GOING GLOBAL
PHASE 3

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Saudi Arabia

OVERVIEW

Saudi Arabia is the world's second largest holder of crude oil proven reserves. The country is heavily dependent on petroleum. In 2013, petroleum exports accounted for 85 per cent of total Saudi export revenue.

In 2016, it produced around 14.1 million boe/d including around 12.34 million barrels of oil and 13.3 bcf/d of natural gas.

Saudi Arabia's oil and gas operations are dominated by Saudi Aramco, the national petroleum company of Saudi Arabia, and the world's largest oil company in terms of production.

OIL & GAS RESERVES
266,936 (million boe)

RESERVE LIFE
61.4 years

OIL & GAS PRODUCTION
13,434 (thousand boe/d)

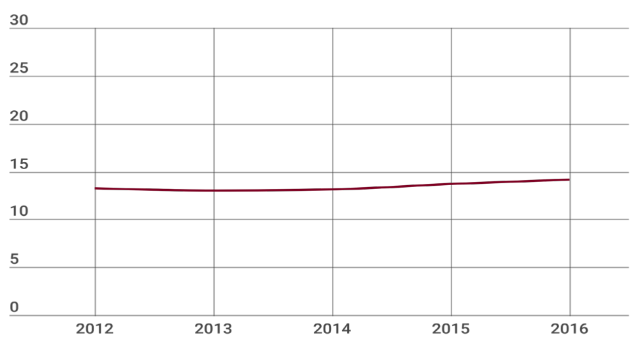
PRODUCTION FIVE-YEAR CAGR
1.2%

ACTIVE E&P COMPANIES/ACTIVE CANADIAN E&P COMPANIES
6/0

OIL PRODUCTION **88%**

GAS PRODUCTION **12%**

FIVE YEAR PRODUCTION (MILLION BOE/D)



OPPORTUNITIES

Saudi Arabia ranks as a high-risk/high reward export market in our analysis. It has opportunities in enhanced recovery and heavy oil development, and is beginning exploration for shale gas.

The Saudi government is targeting increased natural gas production with the goal of raising production from 13.3 bcf/d to 18.8 bcf/d by 2020.

Saudi Aramco plans on spending $300 billion over the next 10 years on upstream development.

Enhanced oil recovery

Saudi produces a wide range of crude oils from heavy to super light. Seventy per cent of Saudi Arabia's total crude oil production is considered to be light gravity with the remaining crude oil considered medium or heavy gravity.

While the Saudi government claims its reservoirs do not need enhanced recovery technologies at this time, many fields have been producing for 50–60 years.

However, this attitude is changing. Through Saudi Aramco's R&D arm, the Exploration and Petroleum Engineering and Advanced Research Center, the company is working on various R&D projects in an effort to increase the recovery factor of major producing reservoirs from the current 50% to 70%.

The company said it is emphasizing high-impact technologies that typically involve long-range strategies. So far, the company's effort has focused on IOR and EOR, such as CO_2 EOR and chemical EOR, with an objective to find surfactants and polymers that will tolerate Saudi Arabian reservoirs' salinity and temperature. Another area of focus involves smart waterflooding, which addresses the role of ions, at microscopic scale, to increase recovery without major investment.

The company said in its 2016 annual review that its SmartWater flooding research program continued to show potential to improve oil recovery rates from carbonate reservoirs by an additional 4% to 8%.

There is also a carbon dioxide test project under way.

Unconventional resources

Saudi Arabia has an estimated 600 trillion cubic feet of unconventional gas reserves. In 2015, Saudi Aramco invested $3 billion on capital expenditure for shale gas production.

In 2011, Aramco started up the Aramco Research Centre in Houston, Texas. The facility aims to conduct research on unconventional upstream exploration, drilling, field development and project management. Saudi wants to exploit its unconventional fields potential by seeking U.S. drilling expertise.

Three main basins for unconventional shale gas include: the Al-Jalamid Field (north), the Empty Quarter Field (south) and the South Ghawar Field (east).

Saudi Arabia is not producing commercial volumes of shale gas and tight oil.

In April 2016, Aramco awarded an $800-million shale gas contract to SNC Lavalin. The objective of the contract is to develop Saudi Arabia's shale gas in the northern region. Scope of the project includes processing facilities, wellheads and pipelines.

Saudi Arabia's success on shale gas discovery is highly dependent on the ability to find water required for drilling, drilling success and Saudi's ability to leverage international oil companies' expertise.

Early this year it was announced that unconventional production at the kingdom's North Arabia basin will start by the end of March and reach its target by the end of the year,

Aramco is also drilling for unconventional gas in the South Ghawar and Jafurah basins.

Jafurah in eastern Saudi Arabia is similar in size to Eagle Ford, the second-biggest U.S. shale play for gas, said the government. Pipeline networks and other facilities needed for Aramco to produce unconventional gas at Jafurah are nearby, and this existing infrastructure should help expedite the basin's development.

Aramco plans to develop the entire basin, using improved technology to reduce fracking costs, it said. The company will focus on cutting costs at Jafurah before proceeding with plans to produce gas there, it said.

Offshore

Saudi Aramco is the largest offshore producer in the world and has focused on offshore fields in the Persian Gulf to expand its natural gas production. Three non-associated gas fields have been targeted:

- Karan offshore: produces 1.8 bcf/d of sour gas
- Arabiyah offshore: produces 1.2 bcf/d (part of the Al Wasit Gas Program)
- Hasbah offshore: produces 1.3 bcf/d (part of the Al Wasit Gas Program)

Aramco started producing gas from the Hasbah offshore oil and gas field to meet Saudi's domestic needs. Hasbah is a difficult offshore field to develop. The gas from Hasbah contains four to eight per cent sulphur content, which means it requires a lot of processing. The additional processing costs to develop the gas is greater than importing LNG. Saudi is unwilling to import cheaper gas since the country is focusing on becoming self-sufficient in terms of its gas needs. The cost of producing gas at Hasbah is around $3.50–$5.50/mmBtu. In general, Saudi subsidizes $1.25/mmBtu for industrial consumers. Given the high processing cost, Saudi will need to subsidize a greater amount for this project.

Service sector

Saudi Aramco is projected to spend US$110 billion on three types of services in the next five years:

- $45 billion on exploration and drilling services (rig construction, well services, seismic services)
- $45 billion in constructing projects (onshore projects, design and engineering, facilities construction and pipeline projects)
- $20 billion on operations, maintenance and general services (transportation, maintenance)

Saudi Arabia wants to promote local production through the use of long-term procurement agreements, exclusivity in bidding and a price advantage of up to 10 per cent to local producers.

Saudi prefers the use of natural gas to produce fuel and energy. By consuming more natural gas, Saudi can export additional oil to other countries (lower cost to produce oil). Moving forward, Saudi will continue to aggressively grow its natural gas production.

Saudi plans to develop its potential shale gas reserves in order to meet its growing domestic demand. This creates opportunities for Canadian S&S companies. There are also opportunities in production and processing of sour gas.

Local content

There is a major push in Saudi Arabia to further develop its domestic oilfield services industry, including through partnerships with foreign companies. Called the In Kingdom Total Value Add (IKTVA) program, its aim is to drive growth in small to medium sized energy related services.

In December, 2017, a forum took place promoting over 140 investment opportunities in localization valued at over $16 billion in several industrial and business sectors across the Saudi Arabian energy sector.

In welcome remarks before an audience of over 2,300 delegates from 30 countries, Amin H Nasser, president and CEO, Saudi Aramco, highlighted the IKTVA program and the opportunities it offers for a localized supply chain. Nasser said that IKTVA aims to deliver a world-class, locally sourced supply chain in the country with an overarching objective of achieving 70 per cent of locally supplied content by 2021.

Nasser said the two-day forum provided a platform for companies interested in establishing operations in Saudi Arabia to engage with the country's energy sector stakeholders and their key suppliers. He highlighted the important role of small and medium-sized enterprises (SMEs) in driving value creation and innovation in the localization process.

SMEs currently contribute just 20 per cent to the country's GDP, which is less than half of industrialised economies. The initial Saudi target is to increase that number to 35 per cent.

Schlumberger already has plans to develop an industrial manufacturing centre within the King Salman Energy Park in Saudi Arabia. Multinational companies operating in Saudi Arabia are increasingly seeking ways to add local manufacturing capacity in order to align with economic diversification goals aimed at creating more jobs for Saudis and making the country less reliant on oil. The new centre will manufacture products for drilling, exploration and production, as well as midstream, Schlumberger said in a statement.

The industrial manufacturing centre will be developed over 500,000 square metres on land allocated for energy-related industries.

The first phase will bring Schlumberger land rig manufacturing to the country.

Infrastructure

Saudi Aramco operates the world's largest oil processing facility and crude stabilizing plant. The plant processes the majority of Arab extra light and light crude oil. The facility's infrastructure includes pumping stations, gas-oil separation plants, hydro-desulphurization units and an extensive network of pipelines that connects the plant to the ports of Ra's al Ju'aymah, Ras Tanura and Yanbu for natural gas liquids.

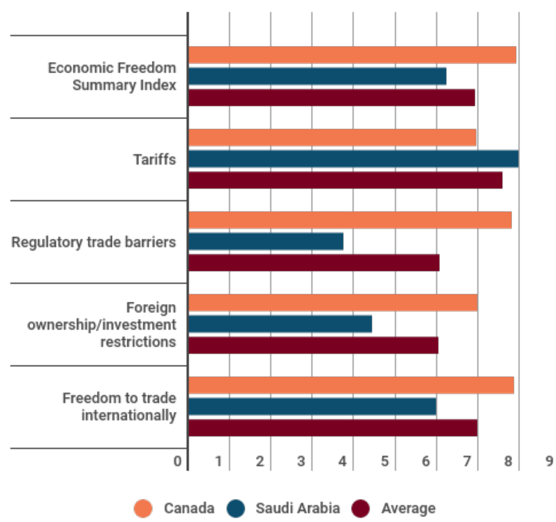
Saudi Arabia's world class oil and gas infrastructure makes it easy for oil and gas companies to operate in the country.

DOING BUSINESS IN SAUDI ARABIA

Saudi Arabia's oil and natural gas operations are dominated by Saudi Aramco, the national oil and gas company and the world's largest oil company in terms of production. Saudi Arabia's Ministry of Petroleum and Mineral Resources and the Supreme Council for Petroleum and Mineral Affairs have oversight of the oil and natural gas sector and Saudi Aramco.

Saudi Arabia ranks 122nd on the Fraser Institute's economic freedom index, in the bottom quartile. It scores a six out of 10 when it comes to trade freedom.

FRASER INSTITUTE FREEDOM TO TRADE SCORES COMPARED TO CANADA AND GROUP AVERAGE (SCORE OUT OF 10)



SOURCE: FRASER INSTITUTE

Saudi Arabia ranks 67th out of 136 countries on the World Economic Forum Enabling Trade Index.

In spite of the availability of good transport and ICT infrastructure, Saudi Arabia enters the ranking at 67th this year, down 11 positions since 2014. Market access (116th) and border administration (83rd) remain the two weak spots of the country. Only 27 per cent of imports enter the Saudi market free of duty, while exports face the sixth-highest average tariffs in the world (4.9 per cent). Border compliance for importing is both costly (121st) and time-consuming (126th), with low information publicly available to traders (96th). Transport infrastructure (31st) benefits from good international air connectivity (23rd) and one of the best road systems in the world (2nd after the United States for speed of connection between the main cities). The operating environment suffers from restrictions to foreign participation, especially in terms of labour (105th) and foreign direct investment (116th).

The World Bank Group's Doing Business series currently ranks Saudi Arabia at 92nd in the world.

WORKING IN SAUDI ARABIA

Work visa

The sponsor in Saudi Arabia must apply for a visa authorization through the Saudi Ministry of Foreign Affairs. Once the request is granted, the Ministry of Foreign Affairs will send the authorization directly to the Consulate. Your sponsor must provide you with the authorization copy.

For more information, please refer to http://embassies.mofa.gov.sa/sites/canada/EN/Services/ConsulateSection/Visa/Pages/Employment.aspx.

Taxes

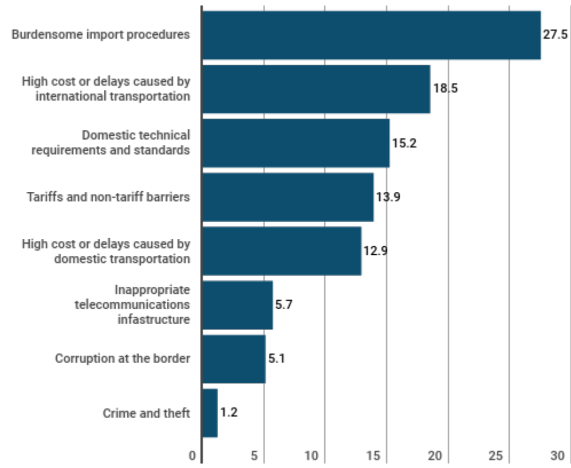
Individuals are considered residents in Saudi Arabia if they meet one of the following tests:

- He/She is present in Saudi for 183 days or more during any taxable year, or
- He/She is present in Saudi for at a total of 30 days or more and has a place of abode in Saudi Arabia.

Non-residents receiving income from Saudi sources may be subject to withholding tax at rates ranging from five per cent to 20 per cent depending on the nature of the service. Saudi Arabia has no tax treaty with Canada.

WEF EXECUTIVES' RANKING OF THE MOST PROBLEMATIC FACTORS FOR IMPORTING TO SAUDI ARABIA

% OF RESPONDERS RANKING AS # 1 ISSUE



Note: From a list of factors, respondents were asked to select the five most problematic factors in their country and rank them. The scores correspond to the responses weighted according to their rankings

WORLD BANK *DOING BUSINESS* RANKING COMPARED TO CANADA

This distance to frontier score helps assess the absolute level of regulatory performance over time. An economy's distance to frontier is reflected on a scale from 0 to 100, where 0 represents the lowest performance and 100 represents the best performance across all economies and across time.

SOURCE: 2018 WORLD BANK *DOING BUSINESS* REPORT

PESTEL ANALYSIS

Category	Analysis
POLITICAL	Saudi Arabia has undergone a significant change in leadership and the country is on course to liberalize its economy and social life. It remains heavily dependent on oil revenues to finance its government. It has been draining its financial reserves to battle for market share. There are questions how long this situation can continue. It is also investing in renewable energy to diversify its economy. Relations with neighbours, particularly Qatar, are strained. And it continues to fight a war with rebels in Yemen.
ECONOMIC	In Saudi Arabia Vision 2030, Prince Mohammed bin Salman claims to reduce the country's oil and gas dependency. The Vision 2030 is to increase non-oil revenue from $43.6 billion to $267 billion by 2030. In the low commodity price climate, Saudi Arabia will try to reduce its exposure to the petroleum sector.
SOCIAL	Aramco is planning to implement a new program called In-Kingdom Total Value Add to promote local content. The program is designed to help create 500,000 direct and indirect Saudi jobs in the oil service sector. Western oil service providers that want to keep their Aramco accounts would incur additional costs to employ Saudi locals and comply with requirements.
TECHNOLOGICAL	In Saudi Arabia, there are many mature heavy or light oilfields, which make it difficult for Aramco increase production. To overcome these hurdles, EOR methods can be used to extract oil from more complex geology in some areas. As of now, Aramco is willing to conduct EOR methods, such as steam flooding, on its neutral zone. Aramco is also researching shale gas technologies to develop its resources.
ENVIRONMENT	Over the years, Saudi Arabia is becoming more environmentally conscious. In 2014, the Presidency of Metrology and Environment announced that all companies have five years to meet the air, water and noise pollution standard. Companies that fail to comply will see their projects suspended. Given Saudi Arabia's dependency on oil and gas projects, it is uncertain how this would affect future projects.
LEGAL	The Council of Ministers of the Kingdom of Saudi Arabia has agreed to increase foreign investment from the present 75 per cent limit to 100 per cent in the retail and wholesale sectors. This change does not apply to the oil and gas sector. Aramco retains exclusive rights over oil exploration, drilling and production. Overall, this shows the Saudi kingdom is taking gradual steps in promoting foreign investment.

RECOMMENDATIONS

- Saudi has allocated $43.8 billion for transport, telecommunications, water and other related infrastructure. The country is heavily invested in some of the world's biggest infrastructure projects.
- Due to technological and geological challenges, Saudi is unable to unlock its reserves. In the next five years, Saudi is planning to spend $45 billion on exploration and drilling services and $20 billion on operations, maintenance and general services.
- To counter the low commodity price situation, Saudi Arabia and other OPEC producers maintain production levels in order to defend and grow market share by forcing more expensive unconventional producers out of the market.
- Aramco started producing gas from the Hasbah offshore oil and gas field to meet Saudi's domestic needs. The project is estimated to add 1.37 bcf/d to Saudi Arabia's output. The challenge of this oilfield is that the gas from Hasbah contains four to eight per cent sulphur content, which means it requires a lot of processing. Saudi is planning to spend $45 billion on constructing projects.
- In 2011, Aramco started up the Aramco Research Centre in Houston. The facility aims to conduct research on unconventional upstream exploration, drilling, field development and project management.
- There are many mature heavy or light oilfields, which make it difficult for Aramco produce. To overcome these hurdles, enhanced oil recovery (EOR) methods can be used to extract oil from more complex geology in some areas.
- The EOR markets currently represent the best opportunity for Canadian supply and service companies willing to do business in the oil and gas sector in Saudi Arabia.
- Shale gas exploration and production is an emerging opportunity.