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**OIL & GAS PROJECTS  
AND DEVELOPMENTS  
IN SAUDI ARABIA**

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# OIL & GAS PROJECTS AND DEVELOPMENTS IN SAUDI ARABIA

*These types of projects could be a boon for developing host countries, yet their environmental and social costs often outweigh their benefits. Partnerships between project developers, governments, and local communities are crucial for projects to have a lasting development impact.*

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## INTRODUCTION

In 1998 and 1999, the world witnessed a dramatic fall in the price of oil. The Saudi government, whose oil revenues constitute 75 percent of state income, had to control spending. However, the recent improvement in the price of oil, coupled with the introduction of several non-oil revenue raising measures, enabled the Saudi treasury to increase spending and service Saudi government debts, estimated at \$139 billion.

In a related move to enhance Saudi Arabia's importance among oil producing countries, the Saudi Government issued a Royal Edict announcing the formation of the Supreme Petroleum & Mineral Affairs Council (SPMAC). The SPMAC is responsible for the country's energy policy and will supervise Saudi Aramco's projects. SPMAC will also make decisions related to foreign investment in all upstream gas production.

Oil remains important to the Saudi economy and with current forecasts of continued strength in oil prices through 2000, Saudi Aramco is reinstating projects that were put on hold. Saudi Aramco is the largest oil producer in the world. Crude oil reserves in its managed fields are estimated at 259,100 million barrels. Its natural gas reserves total 204.4 trillion cubic feet (tcf) including about 68 tcf of non-associated gas. With an extra production capacity of more than 3 million-oil b/d, Saudi Aramco is concentrating on increasing its gas production. The company is going ahead with its \$4.5 billion program to expand and raise the capacity of its master gas gathering system to meet the local demand of the power and petrochemical industries.

Over the next three years, Saudi Aramco is expected to invest more than \$5 billion in the Hawiya gas project, Berri gas plant, Haradh gas plant, Ras Tanura oil refinery, and other projects. These investments will offer good opportunities for U.S. machinery and material suppliers, as well as contractors. The United States is by far the largest country supplier of goods and services to the Saudi oil and gas industry. U.S. suppliers are estimated to hold roughly 70 percent of the market for engineered equipment and 75 percent of the program management/engineering and design market.

## **Oil, the Present and the Future**

Between 1970 (1389/90 AH) and the present the Kingdom's level of production and its share of the oil market has shown great fluctuations.

Because Saudi Arabia holds some 25% of the world's oil reserves, it is inevitable that the Kingdom should play a pivotal role in the affairs of the Organization of Petroleum Exporting Countries. It is also inevitable that the role which the Kingdom discharges should attract the continuing attention of foreign governments and the world's media. It may be helpful to begin a review of the present and future status of oil within the Saudi Arabian economy by setting the Kingdom's oil (production and reserves) into a wider historical and geographical context.

It is fair to say that the attitude of the Kingdom of Saudi Arabia to the exploitation of its own oil reserves and to the oil market in general has, from the earliest years, shown a considerable degree of sophistication. From 1974 (1393/94 AH), the Kingdom of Saudi Arabia has continuously used its influence to try to impose some degree of stability on the oil market. It has consistently shown an understanding of the economic needs of consuming nations, as well as those of its fellow producers.

It is the Kingdom's view that, in the exploitation of a finite resource as precious as oil, international and global considerations, as well as national needs, should be taken into account. It is damaging to the world economy to have major rises or falls in the price of such an essential source of energy. This fact alone suggests that rather than presenting the producer/consumer relationship as one of conflict, it would be more constructive to recognize it as one of interdependence. It must also be true that, as the world's reserves of oil diminish, and the value of that diminishing resource increases, agreement between the producers and consumers on how best to manage this economic process would seem to be highly desirable.

What will happen to the oil market in the next few years is difficult to predict. So many factors are involved. How quickly will the world's recoverable reserves of oil be depleted? How far and how quickly will alternative sources of energy be employed to replace oil in some of its applications? What impact will environmental considerations have upon national and international energy policies? What scientific advances will be made which might radically alter the total energy resources of the planet? Will nuclear fusion become a practical, as distinct from a theoretical, source of virtually limitless energy? And what of the international political environment within which the oil market game has always been played?

As the years pass and as oil reserves diminish, it seems most likely that the oil price will rise. If this process is managed sensibly, the rise should be gradual, causing minimum economic disruption. If it is left to the market, there are likely to be sudden and substantial rises in price which the consuming economies will no doubt find difficult to absorb - as difficult to absorb as the producing economies found the falls in price of the 1980s and 1990s.

In terms of the economy of the Kingdom of Saudi Arabia, oil will continue to play a key role. The Kingdom's development plans have used the oil revenues to diversify the Saudi Arabian economy, expanding the non-oil industrial sector and the

agricultural sector. It remains, nevertheless, true that oil will continue to represent the major sector of the economy. Latest official estimates of Saudi Arabian oil reserves (1998 - 1418 AH) stand at 262,000 million barrels; proven gas reserves are currently estimated at 5.8 trillion cubic meters. Even these latest estimates are considered conservative by many who have suggested that reserves of oil could be as high as 315,000 million barrels of oil and 7.4 trillion cubic meters of gas. It is therefore inevitable that in the coming decades the Kingdom of Saudi Arabia will continue to derive most of its income from the black gold that lies within its territory. It is also inevitable that the Kingdom's role in the politics and economics of the Middle East and, indeed, on the wider international stage, will grow in importance as the smaller oil reserves of other countries become more difficult and more expensive to exploit or, finally, are exhausted.

## **A. MARKET HIGHLIGHTS AND BEST PROSPECTS**

- Market Profile

Towards the end of 1998, the Saudi Arabian Oil Company (Saudi Aramco) reduced its oil production from 8.7 million b/d to 8 million b/d to help increase the price of oil. These production cuts coupled with low oil prices affected the status of Saudi Aramco's planned projects. In 1999, Saudi oil production was further cut to around 7.3 million b/d reaching its lowest level in nine years. By the end of 1999, oil prices recovered enticing Saudi Aramco's management to revive a number of pre-planned programs to improve and expand its oil and gas facilities. In addition, the company has easy access to both local and international financing. Industry experts do not expect major new projects to be dusted quickly off the shelf.

Saudi Aramco is moving forward with a five-year plan, which began in 1997, to increase the capacity at its gas fields and gas gathering systems to meet local demand in the petrochemical, power generation and water desalination industries. Industry analysts expect that the demand for gas will rise from 5,000 million standard cubic feet a day (scf/d) in 2000 to 7,000 million scf/d in 2005. In coordination with the Saudi Electricity Company in the Eastern Province, Saudi Aramco started supplying power stations with gas, thus freeing around 300,000 barrels of oil a day for export.

A Royal Edict announced the formation of the Supreme Petroleum & Mineral Affairs Council (SPMAC) chaired by King Fahd. The Council will devise the energy policy and supervise Saudi Aramco's projects. It will also define the scope of the investment proposals submitted by international oil companies for the upstream gas project initiated by HRH Crown Prince Abdullah in 1998.

SPMAC's objectives are as follows:

- To have the final word on all matters related to oil, gas and other hydrocarbon materials,
- To recommend the volume of production and decide the prices of various fuel categories,
- To devise Saudi Aramco's general policy, approve its five-year plan, decide its capital expenditures and appoint its chairman,

- To make decisions on all investment issues regarding post-production stages, knowing that Saudi Aramco maintains exclusive control of exploration, drilling and production,
- To decide on all matters related to investment in the Neutral Zone (between Saudi Arabia and Kuwait) concessions,
- To study and endorse general mining policies.

Industry analysts say that the new Council is to decide which projects will be implemented in the energy sector. Later, the Council will look at permitting foreign investors into the gas sector, an alternative to Saudi Aramco's investing in its large non-associated gas reserves estimated at 68 trillion standard cubic feet. Gas production can significantly increase once the government permits the participation of international oil companies into the upstream industry.

Exploration activity in 2000 and beyond will concentrate on gas and condensate fields discovered in the Eastern Province. So far, the discoveries show potential reserves of 4 trillion cubic feet of gas and 6,000 million barrels of condensate. At the beginning of 1999, Saudi Arabia's proven gas reserves were 204.5 trillion cubic feet. After the completion of the 1,400 million cubic foot/day gas processing plant in Haradh, Saudi Aramco's gas production capacity will reach 7,500 million cubic foot/day. Foreign contractors are predicting that new gas and condensate discoveries might ultimately generate more contracts to develop Saudi Aramco's gas gathering facilities. Prior to the latest discoveries at Niban and Shaden fields, gas and condensate had been found at Haradh, Tinat, Al-Waar, Shamah and Al-Widaihi fields.

Saudi Aramco's management estimates that close to \$10 billion will be spent on oil and gas projects over the next seven years (2000-2007). Sources at the oil company projected that, between 2000 and 2002, close to \$2.56 billion will be spent annually on projects. The following is a list of current and future projects to be awarded by Saudi Aramco:

Hawiyah Gas Project. The total value of the project is \$2 billion and the project manager is Parsons Corporation (U.S.). The largest contract, estimated at \$600 million, for equipment procurement and construction of a gas treatment plant was awarded to JGC Corp. (Japan). JGC Corp. subcontracted the civil, mechanical, electrical and instrumentation work valued at \$150 million to the local Consolidated Contractors Company (CCC). The first of the remaining two contracts went to Techint (Argentina) to build the inlet portion of the plant and auxiliary facilities. Technip (Italy) got the contract to build a sulfur recovery plant and utilities. A 365-mile gas pipeline (24-56) inch diameter from Hofuf to Riyadh was awarded to Saipem (Italy) as part of the Hawiyah gas development project. Also, Worldwide Telecommunications Services, a subsidiary of GTE (U.S.), was awarded a \$20 million contract to install communications at the Hawiyah gas plant. Upon completion in 2001, the Hawiyah Gas plant will produce 1,440 million cubic feet of gas per day.

ABB Lummus Global (US) was awarded a \$22 million contract to provide project management, and front-end engineering and design services to build a Khuff gas condensate fractionation plant and renovate terminal facilities at Saudi Aramco's oil refinery in Ras Tanura. The project management contract

will be completed by the end of 2000. A lump sum turnkey contract will be given in the third quarter of 2001.

Build a new 90-MW power plant at Saudi Aramco's oil and natural liquids recovery center at Abqaiq. Estimated cost is \$100-120 million.

Build a new natural gas liquids recovery unit at the Berri gas processing plant. The \$385 million contract for engineering, procurement and construction was awarded to AMEC-Babcock King Wilkinson (UK). The project manager is Delta Hudson (Canada).

Build a fluid catalytic cracking unit (FCC) at Ras Tanura Oil Refinery at an estimated cost of \$500 million.

Build a new gas processing plant at Haradh in the Eastern Province. The value of the project is estimated at \$2.6 billion with a daily capacity of 1,400 million cubic feet. The project management contract was awarded to Foster Wheeler (US). Foster Wheeler will prepare front-end engineering and design work of the gas plant. Engineering, procurement and construction bids will be invited by the end of 2000 for each of the following eight packages: Gas manifolds and TL (\$200 million), Site preparations (\$75 million), Haradh Gas Plant (\$1,320 million), Downstream Sales Gas P/L (\$650 million), Condensate P/L (\$80 million), Haradh Camp (\$115 million), Power Line (\$115 million).

Build six new platforms and nine pipeline sections in offshore oil fields in the Arabian Gulf.

Build a Fluid Catalytic Cracking (FCC) Unit at Ras Tanura at an estimated cost of \$500 million, including facilities, planning, developing design base and scope.

- Best Sales Prospects

There is continuing demand at Saudi Aramco for experienced companies and quality products in the following areas:

- Oil and gas design engineering firms
- Oil and gas consulting firms
- Oil & gas facilities construction contractors
- Products and services related to the oil and gas industries, such as tubular goods, valves, compressors, pumps, chemicals, turbines, drilling rigs and parts, generators, computers and software, telecommunication equipment, instrumentation and industrial process controls, fire fighting and safety equipment, spare parts, supplies and equipment for refineries, oil/gas products storage monitoring systems, as well as various other related equipment and products.

### **Statistical Data**

The following are 2000 Saudi import figures for some of the products used by the oil and gas industry in the kingdom:

| Product                       | (Millions U.S. Dollars) |
|-------------------------------|-------------------------|
| Pipe & Casing                 | 377.3                   |
| Pipe Fittings                 | 139.0                   |
| Instruments, Controls & Parts | 110.1                   |
| Pumps & Parts                 | 167.1                   |
| Turbines & Parts              | 257.5                   |
| Fire Fighting Equipment       | 008.7                   |

(SOURCE: Official Saudi Imports Statistics for 2000)

## **B. COMPETITIVE ANALYSIS**

Major design, engineering and project management contracts are normally awarded to large foreign firms, which must have a local partner or sponsor. Many construction subcontracts and limited scope engineering/design contracts are awarded to local firms that nevertheless tend to employ expatriates at all levels to do the work. Saudi Aramco usually invites pre-qualified companies to submit bids for its projects. Bids can either be technical or commercial. Commercial bids are only looked at after the technical offers are evaluated and reviewed. Quoted offers must be realistic, since Saudi Aramco's policies are highly defined, abide by strict standards, and provide for a scale of allowed profit margins for project design, management, engineering, contracting, and construction jobs.

In order to carry out front-end engineering and design work for huge projects in the oil and gas sectors, Saudi Aramco selects international consultants and invites them to submit their pre-qualification documents, which are then reviewed by a technical committee. Moreover, that same committee will also review contractors' bids and make recommendations. A good number of Saudi Aramco's contracts are awarded on a lump sum turnkey basis. Competition among contractors is very high, and generally the lowest bidder is most likely to get the job, pending negotiations with Saudi Aramco's appointed project committee. In case the quotes are high, Saudi Aramco will re-tender the project, contributing to a more competitive environment and reducing the companies' profit margins. To gain a foothold for follow-on contracts, foreign companies operating in Saudi Arabia sometimes spends thousands of hours on engineering/design work without billing Saudi Aramco.

### **Local Companies**

Local companies working on Saudi Arabia's oil development projects represent over 10 percent of the value of products and services spent annually. Almost all of the civil construction work and the electro-mechanical jobs are sub-contracted to local companies. Some of these companies collaborate with foreign firms in their bidding process. Saudi-foreign joint venture contracting companies registered with Saudi Aramco can obtain jobs through Saudi Aramco's bids and tenders procedures in civil construction, modernization of control systems, upgrading of fire detection systems, and maintenance of offshore oil facilities. Local companies usually provide a number

of other support services such as catering, transportation, housing, safety and medical services. Saudi manufacturing companies are usually invited to provide some or most of the following items: valves, diaphragms, rings, washers, fittings, seals, refractories, steel girders, drilling chemicals, structural steel works, storage tanks, cables, nuts and bolts, anchors, couplings, pipes and tubes, electrical transformers, power distribution equipment, fire fighting equipment, cooling towers, heat exchanges, drill bits and heads, casing centralizers, clamps, cementing guide shoes, float shoes, cementing equipment, trailers, pallets and containers, and anti-corrosion coatings.

### **U.S. Market Position**

Major U.S. oil/gas design, engineering, and project management companies have a strong presence in Saudi Arabia, holding about 70 percent of the market for engineered equipment and 75 percent of the project management/engineering and design portion. Foreign companies usually bid for projects in partnership with local affiliates. U.S. petroleum engineering and construction firms operating in Saudi Arabia enjoy a very good reputation, are reliable, and have a very high profile. Many U.S. companies have been working in Saudi Arabia for a good number of years and have provided quality products and services to the Saudi oil industry. This in turn has benefited other American companies in their approach to sell their products and services to the Saudi oil and gas industry. Since its inception some 60 years ago by four U.S. oil companies (Texaco, Exxon, Mobil, and Chevron), Saudi Aramco has set extremely high standards for the procurement of products and services. Unmatched in the industry, these standards provide for the harsh weather conditions prevailing in the country and, therefore, aim at reducing equipment downtime.

While recent budget cuts have forced the company to re-evaluate the trade-off between price and quality in less critical areas, U.S. products continue to be in demand where performance counts most.

Some of the leading U.S. companies represented in Saudi Arabia include: Kellogg Brown & Root, The Parsons Corp., Bechtel, Stone & Webster Engineering Corporation, ABB Lummus Global, Foster Wheeler, Fluor Daniel, Walk Haydle & Associates, Black & Veatch Pritchard, Rust, Lockwood Green, Williams Brothers, Halliburton Energy Services and Chicago Bridge & Iron Company.

### **Foreign Companies**

Principal foreign competitors in the area of engineering services include companies from Japan, Italy, U.K., Canada, United Arab Emirates and Argentina. Foreign companies bidding on Saudi Aramco oil and gas engineering and construction tenders and bids include:

- JGC Corp.; Toyo Engineering Corp. (Japan)
- Kvaerner Energy (UK/Norwegian)
- AMEC-Babcock King Wilkinson (UK)
- Snamprogetti; Saipem; Technipetrol (Italy)
- SNC Lavalin; Delta Hudson (Canada)
- Techint (Argentina)
- J. Ray McDermott Middle East (United Arab Emirates)

### **C. END-USER ANALYSIS**

Saudi Aramco is the world's largest producer of crude oil and natural gas liquids. The state-owned company has more than 70 onshore and offshore fields, with 2,200 producing oil wells and five wholly owned and operated oil refineries. The company is organized into five major business areas, exploration and production, manufacturing, international operations, finance and public relations, and engineering and operation services. The company has very high standards, which apply to the procurement of both goods and services. Those standards usually follow API and other well-known guidelines of U.S. oil companies'.

The former Arabian Oil Company (Saudi-Japanese joint venture) is the second oil company, which operates in the Neutral Zone between Saudi Arabia and Kuwait. A team from Saudi Aramco is now running and managing the company, known as Aramco Gulf Operations Company Ltd. That company was formed after negotiations between the Saudi and Japanese officials failed to renew the oil concession agreement between the Saudi and Japanese governments. The concession covers the offshore area outside the territorial waters limit of the Saudi-Kuwaiti Neutral Zone. The company operates four offshore oil fields with 222 oil wells, and a crude oil refinery at Khafji. The company's oil production is 350,000 barrels per day. Similarly, Saudi Aramco standards as well as API standards apply to purchased goods and services.

Saudi Arabian Texaco, a wholly owned Texaco subsidiary, operates the onshore portion of the Neutral Zone between Saudi Arabia and Kuwait. The company holds a Saudi concession valid through 2009, working closely under a joint agreement with the Kuwait Oil Company. The company also applies both API and Texaco standards to purchased goods and services.

### **D. MARKET ACCESS**

- Import Climate

Saudi Arabia has a laissez-faire market system. There are no impediments or any government restrictions on the import and sale of oil and gas field equipment, parts, and services. Imported equipment and parts designated for Saudi Arabia's oil and gas projects are exempted from a 12 percent *ad valorem* customs duty, which non-oil sectors are subject to. Saudi Aramco and the other two oil companies encourage local content and grant local manufacturers preferential treatment provided they meet the oil companies' written standards and specifications. The Saudi Arabian Standard Organization (SASO) regulates product standards within Saudi Arabia. Under a new program designated as the International Conformity Certification Program (ICCP), a number of products imported for the oil and gas industry require certification before being allowed entry into Saudi Arabia. SASO does have some additional standards, including those of an operating environment where electrical current is set at 127 volts, 60-cycles.

- Business Practices

Saudi commercial regulations stipulate that foreign companies interested in doing business in Saudi Arabia should conduct their activities through an authorized Saudi representative/agent or joint venture partner who should have a duly registered company with the appropriate Saudi government agencies. Foreign companies can

also sell their services/products directly to Saudi firms, but could lose the benefit of continued and on-going sales. Nonetheless, Saudi regulations require any foreign company without a local partner that obtains a contract with the Saudi government to appoint a Saudi service agent. The primary function of the service agent is to provide a vehicle for the foreign company to obtain the temporary commercial registration required to perform the project in Saudi Arabia and to assist in other routine tasks, particularly the issuance of visas for expatriate employees. Saudi Aramco uses a system enabling it to classify, approve, and pre-qualify local and foreign manufacturers and vendors.

Depending on the company's need for a certain product, the foreign manufacturer can either sell directly to Saudi Aramco or through a local agent. The same procedure applies to foreign engineering firms, although major American and British engineering companies operate through joint venture partnerships with local companies. In a few instances, Saudi Aramco signs contracts with foreign firms, in which case Saudi Aramco acts as the local sponsor of these firms.

The normal Saudi workweek is Saturday through Wednesday. Government offices are closed on Thursday and Friday. Most private sector firms do not open on Thursday afternoon and Friday. Arabic is the official language in Saudi Arabia, and English is the unofficial business language. Saudi Aramco's business hours are from 7:00 AM to 3:30 PM Saturday through Wednesday including a lunch break from 11:30-12:30. During the month of Ramadan (fasting month), work hours are reduced to six hours. As with all government offices, Saudi Aramco closes Thursdays and Fridays.

Advertising and technical seminars are the most important tools to promote and market U.S. oil and gas equipment, parts and services to Saudi Arabia's oil and gas industry. Most dealers advertise through local newspapers, specialty magazines and journals.

Recently, Saudi Aramco's Materials Supply Division invited its national suppliers to a meeting on E-commerce. Officials at the Materials Supply Division announced that they plan to make E-commerce the company's preferred way of conducting business. They will introduce new strategies and implement best industry practices into its operations to meet customer demand for better services at the least cost. They stressed the need for Saudi Aramco's suppliers to allocate resources and develop their skills to implement supply chain management processes and systems, and to build information technology infrastructure. Materials Supply plans to expand the local delivery order and receipt (LDOR) system and E-commerce, and use long-term frame agreements for strategic commodities.

- Financing

Saudi Arabia does not restrict foreign currency exchange or repatriation of foreign capital invested locally. Saudi Aramco pays local and foreign suppliers within 40 days from the date of delivery of the goods to the company's designated destinations. Payment procedures differ, however, to contractors and engineering firms. The method of payment for a project is usually outlined in the contract. Saudi Aramco's

payment will be based on a project schedule and work progress. Low oil prices in 1998 and most of 1999 have affected Saudi Aramco's budget and in-house financing. To help finance its capital-spending program, Saudi Aramco seeks syndicated loans in the international market. U.S. suppliers of goods and services are advised to seek counsel with their bankers or the U.S. Export-Import Bank on matters related to credit, project financing, insurance, and guarantees. Sales of equipment and parts should be conducted through letters of credit, although other payment arrangements can be used depending on the business relation between the two parties.

### **Oil & Gas Fields**

#### **Oil & Gas Reserves**

Oil reserves were estimated at 263,500 million barrels in 1997, which is equal to 37.2 % of the total world reserves. With an oil production limited by the new OPEC quota to 8.76 million bpd, the reserves are expected to last another 88 years. The reserves are the largest of any country in the world.

Gas reserves are estimated at 207.5 trillion cu ft, including 3.5 trillion cu ft of reserves in the Partitioned Zone, as of 1st January 1998. The estimate was announced by the Oil Minister in January 1998.

**Distribution of Oil & Gas Reserves in Saudi Arabia**

| Country      | Oil / Million Barrels | Gas / Trillion Cu ft (Tcf) |
|--------------|-----------------------|----------------------------|
| Saudi Arabia | 263,500               | 207.5                      |

#### **Oil & Gas Fields**

The OPEC specified ceiling for oil production is now 27.5 million bpd. The three main types of crude oil currently being developed in the Saudi Arabian oil fields are Arab Heavy (27), Arab Medium (31), and Arab Light (34).

### **Distribution of the Major Gas Fields in Saudi Arabia**

| Type of Crude                               | Major Fields                             | Capacity   |
|---|--|--|
| Arab Super Light (ASL) Crude                | Hawtah<br>Ghinah<br>Umm Jurf<br>Hazmivah | All fields together produce 200,000 b/d            |
| Berri Extra Light Crude<br>(38 degrees API) | Abqaiq<br>Berri                          | 650,000 b/d<br>300,000 b/d                         |
| 41.5 degrees API<br>Shaybah Crude           | Shaybah (due to come on-stream in 1998)  | Start up rate - 200,000 b/d<br>Maximum 500,000 b/d |
| Arab Heavy Crude                            | Zuluf                                    | 700,000 b/d  |

|                   |        |             |
|-------------------|--------|-------------|
| Arab Medium Crude | Marjan | 600 000 b/d |
|-------------------|--------|-------------|

Berri Extra Light is set to be replaced once the Shaybah field comes on stream and will be replaced by a new blend called Shaybah. The new blend will be made up of 37.04% Shaybah crude, 22.22% Berri and 40.74% Abqaiq.

Exploration for new structures are being continued by Aramco. One of the major exploration works being the seismic surveys of Khafji and Hont fields being conducted by the Arabian Oil Company for a cost of 15 million dollars.

Financial constraints have led to cutting back on the exploration operations. But it should be noted that with the existing production capacity, pressures for discovering new zones are insignificant.

The gas reserves discovered during 1994 were the Deep Khuff in the eastern flank of Ghawar field, and the Pre-Khuff producing sour gas, sweet gas and condensate accumulations.

### **Distribution of Oil Reserves**

The oil reserves in Saudi Arabia are due to last well into the next century, as the major fields have very high capacities. The major fields are detailed below along with information regarding reserves in billion barrels per day.

#### **Distribution of Oil Reserves in Saudi Arabia**

| Field                 | Reserves ( In Barrels/Day )  | Remarks                         |
|-----------------------|------------------------------|---------------------------------|
| Ghawar                | 70.0 billion barrels         | World's largest onshore field.  |
| Safaniya              | 19.0 billion barrels         | World's largest offshore field. |
| Abqaiq                | 17.0 billion barrels         |                                 |
| Shaybah               | 14.0 billion barrels         |                                 |
| Berri                 | 11.0 billion barrels         |                                 |
| Manifa                | 11.0 billion barrels         |                                 |
| Zuluf                 | 8.0 billion barrels          |                                 |
| Abu Saafa             | 6.0 billion barrels          |                                 |
| <b>TOTAL RESERVES</b> | <b>156.0 billion barrels</b> |                                 |

As evident from the table given below, oil production in Saudi Arabia has remained stable during recent years, in order to stay in line with the OPEC quota of 8.76 million bpd. The current production capacity hovers around 10 million bpd.

#### **Oil Refineries in Saudi Arabia**

| Client              | Location                 | Shareholder | Capacity    |
|---------------------|--------------------------|-------------|-------------|
| Arabian Oil Company | Khafji, partitioned zone | 100%        | 30,000 bpd  |
| Saudi Aramco        | Yanbu                    | 100%        | 190,000 bpd |
| Saudi Aramco Mobil  | Riyadh                   | 100%        | 120,000 bpd |
|                     | Jeddah                   | 100%        | 105,000 bpd |
|                     | Rabigh                   | 100%        | 325,000 bpd |
|                     | Ras Tanura               | 100%        | 300,000 bpd |
|                     | Yanbu                    | 100%        | 350,000 bpd |

|   |                        |                          |                      |
|---|------------------------|--------------------------|----------------------|
| Refinery Co.<br>Saudi Aramco Shell Refinery | Jubail                 | Mobil -50%<br>Aramco-50% | 300,000 bpd          |
|   |                        | Shell -50%               |                      |
|   | <b>Total Capacity:</b> |                          | <b>1,720,000 bpd</b> |

In order to keep pace with the rising local product demand and to boost middle distillate exports, Saudi Arabia is spending more than \$ 3 billion in upgrading its refineries. This included boosting the capacity at the Ras Tanura plant from the present 265,000 bpd to 300,000 bpd and a \$1.7 billion programme that will upgrade and debottleneck what is currently a simple topping plant with runs restricted to around 250,000 bpd.

In addition, overseas interests include a 1 million bpd capacity in South Korea, United States, Philippines, China and Greece. Plans for expansion of these facilities are underway and is negotiating new ventures in India, China and Thailand.

### **SUMMARY**

Many developing countries, rich in natural resources, have welcomed private investment in their oil, gas, and mining industries. Although projects in the extractive industries can have a serious environmental impact and be socially disruptive as well—particularly if people must be resettled to make way for them—they can make a significant contribution to the economic development of host countries if their adverse consequences are minimized through careful planning. Because they generate sizable revenues, create jobs and business opportunities, and often bring new roads and access to water and power to the isolated rural areas in which they are typically located, they have the potential to stimulate economic growth, reduce poverty, and raise living standards. In addition, host countries benefit from being exposed to best international practices in project planning and implementation and forced to build up their administrative and institutional capacity. Frequently, however, national governments reap the most benefit from these projects, while social and environmental costs tend to be borne by local communities.