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BMI Industry View

BMI View: Fuelled by the world's third largest proven conventional gas reserves, Qatar has positioned itself as the leading global exporter of liquefied natural gas (LNG). Rising competition, led by liquefaction growth in Australia and potentially the US and East Africa, will pose a challenge to Qatar's hold on the global gas market later in the decade. Qatar is responding by making increasing efforts to diversify its economy through expanding its downstream and petrochemical sectors. The country is growing the international presence of Qatar Petroleum International to offset slowing growth in domestic oil and gas projects, given the absence of plans for an expansion of LNG and GTL export capacity.

Table: Headline Forecasts (Qatar 2012-2018)

	2012	2013e	2014f	2015f	2016f	2017f	2018f
Crude, NGPL & other liquids prod, 000b/d	1,568.9	1,567.4	1,561.1	1,572.5	1,585.3	1,581.2	1,581.6
Dry natural gas production, bcm	142.6	143.7	144.0	150.5	153.5	154.5	156.1
Dry natural gas consumption, bcm	20.5	21.5	22.6	23.5	24.9	26.4	27.2
Refined products production & ethanol, 000b/d	307.7	429.1	431.7	434.1	638.6	638.4	638.6
Refined products consumption & ethanol, 000b/d	189.7	198.9	209.9	220.4	230.3	240.7	250.3

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

We highlight the following trends and developments in Qatar's oil and gas sector:

- The first phase of the Barzan natural gas project has reached 96% completion and is due to begin production in early 2015. We have adjusted our forecast to represent this delay.
- We have also postponed the second phase of the Barzan project which is due to begin production one year after the first phase. This will be the last upstream project on the North Field until the moratorium is lifted.
- Qatar's state-run oil marketing firm Tasweeq reported plans to cut condensates exports by 150,000 barrels per day (b/d) over the next two years in November 2014. This is in line with the country's strategy to process larger volumes domestically, displacing condensates exports with exports of naphtha and other higher value-added, light-end products.
- Gas production in Qatar will remain relatively flat as LNG exports continue at strong levels and domestic gas consumption increases are catered for by the Barzan project.
- Qatar is expected to see reduced investment in its oil and gas sector over the coming quarters as it attempts to diversify its economy. The majority of upstream investment in the next three years will focus on oil field redevelopments.

- In May 2013 **Qatargas** awarded the EPC contract for the Laffan Refinery Phase II to **Chiyoda Corporation**. The second phase will double capacity at the refinery and allow for a greater volume of condensate to be processed into higher-end products. The 146,000 barrel per day (b/d) facility is due to be operational in 2016.
- Oil production will follow a flat pattern, with growing investment in field redevelopment and enhanced oil recovery offsetting production declines and maintaining a consistent output level. We forecast oil production of 1.71mn b/d in 2013 to rise slightly over the forecast before dropping to the same level in 2023.
- **Occidental Petroleum** will enter the fifth phase of the Idd El Shargi field development after signing an agreement with QP in mid-2013. The USD3bn project will stretch over six years and adding 200 new production and injection wells in an effort to sustain oil production at around 100,000b/d.
- **Qatar Petroleum (QP)** is budgeting USD13bn for the redevelopment of the Bul Hanine oil field. While the project is only expected to add 50,000b/d of oil output to the field, it will extend production life for 25 years.

SWOT

Oil & Gas SWOT

SWOT Analysis

Strengths

- Qatar has the world's third largest proven conventional gas reserves and is also a top 15 oil exporting country.
- The country remains partially open to foreign investment in its upstream segment and is actively encouraging exploration.
- Qatar has the largest liquefied natural gas (LNG) capacity and gas-to-liquid (GTL) capacity in the world, allowing it to diversify its gas sales.

Weaknesses

- Heavy reliance on the Asia Pacific liquefied natural gas (LNG) export market.
- Majority of gas production comes from a single field with uncertainty regarding ultimate resources and recovery despite its prolific potential.
- Qatar remains one of OPEC's smallest oil producers with output just ahead of Ecuador and limited upside potential for liquids.

Opportunities

- Ongoing exploration activity could open up new offshore oil and gas reserves such as the recent Block 4 discovery.
- Over the long term, gas-to-liquids (GTL) projects will allow for the accrual of significant revenues from exports of liquid products. Qatar is an industry leader in GTL technology, while low gas costs and high end product costs gives it a significant advantage.
- Qatar is promoting the maximisation of production from current oil fields, offering opportunities for enhanced oil recovery and field redevelopments.

Threats

- The risk of terrorism or regional conflict cannot be discounted, with dependency upon shipping through the Strait of Hormuz a key vulnerability.

SWOT Analysis - Continued

- Competition from new suppliers of LNG could hit Qatar's chief source of hydrocarbons revenue, resulting in downward pressure on pricing which Qatar has been resistant to reform from oil-indexed linkages.
 - Falling commodity prices is reducing positive sentiment to invest in the Qatari upstream.
-

Industry Forecast

Upstream Exploration

BMI View: A moratorium on new projects in the North Field is limiting exploration with few other opportunities within Qatari borders. The 2014 Khuff discovery added some optimism to the sector, though current gas reserves ample and in no need of new additions.

Table: Proven Oil and Gas Reserves (Qatar 2012-2017)

	2012	2013	2014f	2015f	2016f	2017f
Proven oil reserves, bn bbl	25.4	25.4	24.9	24.5	24.1	23.6
Proven oil reserves, mn bbl	25,380.0	25,380.0	24,943.0	24,508.1	24,073.8	23,643.9
Proven oil reserves, % y-o-y	0.0	0.0	-1.7	-1.7	-1.8	-1.8
Reserves to production ratio (RPR), years	44.3	44.4	43.8	42.7	41.6	41.0
Natural gas proven reserves, tcm	25.2	25.2	25.1	25.0	24.8	24.7
Natural gas proven reserves, bcm	25,202.0	25,202.0	25,128.8	24,978.3	24,824.9	24,670.3
Natural gas proven reserves, % y-o-y	-0.6	0.0	-0.3	-0.6	-0.6	-0.6
Natural gas reserves-to-production ratio, years	176.8	175.4	174.5	166.0	161.8	159.6

f = BMI forecast. Source: EIA/BMI

Table: Proven Oil and Gas Reserves (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
Proven oil reserves, bn bbl	23.2	22.8	22.4	21.9	21.5	21.1
Proven oil reserves, mn bbl	23,214.5	22,783.8	22,351.7	21,920.1	21,492.6	21,069.1
Proven oil reserves, % y-o-y	-1.8	-1.9	-1.9	-1.9	-2.0	-2.0
Reserves to production ratio (RPR), years	40.2	39.4	38.5	37.8	37.4	36.9
Natural gas proven reserves, tcm	24.5	24.4	24.2	24.0	23.9	23.7
Natural gas proven reserves, bcm	24,514.2	24,357.4	24,199.7	24,041.7	23,883.0	23,724.0
Natural gas proven reserves, % y-o-y	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7
Natural gas reserves-to-production ratio, years	157.0	155.3	153.5	152.2	150.4	149.3

f = BMI forecast. Source: EIA/BMI

The North Field holds the vast majority of Qatari reserves, both gas and liquids in the form of condensate and NGLs. Our forecasts suggest Qatari proven oil reserves will remain broadly flat, with reserves of 24.9bn barrels (bbl) in 2014 falling to 21.1bn bbl by 2023, given stable production and the prospect, albeit limited, of new offshore oil discoveries. New liquids production is most likely to emanate from condensate and natural gas liquids (NGL) output from gas developments.

Gas reserves are expected to fall from an estimated 25.1trn cubic metres (tcm) in 2014 to 23.72tcm by 2023. This includes the minimal upward revision to our reserves growth forecast in on the back of the Khuff discovery at offshore Block 4 North. The find, the first gas discovery in Qatar for 42 years, is expected to add around 70.8bn cubic metres (bcm) to total reserves.

The Khuff discovery provides positive news to the exploration and production (E&P) sharing agreements **Qatar Petroleum** (QP) has inked with international oil companies (IOCs) in recent years. Importantly, the find suggests Qatar may yet have further untapped hydrocarbons resources, with gas currently sourced from North Field - the world's largest single source of gas, holding more than 25tcm.

We have been conservative with regards to new gas reserves growth estimates as the vast volumes in the North Field provide little incentive to explore further. As of late-2014, no plans have been outlined for the development of the Khuff discovery. The moratorium on new natural gas developments at the North field, put in place in 2005, remains a barrier to further activity and a study is being undertaken to assess the full impact of extraction projects. The government says the study is looking into how quickly gas can be developed without damaging the reservoir and will allow for time to study field optimisation plans.

Upstream Projects

Table: Key Upstream Projects In Qatar

Field Name	Companies	Completion Date	Status	Status notes	Type of Hydrocarbon
Al-Rayyan	Occidental Qatar Energy Company [Operator]	1996	Production (Currently Al-Rayyan Crude Oil production is around 10,000b/d)	Currently Al-Rayyan Crude Oil production is around 10,000b/d	Oil
Al Shaheen	Maersk Oil [Operator], Qatar Petroleum	1994	Production	Redevelopment	Oil
Dolphin	Total (24.5%), Occidental Petroleum (Oxy) (24.5%), Mubadala [Operator] (51%)	2007	Production	The project's operator is Dolphin Energy Ltd	Gas
Idd El Shargi North Dome (ISND)	Qatar Petroleum, Occidental Petroleum (Oxy) [Operator]	1964	Production	April 2014 - The Idd El Shargi South Dome Oil Field (ISSD) has been developed as a satellite.	Oil
North Field	Qatar Petroleum, ExxonMobil	2010	Production	Completed in December 2009 and inaugurated in May 2010.	Gas
Bul Hanine	Qatar Petroleum[Operator] (100%)	1972	Production	May 2014 - USD11,000mn will be invested by Qatar Petroleum to redevelop the offshore field by drilling 150 new wells which will double the current output of 40,000b/d by 2020, after the redevelopment, oil will continue to move by pipeline to Halul Island for export	Oil
QSD-1	Royal Dutch Shell [Operator] (75%), PetroChina (25%)	-	Exploration (July 2014 - Royal Dutch Shell has abandoned plans to explore for gas in Qatar's Block D)	July 2014 - Royal Dutch Shell has abandoned plans to explore for gas in Qatar's Block D QSD-1 well	Gas

Source: BMI Upstream Database

Upstream Production - Oil

BMI View: Oil production in Qatar is due to remain relatively flat over the forecast period. Output will be supported by field redevelopment projects, NGL production from the **Ras Laffan** refinery expansion and condensates from gas fields.

Table: Oil Production (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Crude, NGPL & other liquids prod, 000b/d	1,568.9	1,567.4	1,561.1	1,572.5	1,585.3	1,581.2
Crude, NGPL & other liquids prod, % y-o-y	-3.8	-0.1	-0.4	0.7	0.8	-0.3
Crude, NGPL & other liquids prod, mn bbl/year	572.6	572.1	569.8	574.0	578.6	577.1
Crude, NGPL & other liquids prod, USDbn	62.7	60.6	58.1	41.3	40.5	39.8
Crude, NGPL & other liquids prod, USDbn, % y-o-y	-2.0	-3.4	-4.1	-28.9	-2.0	-1.7
Crude, NGPL & other liquids prod, USDbn at USD50/bbl	28.6	28.6	28.5	28.7	28.9	28.9
Crude, NGPL & other liquids prod, USDbn at USD100/bbl	57.3	57.2	57.0	57.4	57.9	57.7
Crude, NGPL & other liquids prod, USDbn at USD150/bbl	85.9	85.8	85.5	86.1	86.8	86.6

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

Table: Oil Production (Qatar 2018-2023)

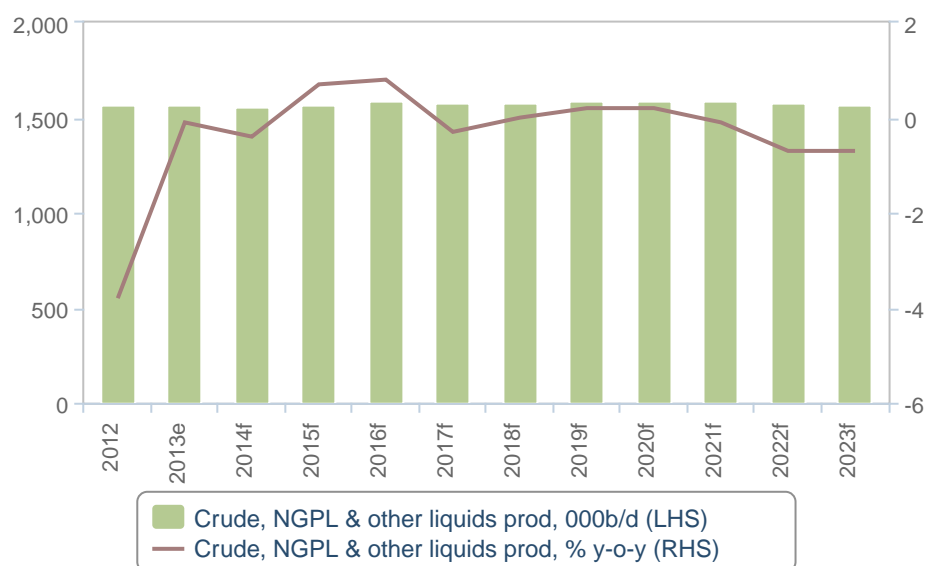
	2018f	2019f	2020f	2021f	2022f	2023f
Crude, NGPL & other liquids prod, 000b/d	1,581.6	1,585.1	1,588.8	1,587.6	1,576.5	1,565.5
Crude, NGPL & other liquids prod, % y-o-y	0.0	0.2	0.2	-0.1	-0.7	-0.7
Crude, NGPL & other liquids prod, mn bbl/year	577.3	578.6	579.9	579.5	575.4	571.4
Crude, NGPL & other liquids prod, USDbn	41.6	43.4	44.1	44.6	44.9	45.7
Crude, NGPL & other liquids prod, USDbn, % y-o-y	4.4	4.4	1.6	1.2	0.6	1.8
Crude, NGPL & other liquids prod, USDbn at USD50/bbl	28.9	28.9	29.0	29.0	28.8	28.6
Crude, NGPL & other liquids prod, USDbn at USD100/bbl	57.7	57.9	58.0	57.9	57.5	57.1
Crude, NGPL & other liquids prod, USDbn at USD150/bbl	86.6	86.8	87.0	86.9	86.3	85.7

f = BMI forecast. Source: EIA/BMI

We expect Qatari liquids output, which includes crude oil, NGLs and other liquids, to average 1.56mn barrels per day (b/d) in 2014. We expect this to remain largely flat over the forecast period with production decline supported by redevelopment projects.

Oil Production Forecast

(2012-2023)



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

With fields maturing, production gains will be led by enhanced recovery operations from crude oil fields, as well as gains in condensates and natural gas liquids (NGL) production. The largest oil project will be the USD13bn investment planned for the Bul Hanine field which is due to be redeveloped in order to boost production by 50,000b/d. While the figure is minimal in comparison to Qatar's total oil output, the project should support stable production volumes at the field for 25 years, offering production longevity.

New tranches of production from the al-Shaheen fields have been brought online, spurring recent production increases. Condensate production from the Barzan gas project will also add to produced liquid volumes from 2015 and 2016, while an expansion of the Laffan refinery will further add to NGL production from 2016. As a result, over the course of our forecast period, we expect stagnation in total liquids output, with production reaching 1.58mn b/d by 2018 and 1.57mn b/d by the end of our forecast period in 2023.

However, we do note some downside risk to further investment in more the more expensive redevelopment and enhanced oil recovery projects. With the recent oil price collapse with Brent front-month falling below USD60/bbl, **BMI** sees further weakness to the market, which will last at least until 2020. This will mean that there is likely to be a capex reduction for upstream segment, especially when it comes to more expensive projects, such as enhanced oil recovery projects.

Furthermore, there could be a downside risk to our oil production outlook if OPEC were to decide to cut production. However, this is not currently our core view.

Upstream Production - Gas

BMI View: The Barzan gas project will drive a small amount of growth in gas output from early 2015 and into 2016, though following this development gas production will largely remain flat. Greater production potential could arise if the North Field moratorium is lifted in 2015.

Table: Gas Production (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Dry natural gas production, bcm	142.6	143.7	144.0	150.5	153.5	154.5
Dry natural gas production, bcm, % y-o-y	7.0	0.8	0.2	4.5	2.0	0.7
Dry natural gas production, USDbn	77.7	75.7	73.1	53.9	53.4	53.0
Dry natural gas production, USDbn, % y-o-y	9.0	-2.5	-3.5	-26.2	-0.8	-0.7
Dry natural gas production, USDbn at USD6/mn btu	30.5	30.8	30.9	32.2	32.9	33.1
Dry natural gas production, USDbn at USD12/mn btu	61.1	61.6	61.7	64.5	65.8	66.2
Dry natural gas production, USDbn at USD18/mn btu	91.6	92.4	92.6	96.7	98.7	99.4
Dry natural gas production, % of domestic consumption	695.2	667.4	636.9	639.9	615.8	585.0

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

Table: Gas Production (Qatar 2018-2023)

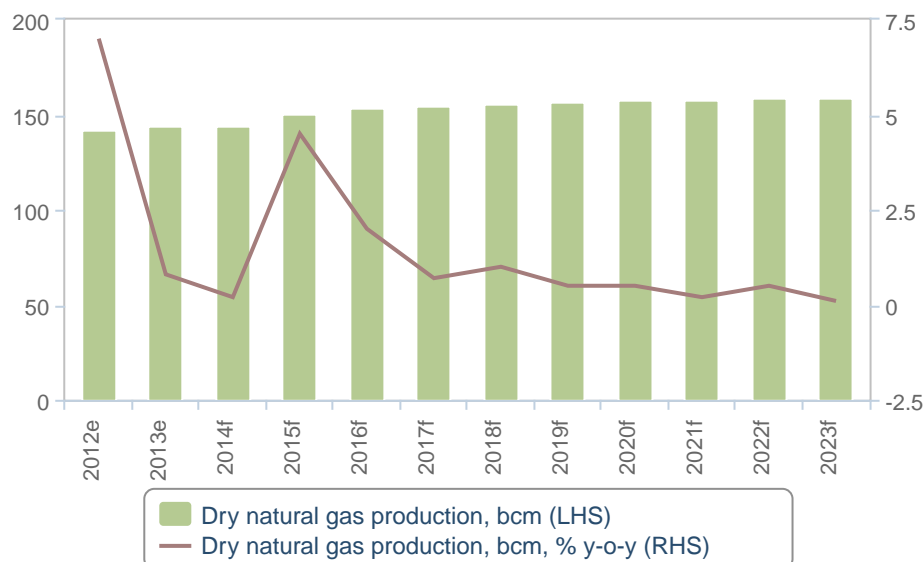
	2018f	2019f	2020f	2021f	2022f	2023f
Dry natural gas production, bcm	156.1	156.9	157.7	158.0	158.8	158.9
Dry natural gas production, bcm, % y-o-y	1.0	0.5	0.5	0.2	0.5	0.1
Dry natural gas production, USDbn	55.9	58.5	59.6	60.5	61.6	63.2
Dry natural gas production, USDbn, % y-o-y	5.4	4.7	1.8	1.5	1.8	2.7
Dry natural gas production, USDbn at USD6/mn btu	33.4	33.6	33.8	33.9	34.0	34.1
Dry natural gas production, USDbn at USD12/mn btu	66.9	67.2	67.6	67.7	68.0	68.1
Dry natural gas production, USDbn at USD18/mn btu	100.3	100.8	101.4	101.6	102.1	102.2
Dry natural gas production, % of domestic consumption	573.6	559.7	546.1	516.2	498.9	489.6

f = BMI forecast. Source: EIA/BMI

We estimate that 2014 natural gas production will total approximately 144bn cubic metres (bcm). With LNG and GTL output at near capacity and no plans to enlarge these sectors, we expect most of the increase in output to meet domestic demand. Currently the Barzan gas project is the last remaining North field project under development, and output from the field will largely be focused towards domestic consumption. The first phase of the Barzan project will come online in early 2015, with the second phase further boosting output in 2016. By 2018 we forecast natural gas production of 156bcm, largely as a result of new gas from the two Barzan phases. We expect LNG exports to remain largely flat, though pipeline exports to the UAE and Oman could increase slightly.

Gas Production Forecast

(2012-2023)



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

Upstream Upside

Qatar's energy minister Mohammed al-Sada said shortly after the Block 4 North Khuff discovery was announced, that 'exploration efforts have been intensified in new blocks', with the minister citing six 'active blocks are being explored' both onshore and offshore. Al-Sada also told reporters at the Gulf Energy Forum in Doha that the Block 4 find, which lies adjacent to North Field, was currently being assessed to determine 'to which extent it can be monetised'.

The Khuff discovery in Block 4 comes at an important time for Qatar's gas industry, with a self-imposed moratorium on new upstream developments at North Field currently in place as officials determine the best way to develop the field and monitor the impact of extraction. **The Qatar Petroleum** and **ExxonMobil** Barzan gas project will be the final project to be undertaken in line with the 2005 moratorium. The project will be carried out in two phases, both with a capacity to produce 10bcm. The first phase is scheduled to come on stream in early 2015, with the second phase coming a year later. In September 2014, it was reported that the first train is nearly 95% complete, which means that the project is on course to come

online in time early in 2015 The USD8.6bn project will deliver gas to the domestic market, primarily serving power and desalination needs.

With mixed signals from Qatari officials about when, or if, the moratorium on additional development at North Field may be lifted, any increase in production over the forecast may have to be sourced from new discoveries outside of the North Field, such as the Block 4 discovery. However, with growing competition in the LNG market from Australia and the US, any new field development will likely be directed towards domestic consumption.

Refining

BMI View: Qatar is boosting its downstream presence by doubling capacity at the Ras Laffan refinery. The 146,000b/d expansion is due online in mid-2016. No further downstream growth is expected prior to 2023.

Table: Refining Capacity and Refined Products Production (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Crude oil refining capacity, 000b/d	338.7	338.7	338.7	338.7	484.7	484.7
Crude oil refining capacity, % y-o-y	0.0	0.0	0.0	0.0	43.1	0.0
Crude oil refining capacity, utilisation, %	90.8	126.7	127.5	128.2	131.7	131.7
Refined products production & ethanol, 000b/d	307.7	429.1	431.7	434.1	638.6	638.4
Refined products production & ethanol, % y-o-y	6.0	39.5	0.6	0.5	47.1	0.0
Refined products production, 000b/d	307.7	429.1	431.7	434.1	638.6	638.4
Refined products production, % y-o-y	6.0	39.5	0.6	0.5	47.1	0.0

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

Table: Refining Capacity and Refined Products Production (Qatar 2018-2023)

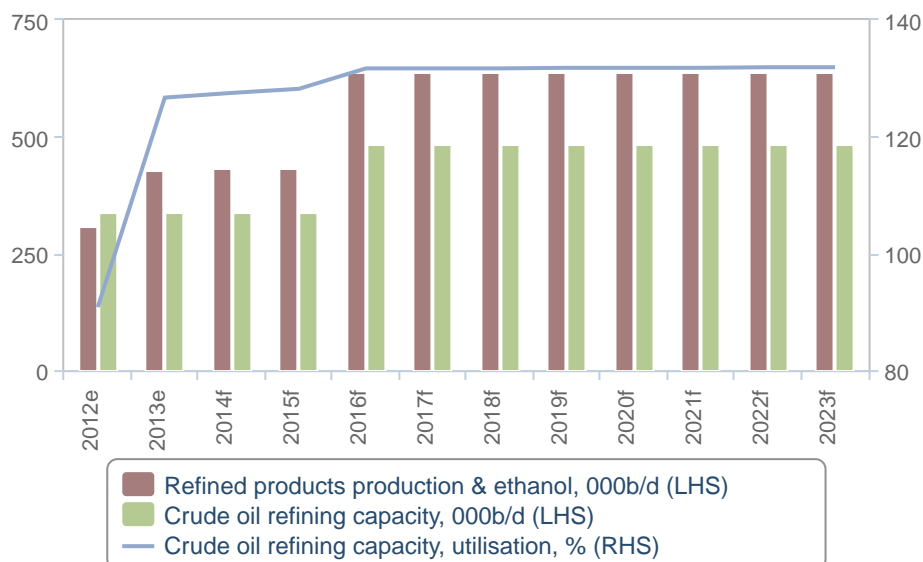
	2018f	2019f	2020f	2021f	2022f	2023f
Crude oil refining capacity, 000b/d	484.7	484.7	484.7	484.7	484.7	484.7
Crude oil refining capacity, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude oil refining capacity, utilisation, %	131.7	131.8	131.8	131.8	131.9	131.9
Refined products production & ethanol, 000b/d	638.6	638.7	638.9	639.1	639.3	639.4
Refined products production & ethanol, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Refined products production, 000b/d	638.6	638.7	638.9	639.1	639.3	639.4
Refined products production, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0

f = BMI forecast. Source: EIA/BMI

The Qatar Petroleum Refinery was built in 1958 and is capable of processing both crude oil and condensate. The QP refinery was last expanded in 2001, increasing total capacity from 57,500b/d to 194,000b/d. Qatar's latest refinery in the industrial city of Ras Laffan came on stream in late-September 2009, about a year behind schedule, adding 146,000b/d to the country's refining capacity.

Refining Capacity Forecast

(2012-2023)



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

QP has formally announced a joint venture (JV) with private players led by **Total** for the construction of USD1.5bn phase II expansion of the Ras Laffan refinery. At 146,000b/d, the Ras Laffan 2 (LR2) will double the capacity of the existing Laffan Refinery (LR1) when it comes online in H216. The plant will have a production capacity of:

- 60,000b/d of naphtha
- 53,000b/d of jet fuel
- 24,000b/d of gas oil
- 9,000b/d of liquid petroleum gas (LPG)

The project will be developed by QP (84%) and Total (10%), with **Idemitsu Kosan**, **Cosmo Oil** and **Marubeni and Mitsui** holding the remainder. Supplied from Qatar's giant gas-rich North Field, the combined 292,000b/d capacity of LR1 and LR2 will make the plant the largest condensate refinery developed to date.

Gas-To-Liquids

Apart from the two conventional refineries, Qatar also has a 34,000b/d GTL plant known as Oryx, which is operated by South African synthetic oil specialist **Sasol**. Sasol has plans to treble the capacity of the site, potentially taking it to more than 100,000b/d using gas from the Al Khaleej field. However, no progress has yet been made on the project, with Sasol appearing to put greater focus on its other international GTL projects.

In addition, the larger **Shell**-operated Pearl GTL plant has the capacity to produce 140,000b/d of petroleum productions including ultra-clean diesel and naphtha. The first train started up in 2011 and the facility reached full capacity at the end of 2012. The Pearl facility also produces some 120,000b/d worth of associated condensate and LPG volumes. The plant is currently the world's largest GTL facility and is notable as the first GTL facility to integrate upstream natural gas production with the downstream conversion facility. In December 2014, Qatar Kentz, a part of Canadian construction company SNC-Lavalin, secured a four-year engineering, procurement and construction management (EPCM) contract with an option of two-year extension from Qatar Shell for its Pearl's facility.

The planned USD11bn al-Shaheen refinery was reported in February 2010 to be indefinitely delayed, with re-scaling and re-tendering expected. The 250,000b/d facility was to be fed with heavy, sour crude from the eponymous offshore oil field.

Refined Fuels Consumption

BMI View: Low fuel prices will continue to stimulate strong refined product demand growth to 2023. While we note there is growing concern over the increasing cost of fuel subsidies in the Middle East, Qatar is under no particular financial pressure to alter the status quo.

Table: Refined Products Consumption* (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Refined products consumption, 000b/d	189.7	198.9	209.9	220.4	230.3	240.7
Refined products consumption, % y-o-y	18.6	4.9	5.5	5.0	4.5	4.5

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

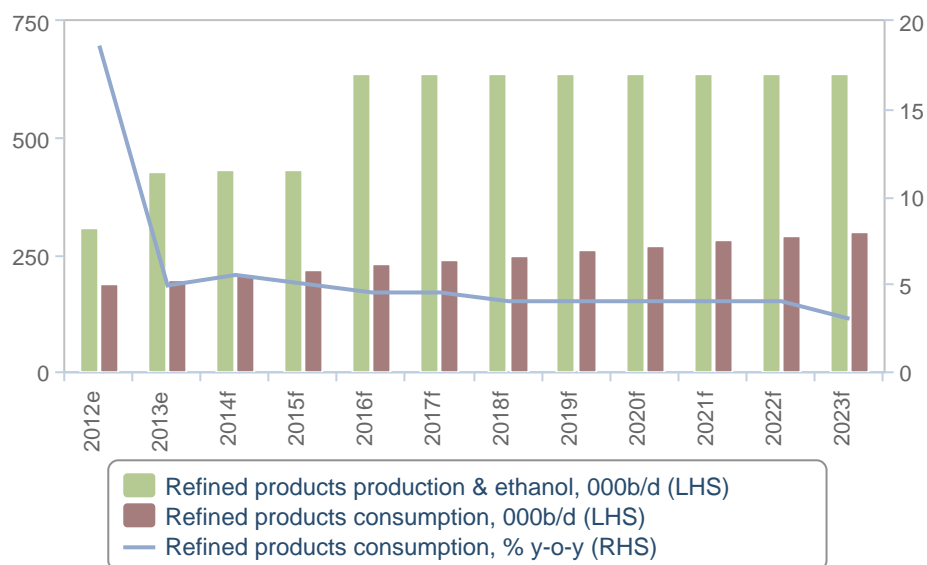
Table: Refined Products Consumption* (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
Refined products consumption, 000b/d	250.3	260.3	270.7	281.5	292.8	301.6
Refined products consumption, % y-o-y	4.0	4.0	4.0	4.0	4.0	3.0

f = BMI forecast. Source: EIA/BMI

Demand for petroleum products in 2013 was around 199,000b/d. We expect this to rise as the growing economy requires more energy and low fuels prices sustain strong demand from a small population. We forecast consumption to reaching 250,000b/d by 2018.

Refined Products Production and Consumption Forecast (2012-2023)



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

As a result of rapid economic development, consumption has increased dramatically over recent years and looks set to continue with Qatar relying on oil and gas to meet its entire energy consumption needs. We note high subsidies for both oil products and gas in Qatar will sustain strong demand over the forecast unless the subsidy system sees alteration.

We expect demand for transport fuels to remain strongest. In particular, gasoline for the main vehicle fleet and jet fuel as the airport hub expands.

Gas Consumption

BMI View: Low feedstock cost and an increasing natural gas power and desalination capacity are the principal drivers of domestic gas demand in Qatar. We forecast between two and six percent annual consumption growth to 2023 with growth tapering off towards the end of forecast period.

Table: Gas Consumption (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Dry natural gas consumption, bcm	20.5	21.5	22.6	23.5	24.9	26.4
Dry natural gas consumption, % y-o-y	5.0	5.0	5.0	4.0	6.0	6.0
Dry natural gas consumption, USDbn	11.2	11.3	11.5	8.4	8.7	9.1
Dry natural gas consumption, USDbn % y-o-y	6.9	1.5	1.1	-26.6	3.1	4.5

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

Table: Gas Consumption (Qatar 2018-2023)

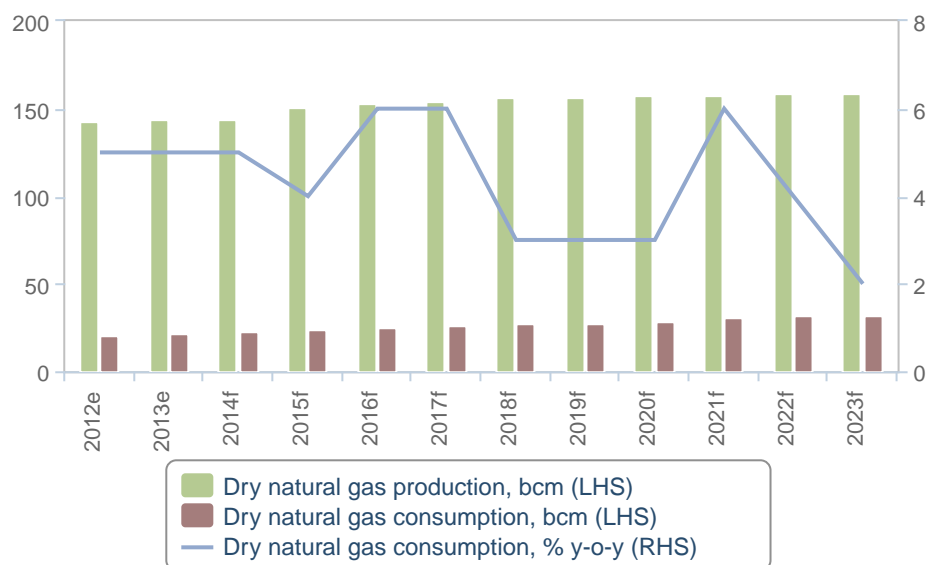
	2018f	2019f	2020f	2021f	2022f	2023f
Dry natural gas consumption, bcm	27.2	28.0	28.9	30.6	31.8	32.5
Dry natural gas consumption, % y-o-y	3.0	3.0	3.0	6.0	4.0	2.0
Dry natural gas consumption, USDbn	9.7	10.5	10.9	11.7	12.3	12.9
Dry natural gas consumption, USDbn % y-o-y	7.5	7.3	4.4	7.4	5.4	4.6

f = BMI forecast. Source: EIA/BMI

Domestic gas consumption is due to rise at a steady rate, increasing from around 22.6bcm in 2014 to 32.5bcm in 2023. We forecast strong growth in consumption particularly linked to major energy intensive industries, including desalination and gas power supporting the Ras Laffan industrial city.

Gas Production and Consumption Forecast

(2012-2023)



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

We also expect a small spike in consumption at the end of the forecast due to higher power usage over the World Cup period. Qatar's power production is currently 100% generated from natural gas, with the country due to add a further 2,000MW of capacity prior to 2018 and roughly another 3,000MW up to 2023.

Trade - Oil

BMI View: Net exports of crude will decrease from 2016 as more condensate is used domestically at the expanded Ras Laffan facility. This will increase Qatar's refined fuel net exports, though combined crude and fuel exports will decline over the forecast due to growing domestic demand.

Table: Crude Oil Net Exports (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Crude & other liquids net export, 000b/d	1,261.2	1,138.3	1,129.4	1,138.5	946.7	942.8
Crude & other liquids net export, % y-o-y	-5.9	-9.7	-0.8	0.8	-16.8	-0.4
Crude & other liquids net export, USDbn	50.4	44.0	42.0	29.9	24.2	23.7
Crude & other liquids net export, USDbn, % y-o-y	-4.2	-12.7	-4.4	-28.8	-19.1	-1.8
Crude & other liquids net export, USDbn at USD50/bbl	23.0	20.8	20.6	20.8	17.3	17.2
Crude & other liquids net export, USDbn at USD100/bbl	46.0	41.5	41.2	41.6	34.6	34.4
Crude & other liquids net export, USDbn at USD150/bbl	69.1	62.3	61.8	62.3	51.8	51.6

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

Table: Crude Oil Net Exports (Qatar 2018-2023)

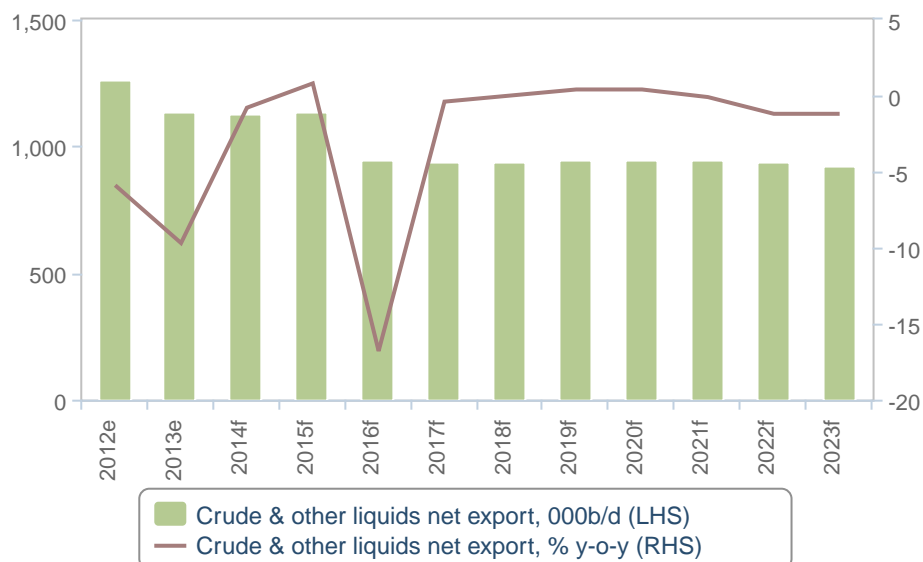
	2018f	2019f	2020f	2021f	2022f	2023f
Crude & other liquids net export, 000b/d	943.0	946.4	949.9	948.5	937.2	926.0
Crude & other liquids net export, % y-o-y	0.0	0.4	0.4	-0.1	-1.2	-1.2
Crude & other liquids net export, USDbn	24.8	25.9	26.3	26.7	26.7	27.0
Crude & other liquids net export, USDbn, % y-o-y	4.4	4.5	1.7	1.2	0.1	1.3
Crude & other liquids net export, USDbn at USD50/bbl	17.2	17.3	17.3	17.3	17.1	16.9
Crude & other liquids net export, USDbn at USD100/bbl	34.4	34.5	34.7	34.6	34.2	33.8
Crude & other liquids net export, USDbn at USD150/bbl	51.6	51.8	52.0	51.9	51.3	50.7

f = BMI forecast. Source: EIA/BMI

Net exports of crude and condensates are forecast to slip below the 1mn b/d level from 2016 as more oil and condensate will be directed to the expanded Ras Laffan refinery. This will boost refined fuel exports, and net crude exports should sustain at over 900,000b/d through to 2023.

Crude Oil Net Exports Forecast

(2012-2023)



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

We forecast refined product net exports to increase strongly from 2016 as the expanded Ras Laffan refinery doubles output at the facility.

Table: Refined Fuels Net Exports (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Refined products net exports, 000b/d	117.9	230.2	221.8	213.7	408.3	397.7
Refined products net exports, % y-o-y	-9.5	95.1	-3.6	-3.7	91.0	-2.6
Refined products net exports, USDbn	5.6	10.5	9.6	8.1	15.1	14.4
Refined products net exports, USD, % y-o-y	-3.4	87.9	-8.3	-16.0	86.8	-4.8
Refined products net exports, USDbn at USD50/bbl	2.5	4.8	4.7	5.4	10.4	10.0
Refined products net exports, USDbn at USD100/bbl	5.0	9.7	9.3	10.8	20.7	20.0
Refined products net exports, USDbn at USD150/bbl	7.5	14.5	14.0	16.2	31.1	30.0

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

Table: Refined Fuels Net Exports (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
Refined products net exports, 000b/d	388.3	378.4	368.2	357.5	346.4	337.8
Refined products net exports, % y-o-y	-2.4	-2.5	-2.7	-2.9	-3.1	-2.5
Refined products net exports, USDbn	13.9	13.6	13.2	12.9	12.5	12.2
Refined products net exports, USD, % y-o-y	-3.3	-2.4	-2.6	-2.8	-3.0	-2.6
Refined products net exports, USDbn at USD50/bbl	9.3	8.7	8.4	8.0	7.7	7.3
Refined products net exports, USDbn at USD100/bbl	18.6	17.4	16.8	16.1	15.4	14.7
Refined products net exports, USDbn at USD150/bbl	27.9	26.1	25.1	24.1	23.1	22.0

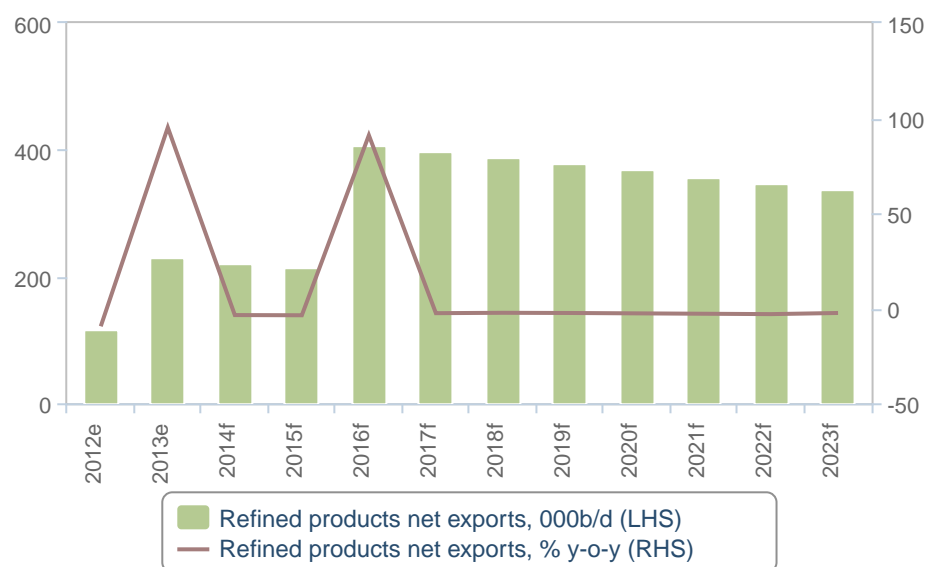
f = BMI forecast. Source: EIA/BMI

The bulk of the new output at Ras Laffan will be naphtha and jet fuel. We expect naphtha production will largely be targeted at Asian markets with a large petrochemicals sectors. Jet fuel will more likely find regional markets throughout the Middle East.

It emerged in November 2014 that Qatar's state-run oil marketing firm Tasweeq plans to cut condensates exports by 150,000 barrels per day (b/d) over the next two years as Qatar will look to process larger volumes domestically, displacing condensates exports with exports of naphtha and other higher value-added, light-end products. BMI believes that Qatar's shift from condensates exports to naphtha will offer limited benefits, due to a softening in global demand and continuing price weakness.

Refined Products Net Exports Forecast

(2012-2023)



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

We expect strong domestic demand for fuels to gradually decrease net export volumes as Qatar's non-petroleum based economy continues to grow from strength to strength. We therefore see Qatar's capacity as a net exporter of crude and products declining over the forecast period.

Table: Total Net Oil Exports - Crude and Products (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Total net oil exports (crude & products), 000b/d	1,389.4	1,378.8	1,361.5	1,362.4	1,369.6	1,355.2
Total net oil exports (crude & products), % y-o-y	-6.2	-0.8	-1.3	0.1	0.5	-1.1
Total net oil exports (crude & products), USDbn	56.0	54.5	51.7	38.0	39.3	38.2
Total net oil exports (crude & products), USDbn, % y-o-y	-4.1	-2.7	-5.2	-26.4	3.4	-3.0
Total net oil exports (crude & prod.), USDbn at USD50/bbl	25.5	25.6	25.3	26.2	27.6	27.2
Total net oil exports (crude & prod.), USDbn at USD100/bbl	51.0	51.2	50.5	52.4	55.3	54.4
Total net oil exports (crude & prod.), USDbn at USD150/bbl	76.6	76.8	75.8	78.5	82.9	81.6

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

Table: Total Net Oil Exports - Crude and Products (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
Total net oil exports (crude & products), 000b/d	1,345.9	1,339.4	1,332.7	1,320.7	1,298.3	1,278.5
Total net oil exports (crude & products), % y-o-y	-0.7	-0.5	-0.5	-0.9	-1.7	-1.5
Total net oil exports (crude & products), USDbn	38.7	39.5	39.6	39.5	39.2	39.2
Total net oil exports (crude & products), USDbn, % y-o-y	1.5	2.0	0.2	-0.1	-0.9	0.1
Total net oil exports (crude & prod.), USDbn at USD50/bbl	26.5	26.0	25.7	25.4	24.8	24.2
Total net oil exports (crude & prod.), USDbn at USD100/bbl	53.0	52.0	51.4	50.7	49.6	48.5
Total net oil exports (crude & prod.), USDbn at USD150/bbl	79.5	78.0	77.2	76.1	74.4	72.7

f = BMI forecast. Source: EIA/BMI

Trade - Gas (Pipeline and LNG)

BMI View: LNG will remain Qatar's principle revenue stream over the next ten years. Qatar is the largest LNG exporter in the world and has long-term supply contracts with 16 countries, delivering spot cargoes to many more. The UK, Korea, Japan and India remain the country's key export markets.

Table: Gas Net Exports (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Dry natural gas net exports, bcm	122.1	122.2	121.4	127.0	128.6	128.1
Dry natural gas net exports, % y-o-y	7.3	0.1	-0.6	4.6	1.3	-0.3
Dry natural gas net exports, USDbn	66.5	64.4	61.6	45.5	44.8	44.0
Dry natural gas net exports, USDbn % y-o-y	9.3	-3.2	-4.3	-26.2	-1.6	-1.8
Dry natural gas net exports, at USD50/bbl USDbn	30.4	30.4	30.2	31.6	32.0	31.9
Dry natural gas net exports, at USD100/bbl USDbn	60.7	60.8	60.4	63.2	63.9	63.7
Pipeline gas net exports, bcm	17.5	17.8	19.8	20.5	23.0	23.0
Pipeline gas net exports, % y-o-y	2.9	1.7	11.2	3.5	12.2	0.0
Pipeline gas net exports, % of total	0.1	0.1	0.2	0.2	0.2	0.2
Pipeline gas net exports, USDbn	9.5	9.4	10.0	7.3	8.0	7.9
Pipeline gas net exports, USDbn % y-o-y	4.8	-1.6	7.1	-26.9	9.1	-1.4
LNG net exports, bcm	104.6	104.4	101.6	106.5	105.6	105.1
LNG net exports, % y-o-y	8.1	-0.2	-2.7	4.8	-0.8	-0.4
LNG net exports, % of total gas exports	0.9	0.9	0.8	0.8	0.8	0.8
LNG net exports, USDbn	60.8	58.7	55.0	40.7	39.2	38.5
LNG net exports, USDbn % y-o-y	0.7	-0.3	-2.0	0.2	-2.1	-0.1

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

Table: Gas Net Exports (Qatar 2018-2023)

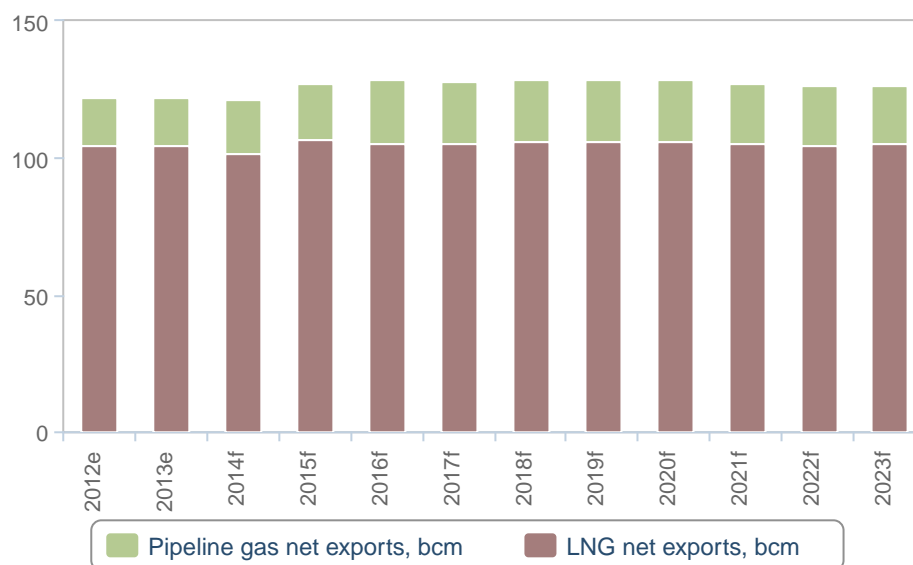
	2018f	2019f	2020f	2021f	2022f	2023f
Dry natural gas net exports, bcm	128.9	128.8	128.8	127.4	126.9	126.5
Dry natural gas net exports, % y-o-y	0.6	0.0	0.0	-1.1	-0.3	-0.4
Dry natural gas net exports, USDbn	46.2	48.1	48.7	48.8	49.3	50.3
Dry natural gas net exports, USDbn % y-o-y	5.0	4.1	1.3	0.2	1.0	2.2
Dry natural gas net exports, at USD50/bbl USDbn	32.1	32.0	32.0	31.7	31.6	31.5
Dry natural gas net exports, at USD100/bbl USDbn	64.1	64.1	64.1	63.4	63.1	62.9
Pipeline gas net exports, bcm	23.0	23.0	23.0	22.0	22.0	21.0
Pipeline gas net exports, % y-o-y	0.0	0.0	0.0	-4.3	0.0	-4.5
Pipeline gas net exports, % of total	0.2	0.2	0.2	0.2	0.2	0.2
Pipeline gas net exports, USDbn	8.2	8.6	8.7	8.4	8.5	8.4
Pipeline gas net exports, USDbn % y-o-y	4.3	4.2	1.3	-3.1	1.3	-2.1
LNG net exports, bcm	105.9	105.8	105.8	105.4	104.9	105.5
LNG net exports, % y-o-y	0.7	0.0	-0.1	-0.4	-0.4	0.5
LNG net exports, % of total gas exports	0.8	0.8	0.8	0.8	0.8	0.8
LNG net exports, USDbn	40.5	42.1	42.7	43.1	43.4	44.8
LNG net exports, USDbn % y-o-y	0.1	0.0	0.0	0.7	-0.1	0.9

f = BMI forecast. Source: EIA/BMI

Qatar is the world's biggest exporter of liquefied natural gas (LNG), accounting for more than 27% of global contracted volumes in 2013. The country has two LNG exporters, namely **Qatargas** and **Ras Laffan LNG Company** (RasGas). Each operates seven trains, which represent a total LNG export capacity of 77.7mn tonnes per annum (mtpa), or around 105.6bcm. Qatar has not announced plans to add more liquefaction capacity beyond the existing facilities. We believe growing competition from liquefaction capacity in Australia and the US will limit the need for new LNG trains in Qatar. **Qatar Petroleum** has moved its investment focus from its domestic market, joining ExxonMobil at a possible LNG export project from Golden Pass in the US.

Gas Net Exports Forecast

(2012-2023)

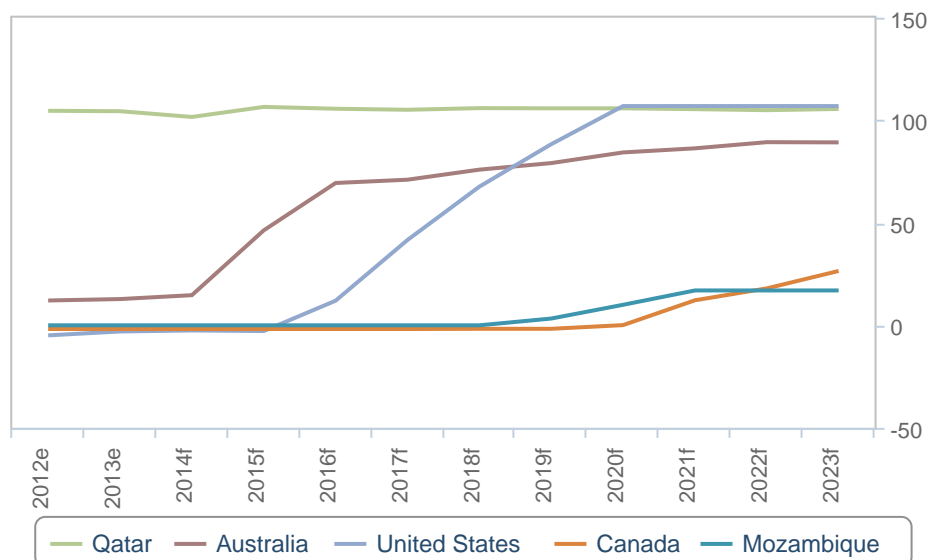


e/f = BMI estimate/forecast. Source: EIA/BMI

We expect to see Qatar's position as the world's top LNG producer increasingly come under pressure as projects in the US and Australia boost their respective export capacities over the next 10 years. Australia's mega projects are due to come online first, overtaking Qatar's flat outlook in 2018, while the US is expected to challenge for the top spot by 2020. Further liquefaction growth could come from Canada and East Africa adding to the growing number of LNG suppliers globally, and reducing Qatar's currently dominant position.

Stiff Competition

Qatar, US, Australia, Mozambique, Canada LNG Exports (bcm)



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

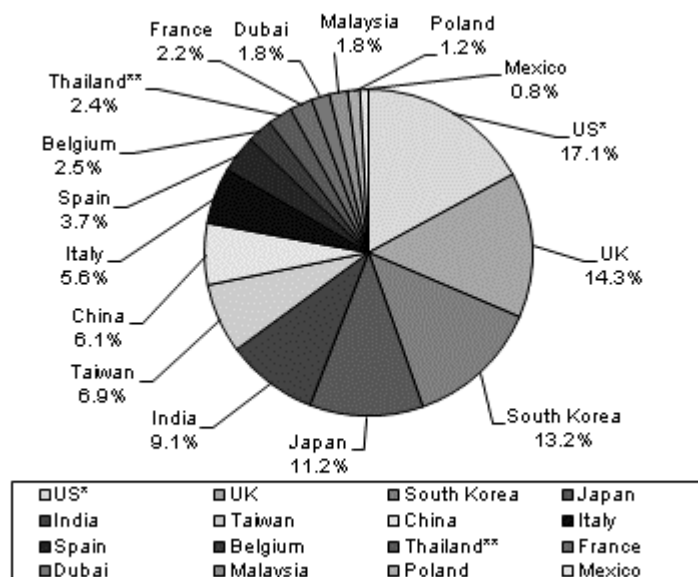
Qatar has increased its exports to Japan by around 8bcm above contracted volumes as the Asian country has increased LNG imports to cover for lost nuclear power following the Fukushima disaster. We expect this trend to sustain until around 2016 when new contracted LNG supplies will cover Japanese demand.

Major new LNG export agreements from Qatar due to start over the coming years have been signed with China, Argentina and Thailand as well as with traditional customers. We expect other Asian markets such as India and Pakistan to be an area of growth over the longer term. It has been reported that Pakistan is already in talks with Qatar for LNG deliveries to its Karachi terminal for 2015. While we forecast gas production to grow slowly in Qatar, a decision to halt the expansion of LNG export capacity will keep exports steady over the course of our forecast. Rises in gas output will be directed to the domestic market.

Asia still dominates Qatari long-term contracted exports, and will likely do so for the foreseeable future. New Asian markets will likely supply the bulk of demand growth over the longer term with European demand stagnating and the US expected to become an export market from 2016.

Asian Markets Remain Key

2014 Contracted LNG Supplies (%)



*US contracts are largely landed elsewhere due to a lack of demand. ** Thai contract to begin in 2015. Source: Bloomberg

It should be noted that the above chart does not show all Qatari exports due to large volumes also being sold on the spot market. Despite having the majority of supply locked up in long-term deals, Qatar also remains the largest swing producer and has been key to covering increased demand in Japan and Korea over the last few years.

Industry Risk Reward Ratings

Middle East - Risk/Reward Ratings

BMI View: In spite of their vast below-ground potential, the major Middle East producers, such as Saudi Arabia and Kuwait, continue to trail in our upstream and downstream risk-reward ratings. A heavy state dominance, opaque regulatory environments and weak privatisation trends severely limit the returns open to investors. In contrast, Israel continues to outperform the region, due to its stable above-ground environment and greater openness to foreign investment.

The main themes from our overall Middle East Risk/Reward Ratings are:

- The Middle East outperforms every other region in our Oil & Gas Risk/Reward Ratings, supported by a substantial resource base and strong production profile.
- Despite vast proven reserves, Saudi Arabia and Kuwait continue to fall to the bottom of our upstream rankings. This illustrates the closed nature of both countries' oil and gas sectors, and the paucity of opportunities open to foreign investors.
- Israel continues to outperform the Middle East region in both upstream and downstream rating. The country boasts a stable operating environment, limited state participation and a diversely competitive landscape.
- As a region, the Middle East performs poorly in the downstream ratings, due to the high level of state involvement and the limited room for non-state competitors.

Table: BMI's Middle East Oil & Gas Risk/Reward Ratings (RRRs)

	Upstream R/R Ratings	Downstream R/R Ratings	Oil & Gas R/R Ratings	Rank
Israel	70.3	54.9	62.6	1
UAE	68.1	50.8	59.4	2
Qatar	65.8	40.1	52.9	3
Oman	60.8	44.2	52.5	4
Iraq	63.3	33.9	48.6	5
Saudi Arabia	45.3	50.8	48.1	6
Bahrain	51.7	39.8	45.8	7
Iran	42.5	42.8	42.6	8
Kuwait	46.9	35.9	41.4	9
Average	57.2	43.7	50.4	-

N.B. scores are out of 100. Source: BMI

Below-Ground Potential Boosting Ratings

The Middle East outperforms every other region in our Upstream Risk/Reward Ratings. This is due to an exceptionally high Industry Rewards score, reflecting the region's vast resource base and strong growth potential.

According to data from the US Energy Information Administration, the Middle East holds over 40% of the world's recoverable gas resources, and almost half of its recoverable oil. It also hosts several highly prospective resource plays. Large areas of the Middle East remain heavily underexplored, and in recent years there has been a growing interest in the region's unconventional resource potential.

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

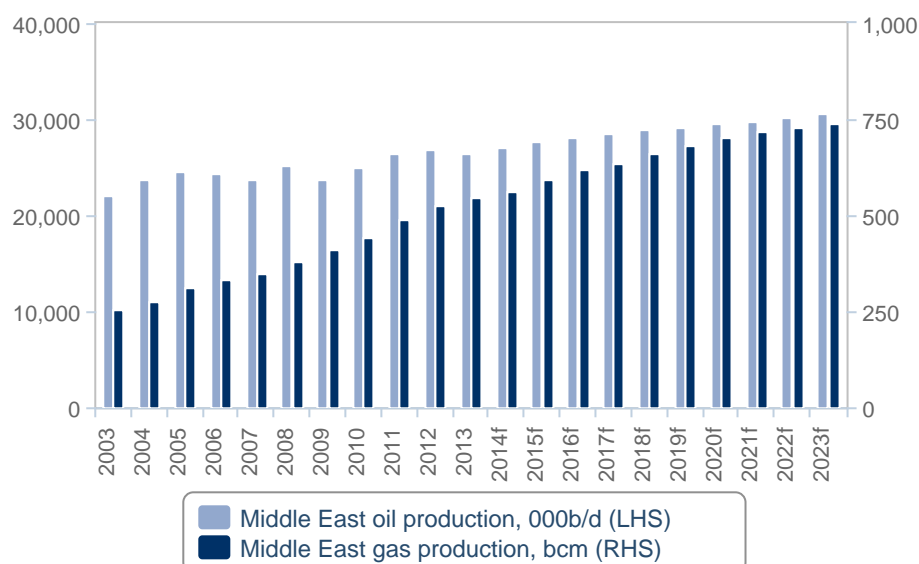
	Upstream Industry Rewards	Upstream Country Rewards	Upstream Rewards	Upstream Industry Risks	Upstream Country Risks	Upstream Risks	Upstream R/R Ratings	Rank
Israel	63.8	70.0	65.3	90.0	67.0	81.9	70.3	1
UAE	66.3	75.0	68.4	70.0	62.2	67.3	68.1	2
Qatar	63.8	85.0	69.1	55.0	64.0	58.1	65.8	3
Iraq	78.8	75.0	77.8	35.0	19.4	29.5	63.3	4
Oman	51.3	65.0	54.7	85.0	56.9	75.2	60.8	5
Bahrain	35.0	65.0	42.5	80.0	60.7	73.3	51.7	6
Kuwait	73.8	5.0	56.6	5.0	60.4	24.4	46.9	7
Saudi Arabia	71.3	10.0	55.9	5.0	49.3	20.5	45.3	8
Iran	61.3	27.5	52.8	10.0	34.0	18.4	42.5	9
Average	62.8	53.1	60.3	48.3	52.7	49.8	57.2	-

N.B. Scores out of 100. Source: BMI

The region also has an impressive production profile. According to a 2014 report by GEO ExPro, in 2012 global production averaged 30,515 barrels (bbl) per well. In the Middle East, the average was 452,459 bbl per well. The region's upstream sector continues to draw substantial investments internationally, and we are forecasting strong output growth for both oil and gas across our 10-year forecast period.

A Robust Growth Story

Middle East Oil and Gas Production

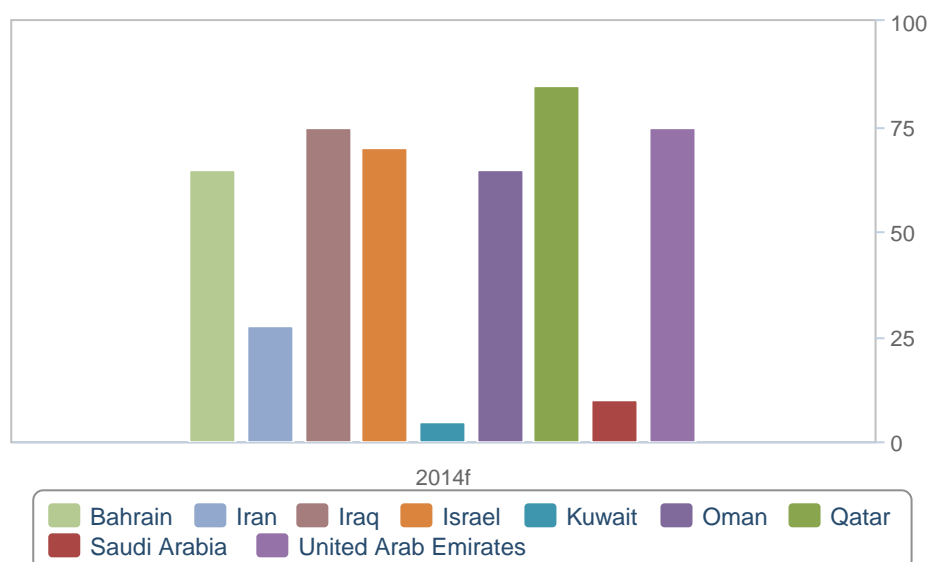


e/f = BMI estimate/forecast. Source: EIA/BMI

However, 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 Israel, the UAE, Qatar and Iraq, which are all supported by strong Country Reward scores. This reflects the broad participation of non-state competitors and the comparatively low level of state ownership of assets in these countries.

Open Markets Gaining Advantage

Upstream Country Reward Ratings

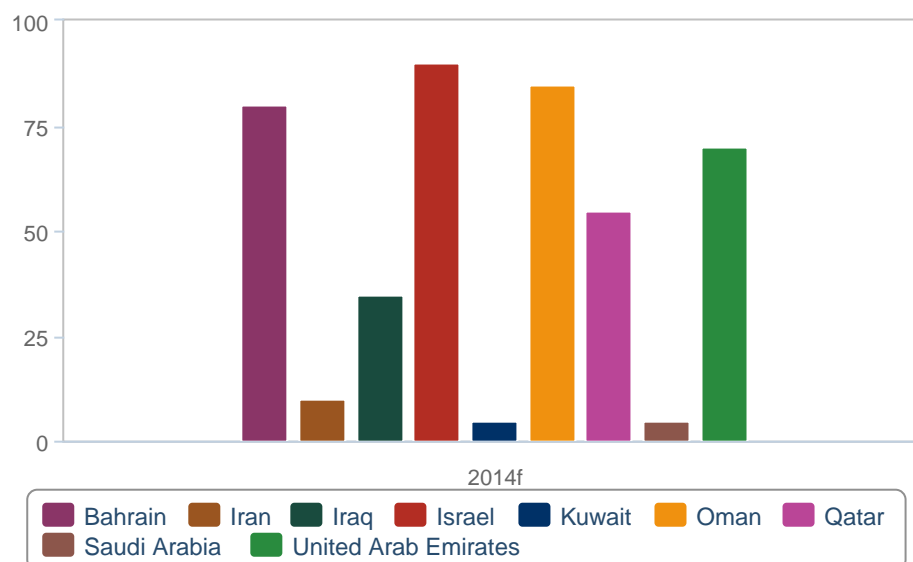


f= BMI forecast. Source: BMI

In contrast, those that fall to the bottom of the rankings, and in particular Saudi Arabia and Kuwait, suffer from both low Country Rewards and Industry Risk ratings. This is due to the closed nature of their upstream sectors, and the limited opportunities accruing to prospective investors. Licensing terms are unattractive, with both countries offering technical service contracts, as opposed to production sharing or concessional agreements. Opaque regulatory environments further weigh on the countries' scores.

Divergent Environments Above Ground

Upstream Industry Risk Ratings



f = BMI forecast. Source: BMI

Typically, the Middle East upstream rankings see little movement, due to the mature nature of the region's producers. However, we see some scope for change over the coming quarters.

- Although we do not anticipate any significant disruption to Iraqi output this year, we have downgraded the country's longer-term production forecast this quarter, as rising political and security risks deter and delay investments. This will impact the score over coming quarters.
- Despite comparatively stable political environments and openness to foreign participation, Qatar could see its ratings fall if the North Pars moratorium remains in place, limiting investment and growth opportunities.
- Easing of international sanctions would allow the return of foreign capital to Iran, bolstering the country's production outlook. However, given chronic underinvestment and a challenging operating environment, we view this as a longer-term play.
- Further escalation in the conflict with Gaza could undermine Israel's strong Country Risk rating. However, this is not our core view; the recent ceasefire has seen a marked improvement in the security environment, and the oil and gas sector has remained broadly insulated from the fighting.

Limited Opportunities Downstream

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

	Downstream Industry Rewards	Downstream Country Rewards	Downstream Rewards	Downstream Industry Risks	Downstream Country Risks	Downstream Risks	Downstream R/R Ratings	Rank
Israel	34.4	60.0	40.8	100.0	69.1	87.6	54.9	1
Saudi Arabia	65.6	34.0	57.7	10.0	72.2	34.9	50.8	2
UAE	52.2	40.0	49.2	50.0	61.5	54.6	50.8	3
Oman	38.9	36.0	38.2	60.0	55.5	58.2	44.2	4
Iran	53.3	42.0	50.5	10.0	46.8	24.7	42.8	5
Qatar	45.6	26.0	40.7	20.0	67.0	38.8	40.1	6
Bahrain	30.0	32.0	30.5	60.0	63.7	61.5	39.8	7
Kuwait	40.0	28.0	37.0	15.0	61.2	33.5	35.9	8
Iraq	41.1	30.0	38.3	15.0	36.6	23.6	33.9	9
Average	44.6	36.4	42.5	37.8	59.3	46.4	43.7	-

N.B. Scores out of 100. Source: BMI

We hold a bullish view on the Middle East refining sector. The region's refining capacity is set grow, as governments target aggressive downstream expansions. We estimate total refining capacity in the region stood at over 8m barrels per day (b/d) in 2013, and forecast this to reach 11.3mn b/d by 2023.

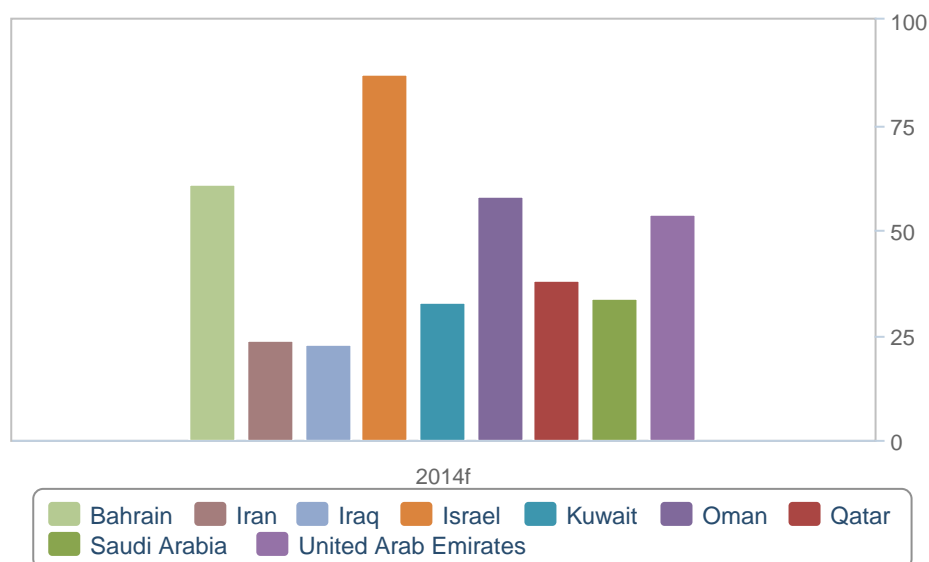
Nevertheless, the Middle East scores relatively poorly in our Downstream Risk/Reward Ratings (RRR), with an average score of 44 out of 100. This captures several key structural weaknesses in the region's downstream sector.

- The state is heavily dominant, having control over the bulk of downstream assets.
- There are limited numbers of non-state competitors and a weak privatisation trend restricts room for new entrants.
- The business environment can be challenging and sector regulation is often oppressive.

In combination, these factors severely limit the opportunities open to private sector investors.

Poor Risk Profiles Weakening Performance

Downstream Risk Ratings



f = BMI forecast. Source: BMI

The region scores highly on Industry Rewards, reflecting large and growing domestic markets for refined fuel products. We are forecasting refined fuel consumption to increase from 7.8mn b/d in 2013, to over 10.3mn b/d by 2023. However, the widespread use of fuel subsidies weighs heavily on the sector's overall profitability. Limited subsidy reforms notwithstanding, we expect this dynamic to remain largely unchanged throughout our 10-year forecast period.

The main exception in the region is Israel, which tops our downstream rankings. The Israeli downstream is competitive, it boasts a stable and transparent regulatory environment and there is no state ownership of assets.

Major capacity expansions in Saudi Arabia, Kuwait, Iraq and the UAE will lift our assessment of the region's downstream infrastructure and export potential, adding upside pressure to the ratings in each market. However, the new capacity will do little to alter the fundamentals of a sector largely closed to international participation.

Qatar - Risk/Reward Ratings

Qatar Upstream Rating

Qatar, a member of OPEC, is the world's largest supplier of liquefied natural gas (LNG) worldwide. It also remains one of the world's top crude oil exporters. Its significant below-ground potential, as well as its leadership of the natural gas and particularly LNG industry, ensures that the country will remain a key global player for the foreseeable future. The presence of non-state competitors and relatively stable political outlook support an attractive business environment.

Vast proven natural gas reserves and a strong gas reserves to production ratio support Qatar's high ranking in our Middle East Risk/Reward Ratings (RRRs). However, limitations are seen in light of the few options available for gas production growth due to a moratorium on the North Field until at least 2015. Qatar's oil reserves are significant as well, although its fields are maturing. Qatar is making particular efforts to stem the decline through field redevelopments to prolong field life. Recent oil production growth has stemmed from natural gas liquids (NGLs) and gas-to-liquids (GTL) products. However, other than these developments Qatar has only had one new gas discovery in over 42 years, which was made in Block 4 in March 2013. Nevertheless, the strong presence of foreign players and positive licensing terms make Qatar an attractive investment location, making its overall outlook very positive if opportunities materialise.

The strong likelihood of governance and policy continuity, as well as relatively low levels of corruption, especially for the Middle East region, reduces some of the country's political risks. The country receives an average score for physical infrastructure, although much of the LNG and GTL infrastructure is relatively new.

Qatar Downstream Rating

Qatar's downstream rating is mediocre among its Middle East peers, and has declined recently due to slowing economic growth. Meeting growing domestic energy demand will be critical in the years ahead, particularly in terms of gas production which is the primary input for the country's power generation facilities. While oil consumption remains low relative to production, it is also rising. The downstream segment remains relatively closed off to foreign investment with **Qatar Petroleum (QP)** owning around 80% of operations. The expanded Laffan refinery will also be 84% owned by QP, showing little change in the country's downstream policy.

Market Overview

Qatar Energy Market Overview

The latest data from the Qatar Statistics Authority (QSA) show that the Qatari economy expanded by 6.5% from 2012 to 2013. However, while oil and gas makes up around 41% of Qatari GDP, growth in the sector was less than 0.1% from 2012 to 2013. We expect hydrocarbons sector to offer little in growth potential through 2014, constrained by the moratorium on the North Field and few other upstream opportunities in the sector. Liquids production increases will come from higher gas-to-liquids (GTL) capacity utilisation and growing liquefied petroleum gas (LPG) output.

The end of the liquefied natural gas (LNG) construction boom in Qatar and the changing global dynamics of the LNG market are pushing the country to shift strategies on gas. Growing completion projected from Australian and US LNG exports leaves little incentive to further invest in new liquefaction capacity. Investment in Qatari upstream activities is increasingly therefore being focused on maximising production from maturing oil fields and liquid gases, while diversification of the oil industry will focus more on petrochemicals and possibly gas-to-liquids (GTL). Qatar may also seek alternative export opportunities for gas. This could bring about an increase in existing pipeline connections within the Gulf region, though over the coming years is likely to be limited to a pipeline expansion to Abu Dhabi.

With a moratorium on development of North Field until at least 2015, Qatar's strategy on gas is in a period of stagnation. Apart from the Barzan gas project, which will largely fuel growing domestic consumption, no further gas projects have been sanctioned. This could change if the moratorium on North Field development is reassessed post 2015. As a result we are not anticipating any further LNG or GTL projects over the short term future, and even if the North Field moratorium is lifted, it will take some time for new facilities to be constructed. It is therefore unlikely that Qatar will see expansions in its gas export industry until 2020 at the very earliest, if at all.

The biggest downside risk to our upstream outlook is the bearish oil price. **BMI** recently downgraded its oil price forecast and the benchmark Brent crude contract is expected to trade below USD80/bbl until 2020, with OPEC prices trading an average of USD3/bbl below Brent. OPEC has currently decided not to cut its production and **BMI** believes that it will not have a big impact on Qatar, but if OPEC were to decide to reduce its output, Qatar too would be forced to do so. Furthermore, low oil prices are likely to result in reduction of capex for some of the more expensive projects.

An expansion of downstream capacity, although not a recent proposal, is consistent with Qatar's broader aims to diversify and strengthen its energy position. Boosting refining capacity through the Laffan refinery expansion will allow Qatar to move up the value chain and capture higher revenues with export of refined products rather than unprocessed oil and condensate. Qatar's state-run oil marketing firm Tasweeq reported plans to cut condensates exports by 150,000 barrels per day (b/d) over the next two years in November 2014. This is in line with the country's strategy to process larger volumes domestically, displacing condensates exports with exports of naphtha and other higher value-added, light-end products. However, **BMI** believes that Qatar's shift from condensates exports to naphtha will offer limited benefits, due to a softening in global demand and continuing price weakness.

In 2012, Qatar saw talks for LNG exports to India and Pakistan enter deadlock as both governments rejected Doha's offers based on prices that were seen as too high. Qatar, which has been resistant to altering gas prices indexed to oil, could come under pressure as alternative supplies enter the LNG market, particularly for potentially gas hub-priced supplies out of the US. It sounds as if there has been a breakthrough with negotiations with Pakistan as the two countries have reportedly renewed talks for LNG exports, to be delivered to Pakistan's Karachi terminal early in 2015. Japan's efforts to introduce an LNG futures market, as well as Tokyo and Seoul's joint efforts to use their combined purchasing power to lower prices and pressure greater use of gas indexed, could place further pressure on Qatari LNG pricing, though the tightness in global LNG markets at the current time is giving the sellers the upper hand and Qatar is benefiting from the gains.

Qatar has also announced plans to boost investment in North America. The moves seek to take advantage of the glut of low-priced gas that is likely to transform North America from an importer into a supplier to the global market. We believe the move will benefit not only upstream and downstream investment in North America, but will help Qatar remain a key player in the global LNG market, even as alternative supplies start to come online. In May 2013 **Qatar Petroleum International** (QPI) signed a framework agreement of the Golden Pass LNG export terminal in Texas. The investment is thought to reach around USD10bn for the 15.6mn tonne per annum (21.2bn cubic metre [bcm]) export facility. QPI will have a 70% stake in the terminal, highlighting Qatar's efforts to diversify internationally as domestic projects become limited. This also indicates the lack of opportunities remaining in Qatar and that some foreign markets are proving a better investment environment, even in the LNG industry.

Overview/State Role

The oil and gas sector is state-controlled, with Qatar Petroleum responsible for exploration and production (E&P). **NODCO** is in charge of refining and distribution. **Qatargas** and **RasGas** are responsible for the

production and marketing of LNG. The state controls virtually all aspects of the energy sector, sets policy and determines domestic pricing. **Qatar Petroleum** itself accounts for 50% of national oil production and almost 40% of gas volumes. The QP is even more dominantly invested in the downstream industry.

Licensing And Regulation

Following a bloodless coup in 1995, Qatar initiated policies aimed at increasing oil production, locating additional oil reserves and investing in advanced oil recovery systems to extend the life of existing fields. The government also improved the terms of exploration and production (E&P) contracts and production sharing agreements (PSAs). The aim was to encourage international oil companies (IOCs) to improve oil recovery in producing fields and to explore for new oil deposits. There has been considerable success in the field of natural gas, making it the world's leader in LNG, but there is less IOC involvement in oil. Major foreign oil companies now involved in Qatar include **ExxonMobil**, **Royal Dutch Shell**, **Maersk Oil & Gas**, Japan's **Marubeni** and **Mitsui**, **Occidental Petroleum** and **Total**.

Government Policy

Qatar is a member of OPEC, making it such that its oil production levels are subject to the quotas and policies of the organization. However, because natural gas liquids (NGLs) are not considered under the auspices of OPEC, their share of production in Qatar has been on the rise in recent years. Furthermore, output from Shell's Pearl GTL facility has boosted supplies of natural gas liquids by around 120,000b/d, and synfuel by as much as 140,000 barrels per day (b/d).

Qatar Petroleum remains the dominant player in the country's natural gas sector. Its preference for large-scale projects with an eye to either boosting the country's exports or facilitating a deeper utilisation of the country's natural resources by its industries allows the government to favour partnerships with the world's top integrated oil companies with expertise in mega-projects. QP does maintain, however, a majority share in all of the country's projects.

International Energy Relations

While Qatar has historically tended to focus on investing in its domestic energy resources, companies such as QP are looking to develop a higher-profile international presence. This links into a more general Qatari policy of raising the country's international profile both economically and diplomatically. Highlighting the change in global dynamics of the LNG market, Qatar Petroleum International has chosen to focus on a joint venture with ExxonMobil in the US, over domestic expansion. In May 2013, QPI, which will take a 70% stake in the project, and Exxon, signed a framework agreement of the Golden Pass LNG export terminal in

Texas. The investment is expected to reach around USD10bn for the 15.6mn tonne per annum (21.2bcm) export facility.

Qatar is looking to diversify its customer base for LNG sales, with a significant amount of new demand coming from China and India. In 2013 Qatar had long-term contracts in place with 18 different countries, while also has spare capacity to sell cargoes on the spot market to further demand markets. This represents a significant increase from the eight countries with which Qatar did business in 2007.

Middle East

The Dolphin pipeline which currently supplies exports to Oman and the UAE from Qatar could see investment in new infrastructure to deliver additional supplies. However, the current steep discount at which gas is sold means that the actual delivery of any additional volumes will likely be dependent upon an increase in prices as Qatar looks to maximise profits from its natural gas assets. Under current plans, a new compression facility at Ras Laffan would allow Dolphin to economically deliver volumes of around 33bcm, from 2015, up from current capacity of around 23bcm. The cost at which any gas would be sold will be key to determining whether a capacity expansion would be utilised. Currently, gas is sold at a significant discount, with customers in the UAE and Oman reportedly paying just USD1.30 per mn British thermal units (mnBTU), compared to the USD16/mnBTU plus that Qatari gas fetches in Asia.

Asia

In 2012, Qatar exported 63% of its total LNG supplies to Asia, which increased to around 65% in 2013. The leading importers are Japan, India and South Korea, respectively, while Taiwan and China are also important customers. New markets such as Thailand and Pakistan are also being found. The willingness of Asian countries to sign long-term supply contracts also supports Qatar's preferred method of supply, locking demand in to stable revenue generators.

Europe

Given the desire of many European countries to reduce their reliance on Russian gas imports, Qatar has sensed an opportunity for new markets for its LNG cargoes. In 2009, Qatar signed a supply agreement with Poland from 2014, and the Gulf state is also looking to build an LNG terminal on Greece's Aegean coast, for re-export by pipeline to the Italian market. Greece received its first cargo of Qatari LNG in May 2011 at the Revithoussa terminal.

In 2012, Europe imported 31.5% of Qatari LNG production, though this fell sharply in 2013 to around 25% as cheaper pipeline gas took a greater market share. European LNG demand has sagged recently due to improved gas pricing structures for pipeline deliveries from Russia and Norway, while high LNG prices have kept companies out of the spot market. European demand for gas has also been curtailed as it struggles to find momentum in economic growth, while the mild 2013/2014 winter left Europe with above-average gas storage levels, further limiting demand. The UK is Qatar's largest individual European importer.

Latin America

Qatargas has signed a 20-year LNG supply deal with Argentina's **Enarsa**, marking the company's first supply deal in Latin America, Qatargas announced on June 29 2011. The deal will see Qatar start shipping as much as 6.9bn cubic metres (bcm) of LNG to the Latin American country in 2014.

Oil And Gas Infrastructure

Oil Refineries

Qatar has two crude oil refineries, both of which are owned by **Qatar Petroleum (QP)**. Throughout 2013 contracts were awarded for the 146,000 barrels per day (b/d) expansion of the Laffan Refinery. This is scheduled to increase refining capacity in Qatar to 485,000b/d by 2016.

Table: Refineries In Qatar

Refinery	Capacity (b/d)	Owner (Contractor)	Completed	Details
Qatar Petroleum	193,000	Qatar Petroleum	1958	na
Ras Laffan	146,000	Qatar Petroleum	2009	Condensate refinery
Total capacity	339,000	-	-	-
Planned additional capacity				
Al-Shaheen	250,000	Qatar Petroleum	Suspended	USD11bn project
Ras Laffan (Expansion)	146,000	Qatar Petroleum	2016	Technip awarded design contract; Chiyoda awarded EPC contract Q213, cornerstone laid April 2014.

na = not available/applicable. Source: BMI

Qatar Petroleum Refinery

The first refinery in Qatar, known as the Qatar Petroleum Refinery, was built in 1958 and is capable of processing both crude oil and condensate. The QP refinery was last expanded in 2001, raising refining capacity from 137,000b/d to 193,000b/d. The expansion added a 57,000b/d condensate refining facility able of producing higher-value products. The 100%-state owned plant mainly produces liquefied petroleum gas (LPG), premium gasoline, super gasoline, jet fuel, diesel and marine fuel oil, as well as large quantities of naphtha for petrochemical operations. Over half of the refinery's products are supplied to the Gulf region, although much of the jet fuel is sold to Europe and the bulk of the naphtha is exported to East Asia for further processing. Asian markets are being targeted for future expansions, where Qatar is envisaging strong demand, particularly for LPG.

Ras Laffan Refinery

The 146,000b/d Ras Laffan plant, which became operational in late-September 2009 (about a year behind schedule), is the country's second refinery and the first designed exclusively to process condensate, a by-product of Qatar's massive gas industry. The Ras Laffan condensate refinery is operated by a consortium comprising state-run Qatar Petroleum (51%), oil majors **ExxonMobil** (10%) and **Total** (10%), and four Japanese companies: **Cosmo Oil** (10%), **Idemitsu Kosan** (10%), **Mitsui** (4.5%) and **Marubeni** (4.5%). The Japanese companies farmed in to the project in 2006 as Japan was expected to be one of the main markets for Ras Laffan's liquids products.

At full capacity the refinery produces 52,000b/d of kerosene and jet fuel, 24,000b/d of gas oil (heating fuel), as well as other clean-burning middle distillates and 9,000b/d of LPG. The facility is fed from all three main Qatari upstream projects: gas fields run by QP and **RasGas** and the Al-Khaleej condensate complex. The second phase of the Ras Laffan refinery is scheduled be completed by 2016, and would boost output to 292,000b/d, with most of the produced fuels likely destined for Asian markets. Our forecasts see Ras Laffan's phase II capacity coming on-stream in 2016. The stakeholders are making strong headway with the project with the construction already in progress.

Al-Shaheen Refinery (Proposed)

QP had been considering building a third facility, although construction has been indefinitely delayed. The 250,000b/d al-Shaheen refinery was slated for construction in the Mesaieed Industrial City in south-eastern Qatar. The USD11bn refinery was designed to process heavy sour crude from al-Shaheen offshore oil field,

which would be supplied to the facility by a 200km pipeline. Front end engineering and design (FEED) work was carried out by French services provider **Technip** between 2007 and 2009. The first phase was expected to involve the construction of a crude distillation unit and a hydrocracker, while the second phase would see the addition of a fluid catalytic cracker. In April 2009, however, MEED reported that QP intended to break the project up into smaller sections to cut costs and spread project risks.

GTL

Qatar's large gas reserves have made it a frontrunner in the development of gas-to-liquids (GTL) plants. The country has one operational plant, Oryx, with a capacity of 34,000b/d. This capacity rose significantly with the start-up of Pearl GTL operations in 2011. The Pearl project, which cost a total of USD19bn, hit full capacity of 140,000b/d in September 2012. It is now the largest GTL project in the world.

Qatar Kentz, a part of Canadian construction company SNC-Lavalin, secured a four-year engineering, procurement and construction management (EPCM) contract in December 2014 with an option of two-year extension from Qatar Shell for its Pearl gas-to-liquids (GTL) onshore and offshore facilities in Qatar.

Table: GTL Plants In Qatar

Facility	Capacity (b/d)	Owner	Completion date
Oryx	34,000	QP, Sasol	2007
Pearl	140,000	Royal Dutch Shell	2012
Possible Additional Capacity			
Oryx expansion	66,000	QP, Sasol	Unknown

Source: BMI

Oryx GTL

Qatar's first GTL plant is a 34,000b/d facility known as Oryx, which is operated by South African synthetic oil specialist **Sasol**. QP and Sasol Chevron signed an MOU to expand the Oryx GTL project, potentially taking it to more than 100,000b/d. However, due to the capital intensity of the project, it appears Sasol will be focusing on its North American developments, with no progress announced for Oryx.

Pearl GTL

The 260,000b/d Pearl plant in Ras Laffan, developed by Shell, is the largest of the world's four GTL plants. It reached full capacity in September 2012. The plant processes around 20bcm of North Field gas per annum in two trains, and, using the Shell Middle Distillate Synthesis (SMDS), produces 140,000b/d of products such as gasoil, kerosene, naphtha and normal paraffin for export. It also strips out 120,000b/d of natural gas liquids (NGLs) and the petrochemical feedstock ethane. Over the 25-30 year life of the plant, Shell says Pearl will use 3bn barrels of oil equivalent (boe) of natural gas. The first phase of the facility started receiving North field gas in March 2011 and its first refined fuels cargoes began shipping in June of that year. The facility reached full output towards the end of 2012.

LNG Terminals

Qatar has two liquefied natural gas (LNG) projects comprising 14 liquefaction trains. The country's send-out capacity reached a peak in 2011, with 77.7mn tpa (around 107bcm) of liquefaction capacity. No further trains are planned at present and with growing liquefaction capacity in Australia and the US we do not expect further LNG facilities over our forecast to 2023.

Table: LNG Terminals In Qatar

Terminal	Trains	Capacity (mn tpa)	Capacity (bcm)	Completed	Ownership
RasGas I	2	6.6	9.2	1999	QP (63%), Exxon (25%), Kogas (5%), LNG Japan (3%)
RasGas II	3	14.1	19.5	2004	QP (70%), Exxon (30%)
RasGas III	2	15.6	21.5	2010	QP (70%), Exxon (30%)
Qatargas I	3	10.0	13.8	2005	QP (65%), Exxon (10%), Total (10%), Mitsui (7.5%), Marubeni (7.5%)
Qatargas II	2	15.6	21.5	2009	Train 4: QP (70%), Exxon (30%). Train 5: QP (65%), Exxon (18.3%), Total (16.7%)
Qatargas III	1	7.8	10.8	2010	QP (68.5%), Conoco (30%), Mitsui (1.5%)
Qatargas IV	1	7.8	10.8	2011	QP (70%), Shell (30%)
Total capacity	14	77.5	107.1	-	-

Source: BMI

RasGas

RasGas I is owned by a consortium made up of QP (63%), ExxonMobil (25%), **Kogas** (5%) and **LNG Japan** (3%). RasGas I consists of two 3.3mn tpa (4.6bcm) trains. The main export market for LNG from trains one and two is South Korea.

RasGas II, a 70:30 joint venture (JV) between QP and ExxonMobil, consists of three additional trains, each of which has a processing capacity of 4.7mn tpa (6.5bcm). Trains three, four and five came on stream in 2004, 2005 and 2006 respectively, raising RasGas' total processing capacity to 20.7mn tpa (28.5bcm). The main export market for LNG from train three is India, with LNG from train four destined for Europe and exports from train five shipped to Europe and Asia.

RasGas III, a 70:30 JV between QP and ExxonMobil, consists of two additional trains, each of which has a processing capacity of 7.8mn tpa. Trains six and seven were originally scheduled to start operations in 2008/2009, but both were delayed by around five months. With these two trains operating at full capacity, RasGas's processing capacity has risen to 36.3mn tpa (50.1bcm).

Qatargas

Qatargas I, made up of a consortium between QP (65%), ExxonMobil (10%), Total (10%), **Mitsui** (7.5%) and **Marubeni** (7.5%), comprises three trains, which originally had a capacity of 2mn tpa (2.7bcm) each. At the end of 2005, Qatargas I completed the de-bottlenecking of its facilities, increasing total capacity to 10mn tpa (13.8bcm). Most of the exported LNG is destined for Japan and to a lesser extent Spain.

Qatargas II consists of two trains, with train four owned by QP (70%) and ExxonMobil (30%) and train five by a consortium between QP (65%), ExxonMobil (18.3%) and Total (16.7%). Trains four and five have a capacity of 7.8mn tpa (10.8bcm). The first LNG cargo from Qatargas II arrived at the UK's South Hook LNG terminal on March 20 2009 and train five became operational in early September 2009.

Qatargas III (also known as train six) is owned by QP (68.5%), ConocoPhillips (30%) and Mitsui (1.5%). Qatargas III has a capacity of 7.8mn tpa (10.8bcm), with exports originally aimed at the US market, mainly through **El Paso Energy**'s terminal at Elba Island. However, due to the lack of demand from the US, LNG from this train has been redirect to the UK as well as Japan, while also being sold on the spot market.

Qatargas IV (train seven) also has a capacity of 7.8mn tpa (10.8bcm). It is a JV between QP (70%) and Shell (30%). Shell announced in January 2010 that half the LNG produced at the Qatargas IV project will be sent to China (which is to receive around 40%) and Dubai (around 10%), instead of to the US market for which it was originally destined. Qatargas started production from Train 7 at Qatargas IV in February 2011. The train increases Qatargas' total capacity to 41.2mn tpa.

Qatargas kicked off with a USD1bn jetty boil-off gas recovery (JBOG) project intended to reduce flaring at liquefied natural gas (LNG) terminals in Ras Laffan Industrial City in November 2014. The JBOG project is expected to save around 28bn cubic metres per day of natural gas in a period of 30 years and reduce greenhouse gas emissions, according to the company's estimates. The facilities would be operated by Qatargas and RasGas with Qatar Petroleum, ExxonMobil, Total, ConocoPhillips and Shell among other shareholders. The project is expected to be the largest LNG boil-off recovery project in the world.

Gas Pipelines

Qatar has one 182km subsea gas export pipeline through which it supplies the UAE and Oman. The pipeline is owned and operated by **Dolphin Energy**, a JV between the state-owned **Mubadala Development Company** (51%), France's Total (24.5%) and the US's **Occidental Petroleum** (24.5%). This is the first cross-border gas project in the Arab Gulf region.

The Dolphin Energy gas pipeline, the Gulf Cooperation Council (GCC)'s first regional gas project, could see a capacity expansion according to Total's senior vice president for the Middle East, Arnaud Breuillac. The pipeline currently has a capacity of 90mn cubic metres per day (Mcm/d) - or 33bn cubic metres (bcm) per annum. However, current sales agreements and existing compression facilities only support volumes of just over 60Mcm/d or 21.9bcm per year. Under current plans, a new compression facility at Ras Laffan would allow Dolphin to economically deliver volumes closer to full capacity from 2015. The pipeline has seen exports rise temporarily to meet demand in excess of contracted capacity, but only for short periods of time.

Dolphin started supplying the UAE with gas in February 2008 and Oman in October 2008. Most of the gas is used to feed the UAE's burgeoning heavy industries, petrochemicals and water desalination plants as well as to maintain production at maturing oil fields through gas injection. Around 2bcm is exported on to Oman. The long-term customers for Dolphin gas from Qatar are **ADWEA** (Abu Dhabi Water & Electricity Authority), **UWEC** (Union Water & Electricity Authority), **DUSUP** (Dubai Supply Authority) and **Oman Oil Company** (OOC). Each has signed a 25-year gas supply agreement with Dolphin Energy.

Qatar is one source of gas for the proposed subsea gas export pipeline from the Middle East to India. In 2008, a technical and commercial feasibility report was undertaken by INTECSEA, which found that the project would be technically feasible. Gas for the project could be sourced from Qatar or Iran, and would be transported to a gas-gathering system on the eastern coast of the Arabian Peninsula (mostly likely Oman) from where deepwater gas pipelines would cross the Arabian Sea to India's west coast.

The pipelines would reach a maximum depth of 3,500m with a total length of about 1,000km, according to Jain. The pipelines would each transport 226.5bcm over a 25-year period, suggesting an annual supply per pipeline of around 9bcm per year. No further action has been taken on the project and Qatar continues to supply large volumes of LNG to India.

Competitive Landscape

Competitive Landscape Summary

- The main government vehicle is **Qatar Petroleum (QP)**, which owns all downstream oil interests, negotiates exploration and production (E&P) agreements, has shares in upstream projects and is involved in liquefied natural gas (LNG) projects, and gas-to-liquid (GTL) schemes. It is responsible for about 30% of oil and 50% of gas production.
- **International oil company (IOC)** upstream involvement is extensive. Foreign groups are active in oil production, gas field development, LNG projects, as well as GTL and petrochemicals schemes.
- **Maersk Oil** operates the al-Shaheen field in Block 5 and has a PSA for the Block 5 extension area.
- Present in Qatar since 1936, **Total** has a 20% interest in the upstream part of the Qatargas 1, a 10% interest in the Qatargas 1 liquefaction plant JV, a 24.5% stake in **Dolphin Energy** and a 16.7% stake in Qatargas 2 Train 5 JV. Total's Qatari production averaged 137,000 barrels of oil equivalent per day (boe/d) in 2013. Total has signed a new agreement with QP under which the two companies will continue to develop the Al Khalij for the next 25 years. The existing exploration and production sharing agreement, signed in 1989, will expire in early 2014.
- QP has formally announced a joint venture (JV) with private players, led by Total, for the construction of a USD1.5bn condensate refinery at Ras Laffan. At 146,000 barrels per day (b/d), the Ras Laffan 2 (LR2) will double the capacity of the existing Laffan Refinery (LR1) when it comes online in H216. The plant will have a production capacity of 60,000b/d of naphtha; 53,000b/d of jet fuel; 24,000b/d of gas oil; and 9,000b/d of liquid petroleum gas (LPG).
- **Occidental (Oxy)** has expanded the ISND field development programme, which is expected to result in the recovery of approximately 145mn additional gross barrels (bbl) of oil. It has been reported that Oxy is considering the sale of a 30-40% stake in its entire Middle Eastern business.
- **ExxonMobil** has a 25% interest in LNG company **RasGas I** and 30% in **RasGas II**. It also has a 10% interest in **Qatargas I** and a 30% stake in **Qatargas II**. It also participates in the Al Khaleej Gas project, the first phase of which became operational in 2005 and the second in December 2009.
- Qatargas I is a consortium of QP, Total, ExxonMobil, **Mitsui** and **Marubeni**. Train four of Qatargas II belongs to QP and ExxonMobil, with train five of Qatargas II being owned by QP, Exxon and Total. Qatargas III is held by QP, **ConocoPhillips** and Mitsui. RasGas comprises QP, ExxonMobil, **Kogas**, **Itochu** and **LNG Japan**.
- **Sasol**, **Shell**, ConocoPhillips and **Marathon Oil** are involved in developing a series of GTL facilities, with the 34,000b/d Sasol/QP Oryx plant entering production in March 2007. Shell, in July 2007, launched the 140,000b/d Pearl GTL project. It reached full capacity in September 2012, and is now the largest GTL plant in the world.
- In late-August 2009, QP signed a 25-year EPSA with Chinese explorer **CNOOC Middle East**, a subsidiary of CNOOC, for Block BC in the deep pre-Khuff reservoirs.
- Japan's **JX Nippon Oil and Gas Exploration (NOEX)** entered Qatar's upstream segment with the signing of a 30-year exploration and production-sharing agreement (EPSA) with QP for the 6,173 sq km offshore Block A.
- Germany's **Winterhalls** and QP have announced exploration success at Block 4 North offshore Qatar after four years of hunting. The discovery in depths of 70m is estimated to contain as much as 70bcm of gas and is the country's first new find in 42 years.

Table: Key Domestic And Foreign Companies In The Qatari Oil And Gas Sector

Company	2011 sales (USDbn)	% Share of total sales	No. of employees	Year established	Ownership
Qatar Petroleum	79.4	100	10,378e	1974	100% state
Total Qatar	na	na	na	1938	100% Total
Maersk Oil	na	na	na	1992	100% AP Moeller
Occidental Qatar	na	na	na	1994	100% Occidental
ExxonMobil Qatar	na	na	na	1935	100% ExxonMobil

na = not available; e = estimate. Source: BMI

Table: Key Upstream Players

Company	Oil production (000b/d)	Market share (%)	Gas production (bcm)	Market share (%)
Qatar Petroleum	517	33e	62	54
Total Qatar	49	3.5	6.6	4
Maersk Oil	167	10.6	na	na
Occidental Petroleum	89	4.8	2.4	na
ExxonMobil	na	na	na	na

na = not available; e = estimate. Source: Company data, BMI

Table: Key Downstream Player

Company	Refining capacity (000b/d)	Market share (%)	Retail outlets	Market share (%)
Qatar Petroleum	346	100	na	na

na = not available. Source: Company data, BMI

Company Profile

Qatar Petroleum

Strengths	<ul style="list-style-type: none">▪ Major domestic oil and gas producer▪ Unrivalled access to exploration acreage▪ Well established partnerships with international oil companies (IOCs)▪ Substantial near-term volume growth▪ Rapid expansion of liquefied natural gas (LNG), gas-to-liquids (GTL) and petrochemicals
Weaknesses	<ul style="list-style-type: none">▪ Limited financial or operational freedom▪ Some cost and efficiency disadvantages▪ Rising investment requirement
Opportunities	<ul style="list-style-type: none">▪ Considerable untapped gas export potential▪ Rising domestic energy consumption▪ Large areas of under-explored territory
Threats	<ul style="list-style-type: none">▪ Competition in regional LNG supply▪ Changes in OPEC/national energy policy

Company Overview QP is active in all segments of the energy chain and participates in all major oil and gas developments. The firm's exploration and production (E&P) activities are centred on the onshore Dukhan oil field and the offshore Bul Hanine and Maydan Mahzam oil fields. The state firm also holds stakes in seven offshore fields that are being developed under production sharing agreements (PSAs). Gas resources are centred on the giant North Field. QP operates all of the country's 200,000 barrel per day (b/d) crude oil refining capacity and brought the 146,000b/d Ras Laffan refinery on stream in 2009.

Strategy

The government is planning a massive expansion of its refinery capacity. Qatar expects to earn more per barrel of crude oil produced if it can export refined products and petrochemicals, as well as creating private sector jobs.

QP is looking to develop a higher-profile international presence through the establishment of an investment arm to finance energy projects across the globe. For starters, Qatar Petroleum International will look at investing in refineries in the energy-hungry markets of India and China, as well as building LNG terminals in Europe and across the Atlantic in the US.

Qatar's crude oil production will rise to 800,000b/d by 2017 due to higher investments and development plans in the country, according to a Qatar National Bank (QNB) report. In its 2010-14 development plan, QP budgeted USD6.6bn for investment in crude oil projects.

The Barzan gas field is a large upstream project that has been pursued by QP. First engineering contracts were awarded in late 2010. Output from the field is expected at 14.5bn cubic metres (bcm) per annum. QP holds a 93% stake in the project, working alongside joint venture (JV) partner ExxonMobil with the remaining 7%.

QP has raised USD10.4bn in financing for the Barzan scheme. The company will fund up to 30% of the project through equity, while the rest will be arranged through a syndicated loan of around USD7.2bn. The loan includes a USD3.34bn commercial bank facility, a USD2.55bn export credit agency financing and a USD850mn Islamic facility. In addition, **ExxonMobil** will offer part of the senior debt. The first and second production lines are scheduled to come online in 2014 and 2015 respectively.

RasGas has announced that Train 1 of the Barzan Gas Project (BGP) should provide first production in Q115. Construction of Train 2 is also in progress and is expected to complete by mid-2015. Construction of the project was started in 2011 and includes offshore and onshore facilities. BGP is a joint venture between QP and ExxonMobil.

Total of France has signed a new agreement with QP, under which the two companies will continue to develop the Al Khaliq oil field offshore Qatar for the next 25 years. The existing exploration and PSA, signed in 1989, will expire in early 2014. The Al Khaliq field was discovered by **Total** in 1991 and commenced oil production in 1997. Under the terms of the deal, QP will own a 60% stake in the oil field, with Total holding the remaining 40%.

QP has formally announced a joint venture with private players led by Total for the construction of USD1.5bn condensate refinery at Ras Laffan. At 146,000b/d, the Ras Laffan 2 (LR2) will double the capacity of the existing Laffan Refinery (LR1) when it comes online in H216. The plant will have a production capacity of 60,000b/d of naphtha; 53,000b/d of jet fuel; 24,000b/d of gas oil; and 9,000b/d of liquid petroleum gas (LPG).

The project will developed by QP (84%) and Total (10%), with Japanese firms **Idemitsu Kosan**, **Cosmo Oil**, **Marubeni** and **Mitsui** holding the remainder. Supplied from the

North Field, the combined 300,000b/d capacity of LR1 and LR2 will make the plant the largest condensate refinery developed to date.

Maersk Oil has been holding discussions with QP over an extension to a PSC for the al-Shaheen oil field offshore Qatar, reports Reuters. The Danish company has been seeking a 13-year extension to 2030. The field's crude production could increase from the current 300,000b/d to 400,000b/d in 2017, one source said. Additionally, new equipment including a floating storage and offloading unit is likely to be deployed at the field if the contract is extended.

QP and **Royal Dutch Shell** are targeting a 2018 completion date for the Al-Karaana petrochemical project in Ras Laffan, Qatar, after awarding a contract for front end design work to US Fluor Corporation, reports Zawya. The USD6.5bn project, 80% owned by QP and 20% by Shell, will comprise a steam cracker, a mono ethylene glycol (MEG) plant, a linear alpha olefin unit and an oxo alcohol unit.

ExxonMobil has signed an agreement with QPI to move forward with construction of a USD10bn natural gas export terminal in Texas. The project will involve installing liquefaction equipment at an existing import facility in Sabine Pass, Texas, according to an e-mailed statement from Golden Pass Products, a subsidiary formed by the two companies. It won permission in 2012 to export the fuel to nations with free-trade agreements with the US and is awaiting approval to send the fuel to all other countries.

Exxon and QPI plan to ship as much as 15.6mn tpa of gas annually from the Golden Pass facility, according to the statement. 'This agreement sets out a highly competitive commercial blueprint for Golden Pass Products, with a commitment that builds on the unique combined strengths of QPI and Exxon Mobil through the global downstream LNG value chain,' Bill Collins, president of Golden Pass, said in the statement.

The country's political leaders are believed to favour more freedom for QP so that the firm can better compete against its national oil company (NOC) peers around the world. Plans could see QP freed from direct control by the energy ministry in an effort to allow the company to be more reflexive and responsive amid changes at home and abroad.

Under the new structure, QP would accelerate its recent push to move beyond Qatar and into more upstream and downstream projects outside its home market.

With no plans for an expansion of export capacity, Qatar is at risk of ceding its place as the world's leading LNG exporter by the end of the decade. The entrance of new supplies of LNG to the market will increase competition and give greater bargaining power to importers who are eager to see relief in their import bills - which Qatar has to date proven reluctant to offer as it insists for oil-indexed long-term contracts to remain.

Occidental Petroleum (Oxy)'s Qatari subsidiary has signed a co-development agreement with QP for the development of the Idd El Shargi North Dome oil field offshore Qatar. Work at the site has already commenced and aims to sustain oil

production levels at about 100,000b/d through the next six years to 2019. The pair will endeavour to improve the ease of recovery from the field's existing contract reservoirs.

QP and Shell have entered into a memorandum of co-operation to support their new international upstream partnership in Brazil. The move comes after QP's acquisition of Shell's 23% interest in the Parque das Conchas (BC-10) oil project in the Campos Basin offshore Brazil for a consideration of USD1bn in April 2014. The BC-10 oil project has a production capacity of about 50,000b/d. It has produced more than 80mn boe/d since coming on stream in 2009.

QP will invest more than QAR40bn (USD11bn) to redevelop the Bul Hanine oilfield offshore Qatar. The company plans to more than double the field's current output of 40,000b/d to 90,000b/d by 2020, reports Reuters. The project includes new offshore central production facilities and a new onshore gas liquids processing facility at Mesaieed. Around 150 new wells will also be drilled between 2014 and 2028.

QP started additional construction work at its Laffan refining complex in Ras Laffan Industrial City. The firm is working on a 146,000b/d condensate splitter at the refinery complex. The Laffan Refinery 2 (LR2) project, a joint venture of QP (84%), Total (10%), Idemitsu(2%), Cosmo (2%), Marubeni (1%), and Mitsui (1%), will enhance Laffan Refinery 1's (LR1) condensate refining capacity to 300,000 b/d. Local liquefied natural gas producer Qatargas will operate LR1 and LR2. Construction work on the USD1.5bn facility is scheduled to be complete by Q316. Once the capacities of LR1 and LR2 are combined, the entire Laffan Refinery will become the largest condensate facility in the world, according to Salman Ashkanani, the chief operating officer of Refinery Ventures at Qatargas. LR2 is likely to have a processing capacity of 71,000b/d of naphtha, 60,800b/d of kerosene, 27,000b/d of gasoil and 850 tonnes of liquefied petroleum gas (LPG), including butane and propane, Ashkanani added.

Market Position

QP is active in all segments of the energy chain and participates in all major oil and gas developments. The firm's E&P activities are centred on the onshore Dukhan oil field and the offshore Bul Hanine and Maydan Mahzam oil fields. The state firm also holds stakes in seven offshore fields that are being developed under PSAs. Gas resources are centred on the giant North Field. QP operates all of the country's 200,000b/d crude oil refining capacity and brought the 146,000b/d Ras Laffan refinery on stream in 2009.

The group's key subsidiaries and affiliates include LNG companies Qatargas and RasGas. QP has a 65% interest in the upstream portion of Qatargas. The ownership of Qatargas' downstream component is split between QP (65%), Total (10%), ExxonMobil (10%), Mitsui (7.5%) and Marubeni (7.5%). RasGas I and II produce 20.7mn tpa of LNG from five trains. RasGas I is owned by QP (63%), ExxonMobil (25%), Kogas (5%), Itochu (4%) and LNG Japan (3%). RasGas II is a 70:30 JV between QP and ExxonMobil.

Qatargas in August 2014 delivered the first cargo on a Q-Max class LNG vessel to China National Oil Corporation's (CNOOC) Hainan LNG terminal in Hainan province, China.

RasGas delivered its second LNG cargo to India's state-owned oil and gas company Petronet LNG at the Kochi LNG Receiving Terminal in November. 'The supply to the Kochi LNG terminal is an indication of the strength of our relationship and the importance we place on India as a strategic LNG market,' said RasGas' CEO, Hamad Rashid al-Mohannadi, reports Gulf Times. RasGas, which had signed a 25-year sale and purchase agreement with Petronet, has been providing LNG to India since 2004.

QAPCO, in which QP holds an 80% stake together with Atofina, produces 525,000tpa of ethylene, 360,000tpa of low-density polyethylene (LDPE) and 70,000tpa of sulphur. QP has a 51% interest in Qatar Chemical Company (Q-Chem) together with ChevronPhillips Chemical Company. Q-Chem operates a world-class petrochemical plant producing high-density polyethylene (HDPE), medium-density polyethylene (MDPE) and 1-hexene (alpha olefin). Other group companies include Qatar Fuel Additives Company (QAFAC, 50% interest), Qatar Vinyl Company (QVC, 25.5%) and Gulf Helicopters (100%).

The Qatari government is scheduled to conclude a reservoir assessment of its North Gas Field Development in 2013, according to the country's Energy Minister Mohamed bin Saleh Al-Sada. He said that the study would facilitate the formulation of future energy and gas field projects. It will also provide Qatar's energy ministry with enough information to ensure it can exploit reserves without causing environmental damage, Al-Sada stated. The 6,000sq km North Field's recoverable gas reserves are estimated at more than 25,500bcm.

Germany's Wintershall and QP have announced exploration success at Block 4 North offshore Qatar after four years of hunting. The discovery in depths of 70m is estimated to contain as much as 70bcm of gas and is the country's first new find in 42 years.

Technip has been handed an engineering, procurement, installation and commissioning contract by QP relating to its FMB offshore project. Neither party disclosed the value of the contract, which will see Technip building a living quarter platform and a utility platform with a bridge connecting the two. Vaseem Khan, senior vice president of Technip in the Middle East, commented: 'This contract reflects the growing interest for the floatover technology, by allowing a safe project execution in a time and cost-effective way while overcoming heavy-lift challenges. With this strategic project, we have the opportunity to further consolidate our presence in Qatar and to strengthen our relationship with Qatar Petroleum. It will also help us establish Technip as a leading company in the region for executing offshore living quarter platform projects.'

Qatar-based drilling contractor Gulf Drilling International (GDI) has entered into several drilling deals worth QAR5.2bn (USD1.43bn) with QP. The deals consist of four new contracts and four contract extensions with QP. The deals are associated with the provision of drilling rig services for a five-year period each. The new contracts are

associated with the provision of two new offshore drilling rigs known as 'Dukhan' and 'Halul' and two new land rigs GDI-7 and GDI-8. The contract extensions are related to the continuation of services of four land rigs GDI-1, GDI-2, GDI-3 and GDI-4.

Qatargas has begun a USD1bn jetty boil-off gas recovery (JBOG) project intended to reduce flaring at LNG terminals in Ras Laffan Industrial City. The JBOG project is expected to save gas and reduce greenhouse gas emissions, according to the company. The facilities would be operated by Qatargas and RasGas with QP, ExxonMobil, Total, **ConocoPhillips** and Shell among other shareholders. The project is expected to be the largest LNG boil-off recovery project in the world.

The joint acid stimulation research project of QP and Total has reached a key phase through the successful installation of the 'QP Dual Core Rig' at Total's Qatar Science and Technology Park facility. The rig, which was built by Texas A&M University, aims at increasing hydrocarbon production to optimise carbon reservoir treatment, which normally causes a series of technical challenges. The joint project is between the Total Research Centre-Qatar and the Qatar Petroleum Research & Technology Centre and comprises laboratory core-flooding experiments, scaling-up and modelling.

Financial Data

Net sales

- QAR330.3bn (2012)
- QAR289.2bn (2011)
- QAR188.0bn (2010)
- QAR118.1bn (2009)
- QAR168.5bn (2008)
- QAR177.4bn (2007)
- QAR100.7bn (2006)

Net income

- QAR114.1bn (2012)
- QAR88.9bn (2011)
- QAR54.6bn (2010)
- QAR35.2bn (2009)
- QAR55.8bn (2008)
- QAR35.0bn (2007)
- QAR31.2bn (2006)

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ExxonMobil Oil Qatar

Strengths

- Major domestic gas producer
- Share of key liquefied natural gas (LNG) export schemes
- Good relationship with state energy company
- Substantial volume growth potential
- Potential role in gas-to-liquids (GTL) and petrochemicals capacity

Weaknesses

- No producing oil interests
- No downstream oil exposure
- Rising investment requirement

Opportunities

- Considerable untapped gas export potential
- Substantial scope for plant expansion
- Bazran volumes

Threats

- Competition in regional LNG supply
- Changes in national energy policy

Company Overview **ExxonMobil** has a 25% interest in RasGas I and a 30% interest in the RasGas II development. Gas for the trains is sourced from the North Field. Total investment in the development is estimated at USD12bn. ExxonMobil also has a 10% interest in Qatargas I, which has been in operation since 1996. ExxonMobil and QP signed a heads of agreement (HoA) in June 2002 for the supply of Qatari LNG to the UK and Northern Europe. It also holds a 30% stake in train four of Qatargas II, alongside Qatar Petroleum (QP) (70%) and ExxonMobil (30%), and an 18.3% stake in train five Qatargas II alongside **QP** (65%) and **Total** (16.7%).

Strategy

Exxon continues to be heavily involved in the Qatar liquefied natural gas (LNG) sector. With significant returns around the corner these interests will continue to grow, while the group's excellent relations with QP should ensure its participation in any future developments in the country.

In late-2010, Exxon launched the development of the massive Barzan gas field, which will produce around 14.5bn cubic metres (bcm) once fully online. Exxon is the only international oil company (IOC) partner in the project, holding a 7% stake, with the remainder held by QP. Fabrication of the topsides for the three offshore wellhead platforms concluded in South Korea, and the heavy lift of the topsides onto the jacket structures offshore Qatar was completed successfully; hook-up and commissioning activities are ongoing. Onshore construction activities continue, and development drilling of all the production wells is complete.

LNG supplier RasGas has announced that Train 1 of its USD10.3bn Barzan Gas Project (BGP) should begin supplying gas from Q115. Construction of Train 2 is also in progress and is expected to complete by mid-2015. After completion, the two processing trains will produce about 39.6mn cubic metres a day (14.5bcm) of sales gas from the North Field. Construction of the project was started in 2011 and includes offshore and onshore facilities. BGP is a joint venture between Qatar Petroleum and ExxonMobil.

ExxonMobil has signed an agreement with Qatar Petroleum International (QPI) to move forward with construction of a USD10bn natural gas export terminal in Texas. The project will involve installing liquefaction equipment at an existing import facility in Sabine Pass, Texas, according to an e-mailed statement from Golden Pass Products, a subsidiary formed by the two companies. It won permission in 2012 to export the fuel to nations with free-trade agreements with the US and is awaiting approval to send the fuel to all other countries.

Exxon and QPI plan to ship as much as 15.6mn tpa of gas annually from the Golden Pass facility, according to the statement. 'This agreement sets out a highly competitive commercial blueprint for Golden Pass Products, with a commitment that builds on the unique combined strengths of QPI and Exxon Mobil through the global downstream LNG value chain,' Bill Collins, president of Golden Pass, said in the statement.

Market Position

ExxonMobil has a major position in the LNG sector. The US oil major has a 25% interest in RasGas I and a 30% interest in the RasGas II development. The RasGas II development comprises three LNG trains that will supply India, Italy, Belgium and Spain. The project, which was completed in 2004, has a contract to supply LNG to the US for a 25-year period under an October 2003 deal. Gas for the trains is sourced from the North Field, with the project to use 737bcm of reserves. Total investment in the development is estimated at USD12bn.

ExxonMobil also has a 10% interest in Qatargas I, which has been in operation since 1996. ExxonMobil and QP signed a heads of agreement (HoA) in June 2002 for the

supply of Qatari LNG to the UK and Northern Europe. It also holds a 30% stake in train four of Qatargas II, alongside QP (70%) and ExxonMobil (30%), and an 18.3% stake in train five Qatargas II alongside QP (65%) and Total (16.7%).

RasGas has entered a medium-term, flexible contract with German energy company E.ON for the supply of LNG from Qatar to the UK's Isle of Grain LNG import terminal. The financial details of the contract were not disclosed. Under the terms of the three-year contract, RasGas could potentially supply around 2bcm of LNG to the UK over the period of the contract.

ExxonMobil was involved in the USD1.1bn phase one development of the al-Khalij Gas project (AKG-1), together with QP. In March 2003, the US major launched the first phase development, which includes the production of gas from the North Field, the recovery of associated condensate and natural gas liquids for sale and the marketing of 49Mcm/d of pipeline gas for domestic and export customers. AKG was developed in phases to meet gas sales commitments. The partners initially agreed to supply 21Mcm/d of gas to the Oryx GTL plant, the Ras Laffan Power Plant and other domestic industrial customers.

QP and ExxonMobil started operations at the AKG-2 project at Qatar's North Field in December 2009, according to a press release by Exxon on February 23 2010. The project has the capacity to produce 35.4Mcm/d, or an annualised 12.9bcm, of gas that will be used to supply domestic industries. The AKG-2 project involved the construction of onshore gas treating, liquids recovery and fractionation facilities, as well as two additional offshore wellhead platforms. The onshore facilities are integrated with the RasGas III LNG project, which has allowed the companies to share some of the infrastructure and utilities.

Operational Data ■ LNG production (ExxonMobil - interest trains) 61mn tonnes (2013)

Company Details ■ ExxonMobil Oil Qatar Inc

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Total Qatar

Strengths	<ul style="list-style-type: none"> ▪ Significant domestic oil and gas producer ▪ Share of major LNG export scheme ▪ Substantial near-term volume growth ▪ Rapid expansion of LNG and petrochemicals capacity
Weaknesses	<ul style="list-style-type: none"> ▪ No downstream oil exposure ▪ Absent from GTL development consortia ▪ Rising investment requirement
Opportunities	<ul style="list-style-type: none"> ▪ Considerable untapped gas export potential ▪ Substantial scope for plant expansion ▪ Large areas of underexplored territory ▪ New condensates refinery project
Threats	<ul style="list-style-type: none"> ▪ Competition in regional LNG supply ▪ Changes in OPEC/national energy policy

Company Overview Present in Qatar since 1936, **Total** has a 20% interest in the upstream part of Qatargas 1, a 10% interest in the Qatargas 1 liquefaction plant joint venture (JV), a 24.5% stake in Dolphin Energy and a 16.7% stake in Qatargas 2 Train 5 JV. Total's Qatari production averaged 137,000 barrels of oil equivalent per day (boe/d) in 2013. Total is also a partner in the Laffan Refinery with a 10% interest and in the Qapco (20%) and Qatofin (48.6%) petrochemical plants.

Strategy Total's good relationship with **QP** should stand it in good stead to expand its broad-based interests in Qatar. The company was linked in late-2010 with involvement in a

large-scale petrochemicals plant in the country, and is likely to be actively interested in other major projects as and when they become available. Total has signed a new agreement with QP, under which the two companies will continue to develop the Al Khalij oil field offshore Qatar for the next 25 years.

QP has formally announced a joint venture with private players led by Total for the construction of USD1.5bn condensate refinery at Ras Laffan. At 146,000 barrels per day (b/d), the Ras Laffan 2 (LR2) will double the capacity of the existing Laffan Refinery (LR1) when it comes online in H216. The plant will have a production capacity of 60,000b/d of naphtha; 53,000b/d of jet fuel; 24,000b/d of gas oil; and 9,000b/d of liquid petroleum gas (LPG).

The project will developed by QP (84%) and Total (10%), with Japanese firms **Idemitsu Kosan**, **Cosmo Oil**, **Marubeni** and **Mitsui** holding the remainder. Supplied from the North Field, the combined 300,00b/d capacity of LR1 and LR2 will make the plant the largest condensate refinery developed to date.

The **Dolphin Energy** gas pipeline, the Gulf Cooperation Council (GCC)'s first regional gas project, could see a capacity expansion according to Total's senior vice president for the Middle East, Arnaud Breuillac. The pipeline, which currently connects Qatar to Abu Dhabi and onwards to Oman has a capacity of 33bcm per annum. However, current sales agreements and existing compression facilities only support volumes of just over 23bn cubic metres (bcm) per year.

Under current plans, a new compression facility at Ras Laffan would allow Dolphin to economically deliver volumes closer to full capacity from 2015. The pipeline has seen exports rise temporarily to meet demand in excess of contracted capacity, but only for short periods of time. However, rising demand for gas in the region, with the UAE set to inaugurate a new liquefied natural gas (LNG) import terminal from 2016 in the face of tightening supplies, provides economic rationale for a Dolphin expansion.

Market Position

Total is active in the upstream and petrochemicals sectors in Qatar. The French oil company has a 20% interest in the upstream and a 10% interest in the downstream portions of Qatargas I, which operates three LNG trains. Further, Total also owns a 16.7% stake in train five of Qatargas II. The French major operates the offshore Al-Khalij field, which was discovered in 1991. A new development phase launched in June 2002 boosted output to 80,000b/d by mid-2004. Total also participated in the development of the North Field's Bravo Block designated to supply gas to the Qatargas liquefaction plant.

Qatargas in August 2014 delivered the first cargo on a Q-Max class LNG vessel to China National Oil Corporation's (CNOOC) Hainan LNG terminal in Hainan province, China.

Total also has a 24.5% interest in the Dolphin Energy project, which is developing gas reserves in the North Field for sale to the UAE and other regional markets. The field

started producing at the end of June 2007, with exports to the UAE and Oman having started in February and November 2008 respectively.

Total's chemicals subsidiary **Atofina** has a 20% stake in Qatar Petrochemical Company (QAPCO), which produces ethylene and low-density polyethylene that is exported to Asian markets and other Gulf countries. Atofina is also involved in **Qatofin**, a JV between Atofina (36%), **QAPCO** (63%) and **QP** (1%), which is planning to build a 450,000tpa linear low-density polyethylene (LDPE) unit at Mesaieed. Production is expected to begin in 2007. Through Qatofin, Atofina will also participate in the construction and operation of the biggest ethane cracker in the world (1.3mn tpa) in Ras Laffan. Qatofin will have a 45.7% interest in the facility. Finally, Atofina has a 19.29% interest in QVC, a new chloro-chemical complex commissioned in April 2001.

Total has signed a new agreement with QP, under which the two companies will continue to develop the Al Khalij oil field offshore Qatar for the next 25 years. The existing exploration and production sharing agreement, signed in 1989, will expire in early 2014. The Al Khalij field was discovered by Total in 1991 and commenced oil production in 1997. Under the terms of the deal, Qatar Petroleum will own a 60% stake in the oil field, with Total holding the remaining 40%.

Qatargas has begun a USD1bn jetty boil-off gas recovery (JBOG) project intended to reduce flaring at LNG terminals in Ras Laffan Industrial City. The JBOG project is expected to save around 28bn cubic metres per day of natural gas in a period of 30 years and reduce greenhouse gas emissions, according to the company's estimates. The facilities would be operated by Qatargas and RasGas with QP, ExxonMobil, Total, ConocoPhillips and Shell among other shareholders. The project is expected to be the largest LNG boil-off recovery project in the world.

The joint acid stimulation research project of QP and Total has reached a key phase through the successful installation of the 'QP Dual Core Rig' at Total's Qatar Science and Technology Park facility. The rig, which was built by Texas A&M University, aims at increasing hydrocarbon production to optimise carbon reservoir treatment, which normally causes a series of technical challenges. The joint project is between the Total Research Centre-Qatar and the Qatar Petroleum Research & Technology Centre and comprises laboratory core-flooding experiments, scaling-up and modelling.

Operational Data

Oil production:

- 36,000b/d (2013)
- 38,000b/d (2012)
- 44,000b/d (2011)
- 49,000b/d (2010)
- 47,000b/d (2009)
- 44,000b/d (2008)

Gas production:

- 5.8bcm (2013)
- 5.8bcm (2012)
- 6.4bcm (2011)
- 6.6bcm (2010)
- 3.0bcm (2009)

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Royal Dutch Shell

Strengths	<ul style="list-style-type: none"> ▪ High-profile international oil company (IOC) position in Qatari gas/NGL sector ▪ Recent expansion into Qatari exploration
Weaknesses	<ul style="list-style-type: none"> ▪ Relatively narrow Qatari investment portfolio
Opportunities	<ul style="list-style-type: none"> ▪ Substantial production growth potential ▪ Exposure to lucrative Asia Pacific LNG market
Threats	<ul style="list-style-type: none"> ▪ Changes in national energy policy ▪ Drilling setbacks in the upstream segment ▪ Competition in regional LNG supply

Company Overview **Shell's** involvement in Qatar spans both the upstream and downstream sectors. The company has developed its flagship Pearl GTL facility at Ras Laffan, which is the largest facility of its kind in the world. First deliveries are now underway from the complex. Shell is also involved in the Qatargas IV (train seven) project, in which it holds a 30% stake (with QP holding the majority 70%). As well as its two downstream projects, Shell is also involved in the Qatari upstream. In May 2010, Shell and **PetroChina** were awarded the Block D concession. Under the terms of the deal, Shell operates the block with a 75% stake and PetroChina holds the remaining 25%.

Strategy Through the twin pursuit of Qatargas IV and Pearl, Qatar is emerging as the heart of Shell's Arab Gulf operations. Liquefied natural gas (LNG) is a key component of Shell's growth strategy, and its Qatari investments guarantee it a slice of a growing market. A poor outlook for US natural gas prices has led Shell to develop its Qatari gas projects with an eye towards the Asia Pacific market. Shell is keen to develop its profile as the leading IOC gas player in the Gulf, given its gas investments in Saudi Arabia and Iraq, and technical assistance towards the development of Kuwait's northern gas reserves.

Although the Block D deal is Shell's first move into Qatari gas exploration, it is already heavily involved in the emirate, both upstream and downstream. The company is developing part of the North Field under an agreement signed in 2003, which called for

it to produce 16.5bn cubic metres (bcm) of gas annually by 2011. Gas produced at the field will be used to supply the Pearl GTL facility. In February 2009, Shell announced plans to drill 22 offshore wells at a block in the North Field.

QP and Royal Dutch Shell are targeting a 2018 completion date for the Al-Karaana petrochemical project in Ras Laffan, Qatar, after awarding a contract for front end design work to US Fluor Corporation, according to Zawya. The USD6.5bn project, 80% owned by QP and 20% by Shell, will comprise a steam cracker, a mono ethylene glycol (MEG) plant, a linear alpha olefin unit and an oxo alcohol unit.

Shell has abandoned the QSD-1 well at Block D in Qatar's North field after drilling failed to encounter commercial volumes of gas, reports Reuters, citing two sources from Qatar Petroleum. 'Shell only pulled out of that section of the North Field (that overlaps with Block D), and they will continue to work on other (Qatari) projects,' said one source (Reuters). However, the other source stated that the company has been out of the Block D licence for months. Shell owns 75% of the QSD-1 project working alongside PetroChina with a 25% interest.

Market Position

Shell's involvement in Qatar spans both the upstream and downstream sectors. The company has developed its flagship Pearl GTL facility at Ras Laffan, which is the largest facility of its kind in the world. Shell estimates Pearl's costs, which it will bear alone, at USD19bn, based on its tapping 3bn boe over 25-30 years at USD6/bbl. Once at capacity, the facility will produce 120,000b/d of NGL and ethane and 140,000b/d of ultra-clean diesel, naphtha and other GTL products, generating around USD6bn annually based on an oil price of USD70/bbl. Major construction was substantially complete by the end of 2010. Pearl GTL went into the start-up phase in 2011 and reached full capacity in 2012.

In March 2011, Shell started supplying gas from the North Field to its Pearl GTL plant. In March 2010, Shell Qatar spokesperson Andrew Brown said the project would generate annual profits of USD6bn based on an oil price of USD70/bbl, adding that operating costs were around USD6/bbl and that the company's production sharing contract (PSA) with QP allows it to claim back the USD19bn project cost. He claimed that following the start-up of deliveries from Pearl and a planned increase in output at the Qatargas LNG project, Shell's operations in Qatar could account for as much as 10% of the company's total hydrocarbons production.

Shell is also involved in the Qatargas IV (train seven) project, in which it holds a 30% stake (with QP holding the majority 70%). Once fully on stream, the train will have a capacity of 7.8mn tpa and will produce about 70,000b/d of NGL. The facility was originally scheduled to become operational in early-2010, but was delayed. It has been operating at full capacity in 2012. The LNG is shipped mainly to markets in North America, China, Europe and the United Arab Emirates.

As well as its two downstream projects, Shell is also involved in the Qatari upstream. In May 2010, Shell and PetroChina were awarded the Block D concession. Under the

terms of the deal, Shell operates the block with a 75% stake and PetroChina holds the remaining 25%. The 30-year contract includes an initial five-year exploration period, during which the two companies are obliged to carry out 2D and 3D seismic surveys, processing and interpretation. This period will also involve the companies drilling an unspecified number of exploration wells to target the pre-Khuff formation. According to PetroChina, part of the concession extends beneath the offshore North Field. Initial drilling results are believed to have been disappointing.

Gulf Drilling International (GDI) has been awarded a drilling services contract by Qatar Shell for offshore exploration in the North field of Qatar. Under the contract, the company will use its Al-Khor jack-up vessel to drill the pre-Khuff interval of block D. This is the third contract between the two companies. The contract was signed by Shell's Executive Vice President Wael Sawan and GDI's CEO Ibrahim J Al-Othman.

Qatargas has begun a USD1bn jetty boil-off gas recovery (JBOG) project intended to reduce flaring at liquefied natural gas (LNG) terminals in Ras Laffan Industrial City. The JBOG project is expected to save around 28bn cubic metres per day of natural gas in a period of 30 years and reduce greenhouse gas emissions, according to the company's estimates. The facilities would be operated by Qatargas and RasGas with **Qatar Petroleum, ExxonMobil, Total, ConocoPhillips** and Shell among other shareholders. The project is expected to be the largest LNG boil-off recovery project in the world.

Qatar Kentz, a part of Canadian construction company SNC-Lavalin, has secured a four-year contract with an option of two-year extension from Qatar Shell for its Pearl GTL onshore and offshore facilities. Under the terms of multi-million-dollar call-off contract, Kentz will manage the engineering, procurement and construction management (EPCM) work for all services related to plant changes, including minor, base and medium projects. The work will also include project and commissioning management, engineering, procurement, logistics and construction.

Financial Data

Revenues:

- USD459.6bn (2013)
- USD481.7bn (2012)
- USD484.5bn (2011)
- USD378.2bn (2010)
- USD278.2bn (2009)
- USD458.5bn (2008)

Net profit/loss:

- USD16.4bn (2013)
- USD26.7bn (2012)
- USD30.9bn (2011)
- USD20.5bn (2010)
- USD12.7bn (2009)
- USD26.5bn (2008)

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Other Summaries

Maersk Oil

Maersk Oil of Denmark operates the al-Shaheen field on Block 5, with capacity of around 240,000 barrels per day (b/d). A production sharing contract (PSA) for the Block 5 extension area was awarded by QP in April 2004; since then, Maersk has carried out an extensive exploration programme for fast-track development. In December 2005, Maersk concluded an agreement about further development of al-Shaheen Field. The plan comprises drilling of more than 160 production and water injection wells up to 2011 and establishment of a further three offshore platform locations with production and accommodation facilities. To date, six drilling rigs have completed drilling 48 of the planned 160 wells.

Maersk has been holding discussions with QP over an extension to a production sharing contract for the al-Shaheen oil field, reports Reuters. The company has been seeking a 13-year extension to 2030. The field's crude production could increase from the current 300,000b/d to 400,000b/d in 2017, one source said. Additionally, new equipment including a floating storage and offloading unit is likely to be deployed at the field if the contract is extended.

Occidental Petroleum

Occidental Petroleum had net Qatari output of 1.5bn cubic metres (bcm) of gas and 81,000b/d of crude and natural gas liquids (NGLs) in 2013. The company operates the Id al-Shargi North Dome (ISND) oil field. In December 1997, Occidental signed another PSA with QP to develop the Id al-Shargi South Dome (ISSD) field that came on stream in November 1999. Occidental's ownership interest in ISSD is 44%. In May 2007, Occidental purchased Anadarko's 92.5% interest in blocks 12 and 13. Block 12 contains the al Rayyan Field, which represented all of Anadarko's production operations in Qatar and had net output of around 6,000b/d. Occidental also holds a 24.5% share in the Dolphin Energy joint venture (JV), alongside **Total** (24.5%) and the Abu Dhabi government (51%).

In 2013, Occidental received approval from the Government of Qatar for the fifth phase of field development of the ISND Field. Based on upgraded reservoir simulation models, the work will focus on implementing and improving waterflooding practices in all oil-producing reservoirs, in order to improve ultimate recovery and further optimise long-term production and recoverable reserves. In addition, Occidental continues field development activities within the ISSD and Al Rayyan oilfields, which will include additional drilling beyond 2014.

Occidental Petroleum's wholly-owned Qatari subsidiary has signed a two-year contract with Gulf Drilling International (GDI) for the al-Rayyan (Gulf-2) drilling rig. The rig will operate along with the al-Wajbah (Gulf-3) rig in the Idd al-Sharqi field's North and South Domes, as well as the al-Rayyan field.

Oxy has signed a contract with Qatar-based oil and gas explorer Gulf Drilling International (GDI) to hire its newly acquired rig for an extensive development

programme. This is the third rig that GDI has leased out to Oxy, with GDI's Al Rayyan and Al Wajba jack-up rigs already deployed in support of Oxy's development programme. The new jack-up rig can accommodate 116 people and can operate in water depths of up to 91.44 metres. Oxy has hired the third rig under a five-year contract valued at QAR865mn (USD237.43mn). The rig will be fully refurbished before being pressed into service.

GDI has now entered into a five-year contract with Oxy for its jack-up drilling rig Al Wajba. The USD277.76mn-contract was signed by GDI CEO Ibrahim Jassim Al Othman and Oxy Qatar president and general manager Steve Kelly. In addition to Al Wajba, Oxy Qatar has two more rigs under contract from GDI.

Qatargas

Qatargas I, made up of a consortium of **QP** (65%), **ExxonMobil** (10%), **Total** (10%), **Mitsui** (7.5%) and **Marubeni** (7.5%), comprises three trains, which originally had a capacity of 2mn tonnes per annum (tpa) (2.7bcm) each. At the end of 2005, Qatargas I completed the debottlenecking of its facilities, increasing total capacity to 10mn tpa (13.8bcm). Most of the exported liquefied natural gas (LNG) is destined for Japan and Spain. In December 1996, the Qatargas venture delivered its first shipment of LNG to Japan.

Qatargas II consists of two trains, with train four owned by QP (70%) and ExxonMobil (30%) and train five by a consortium between QP (65%), ExxonMobil (18.3%) and Total (16.7%). Trains four and five, which each have a 7.8mn tpa (10.8bcm) capacity came on stream in 2009. The first LNG shipment from Qatargas II arrived at the UK's South Hook LNG terminal on March 20 2009 and train five became operational in early September 2009.

Qatargas III is owned by QP (68.5%), **ConocoPhillips** (30%) and **Mitsui** (1.5%). Qatargas III has a capacity of 7.8mn tpa (10.8bcm) and began delivering gas in November 2010.

Qatargas IV has capacity of 7.8mn tpa (10.3bcm). It is a JV between QP (70%) and Shell (30%), and came on stream in February 2011.

QatarGas agreed in April 2011 to supply UK energy firm Centrica with LNG covering an estimated 10% of the country's gas demand. The deal covers a supply of 2.4mn tonnes per annum over three years. Qatargas has also signed a tripartite sales and purchase agreement with Japan's Chubu Electric Power and Shizuoka Gas for an annual delivery of 200,000 tonnes of LNG from 2016. LNG will be supplied through Qatargas I.

Qatargas entered into a long-term LNG sale and purchase agreement with Tokyo Electric Power Company (Tepco) in 2012, under which the Japanese firm will receive 1mn tonnes of LNG every year from Ras Laffan.

Qatar will supply 18-24 cargoes of LNG to Egypt under a swap deal from May 28 2013, reports Middle East News Agency (MENA), citing Tarek el-Barkatawy, the first under-secretary for agreements and exploration at the Egyptian Oil Ministry. Under the terms

of the swap deal, BG Group and Malaysia's Petronas will supply around 152.4mn cubic metres of natural gas per day, el-Barkatawy said. Qatar Gas in turn will supply LNG directly to the companies' overseas customers. Each cargo will be equivalent to 1.0bcm of natural gas.

Qatargas, along with other LNG producers in the country, will continue to base projects on long-term market demands instead of the spot market, according to CEO Sheikh Khalid bin Khalifa al-Thani. Several buyers of LNG have been influencing the market away from the conventional oil-linked pricing structure and multiyear contracts, stated Khalifa al-Thani. It is difficult for LNG traders to function amid the price risk associated with the spot market, Khalifa al-Thani said. The announcement comes amid an increasing number of short-term contracts hitting the LNG market, backed by the rising number of LNG buyers.

E.ON Global Commodities, a subsidiary of German energy company E.ON, has entered into a five-year LNG sales and purchase agreement (SPA) with Qatargas. The Qatari firm will start supplying an annual volume of around 1.5mn tonnes of LNG from January 2014. The LNG will be supplied from Qatargas 4 (Train 7), a joint venture between Qatar Petroleum and Royal Dutch Shell, and is to be delivered on Q-Max LNG ships to the Gate LNG Terminal in Rotterdam, the Netherlands.

Qatargas in August 2014 delivered the first cargo on a Q-Max class LNG vessel to China National Oil Corporation's (CNOOC) Hainan LNG terminal in Hainan province, China.

Qatargas has begun a USD1bn jetty boil-off gas recovery (JBOG) project intended to reduce flaring at LNG terminals in Ras Laffan Industrial City. The JBOG project is expected to save gas and reduce greenhouse gas emissions, according to the company. The facilities would be operated by Qatargas and RasGas with Qatar Petroleum, ExxonMobil, Total, ConocoPhillips and Shell among other shareholders. The project is expected to be the largest LNG boil-off recovery project in the world.

Rasgas

RasGas I is owned by a consortium made up of QP (63%), ExxonMobil (25%), Kogas (5%) and LNG Japan (3%). RasGas I consists of two 3.3mn tpa (4.6bcm) trains. The main export market for LNG from trains one and two is South Korea.

RasGas II, a 70:30 JV between QP and ExxonMobil, consists of three additional trains, each of which has a processing capacity of 4.7mn tpa (6.5bcm). Trains three, four and five came on stream in 2004, 2005 and 2006 respectively, raising RasGas' total processing capacity to 20.7mn tpa (28.5bcm). The main export market for LNG from train three is India, with LNG from train four destined for Europe and exports from train five shipped to Europe and Asia.

RasGas III, a 70:30 JV between QP and ExxonMobil, consists of two additional trains, each of which has a processing capacity of 7.8mn tpa. Trains six and seven were originally scheduled to start operations in 2008/2009. The scheduled start-up for train six for early April 2009 was also missed, with the train having been brought on stream in

August 2009. Train seven was expected to become operational before year-end, but did not become operational until late-February 2010.

RasGas will supply about 11.44bcm of LNG to South Korea's state-owned Kogas in 2011, according to Qatar's minister of energy and industry (and chairman of Qatar Petroleum and RasGas), Mohammed Bin Saleh Al Sada. He said that the quantity supplied is equivalent to almost 25% of South Korea's total projected demand. RasGas' annual LNG supply to South Korea exceeds 9.65bcm on a long-term basis, said Al Sada.

RasGas delivered its second LNG cargo to India's state-owned oil and gas company Petronet LNG at the Kochi LNG Receiving Terminal in November 2013. 'The supply to the Kochi LNG terminal is an indication of the strength of our relationship and the importance we place on India as a strategic LNG market,' said RasGas' CEO, Hamad Rashid al-Mohannadi, reports Gulf Times. RasGas, which had signed a 25-year sale and purchase agreement with Petronet, has been providing LNG to India since 2004.

RasGas has entered a medium-term, flexible contract with German energy company E.ON for the supply of LNG from Qatar to the UK's Isle of Grain LNG import terminal. The financial details of the contract were not disclosed. Under the terms of the three-year contract, RasGas could potentially supply around 2bn cubic metres of LNG to the UK over the period of the contract. The latest contract with RasGas is E.ON's third LNG agreement in around one year and its second LNG agreement with a Qatar-based firm in eight months.

RasGas has announced that Train 1 of its USD10.3bn Barzan Gas Project (BGP) is more than 95% complete with first production of clean-burning natural gas expected in Q115. Construction of Train 2 is also in progress and is expected to complete by mid-2015. After completion, the two processing trains will produce about 39.6mn standard cubic metres a day of sales gas from the North Field. Construction of the project was started in 2011 and includes offshore and onshore facilities. BGP is a JV between Qatar Petroleum and ExxonMobil.

Tasweeq

Qatar's state-run company Qatar International Petroleum Marketing (Tasweeq) is to discontinue term gasoil exports from 2012, owing to an expected rise in domestic demand for the fuel, according to industry sources. Under a monthly term contract, Tasweeq exports approximately 30,000-60,000 tonnes of 0.2% sulphur gasoil each month, while the company sometimes offers a similar amount of gasoil on the spot market, according to traders. Tasweeq's decision to stop exporting is likely to put a strain on the Middle East market, with demand unlikely to register much change but a shortage of supply.

Tasweeq also markets crude oil and GTL entitlements on behalf of QP under an agency agreement that is termed as 'Non-Regulated Products'. It is an independent state-owned company, created under Qatar's Emiri Decree Law Number 15 of 2007, with the mandate of capturing maximum market value from the rapidly increasing exports of

Regulated Products from the state of Qatar, reliably and efficiently. Tasweeq delivers products to customers and markets globally.

Sasol	Sasol of South Africa has built a USD1bn GTL plant that entered production in March 2007, manufacturing high-quality diesel fuel and naphtha from gas using Sasol's technology. Sasol expects the facility to reach full production by 2009. The facility features QP as a partner. In March 2004, Sasol, Chevron and QP announced plans to evaluate the expansion of the GTL project's output from 34,000b/d to 100,000b/d. In addition, the companies have agreed to pursue the opportunity to develop a 130,000b/d upstream/downstream integrated GTL project utilising resources from the North Field.
Conocophillips	Qatargas III is owned by QP (68.5%), ConocoPhillips (30%) and Mitsui (1.5%). Qatargas III has a capacity of 7.8mn tpa (10.8bcm). The integrated project comprises upstream gas production facilities to produce approximately 14.5bcm of natural gas over the 25-year life of the project, as well as an initial average of approximately 70,000b/d gross of LPG and condensate combined from Qatar's North Field. The first LNG cargo was loaded in November 2010, and the Qatargas 3 Plant is now fully operational.
Cosmo Oil	<p>In April 2011, Qatar Petroleum Development (QPD), which is a subsidiary of Cosmo Oil of Tokyo, began oil production from A-Structure South Field in offshore Qatar. QPD was established as the project company for the purpose of petroleum development and operation in Block 1 SE located offshore Qatar in September 1997. After the field development and installations in Al Karkara Field and A-Structure North Field, the first oil flowed in March 2006.</p> <p>In 2007, QP approved the development plan for A-Structure South Field in the same block. Since then, QPD has been continuing the development and on April 27 2011, oil production from the field started and is expected to reach around 3,000b/d, bringing the total production from the three fields in Block 1 SE to around 9,000b/d.</p>
Wintershall	<p>Germany's Wintershall, a wholly-owned subsidiary of BASF, became the operator of the wholly-owned Block 11 in Qatar's territorial waters in 2008. The block, which measures 544sq km and has a water depth of around 70 metres, is in close proximity to the North Field. Wintershall was in 2007 given the go-ahead to operate Offshore Block 3, which covers an area of 1,666sq km.</p> <p>Wintershall and Qatar Petroleum (QP) have announced exploration success at Block 4 North offshore Qatar after four years of hunting. The discovery in depths of 70m is estimated to contain as much as 70bcm of gas and is the country's first new find in 42 years.</p>
Gdf Suez	GDF Suez is active in Qatar, including participating in projects such as high-performance wastewater treatment technologies for water recycling and the

construction of the power plant and desalination facility for Ras Laffan. The acquisition of a 60% stake in Block 4 marked the company's first entry into Qatar's upstream segment. GDF Suez announced in July 2009 that it has acquired a 60% interest in Qatar's offshore Block 4 from Anadarko through the purchase of Anadarko Qatar Block 4 Company.

Cnooc

CNOOC has sold a 25% stake in a licence to explore for hydrocarbons in Qatar to Total as the Chinese company seeks to reduce risk. The Beijing-based producer, which secured rights to the offshore concession in 2009, will retain a 75% stake and operate the area called Block BC, according to a statement.

Petrochina

In May 2010, **PetroChina** and **Shell** were awarded the 8,089sq km Block D concession, which spans an area onshore and offshore north-eastern Qatar. Under the terms of the deal, Shell will operate the block with a 75% stake and PetroChina will hold the remaining 25%. The 30-year contract includes an initial five-year exploration period, during which the two companies are obliged to carry out 2D and 3D seismic surveys, processing and interpretation. This period will also involve the companies drilling an unspecified number of exploration wells to target the pre-Khuff formation. According to PetroChina, part of the concession extends beneath the offshore North Field, the largest non-associated gas field in the world.

Although PetroChina had no direct exposure to Qatar prior to the deal, it is already contracted to receive LNG from Qatargas IV, having signed a binding SPA with Qatargas and Shell in April 2008. The SPA is for 3mn tpa of gas (4.1bcm) over a 25-year period, which will be shipped to PetroChina's receiving terminals. The deal for Block D gives PetroChina its first exposure to the Qatari upstream and the company may consider expanding its presence when new blocks are offered.

Service Companies

London-listed oil services company **Petrofac** set up an office in Qatar in 1997 and is involved in providing technology to the energy, petrochemicals, water and construction sectors. The company counts QP, **WorleyParsons**, **Technip** and **Maersk** among its clients.

In March 2010, Petrofac was awarded a USD600mn contract by QP to provide engineering, procurement, installation and commissioning services for gas-sweetening units at Dukhan and Messaieed. The contract covers a sulphur-recovery upgrade at NGL-3 in Messaieed and an acid gas recovery facility at Arab-D in Dukhan. The work is expected to be completed by May 2013.

Although US-based engineering company **Fluor** does not currently maintain an office in Qatar, the company has been an active bidder for contracts in the country. In 2009, the company completed a four-year USD1.5bn EPCM for RasGas's Common Offplot Projects.

In April 2010, Fluor was awarded an EPCM contract by Qatargas for the Jetty Boil-Off Gas Recovery Project at Ras Laffan in Qatar. The project is designed to minimise gas flaring at LNG berths and is expected to be completed by the end of 2013 or early 2014. The gas will be collected for use by Qatargas and RasGas and is part of a USD1bn project under way at Qatargas' LNG storage and loading facilities.

Fluor awarded a contract to US firm GE Oil & Gas in February 2011 to supply equipment for the Jetty Boil-Off Gas Recovery project. The contract will include delivering six electric-motor-driven compressors to Fluor.

Qatar Kentz, a part of Canadian construction company SNC-Lavalin, has secured a four-year contract with an option of two-year extension from Qatar Shell for its Pearl gas-to-liquids (GTL) onshore and offshore facilities in Qatar. Under the terms of multi-million-dollar call-off contract, Kentz will manage the engineering, procurement and construction management (EPCM) work for all services related to plant changes, including minor, base and medium projects. The work will also include project and commissioning management, engineering, procurement, logistics and construction.

Others

Engineering company Kentz was in January 2011 awarded a framework contract by Qatar Shell GTL to provide services for the Pearl GTL facility in Ras Laffan. The agreement will include procurement, engineering design and construction supervision services at the facility. The services will be provided to offshore platforms, offloading jetties and harbour tank farms, as well as linking infrastructure. The three-year contract includes a two-year extension option.

Qatar-based petroleum products distributor Qatar Fuel (Woqod) has reported a 12.47% increase in net profit to QAR530mn (USD145.6mn) in H114. The increase has been attributed to growth in downstream demand. Earnings per share amounted to QAR6.28 (USD1.72) for H114, compared with QAR5.58 (USD1.53) for the same period in 2013. The company is currently involved in the implementation of more than 39 projects, of which 13 are progressing, while the remainder are at design, tendering and approval stages.

Woqod reportedly plans to build about 150 petrol stations across the country, as part of the development plan for the FIFA World Cup in 2022. Work is in progress to expand at least 25 petrol stations, with some 100 new petrol stations to be added to the network by 2018 and another 50 by 2022, reports Qatar News Agency (QNA), citing CEO Ibrahim Jaham Al Kuwari.

Regional Overview

Middle East Regional

***BMI View:** Middle East oil production will post strong growth across our 10-year forecast period, although ongoing political and security risks will see continued volatility in the supply. Oil export capacity will also come under increased strain, as spiralling domestic demand and an aggressive downstream expansion soaks up the bulk of forecast production growth. We hold a bullish outlook on the Middle East refining sector, although flag tightening gas supply-demand dynamics as a potential bottleneck on the industry.*

To highlight the key themes that will unfold in BMI's Middle East oil and gas forecasts, we have compared the region through the following key indicators:

- Oil Production
- Oil Consumption
- Refining Capacity
- Gas Production
- Gas Consumption

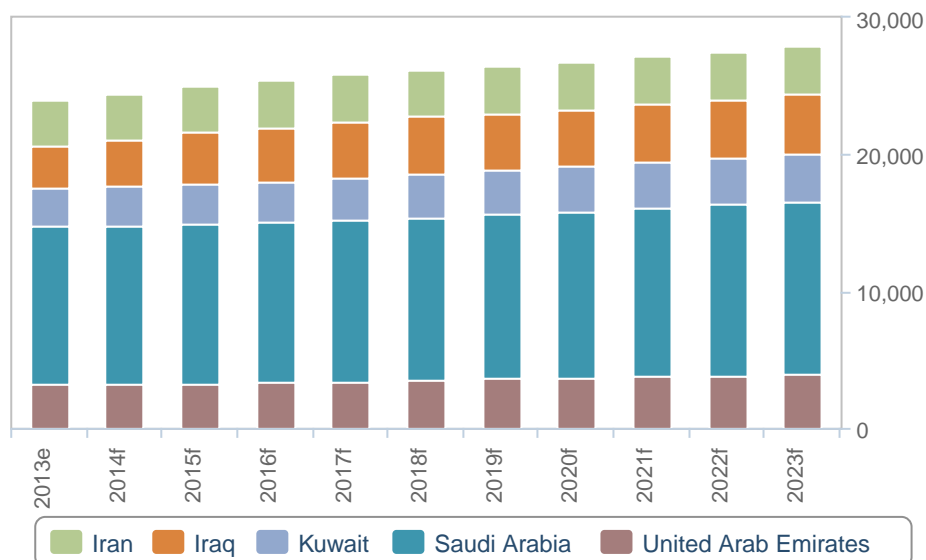
Middle East Oil Production - Risks Dampening Iraqi Outlook

We forecast strong oil production growth for the Middle East region, from an estimated 26.6mn barrels per day (b/d) in 2013, to 30.5mn b/d by 2023. Several of the region's producers - including Saudi Arabia, Kuwait and the UAE - are battling production decline at major maturing fields. However, we see this offset by high level investment, both in enhanced oil recovery (EOR) techniques and field redevelopments, and in new production.

Saudi Arabia will remain the dominant producer across our 10-year forecast period, although Iraq, Kuwait and the UAE are the key drivers of production growth.

Saudi Retains Regional Dominance

Oil Production from Major Middle East Producers



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

Iraq remains a regional wildcard, with an impressive but volatile growth story. The current incursion of the Islamic State in the north, growing instability in the west and a stalemate in the dispute over oil export revenue sharing with the Kurdistan Regional Government (KRG) illustrate some of the broader challenges here.

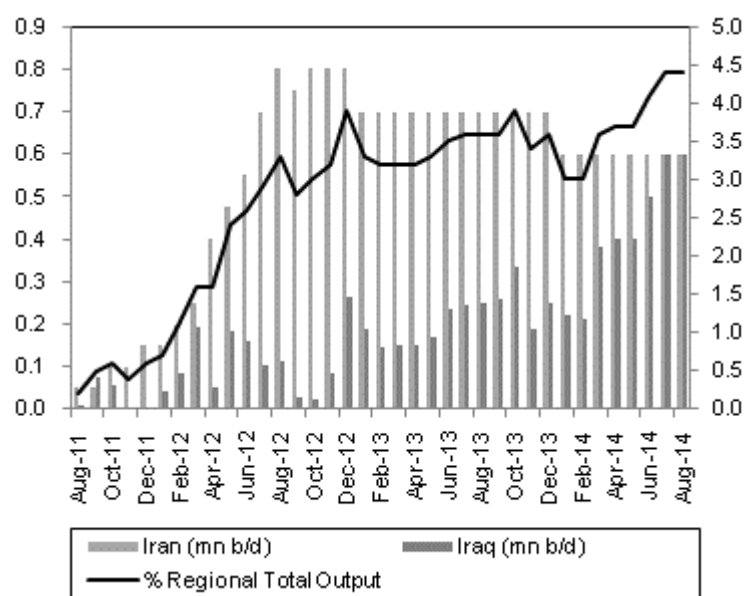
This quarter we have downgraded the country's long-term oil production forecast, from 6.5mn b/d to 4.3mn b/d, by 2023, as mounting political and security risks deter investment. Phased expansion projects at major producing fields are particularly vulnerable to delay, and in September 2014 we saw major cuts to production targets at the Halfaya and Rumaila oilfields. The Kurdistan region has strong potential for growth; however, we see limited export capacity significantly constraining output. The KRG has also been struggling to find buyers, amidst strong opposition from the Iraqi central government.

Iran is another wildcard, as the removal of international sanctions could restore around 1mn b/d of oil to market and allow the return of international capital to develop new oil and gas discoveries. However, we see major political roadblocks delay progress in negotiations. Chronic underinvestment in the country's oil and

gas infrastructure would also slow the return of production, were sanctions to be lifted. Currently we forecast only modest output growth, from an estimated 3.3mn b/d in 2013, to 3.6mn b/d by 2023.

Political Risk

Iran and Iraq Unplanned Supply Disruptions (000b/d - LHS and % Total - RHS), 2011-2014



Source: EIA, BMI

Middle East Oil Consumption - Demand Continues Unrestrained

Heavy fuel subsidies have led to wasteful consumption patterns across the Middle East. Several governments are in the process of enacting subsidy reform, but given the politically sensitive nature of fuel subsidies, there is limited room for manoeuvre.

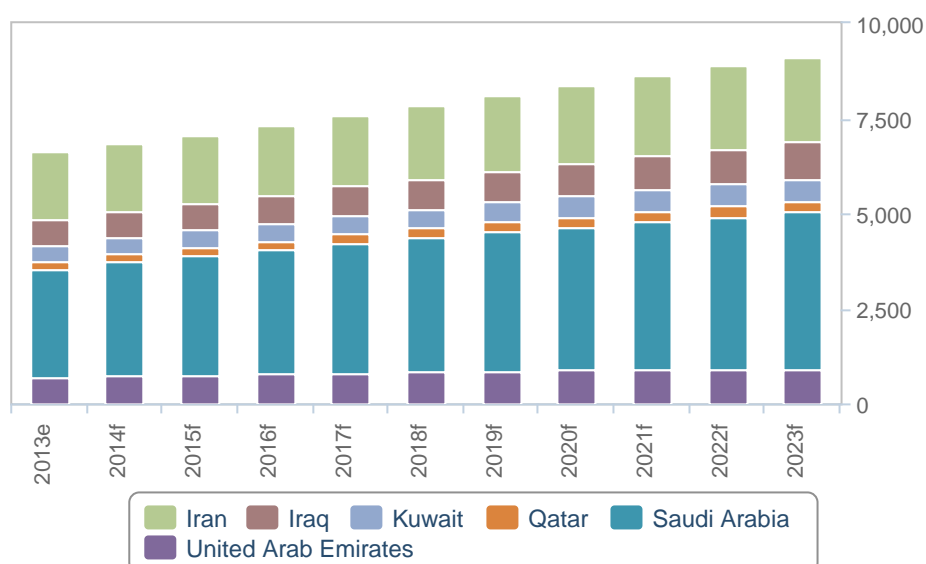
Mounting fiscal pressure may offer some impetus to reform - as in Iran - but the threat of social unrest will likely temper progress. As such, we see subsidies inflating consumption levels across our 10-year forecast period. Sustained economic expansion and growing populations will also drive demand, and we forecast Middle East refined product consumption to increase from an estimated 7.8mn b/d in 2013, to 10.3mn b/d by 2023.

Consumption growth is fairly uniform across the region, averaging 2% year-on-year (y-o-y). Israel is the notable exception, with oil consumption set to decline. We see this trend emerge as the major Tamar and

Leviathan gas fields are brought online and the country reorients its power and transport sectors away from liquid fuels, towards gas-fired generation.

Subsidies Fuelling Demand Growth

Middle East Oil Consumption (000b/d), 2013-2023



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

Middle East Refining Capacity - Soaking Up Domestic Crude Output

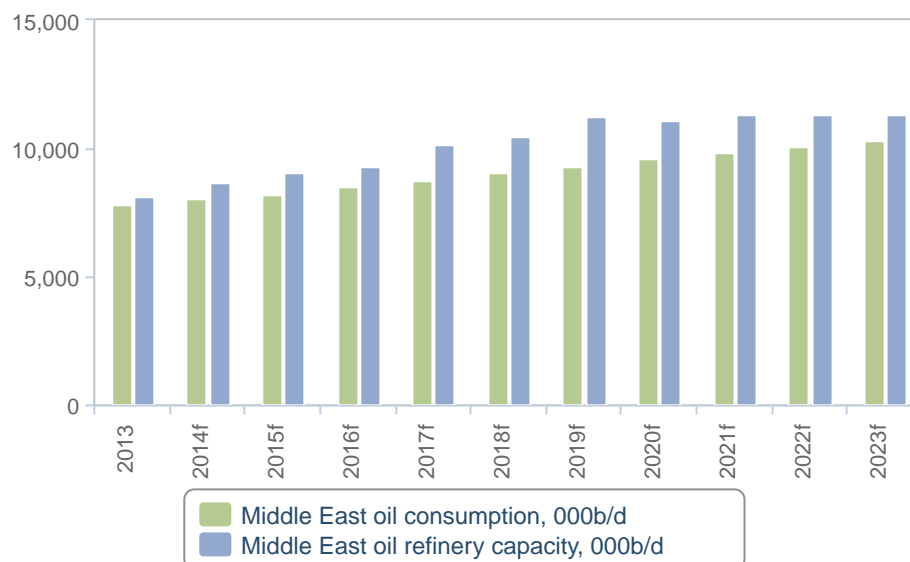
With an abundance of cheap feedstock and widespread government support to diversify the economy, we forecast robust growth in Middle East refining capacity across our 10-year forecast period. New investment will spread across a number of greenfield and brownfield developments, but key contributors to growth include -

- Saudi Arabia's Jubail, Yanbu and Jazan refineries, slated to add 1.2mn b/d capacity by 2016.
- Kuwait's 615,000b/d Al Zour refinery, targeting first production in 2018.
- Capacity upgrades at the Ras Laffan and Sitra refineries in Qatar and Bahrain.

Much of the new production is targeting Asian markets, and we see this as the primary destination for Middle East refined fuels exports. However, with domestic consumption set to grow, we believe local demand could put pressure on regional refining capacity, towards the end of our forecast period in 2023.

Closing The Gap

Middle East Refining Capacity and Refined Product Consumption, 2013-2023



f = BMI forecast. Source: EIA, BMI

Growing refining capacity and rising domestic consumption are also having a significant impact on regional trade; despite a 4mn b/d increase in production by 2023, we forecast only 1.4mn b/d growth in oil exports.

Middle East Gas Production - A Growing Domestic Priority

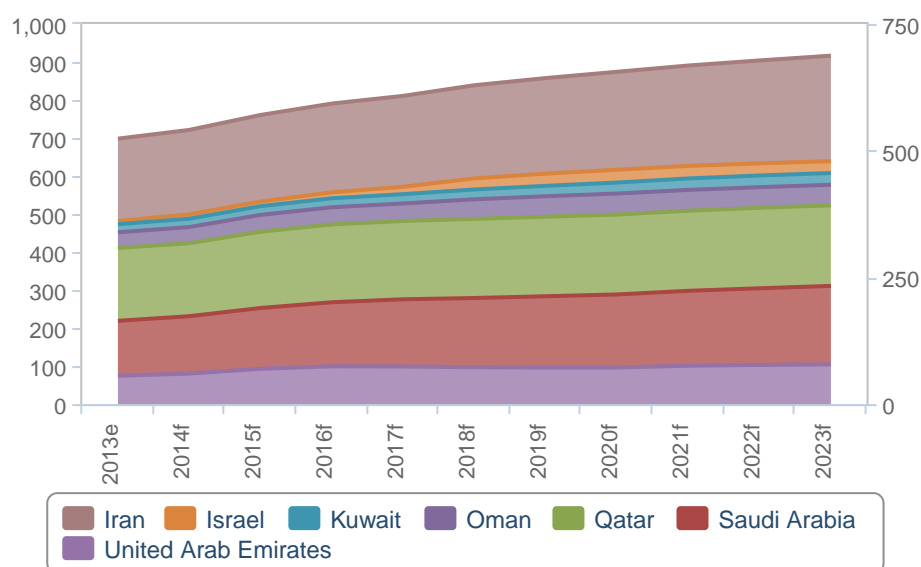
Middle East gas production is set for growth, as the region looks to alternative domestic energy sources to release lucrative oil production for export.

The vast majority of production will come from conventional sources, although we see growing interest in the region's sizeable shale gas resources - notably in Saudi Arabia. However, a lack of infrastructure, unfavourable geology and limited water supplies are major obstacles to development, and we see a limited role for shale gas within our forecast period. Pricing structures are also prohibitive and substantial pricing reforms would be needed to drive wider exploration and development of both unconventional and non-associated gas.

While some new production is targeted for export, including from the Barzan gas project in Qatar and the Leviathan project in Israel, we see rising domestic consumption soak up the bulk of additional output. We forecast net regional gas exports to fall from an estimated 61bn cubic metres (bcm) in 2013, to 49bcm in 2023. However, this masks a varied picture in the region, with some countries - such as Israel - set to become net gas exporters, whilst others - such as the UAE and Kuwait - set to see their import dependence grow.

A Steady Incline

Middle East Gas Production (bcm), 2013-2023



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

Middle East Gas Consumption - Production Struggling To Keep Pace With Demand

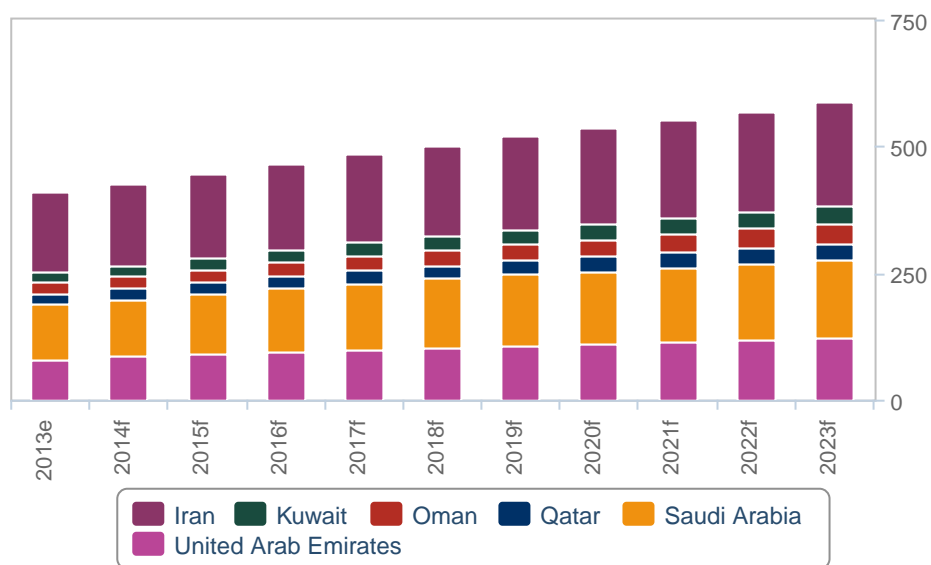
For the Middle East as a whole, gas consumption growth is set to outpace production across our 10-year forecast period. Driving consumption growth will be the region's burgeoning downstream segment and reorientation of the Middle East power sector towards gas-fired generation.

We forecast gas consumption to increase from an estimated 482bcm in 2013, to around 700bcm by 2023. As with production, consumption growth is relatively uniform across the region. We forecast the strongest growth in countries such as Saudi Arabia and Qatar, which are targeting the most aggressive downstream

expansions to-date. However, as demand growth increasingly outstrips the increase in production, we caution that gas could emerge as major downstream bottleneck, towards the second half of our forecast period.

Strong Prospects For Growth

Gas Consumption Selected Middle East Countries (bcm), 2013-2023



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

Global Industry Overview

***BMI View:** Oil at USD80/bbl will be a credible threat to peripheral shale, ultra-deepwater and oil sands projects based on breakeven cost estimates. USD65-USD70 is the next level when a critical mass of projects, including major US shale plays and Gulf of Mexico projects will become economically unviable. While we do not currently forecast prices averaging below USD90/bbl in 2015, here we examine the implications of a steep and precipitous fall of oil prices.*

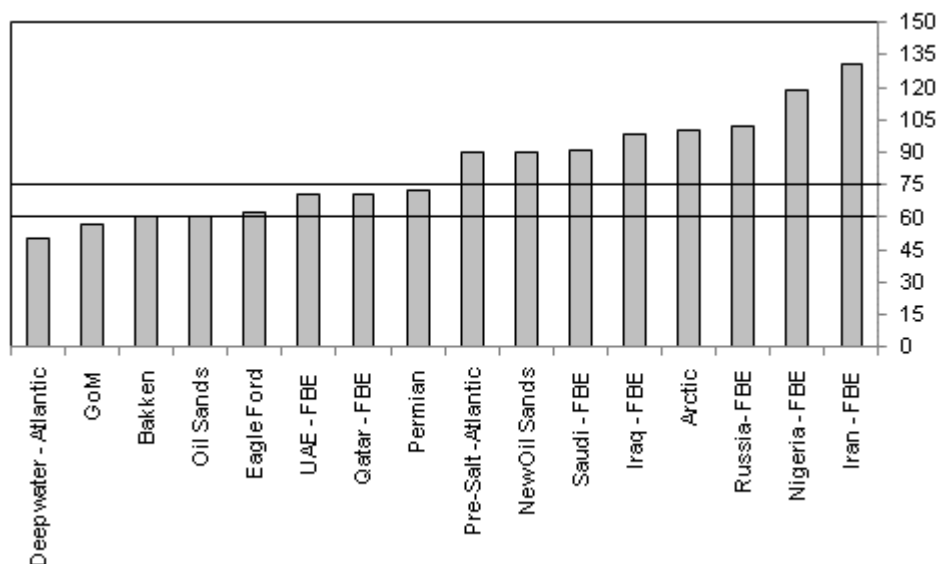
Our core view is that oil prices will trade in the USD90-100/bbl range in the coming months and over 2015, under the assumption that OPEC will act to curb supply in late November. If however, OPEC does not cut production we see a plausible scenario with Brent hitting USD60/bbl over the coming months, presenting major risks to a vast part of current and planned production.

With the key oil Benchmarks of Brent and WTI having (at the time of writing) fallen 22.5% and 19.5% respectively since late June 2014, we analyse the breakeven costs of major oil regions and producers to indicate where production is most likely to be impacted. The focus of our research has been put on areas with the strongest production growth potential, primarily North America, the South Atlantic Margin and the Middle East.

We see new oil sands projects, pre-salt, Arctic and peripheral shale developments as the most at risk if oil prices fall to around USD80/bbl. We also note that OPEC producers, particularly Iraq and Iran, will be under severe fiscal strain.

Middle East And +USD80/bbl Projects At Risk

Average Breakeven Cost Per Barrel Or Fiscal Breakeven (FBE) USD/bbl



Deepwater Atlantic = Campos + Santos Basin, Gulf Of Guinea. GoM = Gulf of Mexico. FBE = Fiscal Breakeven. Project and fiscal breakeven prices estimated from a combination of market sources and BMI estimates. Source: BMI Research.

Non-OPEC Oil - US

US has driven non-OPEC oil production gains with shale oil production and a resurgence of projects in the Gulf of Mexico adding 1mn barrels per day (b/d) in 2012 and 1.2mn b/d in 2013 to US production. In 2014, production from the seven shale plays tracked by the EIA is expected to add a cumulative 1mn b/d by the end of October.

Our research suggests shale oil growth will remain profitable above USD80/bbl. At this level, sweet spot production areas in all the main shale plays will continue to be profitable, but more marginal areas of some of the plays, where oil recovery volumes are poorer will be impacted.

Production in the core areas of the three key oil plays - Bakken, Eagle Ford and Permian - will remain profitable in the USD65-70/bbl range, though a fall of prices below that level will take out critical mass production.

Table: Key US Production Zones Average Full Cycle Breakeven Cost Per Barrel (USD/bbl)

	Upper	Lower	Mid- Range
Bakken	76	40	58-62
Eagle Ford	70	60	60-64
Permian	89	65	70-74
Gulf of Mexico	80	40	54-60

Shale play breakeven prices estimated from a combination of market sources and BMI estimates. Source: BMI Research.

Emerging shale plays where less extensive drilling has taken place and operations not yet full optimised, such as the Cline, Northern Mississippian Lime and Tuscaloosa Marine Shale, would also come under pressure at USD80/bbl.

We expect projects in the Gulf of Mexico (GoM) to be profitable at prices under USD65/bbl, though margins at some projects requiring significant new infrastructure are likely to be squeezed at around USD80/bbl. The supermajors invested in these projects will look for more significant returns and avoid investments in the more costly GoM projects. Higher cost deepwater is likely to be sacrificed before shale. Whereas deepwater projects need longer-term price guarantees to support significant upfront capex costs, shale developments can be more flexible in regards to oil price fluctuations and scaled on a well-by-well basis.

Non-OPEC Oil - Canada

New oil sands projects in **Canada** are already being impacted with Western Canadian Select (WCS) prices trading at a discount to (currently) USD85/bbl WTI, driving project postponements. Both **Total** and **Statoil** have pulled out of investing in new oil sands projects over the course of 2014 (*see 'Oil Sands Outlook Weakens Further', October 10*). While we expect current oil sands projects will remain profitable at over USD65/bbl, the majority of new developments, and particularly the mining and upgrading projects, will be impacted at around USD80/bbl. The stream assisted gravity drainage (SAGD) projects will be more profitable than mining developments and are the more likely projects to move forward, if any.

Table: Canadian Oil Sands Average Full Cycle Breakeven Cost Per Barrel (USD/bbl)

	Upper	Lower	Mid-Range
Oil Sands - Operational	65	50	58-62
Oil Sands - New	115	80	85-95

Project Breakeven prices estimated from a combination of market sources and BMI estimates. Source: BMI Research.

Non-OPEC Oil - South Atlantic Margin

Brazil has the potential to be a major non-OPEC producer due to considerable offshore resources and in particular pre-salt reserves in the Campos and Santos Basins. Growth has already been somewhat stifled by local content and cost challenges, and we expect this to continue. Most estimates point at Campos Basin developments being profitable at between USD40-60/bbl, though some calculations for major pre-salt are far higher. The landmark Libra field has been pessimistically been cited at needing between USD75/bbl and USD120/bbl to breakeven.

Angola may face similar problems. While the final investment decision (FID) was taken by **Total** on the deepwater Kaombo project in April 2014, this was only completed following a USD4bn reduction in project costs. The next wave of projects in Angola's offshore would target the pre-salt. Goldman Sachs estimates Angola pre-salt will require oil prices of between USD80-95/bbl to be viable. Such projects are expected to be postponed given the current oil price climate.

OPEC Oil - GCC

OPEC, in particular the Middle East, holds the vast majority of the world's low cost oil. Production costs are around USD10-30/bbl for conventional onshore and shallow water projects. In particular, Kurdistan has been highlighted as one of the most profitable regions, given its more favourable contract structure and untapped onshore resources.

Table: Middle East Onshore Conventional Breakeven Cost Per Barrel, (USD/BBL)

	Upper	Lower	Mid-Range
Middle East - Onshore	30	10	17

Project Breakeven prices estimated from a combination of market sources and BMI estimates. Source: BMI Research.

However, while breakeven costs in the Middle East are low, less diversified economies have a considerable dependency on oil to fund government budgets. Fuel subsidies, social welfare programmes and substantial capital expenditure on infrastructure, push up the required oil price to balance budgets. Producers in the Middle East leverage between USD50-90 on each barrel produced to fund their budgets; a significant margin that can rapidly become unsustainable in a lower oil price environment.

Table: Average Fiscal Breakeven Prices Of Key Middle East Producers 2014 (USD/bbl)

Iran	130.6
Iraq	103.6
Saudi	89.8
UAE	72.4
Qatar	71.0
Kuwait	62.1

Source: IMF, Deutsche Bank - 2014

The sharp drop in oil prices, if sustained, will therefore lead some producers in the Middle East to run budget deficits. Countries including Iran (under sanctions) and Iraq (missing output targets) are expected to run fiscal deficits in 2014. Under a scenario where oil prices remain under USD90/bbl in 2015, Saudi Arabia will be in far more vulnerable position. While the majority of OPEC members have considerable financial reserves, eating into these to support extensive spending programmes is unsustainable.

Frontier Exploration At Risk

The high oil price environment of the last four years has supported oil companies to explore more extreme and unproven areas for oil. We increasingly see more frontier areas at risk of losing out on investment in our forecast lower oil price scenario. In particular, we highlight risk to further exploration and development in:

- Arctic frontiers, including the Barents Sea (Norway), Chukchi Sea (US), Beaufort Sea (Canada) and Greenland.
- West Africa Ultra-Deepwater, including Sierra Leone, Liberia and Cote d'Ivoire.

Latin America ultra-deepwater, including Guyana and Suriname.

Appendix

Global - Crude Oil, Refined Fuels And Natural Gas Prices, 10-year Forecasts

Table: Energy Price Forecasts, 2012-2017 (Global 2012-2017)

	2012	2013	2014f	2015f	2016f	2017f
OPEC basket, USD/bbl	109.50	105.90	102.00	72.00	70.00	69.00
WTI, USD/bbl	93.30	98.00	96.23	71.00	70.00	69.00
Brent, USD/bbl	111.70	108.70	103.41	75.00	73.00	72.00
Urals, USD/bbl	110.60	107.90	103.00	73.00	71.00	70.00
Dubai, USD/bbl	108.88	105.40	101.00	71.00	69.00	68.00
Unleaded gasoline, Rotterdam, USD/bbl	121.28	115.19	110.71	97.65	95.40	93.66
Unleaded gasoline, New York, USD/bbl	124.79	118.70	114.83	102.14	101.61	100.18
Unleaded gasoline, Singapore, USD/bbl	123.47	115.89	112.46	98.14	96.82	96.20
Unleaded gasoline, global average, USD/bbl	123.18	116.59	112.67	99.31	97.94	96.68
Gasoil/diesel, Rotterdam, USD/bbl	130.36	124.81	118.38	104.89	102.79	101.05
Gasoil/diesel, Singapore, USD/bbl	128.18	123.15	118.07	103.53	100.39	99.39
Gasoil/diesel, global average, USD/bbl	129.78	124.84	118.92	105.35	103.30	101.59
Naphtha, Rotterdam, USD/bbl	106.75	100.27	98.30	98.85	98.79	97.02
Naphtha, Singapore, USD/bbl	102.87	100.27	98.62	84.42	81.62	80.62
Naphtha, global average, USD/bbl	104.81	100.27	98.46	91.64	90.21	88.82
Jet/kerosene, Rotterdam, USD/bbl	131.41	127.30	120.26	106.70	106.00	103.00
Jet/kerosene, New York, USD/bbl	130.74	125.10	119.46	107.40	106.50	104.50
Jet/kerosene, Singapore, USD/bbl	126.90	122.65	116.57	101.80	102.00	100.46
Jet/kerosene, global average, USD/bbl	129.68	125.02	118.76	105.30	104.83	102.65
Bunker fuel 180, Rotterdam, USD/bbl	101.52	95.07	88.05	75.80	71.00	68.50
Bunker fuel 180, New York, USD/bbl	104.65	97.52	95.22	76.90	75.50	74.50
Bunker fuel 180, Singapore, USD/bbl	102.46	93.96	88.65	72.30	73.00	73.00
Bunker fuel 180, global average, USD/bbl	102.88	95.52	90.64	75.00	73.17	72.00
Bunker fuel 380, Rotterdam, USD/bbl	97.47	91.24	84.66	69.80	68.00	66.00
Bunker fuel 380, New York, USD/bbl	100.29	93.13	87.82	72.90	73.00	71.50
Bunker fuel 380, Singapore, USD/bbl	101.08	95.84	88.60	71.30	72.00	72.10
Bunker fuel 380, Singapore, USD/bbl	101.08	95.84	88.60	71.30	72.00	72.10
Bunker fuel 380, global average, USD/bbl	99.61	93.40	87.03	71.33	71.00	69.87
Bunker fuel, Rotterdam, USD/bbl	99.50	93.16	88.04	86.53	83.50	81.33
Bunker fuel, New York, USD/bbl	102.47	95.33	94.02	91.00	87.00	83.50
Bunker fuel, Singapore, USD/bbl	101.77	94.90	90.23	88.18	85.28	83.15

Energy Price Forecasts, 2012-2017 (Global 2012-2017) - Continued

	2012	2013	2014f	2015f	2016f	2017f
Bunker fuel, global average, USD/bbl	101.25	94.46	90.76	88.57	85.26	82.66
Henry Hub, USD/mn BTU	3.35	3.74	4.50	4.60	5.10	5.75

f = BMI forecast. Source: Bloomberg/ BMI

Table: Energy Price Forecasts, 2018-2023 (Global 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
OPEC basket, USD/bbl	72.00	75.00	76.00	77.00	78.00	80.00
WTI, USD/bbl	71.00	72.00	74.00	76.00	77.00	79.00
Brent, USD/bbl	75.00	78.00	79.00	80.00	81.00	83.00
Urals, USD/bbl	73.00	76.00	77.00	78.00	79.00	81.00
Dubai, USD/bbl	71.00	74.00	75.00	76.00	77.00	79.00
Unleaded gasoline, Rotterdam, USD/bbl	93.59	93.59	93.59	93.59	93.59	93.59
Unleaded gasoline, New York, USD/bbl	98.44	98.44	98.44	98.44	98.44	98.44
Unleaded gasoline, Singapore, USD/bbl	96.81	96.81	96.81	96.81	96.81	96.81
Unleaded gasoline, global average, USD/bbl	96.28	96.28	96.28	96.28	96.28	96.28
Gasoil/diesel, Rotterdam, USD/bbl	100.77	100.77	100.77	100.77	100.77	100.77
Gasoil/diesel, Singapore, USD/bbl	100.23	100.23	100.23	100.23	100.23	100.23
Gasoil/diesel, global average, USD/bbl	101.10	101.10	101.10	101.10	101.10	101.10
Naphtha, Rotterdam, USD/bbl	95.10	95.10	95.10	95.10	95.10	96.10
Naphtha, Singapore, USD/bbl	81.62	81.62	81.62	81.62	81.62	81.62
Naphtha, global average, USD/bbl	88.36	88.36	88.36	88.36	88.36	88.86
Jet/kerosene, Rotterdam, USD/bbl	98.50	98.50	98.50	98.50	98.50	98.50
Jet/kerosene, New York, USD/bbl	98.50	98.50	98.50	98.50	98.50	98.50
Jet/kerosene, Singapore, USD/bbl	97.00	97.00	97.00	97.00	97.00	97.00
Jet/kerosene, global average, USD/bbl	98.00	98.00	98.00	98.00	98.00	98.00
Bunker fuel 180, Rotterdam, USD/bbl	68.00	68.00	68.00	68.00	68.00	68.00
Bunker fuel 180, New York, USD/bbl	73.00	73.00	73.00	73.00	73.00	73.00
Bunker fuel 180, Singapore, USD/bbl	71.00	71.00	71.00	71.00	71.00	71.00
Bunker fuel 180, global average, USD/bbl	70.67	70.67	70.67	70.67	70.67	70.67
Bunker fuel 380, Rotterdam, USD/bbl	65.00	65.00	65.00	65.00	65.00	65.00
Bunker fuel 380, New York, USD/bbl	67.00	67.00	67.00	67.00	67.00	67.00
Bunker fuel 380, Singapore, USD/bbl	70.20	70.20	70.20	70.20	70.20	70.20

Energy Price Forecasts, 2018-2023 (Global 2018-2023) - Continued

	2018f	2019f	2020f	2021f	2022f	2023f
Bunker fuel 380, Singapore, USD/bbl	70.20	70.20	70.20	70.20	70.20	70.20
Bunker fuel 380, global average, USD/bbl	67.40	67.40	67.40	67.40	67.40	67.40
Bunker fuel, Rotterdam, USD/bbl	79.50	81.43	81.43	81.43	81.43	82.43
Bunker fuel, New York, USD/bbl	80.85	70.00	70.00	70.00	70.00	70.00
Bunker fuel, Singapore, USD/bbl	82.09	89.18	89.18	89.18	89.18	90.18
Bunker fuel, global average, USD/bbl	80.81	80.20	80.20	80.20	80.20	80.87
Henry Hub, USD/mn BTU	6.50	6.75	7.00	7.00	7.10	7.10

f = BMI forecast. Source: Bloomberg/ BMI

Middle East - Regional Appendix

The data contained in these appendix tables is correct as of 1 October 2014. It represents a snapshot of our regional forecasts at the end of our last publishing quarter. It is included for reference purposes only. Latest data, reflecting forecasts made for the market this quarter, can be found in the Industry Forecast Scenario section of this report. Please note that because this table represents a snapshot of our last regional forecasts, whereas data included in the Industry Forecast Scenario represents our latest forecasts made this quarter, country-specific data may not match.

Table: Oil Consumption - Historical Data & Forecasts, 2011-2018 ('000b/d)

	2011	2012	2013	2014	2015	2016	2017	2018
Bahrain	52	50	53	55	58	61	63	66
Kuwait	398	410	423	439	456	473	490	505
Iran	1,784	1,765	1,776	1,794	1,785	1,820	1,880	1,937
Iraq	720	751	692	699	720	744	769	796
Israel	249	297	256	246	239	231	224	220
Oman	123	145	150	156	162	168	174	180
Qatar	160	190	199	210	220	230	241	250
Saudi Arabia	2,537	2,693	2,850	2,987	3,125	3,268	3,403	3,531
UAE	647	671	696	725	752	781	808	837
Other	698	700	704	707	711	714	718	722

Oil Consumption - Historical Data & Forecasts, 2011-2018 ('000b/d) - Continued

	2011	2012	2013	2014	2015	2016	2017	2018
BMI Universe	6,669	6,973	7,094	7,310	7,516	7,776	8,052	8,321
Regional Total	7,368	7,673	7,798	8,018	8,227	8,490	8,770	9,043

f = forecast. Source: EIA, BMI

Table: Oil Consumption - Long-Term Forecasts, 2015-2023 ('000b/d)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bahrain	58	61	63	66	68	71	73	75	77
Kuwait	456	473	490	505	520	535	548	561	575
Iran	1,785	1,820	1,880	1,937	1,995	2,055	2,116	2,180	2,245
Iraq	720	744	769	796	827	861	895	934	974
Israel	239	231	224	220	218	216	214	211	209
Oman	162	168	174	180	185	191	196	201	205
Qatar	220	230	241	250	260	271	282	293	302
Saudi Arabia	3,125	3,268	3,403	3,531	3,654	3,774	3,897	4,016	4,132
UAE	752	781	808	837	859	874	886	895	902
Other	711	714	718	722	725	729	729	729	729
BMI Universe	7,516	7,776	8,052	8,321	8,587	8,847	9,106	9,367	9,621
Regional Total	8,227	8,490	8,770	9,043	9,312	9,576	9,835	10,095	10,349

f = forecast. Source: EIA, BMI

Table: Oil Production - Historical Data & Forecasts, 2011-2018 ('000b/d)

	2011	2012	2013	2014	2015	2016	2017	2018
Bahrain	45	52	52	53	55	45	52	52
Kuwait	2,682	2,787	2,811	2,869	2,928	2,682	2,787	2,811
Iran	4,270	3,594	3,308	3,436	3,447	4,270	3,594	3,308
Iraq	2,638	2,995	3,039	3,403	3,817	2,638	2,995	3,039
Israel	0	1	1	2	2	0	1	1

Oil Production - Historical Data & Forecasts, 2011-2018 ('000b/d) - Continued

	2011	2012	2013	2014	2015	2016	2017	2018
Oman	891	923	945	964	973	891	923	945
Qatar	1,631	1,569	1,567	1,561	1,573	1,631	1,569	1,567
Saudi Arabia	11,256	11,717	11,582	11,552	11,580	11,256	11,717	11,582
UAE	3,079	3,204	3,212	3,237	3,287	3,079	3,204	3,212
Other	39	40	42	43	44	39	40	42
BMI Universe	26,491	26,842	26,517	27,077	27,661	26,491	26,842	26,517
Regional Total	26,530	26,883	26,559	27,120	27,706	26,530	26,883	26,559

f = forecast. Source: EIA, BMI

Table: Oil Production - Long-Term Forecasts, 2015-2023 ('000b/d)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bahrain	55	57	59	62	64	67	70	73	76
Kuwait	2,928	3,016	3,103	3,198	3,247	3,302	3,351	3,417	3,500
Iran	3,447	3,460	3,474	3,487	3,501	3,515	3,529	3,543	3,557
Iraq	3,817	3,981	4,124	4,165	4,148	4,133	4,175	4,217	4,259
Israel	2	2	2	3	3	3	3	3	3
Oman	973	978	983	974	964	945	927	908	900
Qatar	1,573	1,585	1,581	1,582	1,585	1,589	1,588	1,576	1,565
Saudi Arabia	11,580	11,667	11,776	11,896	12,037	12,201	12,368	12,538	12,711
UAE	3,287	3,353	3,429	3,513	3,595	3,673	3,747	3,822	3,898
Other	44	46	47	48	50	51	51	51	51
BMI Universe	27,661	28,100	28,531	28,879	29,146	29,429	29,757	30,097	30,470
Regional Total	27,706	28,146	28,578	28,927	29,196	29,480	29,808	30,149	30,521

f = forecast. Source: EIA, BMI

Table: Refining Capacity - Historical Data & Forecasts, 2011-2018 ('000b/d)

	2011	2012	2013	2014	2015	2016	2017	2018
Bahrain	270	270	270	270	270	270	270	270
Kuwait	930	930	930	930	930	930	930	930
Iran	1,741	1,750	1,860	1,955	1,955	1,955	2,075	2,075
Iraq	638	638	638	708	708	708	708	708
Israel	270	286	286	296	296	296	296	296
Oman	222	222	222	222	222	222	292	292
Qatar	339	339	339	339	339	485	485	485
Saudi Arabia	2,080	2,112	2,212	2,512	2,912	2,912	3,312	3,312
UAE	527	527	527	527	527	527	727	1,027
Other	765	803	843	886	930	976	1,025	1,076
BMI Universe	7,016	7,073	7,283	7,758	8,158	8,304	9,094	9,394
Regional Total	7,781	7,876	8,126	8,644	9,088	9,280	10,119	10,470

f = forecast. Source: EIA, BMI

Table: Refining Capacity - Long-Term Forecasts, 2015-2023 ('000b/d)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bahrain	270	270	270	270	270	360	360	360	360
Kuwait	930	930	930	930	1,545	1,231	1,415	1,415	1,415
Iran	1,955	1,955	2,075	2,075	2,075	2,075	2,075	2,075	2,075
Iraq	708	708	708	708	848	848	848	848	848
Israel	296	296	296	296	296	296	296	296	296
Oman	222	222	292	292	292	292	292	292	292
Qatar	339	485	485	485	485	485	485	485	485
Saudi Arabia	2,912	2,912	3,312	3,312	3,312	3,312	3,312	3,312	3,312
UAE	527	527	727	1,027	1,027	1,027	1,027	1,027	1,027
Other	930	976	1,025	1,076	1,130	1,187	1,187	1,187	1,187
BMI Universe	8,158	8,304	9,094	9,394	10,149	9,925	10,109	10,109	10,109
Regional Total	9,088	9,280	10,119	10,470	11,279	11,112	11,296	11,296	11,296

f = forecast. Source: EIA, BMI

Table: Gas Consumption - Historical Data & Forecasts, 2011-2018 (bcm)

	2011	2012	2013	2014	2015	2016	2017	2018
Bahrain	12.62	12.81	13.0	13.2	13.4	13.6	13.8	14.1
Kuwait	16.80	17.98	19.2	20.6	22.0	23.6	25.0	26.5
Iran	153.34	155.29	158.9	162.9	166.9	171.1	175.4	179.8
Iraq	0.88	0.65	1.2	1.6	2.0	2.2	4.1	5.3
Israel	3.32	3.69	6.2	8.5	9.1	10.0	10.0	11.2
Oman	17.54	20.25	22.3	23.7	25.2	26.9	28.6	30.3
Qatar	19.53	20.51	21.5	22.6	23.5	24.9	26.4	27.2
Saudi Arabia	92.26	102.80	107.9	112.8	119.6	125.8	132.1	136.0
UAE	75.40	77.67	80.8	84.9	89.3	94.0	98.6	103.0
Other	46.00	48.30	50.7	53.2	55.9	58.7	61.6	64.7
BMI Universe	391.69	411.65	431.0	450.8	471.1	492.1	513.9	533.4
Regional Total	437.69	459.95	481.7	504.0	527.0	550.8	575.5	598.1

f = forecast. Source: EIA, BMI

Table: Gas Consumption, 2015-2023 (bcm)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bahrain	13.4	13.6	13.8	14.1	14.4	14.6	14.9	15.24	15.54
Kuwait	22.0	23.6	25.0	26.5	27.7	29.2	31.5	33.70	36.06
Iran	166.9	171.1	175.4	179.8	184.3	188.9	193.6	198.44	203.41
Iraq	2.0	2.2	4.1	5.3	5.9	8.9	12.5	14.34	14.77
Israel	9.1	10.0	10.0	11.2	11.6	11.9	11.9	11.96	12.03
Oman	25.2	26.9	28.6	30.3	32.1	33.9	35.8	37.57	39.26
Qatar	23.5	24.9	26.4	27.2	28.0	28.9	30.6	31.83	32.46
Saudi Arabia	119.6	125.8	132.1	136.0	140.1	143.6	147.2	150.74	154.21
UAE	89.3	94.0	98.6	103.0	107.1	110.9	114.5	117.95	121.13
Other	55.9	58.7	61.6	64.7	67.9	71.3	71.3	71.3	71.3
BMI Universe	471.1	492.1	513.9	533.4	551.3	570.7	592.5	611.8	628.9
Regional Total	527.0	550.8	575.5	598.1	619.2	642.0	663.8	683.1	700.2

f = forecast. Source: EIA, BMI

Table: Gas Production - Historical Data & Forecasts, 2011-2018 (bcm)

	2011	2012	2013	2014	2015	2016	2017	2018
Bahrain	12.62	12.81	13.00	13.20	13.39	13.60	13.80	14.08
Kuwait	13.53	15.34	15.96	16.50	17.16	17.76	18.38	19.30
Iran	151.80	159.70	162.57	166.63	170.80	175.07	179.45	183.93
Iraq	0.88	0.65	1.18	1.63	2.02	2.22	4.15	6.57
Israel	2.60	2.52	6.18	8.54	9.09	11.67	14.54	21.82
Oman	26.51	28.00	30.90	31.92	33.20	33.86	34.54	38.68
Qatar	133.23	142.56	143.70	143.99	150.46	153.47	154.55	156.09
Saudi Arabia	92.26	103.19	108.35	113.23	120.02	126.27	132.58	136.56
UAE	52.31	54.30	55.93	60.15	69.56	74.57	74.21	72.73
Other	6.00	6.60	7.20	7.90	8.70	9.60	10.60	11.60
BMI Universe	485.75	519.07	537.76	555.79	585.71	608.49	626.19	649.75
Regional Total	491.75	525.67	544.96	563.69	594.41	618.09	636.79	661.35

f = forecast. Source: EIA, BMI

Table: Gas Production - Long-Term Forecasts, 2015-2023 (bcm)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bahrain	13.39	13.60	13.80	14.08	14.36	14.64	14.94	15.24	15.54
Kuwait	17.16	17.76	18.38	19.30	20.46	21.69	22.55	23.01	23.24
Iran	170.80	175.07	179.45	183.93	188.53	193.24	198.08	203.03	208.10
Iraq	2.02	2.22	4.15	6.57	13.47	18.56	22.23	24.04	24.26
Israel	9.09	11.67	14.54	21.82	24.06	25.31	24.66	24.03	23.41
Oman	33.20	33.86	34.54	38.68	40.37	41.44	41.10	40.69	40.59
Qatar	150.46	153.47	154.55	156.09	156.87	157.66	157.97	158.76	158.92
Saudi Arabia	120.02	126.27	132.58	136.56	140.65	144.17	147.77	151.32	154.80
UAE	69.56	74.57	74.21	72.73	72.11	72.07	75.71	77.23	78.39
Other	8.70	9.60	10.60	11.60	12.80	14.10	14.10	14.10	14.10
BMI Universe	585.71	608.49	626.19	649.75	670.89	688.79	705.02	717.34	727.25
Regional Total	594.41	618.09	636.79	661.35	683.69	702.89	719.12	731.44	741.35

f = forecast. Source: EIA, BMI

Table: Net LNG Exports - Historical Data & Forecasts, 2011-2018 (bcm)

	2011	2012	2013	2014	2015	2016	2017	2018
Bahrain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kuwait	3.27	2.63	3.28	4.08	4.86	5.80	6.59	7.17
Iran	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iraq	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Israel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oman	10.80	9.55	10.49	10.09	9.87	8.89	7.88	10.25
Qatar	96.70	104.55	104.37	101.58	106.45	105.55	105.13	105.88
Saudi Arabia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UAE	5.20	5.20	4.20	3.70	3.20	3.20	2.00	2.00
Regional total	115.97	121.93	122.34	119.44	124.38	123.45	121.60	125.31

f = forecast. Source: EIA, BMI

Table: Net LNG Exports - Long-Term Forecasts, 2015-2023 (bcm)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bahrain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kuwait	4.86	5.80	6.59	7.17	7.29	7.47	8.94	10.69	12.82
Iran	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iraq	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Israel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oman	9.87	8.89	7.88	10.25	10.12	9.42	7.22	5.02	3.23
Qatar	106.45	105.55	105.13	105.88	105.85	105.79	105.37	104.94	105.46
Saudi Arabia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UAE	3.20	3.20	2.00	2.00	2.00	-0.20	-0.20	-0.20	-0.20
Regional total	124.38	123.45	121.60	125.31	125.26	122.49	121.33	120.45	121.31

f = forecast. Source: EIA, BMI

Qatar - Refined Products Breakdown, 10-year Forecasts

We have released new data series of the breakdown of Refined Fuels into production, consumption and net trade of different fuels over a 10-year period.

The Liquefied Petroleum Gas (LPG) component is either wholly accounted for in the refined products breakdown tables, or, if the country is a LPG producer at the wellhead then it is contained at the end in its own separate table that includes refined and wellhead production.

Table: Refined Petroleum Products, Production Breakdown (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Motor gasoline production, 000b/d	43.3	43.7	44.2	44.6	45.1	45.1
Motor gasoline production, % y-o-y	-1.0	1.0	1.0	1.0	1.0	0.0
Motor gasoline production, USDbn	1.9	1.8	1.8	1.6	1.6	1.5
Motor gasoline production, % of domestic production	14.1	10.2	10.2	10.3	7.1	7.1
Jet fuel/kerosene production, 000b/d	85.1	89.4	90.3	91.2	149.5	149.5
Jet fuel/kerosene production, % y-o-y	20.0	5.0	1.0	1.0	64.0	0.0
Jet fuel/kerosene production, USDbn	4.1	4.2	4.0	3.6	5.8	5.6
Jet fuel/kerosene production, % of domestic production	27.7	20.8	20.9	21.0	23.4	23.4
Jet fuel production, 000b/d	85.1	89.4	90.3	91.2	149.5	149.5
Jet fuel production, % y-o-y	20.0	5.0	1.0	1.0	64.0	0.0
Jet fuel production, USDbn	4.1	4.2	4.0	3.6	5.8	5.6
Jet fuel Production, % of domestic production	27.7	20.8	20.9	21.0	23.4	23.4
Kerosene production, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene production, USDbn	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene production, % of domestic production	0.0	0.0	0.0	0.0	0.0	0.0
Distillate fuel oil production, 000b/d	57.4	174.0	174.9	175.8	254.9	254.9
Distillate fuel oil production, % y-o-y	5.0	203.0	0.5	0.5	45.0	0.0
Distillate fuel oil production, USDbn	2.7	7.9	7.6	6.7	9.6	9.4
Distillate fuel oil production, % of domestic production	18.7	40.6	40.5	40.5	39.9	39.9
Residual fuel oil production, 000b/d	5.2	5.2	5.2	5.2	5.2	5.2
Residual fuel oil production, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Residual fuel oil production, USDbn	0.2	0.2	0.2	0.2	0.2	0.2
Residual fuel oil production, % of domestic production	1.7	1.2	1.2	1.2	0.8	0.8
Refined LPG production, 000b/d	13.6	13.7	14.2	14.3	17.0	16.8
Refined LPG production, % y-o-y	7.0	1.0	3.0	1.0	19.0	-1.0

Refined Petroleum Products, Production Breakdown (Qatar 2012-2017) - Continued

	2012	2013e	2014f	2015f	2016f	2017f
Refined LPG production, USDbn	0.5	0.5	0.5	0.5	0.6	0.6
Refined LPG production, % of domestic production	4.4	3.2	3.3	3.3	2.7	2.6
Other products production, 000b/d	103.0	103.0	103.0	103.0	166.9	166.9
Other products production, % y-o-y	0.0	0.0	0.0	0.0	62.0	0.0
Other products production, USDbn	4.6	4.3	4.2	3.7	5.8	5.7
Other products production, % of domestic production	33.5	24.0	23.9	23.7	26.1	26.1

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

Table: Refined Petroleum Products, Production Breakdown (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
Motor gasoline production, 000b/d	45.1	45.1	45.1	45.1	45.1	45.1
Motor gasoline production, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Motor gasoline production, USDbn	1.5	1.5	1.5	1.5	1.5	1.5
Motor gasoline production, % of domestic production	7.1	7.1	7.1	7.1	7.0	7.0
Jet fuel/kerosene production, 000b/d	149.5	149.5	149.5	149.5	149.5	149.5
Jet fuel/kerosene production, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Jet fuel/kerosene production, USDbn	5.4	5.4	5.4	5.4	5.4	5.4
Jet fuel/kerosene production, % of domestic production	23.4	23.4	23.4	23.4	23.4	23.4
Jet fuel production, 000b/d	149.5	149.5	149.5	149.5	149.5	149.5
Jet fuel production, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Jet fuel production, USDbn	5.4	5.4	5.4	5.4	5.4	5.4
Jet fuel Production, % of domestic production	23.4	23.4	23.4	23.4	23.4	23.4
Kerosene production, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene production, USDbn	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene production, % of domestic production	0.0	0.0	0.0	0.0	0.0	0.0
Distillate fuel oil production, 000b/d	254.9	254.9	254.9	254.9	254.9	254.9
Distillate fuel oil production, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Distillate fuel oil production, USDbn	9.4	9.4	9.4	9.4	9.4	9.4
Distillate fuel oil production, % of domestic production	39.9	39.9	39.9	39.9	39.9	39.9
Residual fuel oil production, 000b/d	5.2	5.2	5.2	5.2	5.2	5.2
Residual fuel oil production, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Residual fuel oil production, USDbn	0.2	0.2	0.2	0.2	0.2	0.2

Refined Petroleum Products, Production Breakdown (Qatar 2018-2023) - Continued

	2018f	2019f	2020f	2021f	2022f	2023f
Residual fuel oil production, % of domestic production	0.8	0.8	0.8	0.8	0.8	0.8
Refined LPG production, 000b/d	17.0	17.2	17.4	17.5	17.7	17.9
Refined LPG production, % y-o-y	1.0	1.0	1.0	1.0	1.0	1.0
Refined LPG production, USDbn	0.6	0.6	0.6	0.6	0.6	0.6
Refined LPG production, % of domestic production	2.7	2.7	2.7	2.7	2.8	2.8
Other products production, 000b/d	166.9	166.9	166.9	166.9	166.9	166.9
Other products production, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Other products production, USDbn	5.7	5.7	5.7	5.7	5.7	5.7
Other products production, % of domestic production	26.1	26.1	26.1	26.1	26.1	26.1

f = BMI forecast. Source: EIA/BMI

Table: Refined Petroleum Products, Consumption Breakdown (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Motor gasoline consumption, 000b/d	36.1	37.8	39.9	41.9	43.8	46.0
Motor gasoline consumption, % y-o-y	18.6	4.9	5.5	5.0	4.5	5.1
Motor gasoline consumption, % of domestic consumption	19.0	19.0	19.0	19.0	19.0	19.1
Motor gasoline consumption, USDbn	1.6	1.6	1.6	1.5	1.5	1.6
Jet fuel/kerosene consumption, 000b/d	41.7	43.8	46.2	48.5	50.7	53.3
Jet fuel/kerosene consumption, % y-o-y	18.6	4.9	5.5	5.0	4.5	5.1
Jet fuel/kerosene consumption, % of domestic consumption	22.0	22.0	22.0	22.0	22.0	22.1
Jet fuel/kerosene consumption, USDbn	1.9	1.9	1.9	1.8	1.8	1.9
Jet fuel consumption, 000b/d	41.7	43.8	46.2	48.5	50.7	53.3
Jet fuel consumption, % y-o-y	18.6	4.9	5.5	5.0	4.5	5.1
Jet fuel consumption, % of domestic consumption	22.0	22.0	22.0	22.0	22.0	22.1
Jet fuel consumption, USDbn	2.0	2.0	2.0	1.9	2.0	2.0
Kerosene consumption, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene consumption, % of domestic consumption	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene consumption, USDbn	0.0	0.0	0.0	0.0	0.0	0.0
Distillate fuel oil consumption, 000b/d	41.7	43.8	46.2	48.5	50.7	53.3
Distillate fuel oil consumption, % y-o-y	18.6	4.9	5.5	5.0	4.5	5.1
Distillate fuel oil consumption, % of domestic consumption	22.0	22.0	22.0	22.0	22.0	22.1
Distillate fuel oil consumption, USDbn	2.0	2.0	2.0	1.9	1.9	2.0

Refined Petroleum Products, Consumption Breakdown (Qatar 2012-2017) - Continued

	2012	2013e	2014f	2015f	2016f	2017f
Residual fuel oil consumption, 000b/d	3.4	3.6	3.6	3.5	3.5	3.4
Residual fuel oil consumption, % y-o-y	6.7	4.9	-0.4	-1.2	-2.0	-1.9
Residual fuel oil consumption, % of domestic consumption	1.8	1.8	1.7	1.6	1.5	1.4
Residual fuel oil consumption, USDbn	0.1	0.1	0.1	0.1	0.1	0.1
LPG consumption, 000b/d	43.6	45.8	48.3	50.7	53.0	55.7
LPG consumption, % y-o-y	18.6	4.9	5.5	5.0	4.5	5.1
LPG consumption, % of domestic consumption	23.0	23.0	23.0	23.0	23.0	23.1
LPG consumption, USDbn	1.7	1.7	1.7	1.8	1.9	2.0
Other products consumption, 000b/d	22.8	23.9	25.2	26.4	27.6	29.1
Other products consumption, % y-o-y	18.6	4.9	5.5	5.0	4.5	5.1
Other products consumption, % of domestic consumption	12.0	12.0	12.0	12.0	12.0	12.1
Other products consumption, USDbn	1.0	1.0	1.0	0.9	1.0	1.0

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

Table: Refined Petroleum Products, Consumption Breakdown (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
Motor gasoline consumption, 000b/d	47.8	49.8	51.7	53.8	56.0	57.6
Motor gasoline consumption, % y-o-y	4.0	4.0	4.0	4.0	4.0	3.0
Motor gasoline consumption, % of domestic consumption	19.1	19.1	19.1	19.1	19.1	19.1
Motor gasoline consumption, USDbn	1.6	1.7	1.8	1.8	1.9	2.0
Jet fuel/kerosene consumption, 000b/d	55.4	57.6	59.9	62.3	64.8	66.7
Jet fuel/kerosene consumption, % y-o-y	4.0	4.0	4.0	4.0	4.0	3.0
Jet fuel/kerosene consumption, % of domestic consumption	22.1	22.1	22.1	22.1	22.1	22.1
Jet fuel/kerosene consumption, USDbn	1.9	2.0	2.1	2.2	2.3	2.3
Jet fuel consumption, 000b/d	55.4	57.6	59.9	62.3	64.8	66.7
Jet fuel consumption, % y-o-y	4.0	4.0	4.0	4.0	4.0	3.0
Jet fuel consumption, % of domestic consumption	22.1	22.1	22.1	22.1	22.1	22.1
Jet fuel consumption, USDbn	2.0	2.1	2.2	2.2	2.3	2.4
Kerosene consumption, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene consumption, % of domestic consumption	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene consumption, USDbn	0.0	0.0	0.0	0.0	0.0	0.0
Distillate fuel oil consumption, 000b/d	55.4	57.6	59.9	62.3	64.8	66.7

Refined Petroleum Products, Consumption Breakdown (Qatar 2018-2023) - Continued

	2018f	2019f	2020f	2021f	2022f	2023f
Distillate fuel oil consumption, % y-o-y	4.0	4.0	4.0	4.0	4.0	3.0
Distillate fuel oil consumption, % of domestic consumption	22.1	22.1	22.1	22.1	22.1	22.1
Distillate fuel oil consumption, USDbn	2.0	2.1	2.2	2.3	2.4	2.5
Residual fuel oil consumption, 000b/d	3.3	3.1	3.0	2.8	2.9	3.0
Residual fuel oil consumption, % y-o-y	-4.0	-4.0	-4.7	-5.5	4.0	3.0
Residual fuel oil consumption, % of domestic consumption	1.3	1.2	1.1	1.0	1.0	1.0
Residual fuel oil consumption, USDbn	0.1	0.1	0.1	0.1	0.1	0.1
LPG consumption, 000b/d	57.9	60.2	62.6	65.1	67.8	69.8
LPG consumption, % y-o-y	4.0	4.0	4.0	4.0	4.0	3.0
LPG consumption, % of domestic consumption	23.1	23.1	23.1	23.1	23.1	23.1
LPG consumption, USDbn	2.0	2.1	2.2	2.3	2.4	2.4
Other products consumption, 000b/d	30.2	31.4	32.7	34.0	35.3	36.4
Other products consumption, % y-o-y	4.0	4.0	4.0	4.0	4.0	3.0
Other products consumption, % of domestic consumption	12.1	12.1	12.1	12.1	12.1	12.1
Other products consumption, USDbn	1.0	1.1	1.1	1.2	1.2	1.2

f = BMI forecast. Source: EIA/BMI

Table: Refined Petroleum Products, Net Exports Breakdown (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Total net exports motor gasoline, 000b/d	7.3	5.9	4.3	2.7	1.3	-0.9
Total net exports motor gasoline, %y-o-y	-45.6	-18.1	-27.6	-36.1	-52.4	-171.7
Total net exports motor gasoline, USDbn	0.3	0.2	0.2	0.1	0.0	0.0
Total net exports jet fuel/kerosene, 000b/d	43.4	45.6	44.1	42.7	98.9	96.3
Total net exports jet fuel/kerosene, %y-o-y	21.4	5.1	-3.3	-3.2	131.6	-2.6
Total net exports jet fuel/kerosene, USDbn	2.2	2.3	2.1	1.8	4.0	3.7
Total net exports jet fuel, 000b/d	43.4	45.6	44.1	42.7	98.9	96.3
Total net exports jet fuel, % y-o-y	21.4	5.1	-3.3	-3.2	131.6	-2.6
Total net exports jet fuel, USDbn	2.1	2.1	1.9	1.7	3.8	3.6
Total net exports kerosene, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Total net exports kerosene, USDbn	0.0	0.0	0.0	0.0	0.0	0.0
Total net exports distillate fuel oil, 000b/d	15.7	130.2	128.7	127.3	204.2	201.6
Total net exports distillate fuel oil, %y-o-y	-19.5	730.2	-1.2	-1.1	60.4	-1.3

Refined Petroleum Products, Net Exports Breakdown (Qatar 2012-2017) - Continued

	2012	2013e	2014f	2015f	2016f	2017f
Total net exports distillate fuel oil, USDbn	0.7	5.9	5.6	4.9	7.7	7.4
Total net exports residual fuel oil, 000b/d	1.8	1.6	1.6	1.7	1.7	1.8
Total net exports residual fuel oil, %y-o-y	-10.8	-9.3	0.8	2.6	4.3	3.7
Total net exports residual fuel oil, USDbn	0.1	0.1	0.1	0.1	0.1	0.1
Total net exports other products, 000b/d	80.3	79.1	77.8	76.6	139.3	137.8
Total net exports other products, %y-o-y	-4.3	-1.4	-1.7	-1.6	81.9	-1.0
Total net exports other products, USDbn	3.6	3.3	3.1	2.7	4.8	4.7

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

Table: Refined Petroleum Products, Net Exports Breakdown (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
Total net exports motor gasoline, 000b/d	-2.8	-4.7	-6.7	-8.8	-10.9	-12.6
Total net exports motor gasoline, % y-o-y	196.3	68.9	42.4	31.0	24.6	15.4
Total net exports motor gasoline, USDbn	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4
Total net exports jet fuel/kerosene, 000b/d	94.1	91.9	89.6	87.2	84.7	82.8
Total net exports jet fuel/kerosene, % y-o-y	-2.2	-2.4	-2.5	-2.7	-2.9	-2.3
Total net exports jet fuel/kerosene, USDbn	3.4	3.4	3.3	3.2	3.1	3.0
Total net exports jet fuel, 000b/d	94.1	91.9	89.6	87.2	84.7	82.8
Total net exports jet fuel, % y-o-y	-2.2	-2.4	-2.5	-2.7	-2.9	-2.3
Total net exports jet fuel, USDbn	3.4	3.3	3.2	3.1	3.0	3.0
Total net exports kerosene, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Total net exports kerosene, USDbn	0.0	0.0	0.0	0.0	0.0	0.0
Total net exports distillate fuel oil, 000b/d	199.5	197.2	194.9	192.5	190.1	188.1
Total net exports distillate fuel oil, % y-o-y	-1.1	-1.1	-1.2	-1.2	-1.3	-1.0
Total net exports distillate fuel oil, USDbn	7.3	7.3	7.2	7.1	7.0	6.9
Total net exports residual fuel oil, 000b/d	1.9	2.1	2.2	2.4	2.3	2.2
Total net exports residual fuel oil, % y-o-y	7.5	6.7	7.0	7.3	-4.7	-3.9
Total net exports residual fuel oil, USDbn	0.1	0.1	0.1	0.1	0.1	0.1
Total net exports other products, 000b/d	136.7	135.5	134.2	132.9	131.5	130.5
Total net exports other products, % y-o-y	-0.8	-0.9	-0.9	-1.0	-1.0	-0.8

Refined Petroleum Products, Net Exports Breakdown (Qatar 2018-2023) - Continued

	2018f	2019f	2020f	2021f	2022f	2023f
Total net exports other products, USDbn	4.7	4.6	4.6	4.5	4.5	4.5

f = BMI forecast. Source: EIA/BMI

Table: LPG Production, Consumption and Net Exports (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
LPG production (wellhead & refined), 000b/d	363.3	369.4	381.1	404.8	421.0	416.8
LPG production (wellhead & refined), % y-o-y	0.0	1.7	3.2	6.2	4.0	-1.0
LPG production (wellhead & refined), USDbn	14.2	13.5	13.7	14.6	15.2	14.8
LPG consumption, 000b/d	43.6	45.8	48.3	50.7	53.0	55.7
LPG consumption, % y-o-y	18.6	4.9	5.5	5.0	4.5	5.1
LPG consumption, % of domestic consumption	23.0	23.0	23.0	23.0	23.0	23.1
LPG net exports (wellhead & refined), 000b/d	319.6	323.7	332.8	354.2	368.1	361.1
LPG net exports (wellhead & refined), % y-o-y	-2.1	1.3	2.8	6.4	3.9	-1.9
LPG net exports (wellhead & refined), USDbn	12.5	11.8	11.9	12.8	13.3	12.8

e/f = BMI estimate/forecast. Source: National Sources/BMI

Table: LPG Production, Consumption and Net Exports (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
LPG production (wellhead & refined), 000b/d	412.7	408.5	404.4	400.4	396.4	392.4
LPG production (wellhead & refined), % y-o-y	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
LPG production (wellhead & refined), USDbn	14.3	14.2	14.0	13.9	13.8	13.8
LPG consumption, 000b/d	57.9	60.2	62.6	65.1	67.8	69.8
LPG consumption, % y-o-y	4.0	4.0	4.0	4.0	4.0	3.0
LPG consumption, % of domestic consumption	23.1	23.1	23.1	23.1	23.1	23.1
LPG net exports (wellhead & refined), 000b/d	354.7	348.3	341.8	335.3	328.6	322.6
LPG net exports (wellhead & refined), % y-o-y	-1.8	-1.8	-1.9	-1.9	-2.0	-1.8
LPG net exports (wellhead & refined), USDbn	12.3	12.1	11.9	11.6	11.4	11.3

f = BMI forecast. Source: National Sources/BMI

Qatar - Total Hydrocarbons, 10-year Forecasts

Table: Total Hydrocarbons Production, Consumption and Net Exports (Qatar 2012-2017)

	2012	2013e	2014f	2015f	2016f	2017f
Total hydrocarbons production, 000boe	4,035.9	4,054.0	4,052.7	4,175.8	4,244.7	4,259.1
Total hydrocarbons production, 000boe, % y-o-y	2.5	0.5	0.0	3.0	1.7	0.3
Total hydrocarbons production, USDbn	142.1	138.6	133.3	100.0	101.1	99.8
Total hydrocarbons production, USD, % y-o-y	4.0	-2.4	-3.9	-24.9	1.1	-1.3
Total hydrocarbons consumption, 000boe	543.1	570.0	599.5	625.6	659.8	695.9
Total hydrocarbons consumption, 000boe, % y-o-y	9.4	4.9	5.2	4.4	5.5	5.5
Total hydrocarbons consumption, USDbn	21.5	21.6	21.9	18.3	18.9	19.6
Total hydrocarbons consumption, USD, % y-o-y	13.8	0.7	1.1	-16.3	3.0	3.7
Total net hydrocarbons exports, 000boe	3,492.7	3,484.0	3,453.2	3,550.2	3,584.9	3,563.2
Total net hydrocarbons exports, 000boe, % y-o-y	1.5	-0.2	-0.9	2.8	1.0	-0.6
Total net hydrocarbons exports, USDbn	122.5	118.9	113.3	83.5	84.1	82.1
Total net hydrocarbons exports, USDbn % y-o-y	2.7	-3.0	-4.7	-26.3	0.7	-2.3
Total net hydrocarbons exports at USD50/bbl, USDbn	55.9	56.0	55.5	57.8	59.6	59.1
Total net hydrocarbons exports at USD100/bbl, USDbn	111.8	112.0	110.9	115.5	119.2	118.2

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

Table: Total Hydrocarbons Production, Consumption and Net Exports (Qatar 2018-2023)

	2018f	2019f	2020f	2021f	2022f	2023f
Total hydrocarbons production, 000boe	4,286.1	4,303.1	4,320.3	4,324.5	4,327.1	4,318.8
Total hydrocarbons production, 000boe, % y-o-y	0.6	0.4	0.4	0.1	0.1	-0.2
Total hydrocarbons production, USDbn	103.4	107.2	108.7	109.9	111.0	113.1
Total hydrocarbons production, USD, % y-o-y	3.6	3.6	1.4	1.1	1.0	1.8
Total hydrocarbons consumption, 000boe	719.2	743.3	768.2	808.9	841.2	861.0
Total hydrocarbons consumption, 000boe, % y-o-y	3.3	3.3	3.4	5.3	4.0	2.3
Total hydrocarbons consumption, USDbn	20.5	21.6	22.5	23.8	22.6	25.9
Total hydrocarbons consumption, USD, % y-o-y	4.8	5.5	4.1	5.6	-4.9	14.4
Total net hydrocarbons exports, 000boe	3,566.9	3,559.8	3,552.1	3,515.7	3,485.8	3,457.8
Total net hydrocarbons exports, 000boe, % y-o-y	0.1	-0.2	-0.2	-1.0	-0.8	-0.8
Total net hydrocarbons exports, USDbn	84.9	87.6	88.3	88.3	88.4	89.5
Total net hydrocarbons exports, USDbn % y-o-y	3.3	3.2	0.8	0.0	0.1	1.3
Total net hydrocarbons exports at USD50/bbl, USDbn	58.6	58.0	57.8	57.0	56.4	55.7
Total net hydrocarbons exports at USD100/bbl, USDbn	117.1	116.1	115.5	114.1	112.8	111.4

f = BMI forecast. Source: EIA/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
bbl	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.
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

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