance of conventional onshore production in the region and the typically lower cost bases. In a number of markets, upstream activity has strengthened in recent quarters, as state-owned companies look to profit from the downturn and associated industry cost deflation.

Strong Production Drives Regional Outperformance

Middle East Upstream Risk/Reward Index



Scores out of 100, with 100 the best. Source: BMI

The countries at the top of our upstream rankings are not those with the greatest reserves or the strongest production profiles, but those with the best above-ground environments. In particular the UAE and Qatar are supported by high Country Rewards and Industry Risks scores. This reflects the greater participation of non-state competitors in these countries, as well as more favourable licensing terms and the comparatively low level of state ownership of assets. Iraq also benefits from a relatively diverse competitive landscape, but its fee-per-barrel contracts and the limited private ownership of assets drag the country's score down.

Those at the bottom of the rankings, in particular Saudi Arabia and Kuwait, suffer from low Country Rewards and Industry Risks scores. This is due to the closed nature of their upstream sectors, and the limited opportunities for investment. Licensing terms are unattractive, with both countries offering technical service contracts, as opposed to production sharing or concessional agreements. Opaque regulatory environments all weigh on the countries' scores.

Yemen is an outlier, combining a poor fiscal and licensing structure and generally weak business environment with declining production and a small reserves base. Widespread security issues and growing political instability are also major causes for concern, triggered repeated supply outages. The country's Upstream RRI stands at 41.2 out of 100, substantially below the regional average of 54.7.

There is usually little movement in the Middle East upstream rankings, due to the mature nature of the region's producers. However, we would flag the following current and prospective trends:

- Iran's Upstream RRI score has risen in recent quarters. The lifting of sanctions has allowed for a ramp-up in output and exports, while the return of foreign capital will strengthen the country's longer-term production growth.
- Ongoing disputes between the central government in Baghdad and the Kurdistan Regional Government over revenue-sharing have triggered repeated disruptions to exports and output, which continue to pose risk to the country's Upstream Index.
- The deal between OPEC and non-OPEC producers to curtail output will not materially alter the region's RRI, despite the Middle East absorbing the bulk of the cuts. The deal is temporary and rising oil prices will help offset the loss to output.

Downstream: Limited Opportunities

Table: Middle East Downstream Oil & Gas Risk/Reward Index

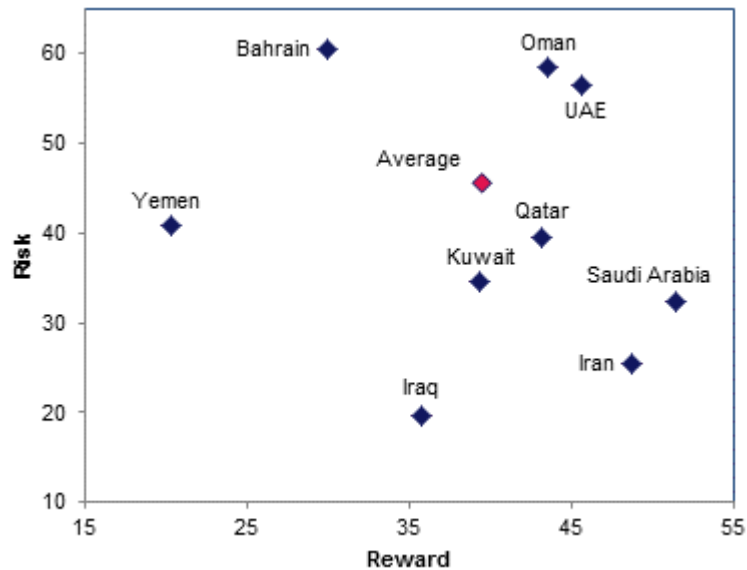
	Downstream Industry Rewards	Downstream Country Rewards	Downstream Rewards	Downstream Industry Risks	Downstream Country Risks	Downstream Risks	Downstream R/R Index	Rank
UAE	48.9	36.0	45.7	50.0	66.0	56.4	48.9	1
Saudi Arabia	56.7	36.0	51.5	10.0	66.0	32.4	45.8	2
Oman	41.1	34.0	39.3	60.0	54.9	58.0	44.9	3
Qatar	48.9	26.0	43.2	20.0	68.9	39.6	42.1	4
Iran	50.0	34.0	46.0	10.0	49.2	25.7	39.9	5
Bahrain	30.0	30.0	30.0	60.0	61.3	60.5	39.2	6
Kuwait	42.2	24.0	37.7	15.0	60.6	33.2	36.3	7
Iraq	36.7	22.0	33.0	15.0	32.2	21.9	29.7	8
Yemen	17.8	28.0	20.3	50.0	25.5	40.2	26.3	9
<i>Average</i>	<i>41.4</i>	<i>30.0</i>	<i>38.5</i>	<i>32.2</i>	<i>53.8</i>	<i>40.9</i>	<i>39.2</i>	

Note: Scores out of 100, with 100 the best. Source: BMI

The Middle's East refining capacity will continue to grow, as governments target economic diversification through downstream expansions. We forecast an increase of 1.9mn b/d in the five years to 2021.

Low Scores Capture Lack Of Opportunities

Middle East Downstream Oil & Gas Risk/Reward Index



Note: Scores out of 100, with 100 the best. Source: BMI

The region ranks poorly in our Downstream Risk/Reward Index, with an average score of 39.2 out of 100. This encompasses several structural weaknesses in the region's downstream sector that combine to severely limit opportunities for private sector investors.

- State-owned companies dominate and have control over the bulk of downstream assets.
- There are limited numbers of non-state competitors. Widespread privatisation of the sector is unlikely, and it is thus doubtful that new entrants will be able to get a toehold in the market.
- The business environment can be challenging and regulation is often onerous.

The region scores highly on Industry Rewards, reflecting large and growing domestic markets for refined fuel products. We forecast refined fuel consumption to increase from 7.7mn b/d in 2016 to 9.1mn b/d by 2025. The widespread use of fuels subsidies has weighed on the sector's overall profitability, although the fall in oil prices and consequent collapse in state revenues has catalysed reforms efforts in a number of

markets across the region: all GCC countries have enacted subsidy reforms in the past 18 months, with Kuwait the last to cut.

We forecast major capacity expansions in Iran, Saudi Arabia and Kuwait and Oman, putting upside pressure on the Industry Rewards scores of these markets. However, the new capacity will do little to alter the fundamentals of a sector largely closed to international participation.

Iran - Risk/Reward Index

Both Iran's Upstream and Downstream Risk/Reward scores remain stable this quarter. Iran holds the world's fourth largest oil reserves and second largest gas reserves, both of which have attractive production cost structures sought by oil companies in a period of lower commodity prices. The more attractive petroleum contracts due to be offered will also improve prospective returns for investors.

Upstream Index

Rewards

Iran's upstream production growth rates are improving with increasing oil exports and new phases of South Pars boosting gas production. The country remains home to vast undeveloped oil and gas reserves offering substantial opportunities to invest in production growth offering longer-term upside to the rewards score. That said, Iran's tight ownership and control over upstream assets limits opportunity and competition. Uncertainty surrounding the new IPC contracts may also limit rewards if they are not sufficiently investor friendly.

Risks

Iran's risk score remains unchanged given the expectations for the new Iran Petroleum Contract remain unchanged. The final draft of the IPC contract is still awaited, though will offer better terms than the previous buyback agreements. Lack of clarity over joint venture structures, remuneration terms and contract arbitrations having to go through Iranian courts, remain the key limits to further upside in the risk score.

We also note high levels of corruption persist and existing infrastructure is in poor condition, limiting the ease and effectiveness of doing business. Confidence over long-term political stability is improving as support for the Rouhani administration continues.

Downstream Index

Iran has a moderate position in the downstream industry index. The commissioning of the Persian Gulf Star refinery will boost capacity and production over the coming two years, while a sanction-free economy is expected to grow more quickly, demanding more refined fuels.

Continued progress with subsidy reform presents some upside, but discounted domestic diesel prices will keep international companies away from investment in the downstream sector other than through EPC contracts.

Iran's downstream score suffers from some particularly high-risk factors including a weak legal system, high levels of corruption and mediocre physical infrastructure.

Market Overview

Iran Energy Market Overview

Overview

Most of Iran's oil and gas production, processing and distribution are carried out by state-owned companies run directly by the Ministry of Petroleum. Foreign partners, particularly national oil companies, have a limited presence in the Iranian energy sector, with most foreign oil company (IOC) involvement currently from national oil companies.

The **National Iranian Oil Company** (NIOC) dominates all upstream and downstream oil and gas activities. Refining and distribution activities are carried out under the control of state-run **National Iranian Oil Refining & Distribution Company**, which was separated from NIOC in 1991. The company operates nine crude oil refineries, oil pipelines and more than 1,000 fuels retail outlets. Gas developments are carried out by the **National Iranian Gas Company** (NIGC), while petrochemicals production and distribution are the responsibility of the **National Iranian Petrochemical Company**.

Table: Key Upstream Operators - Iran Oil & Gas Sector

Company	Oil production (000b/d)	Market share (%)	Gas production (bcm)	Market share (%)
NIOC	Approx. 3,600-3,800	100	Approx. 200	100

Source: BMI

Table: Key Downstream Operators - Iran Energy Sector

Company	Refining capacity ('000b/d)	Market share (%)	Retail outlets	Market share (%)
NIORDC	1,530	100	1,060	100

Source: BMI

Fiscal Regime

Buy-Back Moves To IPC

The buy-back contract model used in pre-sanctions deals is a short-term service contract between the state-owned NIOC or one of its subsidiaries, and a foreign company. Under this type of contract, the IOC agrees to explore and/or develop a field and to fully fund the project but does not gain equity rights in the hydrocarbons produced or the physical assets of the development. Instead, it receives an annual repayment rate based on a pre-agreed rate of return. The field under development must be returned to NIOC after the IOC has been paid, usually within a period of seven to nine years.

These contracts are not attractive for IOCs, offering little flexibility and limited returns on investment. In addition, these types of contracts were of high risk to investors due to the fixed-cost approach: cost recovery was decided on the initial capital costs estimated before the development of the field. This approach meant that costs and projects going above budget could not be recovered, further eroding the profitability of a project.

Iran Petroleum Contract (IPC)

In order to increase the attractiveness of the petroleum sector to foreign investors, the oil ministry will issue a new type of contract model for IOCs willing to re-enter the Iranian oil & gas market. The contract has a clear outline but remains in draft format and has been revised on numerous occasions given hardliner pressure.

A draft of the new contract details was released to attending companies at the Tehran conference on 21-22 November 2015, and will be presented to companies officially once the contract is approved by the government. The new contract model will be substantially different to the buy-back model, though may not be as attractive as initially hoped for. We expect the following format:

- Agreements will be risk service contracts allowing for full cost recovery over the first five to seven years
- Fee-per-barrel remuneration will be linked to both the oil price and complexity of each project, and paid over the life of the project
- The contract term will be up to 25 years, with exploration, development and production under the same contract
- There will be a single contract for both oil and gas developments

Uncertainties that could dissuade some investment remain over the following:

- It remains unclear if and how oil and gas companies will be allowed to book reserves without breaking the Iranian constitution. The ability to book reserves will be a key parameter for foreign company interest and we believe hardliner influence will not allow for this to keep the ownership of oil with the Iranian state.
- Foreign investors will need to form joint ventures with Iranian companies at newly offered fields. It remains unclear what format this would take and may be challenging to implement given the presence of Iranian Revolutionary Guard affiliates operating in the oil sector.
- Disputes arising under an IPC would be subject to the exclusive jurisdiction of the Iranian Court, as opposed to an international arbitration which investors favour. This could make some investors wary of carrying out major projects in the country.

Despite encouraging contractual changes, a lack of clarity surrounding the final contract format continues raise uncertainty. Hardliner influence has likely watered down the original drafts of the IPC, though the structure will be more attractive than buy-back contracts. According to Iran, the contract structures will allow for developments to be lucrative at USD40/bbl.

Oil And Gas Infrastructure

Oil Refineries

Currently, Iran has seven large refineries which produce more than 100,000b/d, with a number of smaller facilities of less than 60,000b/d each. We estimate that Iran has 10 operating facilities, with combined capacity of 1.9mn b/d. All refineries are operated by the **National Iranian Oil Refining and Distribution Company** (NIORDC), a **National Iranian Oil Company** (NIOC) subsidiary.

The first 120,000b/d phase of the Persian Gulf Star refinery is being commissioned with commercial operations expected by March 2017. Two subsequent 120,000b/d phases are due to follow in four-to-six-month intervals, though we anticipate delays given slower than expected progress at the first phase. Refinery upgrade projects are also being outlined for Isfahan, Bandar Abbas, Arak and Lavan refineries.

Table: Refineries In Iran

	Refining Capacity (b/d)	Feedstock
Abadan	400,000	Extra Heavy crude oil from Ahwaz Asmari, Heavy Crude Oil from Central Zone and Darkhuoin
Arak	260,000	Changing feedstock composition, from 100% Ahwaz crude to a blend of 55% Ahwaz crude + 45% heavy crude from other fields
Tehran	250,000	Light crude oil of Ahwaz Asmari, crude oil from Maroon, Shadegan and CIS countries

Refineries In Iran - Continued

	Refining Capacity (b/d)	Feedstock
Isfahan	375,000	Crude oil from Maroon and Shadegan
Tabriz	110,000	na
Shiraz	58,000	Heavy crude oil from Gachsaran and condensate from Dala field
Kermanshah	22,000	Crude oil from Naftshahr, Afarineh and Ahwaz-Asmari
Lavan	60,000	Crude oil from Salman, Reshadat, Belat and Resalat Offshore resources
Bandar Abbas	330,000	Heavy crude oil, condensates
Aras 1&2	15,000	First private mini-refinery in Iran
Persian Gulf Star*	360,000	South Pars Phases 12, 15, 16 17 & 18
Total Operating Capacity	1,984,000	

* targeting Q117 start up for Ph1. Ph2 & 3 expected 2017/2018. Source: Oil & Gas Journal, NIOADC, EIA

Service Stations

NIOADC is the only significant player in fuels retail in Iran, with around 1,100 fuels retail sites and an official market share of 100%.

Oil Storage Facilities

Iran has an oil storage capacity of around 60mn barrels (bbl). According to the EIA, a significant share of this capacity is located in its export terminals. Kharg Island, the country's main export terminal, has a storage capacity of 20.2mn bbl, while the Lavan Island export terminal has a capacity of 5mn bbl.

Iran has tended to supplement its onshore oil storage with the use of floating storage. In 2008, the Fars news agency reported that the country was storing around 28mn bbl of crude oil in tankers offshore. More recently around 25-40mn b/d of oil, condensate and product is thought to be in oil tankers offshore.

Oil Terminals/Ports

Iran has significant oil and oil products export capacity with around 10 terminals, most of which are located on the country's south coast. The two largest terminals are Kharg Island and Lavan Island. Other terminals include Abadan, Bandar-e Mahshah, Ras Bahregan, Sirri Island, Bandar-e Abbas and Kish Island.

Kharg Island

The Kharg Island terminal, located 483km to the west of the mouth of the Persian Gulf, is Iran's main oil export terminal. The facility, constructed in the 1960s, is linked to the shore by a 25km subsea pipeline that starts at a pumping station at Ganaveh. During the 1980s, the terminal was responsible for around 80% of the country's crude oil exports. The facility was bombed repeatedly in 1985-1986 during the Iraq-Iran war, and exports ceased. The terminal was rebuilt in the 1990s and according to the EIA now has an export capacity of up to 5mn b/d, making it one of the largest terminals in the region.

Lavan Island

The Lavan Island terminal is linked to the island's 30,000b/d refinery and is supplied with crude from the nearby Lavan Group of subsea oil and condensate fields. The terminal is one of Iran's largest, with a capacity of 200,000b/d according to the EIA. The largest field supplying the terminal is the Salman structure, which is linked to Lavan Island via a 140km subsea pipeline. Following damage during the Iran-Iraq war, the Lavan terminal was reopened on May 1 1993.

Bandar-e Mahshah

The Bandar-e Mahshah terminal was one of Iran's main terminals prior to the construction of the Kharg island facility. Following construction, Bandar-e Mahshah was primarily used for oil product exports from the Abadan refinery.

Oil Pipelines

According to the EIA, Iran's domestic oil pipeline network comprises five separate pipelines. Two oil pipelines link the country's largest refinery at Abadan with producing areas in Khuzestan, and then further north to the Arak refinery. One of the pipelines continues further north to Tehran, and then to the oil refinery at Tabriz in the north west. Another pipeline transports oil from Khuzestan to the Esfahan refinery,

then south east to the Kerman refinery, and finally to the Bandar-e Abbas refinery and oil export terminal by the Straits of Hormuz. The Esfahan and Tehran refineries are also linked by pipeline.

Gas Pipelines

Iran has a large and well developed network of both domestic and international gas pipelines, with several major pipeline projects on the cards. Gas import pipelines link Iran to Azerbaijan and Turkmenistan, and give the country import capacities of 10bcm and 20bcm respectively. Export pipelines link Iran to Turkey (10.2bcm) and Armenia (2.3bcm). Additional proposed export pipelines would increase Iran's gas export capacity to Turkey as well as enabling exports to Pakistan and India.

Table: Major Proposed Pipelines

Project Name	Size	Unit	Companies	Timeframe Start	Timeframe End	Status
Iran-Iraq-Syria Natural Gas Pipeline (Friendship Pipeline)	-	-	Iranian Gas Engineering Development Company [Operator] {Iran}	-	-	At planning stage
Iran - Oman Subsea Gas Pipeline Project	10.22	bcm/year	Government of Oman [Sponsor] {Oman}, Government of Iran [Sponsor] {Iran}, Iranian Offshore Engineering and Construction Company (IOEC) [Sponsor]	-	-	At pre-FEED stage
Iran-Pakistan-India Pipeline (Peace Pipeline) Project	1,100	km	Government of India [Sponsor] {India}, Government of Pakistan [Sponsor] {Pakistan}, Government of Iran [Sponsor] {Iran}	-	2018	Delayed
Kuwait-Iran Pipeline	-	-	Kuwait Petroleum Corporation [Sponsor] {Kuwait}, National Iranian Gas Exports Company (NIGEC) [Sponsor] {Iran}	-	-	At planning stage
Iran (South Pars Gas Field) - Iraq (Basra) Gas Pipeline Project	-	-	Government of Iraq [Sponsor] {Iraq}, Government of Iran [Sponsor] {Iran}	2015	2016-	Gas injection underway

Source: BMI Infrastructure Key Projects

Gas Storage Facilities

Table: Operation, Under Construction & Planned Gas Storage

Facility	Status	Capacity (bcm)
Shourijeh	Operational	4.8
Serajeh	Operational	3.3
Nasrabad	Progressing	4.5
Yurtsha	Progressing	~
Qezeltappeh	Planned	~

Source: NIGC, various

Competitive Landscape

Currently the Iranian oil sector is heavily state-dominated in all sectors. The Oil Ministry remains in control of NIOC, which controls or has a major stake in nearly all oil companies in the country and the bulk of production. Due to the legacy impact of sanctions there are very few international oil companies operating in Iran. The Chinese companies of **CNPC** and **Sinopec** have been active, but have only progressed work on key field developments once the crude export restrictions were lifted in January 2016. Other national oil companies from Russia, India and South East Asia have also shown interest in entering the Iranian market.

The introduction of the IPC is expected to play a big role in increasing the number of foreign companies operating in the country, though the joint ventures formed under the contract will be 51% owned by the domestic subsidiary. A number of major European and Asian oil companies have shown interest in entering or returning to operations in Iran, once the new contracts have been finalised. NIOC is hoping to sign the first IPC contracts in 2017 or earlier.

Company Profile

NIOC

Latest Updates

- A list of 29 prequalified companies able to partner NIOC Iranian upstream projects has been released, including Shell, Total, Eni, Gazprom.
- Oil output averaged 3.485mn b/d in 2016, with exports averaging around 2.0mn b/d.
- NIOC subsidiary NIORDC finalised a contract with Sinopec for the upgrade of the Abadan refinery. The focus will be on maximising gasoline output, boosting efficiency and producing cleaner fuels.
- The first 120,000b/d phase of the Persian Gulf Star refinery is in the commissioning stage with operations set to begin in March 2017. The first naphtha assignment has been successfully delivered.
- The last platforms for phases 17 & 18 of South Pars were installed in December - adding a further 500mn cubic feet of gas production.
- South pars phases 17, 18, 19, 20 and 21 are due to be operational by March 2017.

Strengths

- 158bn barrels of proven liquid resources - third largest globally by company
- 34tcm of natural gas resources - the second largest globally by company
- Low lifting costs for oil and gas
- Competent and skilled workforce and engineering division

Weaknesses

- Limited technological knowhow in enhanced oil recovery techniques
- No domestic LNG technological capability
- Weak regional export opportunities
- Need for substantial Investment in infrastructure and assets due to under investment under sanctions

Opportunities

- Considerable untapped gas export potential
- Large short-term increase in oil exports
- Joint ventures with international oil companies under new Iranian Petroleum Contract terms

- Growing domestic demand for refined products
- Low lifting costs will support market share growth in low price environment

Threats

- High influence of hardliners in the oil and gas sector
- Strong competition from other sectors for government financial resources
- Restricted access to international banking systems to process USD payments
- Breakdown in the nuclear agreement and re-imposition of sanctions

Company Overview State owned under the Iranian Ministry of Petroleum, National Iranian Oil Company (NIOC) is one of the world's largest oil companies by production and reserves. Through its subsidiaries the company controls around 158bn barrels of liquid, and 34trn cubic metres of gas resources.

Table: Major NIOC Subsidiaries

Production	Service	Management	Administrative	Organisational
National Iranian South Oil Company (NISOC)	Kalanaft Company	Arvandan Oil & Gas Company (AOGC)	Pars Special Economic Energy Zone (PSEEZ)	Iranian Fuel Conservation Organization (IFCO)
Karoon Oil & Gas Production Company (KOGPC)	Petroleum Engineering & Development Company (PEDEC)	Iranian Oil Terminals Company (IOTC)		Research Institute of Petroleum Ministry
Khazar Expl & Prod Co (KEPCO)	North Drilling Company (NDC)	Pars Oil & Gas Company (POGC)		Petroleum Industry Health Organization
South Zagros Oil & Gas Production Company	National Iranian Drilling Company (NIDC)	Naftiran Intertrade Company (NICO)		Pension, Saving & Welfare Funds
Maroun Oil & Gas Company	Manufacturing Support & Procurement Kala Naft Company	National Iranian Gas Export Company		
Iranian Offshore Oil Company (IOOC)	Iranian Drilling Services Company (IDSC)			
Masjedsoleyman Oil & Gas Company (MOGC)	Oil Transportation Services and Logistics Company (OTSLC)			
Gachsaran Oil & Gas Production Company (GOGPC)	South Engineering Services & Turbine Industrial Equipment Company			

Major NIOC Subsidiaries - Continued

Production	Service	Management	Administrative	Organisational
Aghajari Oil & Gas Production Company (AOGPC)				
West Oil & Gas Production Company				
East Oil & Gas Production Company (EOGPC)				
Iranian Central Oil Fields Company (ICOFC)				

Source: NIOC

NIOC will be central to Iran's future expansion, as many of its subsidiaries will form joint ventures under the proposed Iran Petroleum Contract (IPC). In order to attract foreign investment the new contract format will be far more competitive than the previous buy-back model, though it currently remains in draft format. Many of the targeted field will be those in border areas under joint development programmes with neighbouring countries, or more technically complex projects. Given hardliner influence in the IPC, a two-tier system will likely emerge, with buyback contracts remaining and the IPC being introduced for specific fields.

Table: Fields Proposed Under The New IPC

	Border Oil Fields	Border Gas Fields	Other Oil Fields	Other Gas Fields
1	S. Azadegan Ph 1	15 S. Pars Ph 11	23 Mansuri Ph 2	37 Dey
2	N. Azadegan Ph 2	16 Salman Ph 1	24 Band-e-Karkheh	38 Sefidzakhir-Halegan
3	Yadavaran Ph 2	17 Salman Ph 2	25 Jofayr	39 Sefidbaghoun
4	Reshadat	18 Farzad A	26 Somar	40 Aghar Ph 2
5	Foroozan	19 Farzad B	27 Danan Ph 2	41 Farashband: Refining Facilities
6	S. Pars Oil Layer Ph 1	20 Reshadat	28 Darquain Ph 3	42 Varavi: Boosting Gas Pressure Stations
7	Arvand	21 Dalan Kangan At Balal	29 Susangerd	43 Kangan: Boosting Gas Pressure Stations
8	Dehloran Ph 2	22 Arash	30 Sepehr	44 Nar: Boosting Gas Pressure Stations
9	Peydar Gharb		31 Cheshmeh Khosh	45 Homa: Boosting Gas Pressure Stations
10	Aban Ph 2		32 Resalat	46 Behregansar Gas Layer
11	Sohrab		33 Abuzar	47 Tangebajar Ph 2
12	Changouleh		34 Doroud	48 Kish Ph 3 3D Seismic

Fields Proposed Under The New IPC - Continued

Border Oil Fields	Border Gas Fields	Other Oil Fields	Other Gas Fields
13 Esfandiar Ph 1		35 Norouz	49 Kish Ph 1
14 Arash		36 Zagheh	

Source: Iran Oil Ministry

NIOCs priorities are to develop border fields shared with Iraq, Qatar and other countries in the Persian Gulf. High potential greenfields are also a key target, as is improved recovery projects at major brownfield sites.

While under sanctions NIOC did not publish any financial or operational information. The most recent publically available data from 2012 indicates NIOC revenues were USD110bn. Total assets of the company were valued at around USD200bn.

Regional Overview

Middle East Oil & Gas Regional Overview

***BMI View:** Gas production in the Middle East is set for substantial growth over the next 10 years freeing up domestically consumed oil for export. Oil will also increase despite OPEC curtailments, though efforts to diversify economies will support new refining and petrochemicals projects adding value to exports.*

To highlight the key themes that inform **BMI's** Middle East oil and gas forecasts, we have compared countries on the basis of the following key indicators:

- Oil production
- Oil consumption
- Refining capacity
- Gas production
- Gas consumption

Our Middle East coverage includes Bahrain, Kuwait, Iran, Iraq, Israel, Oman, Qatar, Saudi Arabia, UAE and Yemen.

Oil Production: Output Cut To Have Marginal Impact

In 2016, all oil producing countries outside of Yemen in the Middle East, will see increased oil production year on year. The region as a whole will increase output by more than 1.1mn b/d to 30.3mn b/d in 2016, led by Saudi Arabia, Iraq and Iran. The agreement by OPEC and non-OPEC members to cut production over H117 will only marginally impact production over the short term. Production targets revealed at the November 30 meeting, were near output highs for many countries. It remains unclear whether the cut will be sustained into H217, but it is likely most countries in the Middle East will raise production at least seasonally. As such we expect higher output from Middle East countries in 2017, though only marginally.

Table: Marginal Impact On 2017 Output From Cut (mn b/d)

	2016 Oil Production	Cut Target	2017 Oil Production
Saudi Arabia	10.338	10.058	10.215
Iraq	4.290	4.351	4.400
Iran	3.595	3.797	3.810
UAE	2.953	2.874	2.950
Kuwait	2.884	2.707	2.950
Oman	1.000	0.965	0.982
Qatar	0.651	0.618	0.620

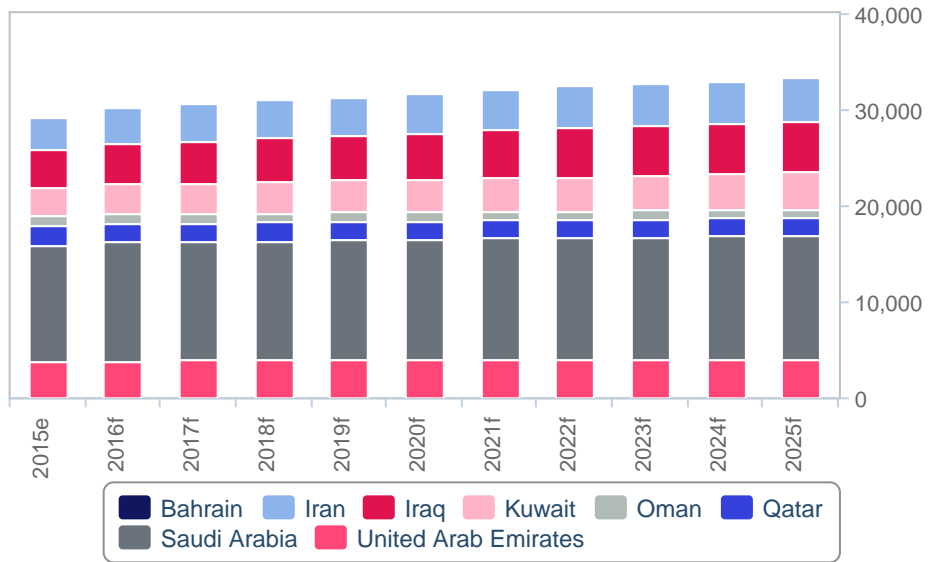
Source: BMI, OPEC

Beyond 2017, most countries in the Middle East will most likely bring back any spare production capacity that was created from limiting output. A number of major projects, both gas and oil, remain under development and will drive production growth over the coming years:

- Saudi Arabia has vowed to maintain its 12.5mn b/d of crude production capacity adding 300,000b/d at the Khurais oil field, 900,000b/d at Manifa and up to 1mn b/d at Shaybah. Production from the neutral zone is also due to restart in early 2017.
- Kuwait, which will also benefit from the neutral zone restart, is investing to reach its target crude and condensate production capacity of 3.165mn b/d by 2017 and 4.0mn b/d by 2020. A water injection scheme to boost production from the Burgan oil field was tendered in September.
- The UAE is aiming to increase crude oil output to 3.5mn b/d by the end of 2018 and sustain that output for 25 years. **ExxonMobil's** Upper Zakum expansion and the addition of **Total, BP** and **Inpex** to the onshore concession investors will support this.
- Iraq has an oil production target of 5.5mn b/d to 6.0mn b/d by 2020, supported by contracted production plateau levels at its largest oil fields. Combined plateau output of the Rumaila, West Qurna-2, Majnoon, Zubair and Halfaya is 5.55mn b/d.
- Iran has signed a sweep of memorandums with companies including Total and **Shell**, to work on expanding oil production from the country's vast resources.

Middle East Expansion Continues

Oil Production In Major Middle East Producers (000b/d)



e/f = BMI estimate/forecast. Source: National sources, EIA, BMI

We forecast crude, condensate and oil liquids production to increase nearly 3mn b/d from 2016 to 2025, with the ten countries we cover in the Middle East increasing output from 30.3mn b/d to 33.0mn b/d.

Oil Consumption: Subsidy Reform Tempering Demand

Low oil prices are driving fuel subsidy reform as government budgets are squeezed by lower revenues. All Gulf Cooperation Council (GCC) countries have implemented changes to increase pump prices for gasoline, and in some cases diesel. Numbing powerful refined fuel demand growth will be essential to prevent countries from dropping net oil export levels and enact production cuts. All major states in the Middle East have seen the price of fuel increase since mid-2015, and in most cases this has led to a weaker or negative year-on-year demand in 2016.

Table: Average Gasoline Pump Price June 2015 & December 2016 (USD/Litre)

	June-15	December-16
Saudi Arabia	0.12	0.24
Kuwait	0.20	0.34
Qatar	0.26	0.41
Bahrain	0.27	0.42
Oman*	0.29	0.45
UAE*	0.47	0.48

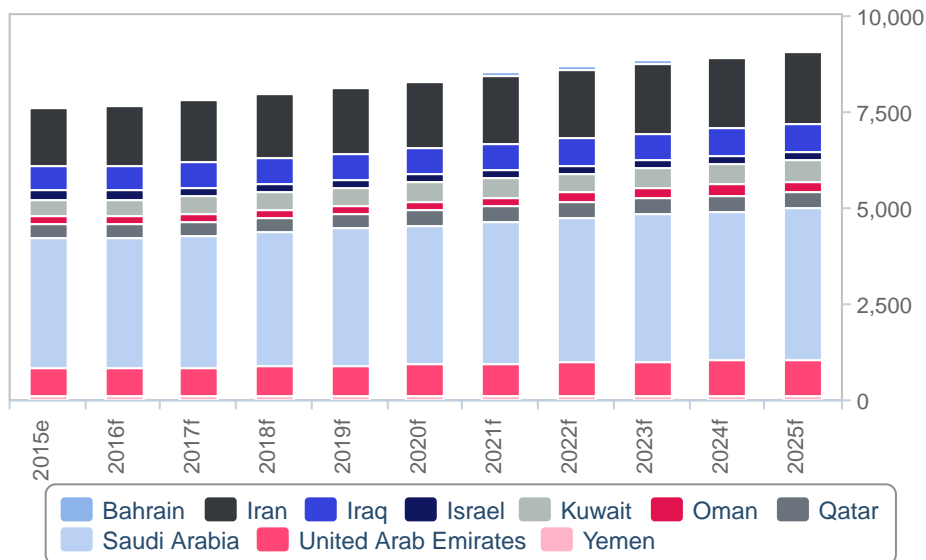
**Revised monthly in line with global market prices; accurate as of September 19 2016. Source: globalpetrolprices.com*

Consumption patterns have been weaker in 2016 and in some cases even negative due to higher fuels prices. We also anticipate a switch from higher quality fuels to lower grades, given the largest price increases have been made in the premium 98 and 95 octane fuels, while 91 and 88 have seen less of an increase. Economic expansion policy, particularly in the refining and petrochemical sectors, will continue to drive demand for oil, while population growth and vehicle sales continue to point to stronger domestic demand. That said, weaker economic growth is weighing on consumption.

We forecast Middle East refined product consumption to increase from 8.1mn b/d in 2016 to 9.5mn b/d in 2025. Consumption is forecast to grow 17% over to 2025, far stronger than our forecast 9% growth in oil production.

Subsidy Reform Slowing Consumption Growth

Middle East Oil Consumption (000b/d)



e/f = BMI estimate/forecast. Source: National sources, BMI, EIA

Refining Capacity: Mega Refineries To Support Economic Diversification

With an abundance of low-cost feedstock and widespread government support to diversify the economy away from crude oil exports, the Middle East's refining capacity is forecast to grow strongly across our 10-year forecast period. We forecast refining capacity to increase from 9.2mn b/d in 2016 to 11.1mn b/d by 2025.

New investment will be spread across a number of greenfield and brownfield developments, but key contributors to growth include:

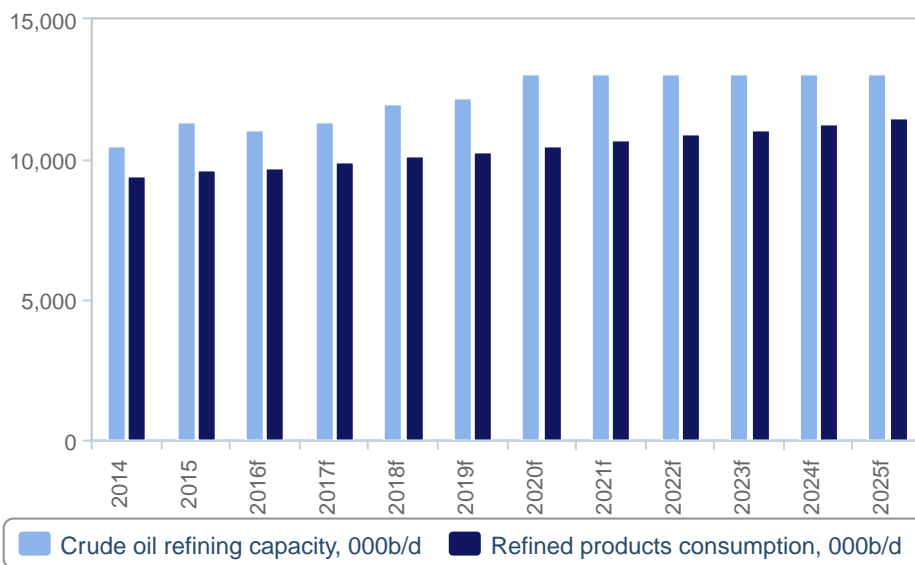
- Saudi Arabia's 400,000b/d Jizan facility is slated for start-up in 2018.
- Kuwait has awarded USD11.5bn in contracts for the 615,000b/d Al Zour refinery and is targeting operational start-up by 2020.
- Iraq let the contract for the 140,000b/d Karbala refinery in June 2015, which is due to be completed by 2020.
- Iran is due to bring on the first 120,000b/d phase of the Persian Gulf Star refinery by early 2017, with two subsequent 120,000b/d phases following. The country has also proposed an extensive upgrade programme to modernise existing facilities.

- Expansions at Ras Laffan in Qatar (Q416), Sohar in Oman (2017) and Sitra in Bahrain (2018) will boost crude distillation capacity.

Fuels import demand in the major consumption market of Europe is forecast to be flat to negative, forcing the Middle East to lean on Asia for fuels exports. China and India are also building up their own domestic refining centres, leaving an increasingly crowded global market. However, the new facilities being built in the Middle East benefit from access to low-cost feedstock, are efficient and leverage economies of scale, which all combine to offer an advantage in a competitive fuels market.

Diversifying Through Refined Product Exports

Middle East Refining Capacity & Refined Product Consumption (000b/d)



f = BMI forecast. Source: Company data, EIA, BMI

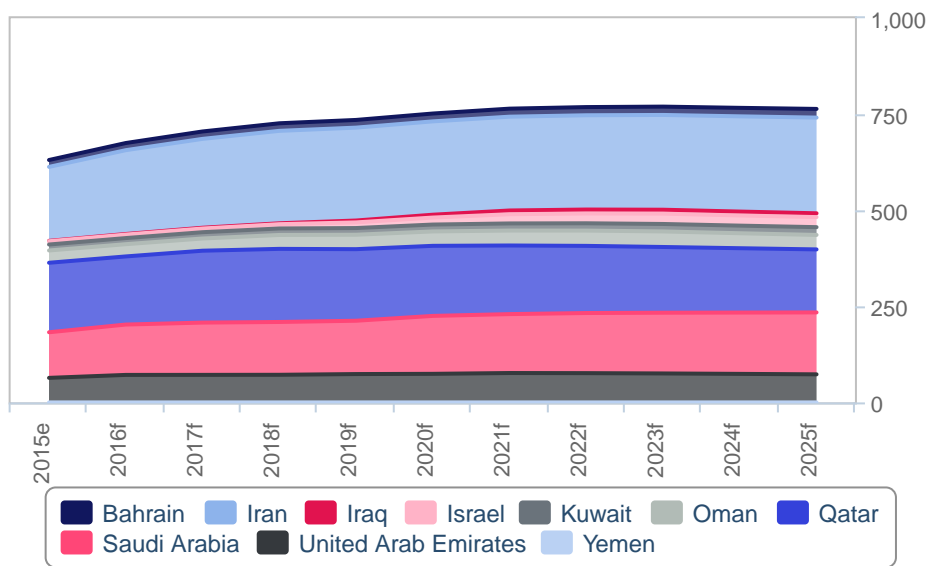
Gas Production: Gas Projects Move Forward

Middle East gas production is set for growth as the region looks to substitute more costly and less efficient oil with gas in power generation (see 'Low Oil Price Supports Gas Projects', August 15). Increased gas output is intended to free up more crude for export, or prevent exports from declining as domestic demand rises. We forecast natural gas production in the Middle East to increase 13.2% from 2016 to 2025, rising from 675bcm to 764bcm, with more potential upside from Iran depending on IPC uptake from foreign investors.

Much of the gas in the Middle East is associated in oilfields and few countries have developed sufficient infrastructure to collect and transport this resource to demand centres. A further disincentive to progress is that many countries do not have separate regulations governing associated gas production, creating a lack of clarity around the reward for monetising gas. As a result, large volumes of gas that could be monetised are flared - particularly in Iraq and Iran.

Gas Focus Grows

Middle East Gas Production (bcm)



e/f = BMI estimate/forecast. Source: National sources, EIA, BMI

Non-associated gas will be the largest contributor to new gas output:

- Iran holds the most gas production upside through further phase development of the South Pars field, which could add over 60bcm of production capacity in the next five years.
- Oman is progressing the Khazzan gas project, which will boost gas production by 15bcm in 2017
- In Saudi Arabia, the Wasit gas project has already reduced crude burn over 2016 - supporting oil exports - and the Fadhilli gas development (26bcm) will be major boost to gas growth in 2019.
- The Miran project (8bcm) in the Kurdistan Region of Iraq, Leviathan (12bcm) in Israel and Barzan phase 2 (10bcm) in Qatar will also be major additions over the next few years.

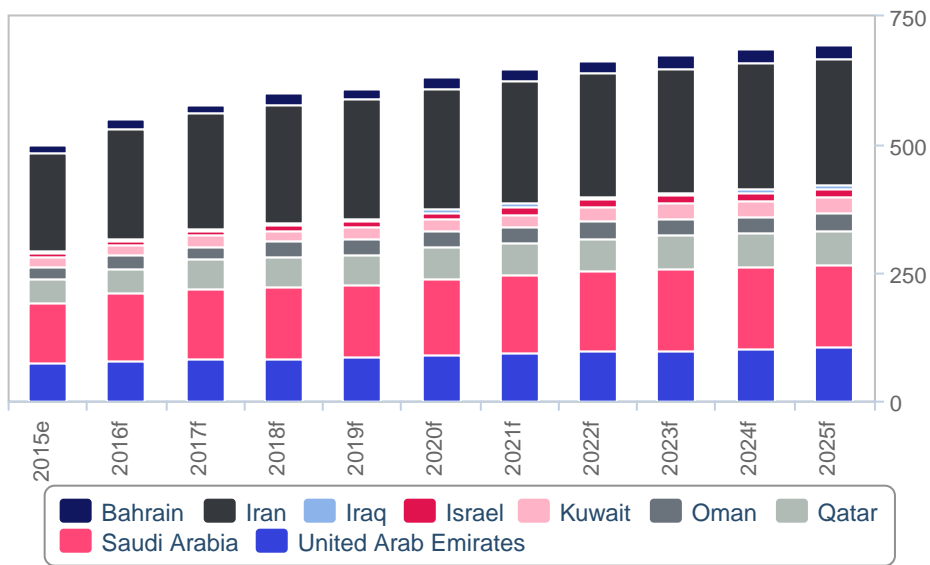
Gas Consumption: Industrial Growth And Power Strengthen Consumption

All countries in the Middle East will see gas consumption grow over the next 10 years and this will be at a faster rate than production growth. We forecast gas consumption to increase from 560bcm in 2016 to 710bcm in 2025, an increase of 26.7%.

Consumption will be driven by the region's burgeoning downstream sector - in particular petrochemicals - and a gradual reorientation of the Middle East power sector from oil to gas-fired generation. Oil continues to be used in power plants due to insufficient gas availability, while some gas power facilities are idle or working at low capacity due to lack of supply. Gas reinjection is also increasing throughout the Middle East to maintain reservoir pressures at maturing oil fields.

Burgeoning Gas Demand

Selected Middle East Countries - Gas Consumption (bcm)



e/f = BMI estimate/forecast. Source: EIA, BMI

Table: Middle East Oil & Gas Production, Refining Capacity & Trade

	2015	2016f	2017f	2018f	2019f	2020f	2021f	2022f	2023f	2024f	2025f
Middle East oil production, 000b/d	29,202	30,226	30,831	31,233	31,433	31,742	32,216	32,612	32,971	33,309	33,683
Middle East oil consumption, 000b/d	8,126.7	8,162.4	8,312.3	8,497.2	8,618.3	8,788.4	8,948.1	9,107.3	9,259.6	9,403.8	9,535.5
Middle East oil net exports, 000b/d	21,076	22,064	22,519	22,736	22,815	22,954	23,268	23,505	23,711	23,906	24,148
Middle East oil refinery capacity, 000b/d	9,463.0	9,215.5	9,416.5	10,000.5	10,230.5	11,075.5	11,075.5	11,075.5	11,075.5	11,075.5	11,075.2
Middle East gas production, bcm	626.1	675.0	705.1	720.4	729.5	749.6	762.4	763.0	762.4	760.6	757.2
Middle East gas consumption, bcm	504.8	552.2	576.0	591.3	605.5	629.3	645.0	662.6	676.3	690.1	705.1
Middle East gas net exports, bcm	121.3	122.8	129.1	129.1	124.0	120.2	117.3	100.4	86.2	70.5	52.1
Middle East LNG net exports, bcm	117.5	120.4	132.7	133.9	123.5	112.1	102.5	87.8	76.4	63.7	49.1

f = BMI forecast. Source: National sources, EIA, JODI, BMI

Glossary

Table: Glossary Of Terms

AOR	additional oil recovery	KCTS	Kazakh Caspian Transport System
APA	awards for predefined areas	km	kilometres
API	American Petroleum Institute	LAB	linear alkyl benzene
bbi	barrel	LDPE	low density polypropylene
bcm	billion cubic metres	LNG	liquefied natural gas
b/d	barrels per day	LPG	liquefied petroleum gas
bn	billion	m	metres
boe	barrels of oil equivalent	mcm	thousand cubic metres
BTC	Baku-Tbilisi-Ceyhan Pipeline	Mcm	mn cubic metres
BTU	British thermal unit	MEA	Middle East and Africa
Capex	capital expenditure	mn	million
CBM	coal bed methane	MoU	memorandum of understanding
CEE	Central and Eastern Europe	mt	metric tonne
CPC	Caspian Pipeline Consortium	MW	megawatts
CSG	coal seam gas	na	not available/ applicable
DoE	US Department of Energy	NGL	natural gas liquids
EBRD	European Bank for Reconstruction & Development	NOC	national oil company
EEZ	exclusive economic zone	OECD	Organisation for Economic Cooperation & Development
e/f	estimate/forecast	OPEC	Organization of the Petroleum Exporting Countries
EIA	US Energy Information Administration	PE	polyethylene
EM	emerging markets	PP	polypropylene
EOR	enhanced oil recovery	PSA	production sharing agreement
E&P	exploration and production	PSC	production sharing contract
EPSA	exploration and production sharing agreement	q-o-q	quarter-on-quarter
FID	final investment decision	R&D	research and development
FDI	foreign direct investment	R/P	reserves/production
FEED	front end engineering and design	RPR	reserves to production ratio
FPSO	floating production, storage and offloading	SGI	strategic gas initiative
FTA	free trade agreement	SoI	statement of intent
FTZ	free trade zone	SPA	sale and purchase agreement
GDP	gross domestic product	SPR	strategic petroleum reserve

Glossary Of Terms - Continued

G&G	geological and geophysical	t/d	tonnes per day
GoM	Gulf of Mexico	tcm	trillion cubic metres
GS	geological survey	toe	tonnes of oil equivalent
GTL	gas-to-liquids conversion	tpa	tonnes per annum
GW	gigawatts	TRIPS	Trade-Related Aspects of Intellectual Property Rights
GWh	gigawatt hours	trn	trillion
HDPE	high density polyethylene	T&T	Trinidad & Tobago
HoA	heads of agreement	TTPC	Trans-Tunisian Pipeline Company
IEA	International Energy Agency	TWh	terawatt hours
IGCC	integrated gasification combined cycle	UAE	United Arab Emirates
IOC	international oil company	USGS	US Geological Survey
IPI	Iran-Pakistan-India Pipeline	WAGP	West African Gas Pipeline
IPO	initial public offering	WIPO	World Intellectual Property Organization
JOC	joint operating company	WTI	West Texas Intermediate
JPDA	joint petroleum development area	WTO	World Trade Organization

Source: BMI

Methodology

Industry Forecast Methodology

BMI's industry forecasts are generated using the best-practice techniques of time-series modelling and causal/econometric modelling. The precise form of model we use varies from industry to industry, in each case being determined, as per standard practice, by the prevailing features of the industry data being examined.

Common to our analysis of every industry is the use of vector autoregressions. Vector autoregressions allow us to forecast a variable using more than the variable's own history as explanatory information. For example, when forecasting oil prices, we can include information about oil consumption, supply and capacity.

When forecasting for some of our industry sub-component variables, however, using a variable's own history is often the most desirable method of analysis. Such single-variable analysis is called univariate modelling. We use the most common and versatile form of univariate models: the autoregressive moving average model (ARMA).

In some cases, ARMA techniques are inappropriate because there is insufficient historic data or data quality is poor. In such cases, we use either traditional decomposition methods or smoothing methods as a basis for analysis and forecasting.

BMI mainly uses OLS estimators and in order to avoid relying on subjective views and encourage the use of objective views, **BMI** uses a 'general-to-specific' method. **BMI** mainly uses a linear model, but simple non-linear models, such as the log-linear model, are used when necessary. During periods of 'industry shock', for example poor weather conditions impeding agricultural output, dummy variables are used to determine the level of impact.

Effective forecasting depends on appropriately selected regression models. **BMI** selects the best model according to various different criteria and tests, including but not exclusive to:

- R^2 tests explanatory power; adjusted R^2 takes degree of freedom into account;
- Testing the directional movement and magnitude of coefficients;
- Hypothesis testing to ensure coefficients are significant (normally t-test and/or P-value);
- All results are assessed to alleviate issues related to auto-correlation and multi-collinearity.

BMI uses the selected best model to perform forecasting.

Human intervention plays a necessary and desirable role in all of **BMI**'s industry forecasting. Experience, expertise and knowledge of industry data and trends ensure that analysts spot structural breaks, anomalous data, turning points and seasonal features where a purely mechanical forecasting process would not.

Sector-Specific Methodology

There are a number of principal criteria that drive our forecasts for each energy indicator.

Energy Supply

This covers the supply of crude oil, natural gas, refined oil products and electrical power, which is determined largely by investment levels, available capacity, plant utilisation rates and national policy. We therefore examine:

- National energy policy, stated output goals and investment levels;
- Company-specific capacity data, output targets and capital expenditures, using national, regional and multinational company sources;
- International quotas, guidelines and projections from organisations such as OPEC, the International Energy Agency (IEA), and the US Energy Information Administration (EIA).

Energy Consumption

A mixture of methods is used to generate demand forecasts, applied as appropriate to each individual country:

- Underlying economic (GDP) growth for individual countries/regions, sourced from **BMI** published estimates;
- Historic relationships between GDP growth and energy demand growth in an individual country are analysed and used as the basis for predicting levels of consumption;
- Government projections for oil, gas and electricity demand;
- Third-party agency projections for regional demand, from organisations such as the IEA, EIA and OPEC;

Extrapolation of capacity expansion forecasts based on company- or state-specific investment levels.

Cross Checks

Whenever possible, we compare government and/or third-party agency projections with the declared spending and capacity expansion plans of the companies operating in each individual country. Where there are discrepancies, we use company-specific data as physical spending patterns to determine capacity and supply capability. Similarly, we compare capacity expansion plans and demand projections to check the energy balance of each country. Where the data suggest imports or exports, we check that necessary capacity exists or that the required investment in infrastructure is taking place.

Source

Sources include those international bodies mentioned above, such as OPEC, IEA, and EIA, as well as local energy ministries, official company information, and international and national news, plus international and national news agencies.

Risk/Reward Index Methodology

BMI's Risk/Reward Index (RRI) provides a comparative regional ranking system evaluating the ease of doing business and the industry-specific opportunities and limitations for potential investors in a given market. The RRI system is divided into two distinct areas:

Rewards: Evaluation of sector's size and growth potential in each state, and also broader industry/state characteristics that may inhibit its development. This is further broken down into two sub-categories:

- Industry Rewards (this is an industry-specific category taking into account current industry size and growth forecasts, the openness of market to new entrants and foreign investors, to provide an overall score for potential returns for investors);
- Country Rewards (this is a country-specific category, and the score factors in favourable political and economic conditions for the industry).

Risks: Evaluation of industry-specific dangers and those emanating from the state's political/economic profile which call into question the likelihood of anticipated returns being realised over the assessed time period. This is further broken down into two sub-categories:

- Industry Risks (this is an industry-specific category whose score covers potential operational risks to investors, regulatory issues inhibiting the industry, and the relative maturity of a market);
- Country Risks (this is a country-specific category in which political and economic instability, unfavourable legislation and a poor overall business environment are evaluated to provide an overall score).

We take a weighted average, combining Market and Country Risks, or Industry and Country Rewards. These two results in turn provide an overall Risk/Reward Index score, which is used to create our regional ranking system for the risks and rewards of involvement in a specific industry in a particular country.

For each category and sub-category, each state is scored out of 100 (with 100 the best), with the overall Risk/Reward Index score a weighted average of the total score. Importantly, as most of the countries and territories evaluated are considered by **BMI** to be 'emerging markets', our index is revised on a quarterly basis. This ensures that the index draws on the latest information and data across our broad range of sources, and the expertise of our analysts.

Sector-Specific Methodology

BMI's approach in assessing the Risk/Reward balance for oil and gas industry investors is three-fold:

- First, we have disaggregated the upstream (oil and gas exploration and production) and downstream (oil refining and marketing, gas processing and distribution), enabling us to take a more nuanced approach to analysing the potential in each segment, and identifying the different risks along the value chain.
- Second, we have identified objective indicators that may serve as proxies for issues and trends that were previously evaluated on a subjective basis.
- Finally, we have used **BMI's** proprietary Country Risk Index in a more refined manner in order to ensure that only those risks most relevant to the industry have been included.

Conceptually, the index is organised in a manner that enables us clearly to present the comparative strengths and weaknesses of each state. The headline oil and gas index score is the principal score. However, the differentiation of upstream and downstream and the articulation of the elements that comprise each segment enable more sophisticated conclusions to be drawn, and also facilitate the use of the index by clients who have varying levels of exposure and risk appetite.

Our sector-specific industry indices include:

- Oil & Gas Risk/Reward Index: this is the overall index score, which comprises 50% upstream and 50% downstream;
- Upstream Oil & Gas Risk/Reward Index: this is the overall upstream index score, which is composed of rewards/risks (see below);
- Downstream Oil & Gas Risk/Reward Index: this is the overall downstream index score, which comprises rewards/risks (see below).

The following indicators have been used. Overall, the index uses three subjectively measured indicators and 41 separate indicators/datasets.

Table: Bmi's Oil & Gas Upstream Risk/Reward Index

	Rationale
Upstream RRR: Rewards	
Industry Rewards	
Resource Base	
- Proven oil reserves, mn bbl	Indicators used to denote total market potential. High values given better scores.
- Proven gas reserves, bcm	
Growth Outlook	
- Oil production growth, 2009-2014	Indicators used as proxies for BMI's market assumptions, with strong growth accorded higher scores.
- Gas production growth, 2009-2014	
Market Maturity	
- Oil reserves/production	Indicator used to denote whether industries are frontier/emerging/developed or mature markets. Low existing exploitation in relation to potential is accorded a higher score.
- Gas reserves and production	
- Current oil production versus peak	
- Current gas production versus peak	
Country Rewards	
State ownership of assets, %	Indicator used to denote opportunity for foreign NOCs/IOCs/independents. Low state ownership scores higher.
Number of non-state companies	Indicator used to denote market competitiveness. Presence (and large number) of non-state companies scores higher.
Upstream RRR: Risks	
Industry Risks	
Licensing terms	Subjective evaluation of government policy towards sector against BMI-defined criteria. Protectionist states are marked down.
Privatisation trend	Subjective evaluation of government industry orientation. Protectionist states are marked down.
Country Risks	
Physical infrastructure	Score from BMI's Country Risk Index (CRI). It evaluates the constraints imposed by power, transport and communications infrastructure.
Long-term policy continuity risk	From CRI. It evaluates the risk of a sharp change in the broad direction of government policy.
Rule of law	From CRI. It evaluates government's ability to enforce its will within the state.

Bmi's Oil & Gas Upstream Risk/Reward Index - Continued**Rationale**

Corruption

From CRI, to denote risk of additional legal costs and possibility of opacity in tendering or business operations affecting companies' ability to compete.

NOC = national oil company; IOC = international oil company. Source: BMI

Weighting

Given the number of indicators/datasets used, it would be inappropriate to give all sub-components equal weight. Consequently, the following weighting has been adopted:

Table: Weighting

Component	Weighting, %
Upstream RRI	50, of which
Rewards	70 of Upstream RRI, of which
- Industry Rewards	75
- Country Rewards	25
Risks	30 of Upstream RRI, of which
- Industry Risks	65
- Country Risks	35
Downstream RRI	50 of Oil & Gas RRI, of which
Rewards	70 ,of which
- Industry Rewards	75
- Country Rewards	25
Risks	30, of which
- Industry Risks	60
- Country Risks	40

Source: BMI