August 2005

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Saudi Arabia

With one-fourth of the world's proven oil reserves and some of the lowest production costs, Saudi Arabia is likely to remain the world's largest net oil exporter for the foreseeable future. During January-May 2005, Saudi Arabia supplied the United States with 1.5 million barrels per day of crude oil, or 15%, of U.S. crude oil imports during that period.

Information contained in this report is the best available as of August 2005.

GENERAL BACKGROUND

With oil export revenues making up around 90-95 percent of total Saudi export earnings, 70-80 percent of state revenues, and around 40 percent of the country's gross domestic product (GDP), Saudi Arabia's economy remains, despite attempts at diversification, heavily dependent on oil (although investments in petrochemicals have increased the relative importance of the downstream petroleum sector in recent years).

The combination of relatively high oil prices and exports led to a revenues windfall for Saudi Arabia during 2004 and early 2005. For 2004 as a whole, Saudi Arabia earned about $116 billion in net oil export revenues, up 35 percent from 2003 revenue levels. Saudi net oil export revenues are forecast to increase in 2005 and 2006, to $150 billion and $154 billion, respectively, mainly due to higher oil prices. Increased oil prices -- and revenues -- since the price collapse of 1998 have significantly improved Saudi Arabia's economic situation, with real GDP growth of 5.2 percent in 2004, and forecasts of 5.7 percent and 4.8 percent growth for 2005 and 2006, respectively.

For fiscal year 2004, Saudi Arabia originally had been expecting a budget deficit. However, this was based on an extremely conservative price assumption of $19 per barrel for Saudi oil -- and assumed production of 7.7 million bbl/d. Both of these estimates turned out to be far below actual levels. As a result, as of mid-December 2004, the Saudi Finance Ministry was expecting a huge budget surplus of $26.1 billion, on budget revenues of $104.8 billion (nearly double the country's original estimate) and expenditures of $78.6 billion (28 percent above the approved budget levels). This surplus is being used for several purposes, including: paying down the Kingdom's public debt (to $164 billion from $176 billion at the start of 2004); extra spending on education and

development projects; increased security expenditures (possibly an additional $2.5 billion dollars in 2004; see below) due to threats from terrorists; and higher payments to Saudi citizens through subsidies (for housing, education, health care, etc.). For 2005, Saudi Arabia is assuming a balanced budget, with revenues and expenditures of $74.6 billion each.

In spite of the recent surge in its oil income, Saudi Arabia continues to face serious long-term economic challenges, including high rates of unemployment (around 13 percent of Saudi nationals, possibly higher), one of the world's fastest population growth rates, and the consequent need for increased government spending. All of these place pressures on Saudi oil revenues. The Kingdom also is facing serious security threats, including a number of terrorist attacks (on foreign workers, primarily) in 2003 and 2004. In response, the Saudis reportedly have ramped up spending in the security area (reportedly by 50 percent in 2004, from $5.5 billion in 2003). Saudi Arabia's per capita oil export revenues remain far below high levels reached during the 1970s and early 1980s. In 2004, Saudi Arabia earned around $4,564 per person, versus $22,589 in 1980. This 80 percent decline in real per capita oil export revenues since 1980 is in large part due to the fact that Saudi Arabia's young population has nearly tripled since 1980, while oil export revenues in real terms have fallen by over 40 percent (despite recent increases). Meanwhile, Saudi Arabia has faced nearly two decades of heavy budget and trade deficits, the expensive 1990/1991 war with Iraq, and total public debt of around $175 billion. On the other hand, Saudi Arabia does have extensive foreign assets -- around $110 billion -- which provide a substantial fiscal "cushion."

Movement towards economic reform (e.g., reducing subsidies) in Saudi Arabia remains uneven at best. In addition, the countryalso made only slow progress on another of its main domestic goals -- attracting foreign direct investment (FDI). In January 2004, the Saudi cabinet approved a reduction in taxes on foreign direct investment (to 20 percent in most sectors; 30 percent in the natural gas sector) as part of an effort to speed up the economic reform and privatization process in the country.

Currently, large state corporations, like oil firm Saudi Aramco (which has a monopoly on Saudi upstream oil development, workforce of 54,000, and controls 98 percent of the country's oil reserves) and the Saudi Basic Industries Corporation (SABIC; the world's 11th largest petrochemical producer) dominate the Saudi economy. To date, there has not been a single sale of state assets to private control, and privatization largely has been limited to allowing private firms to take on certain service functions. In May 2002, Saudi Oil Minister Ali Naimi (reappointed in May 2003 for a third, four-year term) stated that the country was considering privatizing some operations of Saudi Aramco. One impetus for Saudi privatization is its desire to join the World Trade Organization (WTO), but progress has been slow towards achieving this goal, and there were no signs of an imminent breakthrough as of December 2004.

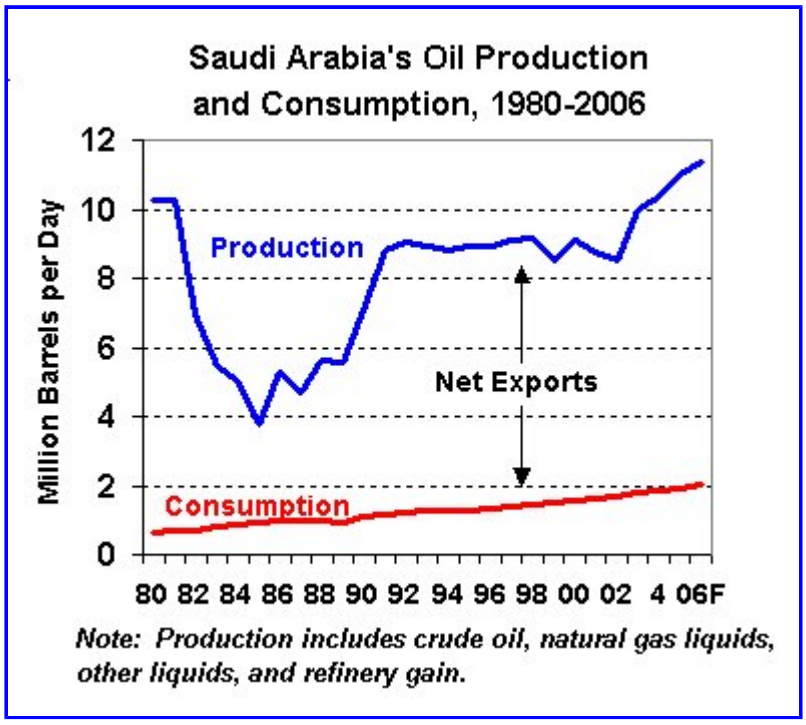
In general, Saudi Arabia also has moved cautiously and slowly towards government subsidy cuts, tax increases, or financial sector reforms. Saudi leadership (King Abdullah, in particular) has indicated that it sees privatization -- although controversial -- as a "strategic choice," and has created (in August 1999) a "Supreme Economic Council" charged with boosting investment, creating jobs for Saudi nationals, and promoting privatization. In May 2000, a new law aimed at attracting foreign investment to the Saudi energy sector came into effect. The law permits full foreign ownership of Saudi property and licensed projects, sets up the General Investment Authority (SAGIA) as a "one-stop shop" for foreign investors, and reduces taxes on company profits from 45 percent to 30 percent. Previously, foreign companies were limited to a 49 percent share of joint ventures with Saudi domestic partners. Several important sectors, however, remain closed to 100 percent foreign ownership, including (as of July 2005): upstream oil, pipelines, media and publishing, insurance, telecommunications, defense and security, and more. Thus, the foreign investment law is far less attractive than it appears at first glance.

In November 1999, former King Fahd, who died on August 1, 2005, stated that "the world is heading for...globalization" and that "it is no longer possible for [Saudi Arabia] to make slow progress." In the context of successfully becoming integrated into the global economy, Fahd also emphasized the importance of regional unity among Gulf states -- economically, politically, and militarily. Along these lines, a customs union among GCC countries was agreed upon at the December 1999 GCC summit and came into effect in 2003. The GCC has also agreed to form a common currency by 2010.

In a treaty signed in June 2000, Saudi Arabia and Yemen agreed on the delineation of sections of their common border which had been in dispute since the 1930s. The deal is expected to open up opportunities for increased Saudi trade and investment in Yemen, a possible pipeline across Yemen to the Arabian Sea (see below for more details), and the possible award of oil and gas exploration rights for areas in Yemen adjacent to previously disputed areas of the border. In February 2001, Saudi Arabia and Syria signed a bilateral free-trade agreement. On June 11, 2001, Saudi Arabia announced (in a letter to UN Secretary General Kofi Annan) that it was taking ownership of Iraq's pipeline to the Saudi Red Sea coast (closed since August 1990), saying that Iraq's behavior had "destroyed any rationale for maintaining the [pipeline] facilities."

OIL

According to the *Oil and Gas Journal*, Saudi Arabia contains 261.9 billion barrels of proven oil reserves (including 2.5 billion barrels in the Saudi-Kuwaiti Divided, aka "Neutral" Zone), around one-fourth of proven, conventional world oil reserves. Around two-thirds of Saudi reserves are considered "light" or "extra light" grades of oil, with the rest either "medium" or "heavy." Although Saudi Arabia has around 80 oil and gas fields (and over 1,000 wells), more than half of its oil reserves are contained in only eight fields, including Ghawar (the world's largest oil field, with estimated remaining reserves of 70 billion barrels) and Safaniya (the world's largest offshore oilfield, with estimated reserves of 35 billion barrels). Ghawar's main producing structures are, from north to south: Ain Dar, Shedgum, Uthmaniyah, Hawiyah, and Haradh. Ghawar alone accounts for about half of Saudi Arabia's total oil production capacity.



Saudi Arabia is the world's leading oil producer and exporter, and its location in the politically volatile Gulf region adds an element of concern for its major customers, including the United States. Saudi Arabia maintains crude oil production capacity of around 10.5-11.0 million bbl/d, and claims that it is "easily capable" of producing up to 15 million bbl/d in the future and maintaining that production level for 50 years. In June 2005, Saudi Aramco's senior vice president of gas operations, Khalid al-Falih, stated that Saudi Arabia would raise production capacity to more than 12 million bbl/d by 2009, and then possibly to 15 million bbl/d "if the market situation justifies it." Falih added

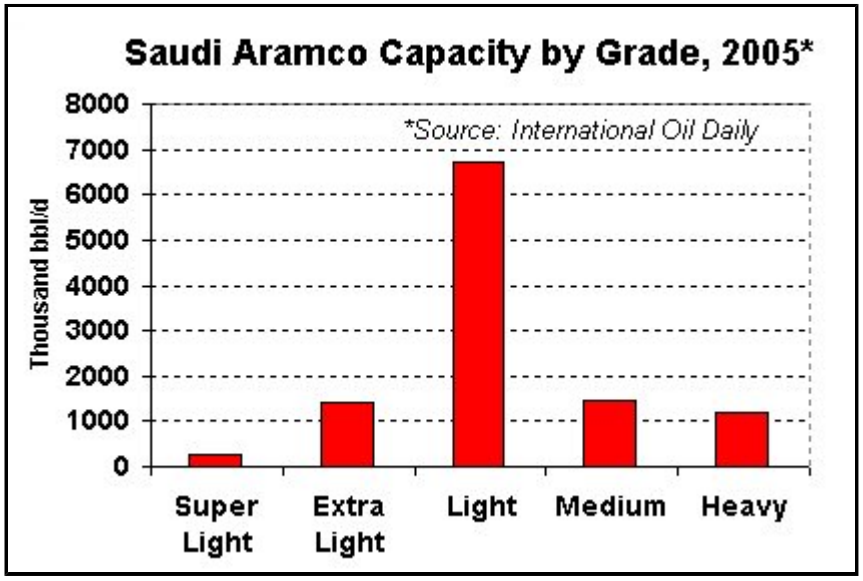
that by 2006, Saudi Arabia would have 90 drilling rigs in the Kingdom, more than double the number of rigs operating in 2004.

One challenge for the Saudis in achieving this objective is that their existing fields sustain 5 percent-12 percent annual "decline rates," (according to Aramco Senior Vice President Abdullah Saif, as reported in *Petroleum Intelligence Weekly* and the *International Oil Daily*) meaning that the country needs around 500,000-1 million bbl/d in new capacity each year just to compensate.

Aramco estimates that the average total depletion for Saudi oil fields is 28 percent, with the giant Ghawar field having produced 48 percent of its proved reserves. Aramco also claims that, if anything, Saudi oil reserves are underestimated, not overestimated. Some outside analysts, notably Matthew Simmons of Houston-based Simmons and Company International, have disputed Aramco's optimistic assessments of Saudi oil reserves and future production, pointing to -- among other things -- more rapid depletion rates and a higher "water cut" than the Saudis report.

Production

For January-July 2005, EIA estimates that Saudi Arabia produced around 10.9 million bbl/d of total oil -- including crude oil, natural gas liquids, and "other liquids"oil, and also including half of the Saudi-Kuwaiti Divided Zone's 610,000 bbl/d). This was up sharply from Saudi Arabia's 8.5 million bbl/d of total oil production in 2002 (see graph). Currently, Saudi Arabia is estimated to be producing around 9.6 million bbl/d of crude oil, well in excess of its current quota level of 9.099 million bbl/d (effective July 1, 2005). In addition to crude oil, Saudi Arabia produces around 1.3 million bbl/d of natural gas liquids (NGLs) and "other liquids," not subject to OPEC quotas.



Saudi Arabia produces a range of crude oils, from heavy to super light. Of Saudi Arabia's total oil production capacity, about 65 percent-70 percent is considered light gravity, with the rest either medium or heavy; the country is moving to reduce the share of the latter two grades. Lighter grades generally are produced onshore, while medium and heavy grades come mainly from offshore fields.

The Ghawar field is the main producer of 34^{o} API Arabian Light crude, while Abqaiq (a super-giant field with 17 billion barrels of proven reserves) produces 37^{o} API Arab Extra Light crude. Since 1994, the Hawtah Trend (also called the Najd fields), which includes the Hawtah field and smaller satellites (Nuayyim, Hazmiyah) south of Riyadh, has been producing around 200,000 bbl/d of 45^{o}-50^{o} API, 0.06 percent sulphur, Arab Super Light. Offshore production includes Arab Medium crude from the Zuluf (over 500,000 bbl/d capacity) and Marjan (270,000 bbl/d capacity) fields and Arab Heavy crude from the Safaniya field. Most Saudi oil production, except for "extra light" and "super light," is considered "sour," containing relatively high levels of sulfur.

Saudi Arabia's long-term goal is to further develop its lighter crude reserves, including the Shaybah

field, located in the remote Empty Quarter area bordering the United Arab Emirates. (In June 2005, the UAE said it wanted to amend a 1974 border pact which gave the Saudis rights to Shaybah, which lies 80 percent in Saudi territory and 20 percent in UAE). Shaybah contains an estimated 15.7 billion barrels (or higher) of premium grade 41.6^{o} API sweet (nearly sulfur-free) Arab Extra Light crude oil, with production as of May 2005 at around 500,000 bbl/d. Overall, the Shaybah project cost around $2.5 billion, with production starting in July 1998. According to Oil Minister Naimi (October 1999), the development of Shaybah showed that "the cost of adding...capacity - that is, all the infrastructure, producing and transportation facilities - necessary to produce one additional barrel of oil per day in Saudi Arabia is, at most, $5,000 compared to between $10,000 and $20,000 in most areas of the world." Plans are to increase Shaybah output by as much as 300,000 bbl/d in the next few years.

The Shaybah complex includes three gas/oil separation plants (GOSPs) and a 395-mile pipeline to connect the field to Abqaiq, Saudi Arabia's closest gathering center, for blending with Arab Light crude (Berri and Abqaiq streams). In addition to oil, Shaybah has a large natural gas "cap" (associated gas), with estimated reserves of 25 trillion cubic feet (Tcf). Gas production of 880 million cubic feet per day (Mmcf/d) is reinjected, along with natural gas liquids (NGLs). A possible gas recovery project could be implemented within 5 or 6 years, potentially for use in petrochemical production.

In March 2002, Aramco awarded major turnkey contracts to Italy's Snamprogetti ($630 million) and Technip-Coflexip ($360 million) aimed at increasing total Saudi oil production capacity by 800,000 bbl/d (500,000 bbl/d of Arabian light and 300,000 bbl/d of Arabian medium). The $1.2 billion project, known as the Qatif producing facilities development program (QPFDP), involved construction of two gas-oil separation plants (GOSPs), as well as gas treatment and oil stabilization facilities, for the Qatif and Abu Saafa oilfields. Additional Qatif and Abu Saafa production had been slated to replace production elsewhere in Saudi Arabia, not to boost overall capacity, although recently this issue has been thrown into some question as the Saudis attempt to maintain a spare capacity cushion in the face of rapidly growing world oil demand. As of December 2004, Saudi Arabia reportedly had brought production from Qatif and Abu Saafa online.

Another project, at the Khurais field west of Ghawar, could increase Saudi production capacity (of Arab Light) by 1.2 million bbl/d at a cost of $3 billion. This is to involve installation of four GOSPs, with a capacity of 200,000 bbl/d each, at Khurais, which first came online in the 1960s but was mothballed by Aramco.

Several other fields -- Abu Hadriya (1.8-2.0 billion barrels in reserves), Fadhili (1-1.4 billion barrels), Harmaliyah, Khursaniyah (3.5 billion barrels), and Manifa -- were mothballed by the Saudis during the the 1990s, but could be brought back online given high world oil demand and the desire to maintain Saudi spare production capacity. In particular, Saudi Aramco appears to be pushing ahead with development of the Abu Hadriya, Fadhili and Khursaniya (AFK) onshore fields. In March 2005, the Saudis awarded eight contracts for work at Khursaniya and also at Hawiya (see below). The Saudis reportedly have "fast tracked" development at AFK. Production of 500,000 bbl/d (medium, 35^{o} API) of Arab Light from the AFK fields could begin in late 2007. Besides AFK, the Saudis are planning to increase Arab Light production from the 1-billion-barrel Nuayyim onshore field by 100,000 bbl/d in 2009.

The $280 million Haradh-3 project aims to increase production capacity at the Haradh oil field to 900,000 bbl/d by February 2006. This will involve adding a third, 300,000-bbl/d GOSP to Haradh (in addition to two other 300,000-bbl/d GOSPs, one of which was inaugurated in January 2004).

Haradh also will produce significant volumes of non-associated natural gas, natural gas condensates (perhaps 170,000 bbl/d), and sulfur. The project is being carried out by Aramco, along with private companies like Foster-Wheeler.

Saudi-Kuwaiti Divided Zone; Bahrain

The Saudi-Kuwait Divided Zone contains about 5 billion barrels of proven oil reserves. Within the Divided Zone, Japan's Arabian Oil Co. (AOC) traditionally had operated two offshore fields (Khafji and Hout) with 300,000 bbl/d in production, but in February 2000, it lost the concession (in January 2003, AOC reached an agreement with Kuwait on the right to purchase at least 100,000 bbb/d of crude for the next 20 years from Khafji). The offshore Saudi Divided Zone had represented Japan's most significant upstream oil interest, with 80 percent of revenues going to AOC and 10 percent each to Saudi Arabia and Kuwait. ChevronTexaco, meanwhile, operates three onshore fields (Wafra, South Fawaris, and South Umm Gudair) in the Divided Zone. Saudi Arabia had stated that it wanted AOC and Japan to increase their investments in Saudi Arabia (including more than $1 billion in a railway linking remote mining areas to export terminals), as well as their purchases of Saudi oil, as a condition for renewal of AOC's drilling rights in the Divided Zone. Efforts to negotiate an extension with Saudi authorities failed when Japan refused to commit to investment in development projects desired by the Saudis. Saudi Aramco has taken over operation of the former AOC fields.

Besides the Kuwaiti-Saudi Divided Zone, Saudi Arabia also produces oil jointly with Bahrain, from the Abu Saafa offshore oilfield. As a way of supporting their neighbor's economy, since 1996 the field's Saudi administrators had donated all of the income from its 150,000 bbl/d of production to Bahrain. However, in late 2004, with output from Abu Saafa doubling to 300,000 bbl/d, the Saudis apparently reduced this share to 50 percent. In addition, Bahrain traditionally has received around 50,000 bbl/d of Saudi oil from other fields, apparently at a significant discount. The Abu Saafa pipeline passes through this area on its way to Bahrain. It now appears that the Saudis have stopped supplying that oil to Bahrain.

Exports, Ports, Pipelines, Shipping

Saudi Arabia is a key oil supplier to the United States and Europe. Asia (e.g., China, Japan, South Korea, India) now takes around 60 percent of Saudi Arabia's crude oil exports, as well as the majority of its refined petroleum product exports. During the first five months of 2005, Saudi Arabia exported 1.57 million bbl/d of oil (of which 1.51 million bbl/d was crude) to the United States. For this time period, Saudi Arabia ranked fourth (after Canada, Mexico, and Venezuela) as a source of total (crude plus refined products) U.S. oil imports, and third for crude only. Saudi Arabia is eager to maintain and even expand its market share in the United States for a variety of economic and strategic reasons. During the first five months of 2005, Saudi Arabia's share of U.S. crude oil imports was 14.9 percent, up from 13.9 percent during the first five months of 2004.

Most of Saudi Arabia's crude oil is exported from the Persian Gulf via the huge Abqaiq processing facility, which handles around two-thirds or so of the country's oil output. Saudi Arabia's primary oil export terminals are located at Ras Tanura (6 million bbl/d capacity; the world's largest offshore oil loading facility) and Ras al-Ju'aymah (3 million bbl/d) on the Persian Gulf, plus Yanbu (as high as 5 million bbl/d) on the Red Sea. Combined, these terminals appear capable of handling around 14 million bbl/d, around 3.0-3.5 million bbl/d higher than Saudi crude oil production capacity (10.5-11.0 million bbl/d), and about 4 million bbl/d in excess of Saudi crude oil production during the first half of 2005. Despite this excess capacity, there have been reports that the Saudis are planning to conduct a feasibility study on construction of an oil pipeline from the Empty Quarter of southeastern Saudi Arabia through the Hadramaut in Yemen to the Arabian Sea.

Saudi Arabia operates two major oil pipelines. The 5-million-bbl/d East-West Crude Oil Pipeline (Petroline), operated by Aramco since 1984 (when it took over from Mobil), is used mainly to transport Arabian Light and Super Light to refineries in the Western Province and to Red Sea terminals for export to European markets. The Petroline was constructed in 1981, with initial capacity of 1.85 million bbl/d on a single, 48-inch line (AY-1). The Petroline was expanded in 1987, during the height of the Iran-Iraq war (and specifically the so-called "tanker war" in the Gulf), to 3.2 million bbl/d, with the addition of a parallel ("looped") , 56-inch line (AY-1L). Finally, in 1993, Petroline capacity was increased to 5.0 million bbl/d by adding significant pumping capability on the line. Reportedly, the Saudis expanded the Petroline in part to maintain Yanbu as a strategic option to Gulf port facilities in the event that exports were blocked at that end.

In purely economic terms, Yanbu remains a far less economical option for Saudi oil exports than Ras Tanura. Among other factors, shipments from Yanbu add about 5 days roundtrip travel time for tankers through the Bab al-Mandab strait to major customers in Asia compared to Ras Tanura (via the Strait of Hormuz). In addition, according to Oil Minister Naimi, the Petroline is only utilized at half capacity.

Running parallel to the Petroline is the 290,000-bbl/d Abqaiq-Yanbu natural gas liquids pipeline, which serves Yanbu's petrochemical plants. The Trans-Arabian Pipeline (Tapline) to Lebanon is mothballed, and the 1.65-million-bbl/d, 48-inch Iraqi Pipeline across Saudi Arabia (IPSA), which runs parallel to the Petroline from pump station #3 (there are 11 pumping stations along the Petroline, all utilizing on-site gas turbine electric generators) to the port of Mu'ajjiz, just south of Yanbu, was closed indefinitely following the August 1990 Iraqi invasion of Kuwait. In June 2001, Saudi Arabia seized ownership of IPSA "in light of the Iraqi government's persistence in its stands." Theoretically, IPSA could be used for Saudi oil transport to the Red Sea, although the Saudis have stated that "there are no plans" to do so. According to Oil Minister Naimi, Saudi Arabia has "surplus oil export and pipelines capacity...[including the] East-West oil pipeline system [which] can carry and deliver 5 million bbl/d" but is being run at "only half capacity."

Aramco's shipping subsidiary Vela has around 20 VLCC's (very large crude carriers) and 4 ULCC's (ultra large crude carriers), carrying a significant proportion of Saudi oil exports. In September 2004, the Saudis placed a $200 million for two VLCCs from Hyundai Heavy Industry, with delivery expected in 2007. In addition to tankers, Aramco owns or leases oil storage facilities around the world, in places like Rotterdam, Sidi Kerir (the Sumed pipeline terminal on Egypt's Mediterranean coast), South Korea, the Philippines, the Caribbean, and the United States.

Refining

Saudi Arabia has eight refineries, with combined crude throughput capacity of around 1.75 million bbl/d, plus around 1.6 million bbl/d of refining capacity overseas. The Rabigh refinery on the Red Sea coast is slated for upgrade, with plans to shift the refinery's product slate away from low-value heavy products towards gasoline and kerosene. In addition, there is talk of building a $4 billion, 400,000-bbl/d heavy conversion export refinery in Yanbu.

In July 2004, Aramco signed an agreement with Shell to purchase a 9.96 percent share in Showa Shell Group, a refining and marketing company based in Japan. Under the deal, Aramco will supply Showa Shell with 300,000 bbl/d of crude oil. In March 2005, Saudi Arabia and India signed an agreement on oil cooperation, with the Saudis reportedly interested in acquiring a stake in the 300,000-bbl/d Paradip refinery and the 152,000-bbl/d Vizakh refinery in India. Saudi Aramco also is reported to be considering a forward oil stockpile and a 400,000-bbl/d, $3 billion refinery in India. In July 2005, a new, $3.6 billion refinery and petrochemical plant complex was inaugurated in Fujian, China. The facility is a joint venture between Sinopec (50 percent), ExxonMobil (25

percent), and Saudi Aramco (25 percent). Crude oil for the plant is to be supplied by Saudi Arabia. Aramco reportedly is in talks with Sinopec on building a second major Chinese refinery, in the northern province of Shandong. Both plants will be able to handle high sulphur ("sour") oils, which is important because there is a dearth of such capacity worldwide.

Security Issues

In December 2004, an attack on the U.S. consulate in Jeddah killed five staff members. In the same month, two car bombs exploded in Riyadh, wounding several people. During the first two weeks of June 2004, several Westerners were murdered, including one who was kidnapped and beheaded. Even before these recent attacks, several terrorist incidents in April and May 2004 (at ABB Lummus offices in Yanbu, security headquarters in Riyadh, and a residential compound in Khobar) had raised concerns about security in the Kingdom. Specifically, these concerns centered around Saudi oil facilities as well as the 3,000 Western oil workers in the Kingdom. Meanwhile, in mid-December 2004, a Saudi branch of al-Qaeda posted a message on its website urging its members to "strike all foreign targets and the hideouts of the tyrants to rid the peninsula of the infidels and their supporters."

In late April 2004, Aramco's Chief Executive, Abdullah Jumah, said that "there is nowhere in the world that oil facilities are protected as well as in Saudi Arabia." According to Jumah, Aramco employs 5,000 security guards to protect oil facilities. In addition, the Saudi National Guard, regular Saudi military forces, and Interior Ministry officers are tasked with protecting oilfields, pipelines (the country has around 10,000 miles), ports (Ras Tanura, Al Juaymah, Yanbu), refineries, and other oil facilities (gathering centers, gas-oil separation plants, etc.). In May 2004, Nawaf Obaid, an advisor to the Saudi royal family, said that the Saudi government had added $750 million to its security budget over the past two years to beef up security in the oil sector. According to Obaid, the Saudis spent $5.5 billion in 2003 on oil security. In addition to direct security, Saudi Arabia is known to maintain "redundancy" (i.e., multiple options for transportation and export) in its oil system, in part as a form of indirect security against any one facility being disabled.

NATURAL GAS

According to *Oil and Gas Journal*, Saudi Arabia's proven natural gas reserves are estimated at 235.0 trillion cubic feet (Tcf), ranking fourth in the world (after Russia, Iran, and Qatar), and up about 5 Tcf from 2002. Most (around 60 percent) of Saudi Arabia's currently proven natural gas reserves consist of associated gas, mainly from the onshore Ghawar field and the offshore Safaniya and Zuluf fields. The Ghawar oil field alone accounts for one-third of the country's proven natural gas reserves. However, it is important to note that only 15 percent of Saudi Arabia has been "adequately explored for gas," according to Aramco.

Most new associated natural gas reserves discovered in the 1990s have been in fields which contain light crude oil, especially in the Najd region south of Riyadh. Most of Saudi Arabia's non-associated gas reserves (Mazalij, Al-Manjoura, Shaden, Niban, Tinat, Al-Waar, etc.) are located in the deep Khuff reservoir, which underlies the Ghawar oil field. Natural gas also is located in the countries extreme northwest, at Midyan, and in the Empty Quarter (Rub al Khali) in the country's southeastern desert. The Rub al Khali alone is believed to contain natural gas reserves as high as 300 Tcf. In June 2004, gas was discovered at the Fazran 23 well located near Dhahran.

Another large natural gas field, called Dorra, is located offshore near the Khafji oil field in the Saudi-Kuwaiti Divided Zone and may be developed by Japan's AOC. Dorra development is controversial, however, because part of it is also claimed by Iran (which calls the field Arash). The maritime border between Kuwait and Iran remains undemarcated, but Saudi Arabia reached an agreement with Kuwait in July 2000 to share Dorra equally. Currently, Iran is resisting any moves

by Kuwait and Saudi Arabia to develop the field on their own.

In June 2003, Saudi Oil Minister Naimi officially announced termination of negotiations with foreign energy companies on the $15-$20 billion "Saudi Gas Initiative" (SGI), which had promised to be the first major reopening of Saudi Arabia's upstream hydrocarbons sector to foreign investment since nationalization in the 1970s. Companies which had been selected (in 2001) for the three "core ventures" under the SGI were: 1) South Ghawar -- ExxonMobil (35 percent), Shell (25 percent), BP (25 percent), Phillips (15 percent); 2) Red Sea -- ExxonMobil (60 percent), plus Marathon (20 percent) and Occidental (20 percent); and 3) Shaybah -- Shell (40 percent), Total (30 percent), and Conoco (30 percent). The SGI had aimed to increase foreign investment and natural gas development in the country, while integrating upstream gas development with downstream petrochemicals, power generation, and water desalination. SGI had been seen as the key to Saudi Arabia's entire foreign investment strategy. However, negotiations broke down over two major stumbling blocks: the extent of gas reserves to be opened to upstream development and whether or not this should include gas from the Saudi Aramco Reserve Area (SARA); and the rates of return to participating companies (the companies wanted a significantly higher rate than the Saudis were offering).

Core Venture 1, in South Ghawar, would have been one of the world's largest ($15 billion) integrated natural gas projects, including exploration, pipelines, two gas-fired power plants, two petrochemical plants, two desalination units, and more. Core Venture 2 was to involve exploration in the Red Sea, development of the Barqan and Midyan fields on the Red Sea coast in northwestern Saudi Arabia, as well as construction of a petrochemical plant, a power station, desalination capacity, etc., at a cost of $4 billion. Core Venture 3 would have involved exploration near Shaybah in the Empty Quarter, development of the Kidan gas field, laying of pipelines from Shaybah to the Haradh and Hawiyah natural gas treatment plants east of Riyadh, and construction of a petrochemical plant in Jubail, at a cost of $4 billion.

Following cancellation of the SGI, Saudi Arabia repackaged the project as a series of smaller, more focused contracts, with better rates of return than previously offered. At the same time, the Saudis moved away from the integrated upstream/downstream gas, water, power, and petrochemical nature of the SGI, and instead specifically targeted upstream natural gas development in the area that had comprised Core Venture 3. Downstream and "midstream" elements of the SGI will now be handled separately, in large part by SABIC and Aramco. In July 2003, Saudi Arabia reached a tentative deal (officially signed on November 15) with Royal Dutch/Shell and Total on Blocks 5-9 and 82-85 in the Shaybah and Kidan areas of the Empty Quarter region. Besides the major European companies, Saudi Aramco -- replacing ConocoPhillips -- will have a 30 percent share in the $2 billion project. Shell will maintain a 40 percent share and Total the remaining 30 percent, in a consortium known as the South Rub al-Khali Company (SRAK). The deal covers an area of 81,000 square miles.

In January 2004, Russia's Lukoil won a tender to explore for and produce non-associated natural gas in the Saudi Empty Quarter. Lukoil will operate in Block A, near Ghawar, as part of an 80/20 joint venture (called "Luksar") with Saudi Aramco. Also in January 2004, China's Sinopec won a tender for gas exploration and production in Block B, while an Eni-Repsol consortium was granted a license to operate in Block C. Under terms of the agreements, Aramco will take "sales quality gas" on a take-or-pay basis for $0.75 per million Btu, while condensates and natural gas liquids will be sold at international market rates (note: Saudi accession to the WTO will most likely require it to give up the dual pricing system for natural gas, and also to set up a comprehensive, transparent regulatory framework for the natural gas sector). In addition, the Saudi government will fund a pipeline connection from the country's Master Gas System (MGS) to contract delivery points.

In October 2002, construction was completed on a $4 billion, 1.4-billion-cubic-feet (Bcf)-per-day, non-associated gas processing plant at Hawiyah, located south of Dhahran and east of Riyadh near the giant Ghawar oil field. Hawiyah represents the largest Saudi natural gas project in more than 10 years, and the first to process only non-associated gas (from the deep Khuff and Jauf reservoirs). Hawiyah was officially inaugurated in October 2002, and reportedly is producing enough natural gas to free up around 260,000 bbl/d of Arabian Light crude oil for export. Aramco also has invited bids to expand Hawiyah to recover "hundreds of thousands of barrels daily of additional petrochemical feedstock," primarily NGLs from the treatment of 4 billion cubic feet (Bcf) per day of natural gas. In March 2005, Japan's JGC was awarded a contract for Hawiya that involves building the world's largest NGL processing plant.

Besides Hawiyah, Foster Wheeler has been managing a $2 billion project to build a new natural gas processing plant at Haradh, 120 miles southwest of Dhahran at the southern tip of Ghawar. The Haradh plant was completed in the summer of 2004, increasing total Saudi natural gas processing capability by 1.6 Bcf/day, to around 9.5 Bcf/day. Haradh processes non-associated natural gas (both sweet and sour) from four fields in the Khuff formation. In addition, a $1.2 billion, 3,800-Mmcf/d "straddle plant" -- a natural gas reprocessing plant located adjacent to a gas transmission line for the purpose of extracting light hydrocarbon liquids newly formed due to recurring compression and decompression of gas during transmission -- is slated to be built. When complete, the straddle plant will service both Haradh and Hawiyah and increase Saudi NGL production.

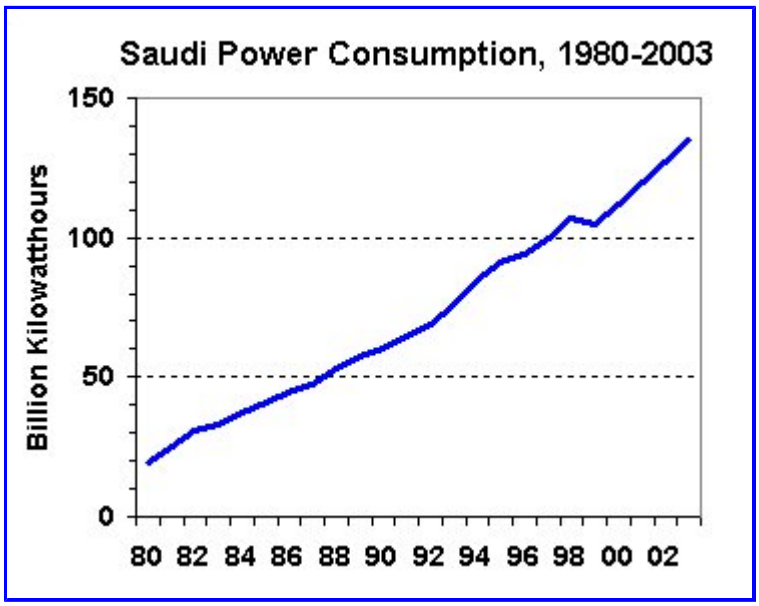
In other natural gas-related developments, a key pipeline project was completed in June 2000 to extend the MGS from the Eastern Province (which contains large potential gas and condensate reserves) to the capital, Riyadh, in the Central Province. This is part of a broader expansion of the existing gas transmission system in Saudi Arabia, reportedly to include the construction of around 1,200 miles of additional natural gas pipeline capacity (on top of 10,500 miles of oil, gas, condensate, products, and natural gas liquid pipelines currently in operation) by 2006. Domestic demand is driving expansion of the MGS, which was completed in 1984. The MGS feeds gas to the industrial cities of Yanbu on the Red Sea and Jubail, which combined account for 10 percent of the world's petrochemical production. Prior to the MGS, all of Saudi Arabia's natural gas output was flared.

ELECTRICITY

Saudi Arabia's rapidly growing population and artificially low power prices (as a result of low, government mandated tariffs and consumer subsidies) are increasing demand on electric utilities, as power demand grows by 7 percent or more each year (see graph). Saudi Arabia's Industry and Electricity Ministry estimates that the country will require up to 20 gigawatts (GW) of additional power generating capacity by 2019 -- nearly the same amount as today's 26.6 GW -- at a cost of $4.5-$6 billion per year. Most of this money is slated to come from the private sector, possibly including foreign investors. Also, the vast majority of this capacity will either be natural gas-fired or combined cycle, as part of the government's plans to expand gas utilization in the power sector (and elsewhere) significantly.

On February 16, 2000, Electricity Minister Dr. Hashem Ibn Abdullah Yamani signed a merger agreement between Saudi Arabia's 10 existing regional power companies (SCECOs), and on April 5, 2000, the long-anticipated SEC, a joint-stock company owned 50 percent by the Saudi government, was established. Creation of the SEC could open the door to private sector construction of new power plants on BOO (Build-Own-Operate) and BOT (Build-Own-Transfer) bases. The future of IPP's (Independent Power Producers) in Saudi Arabia remains uncertain, however, with major challenges including tariffs, the legal and operating framework, taxation, and fuel supply. In January 2003, the Electricity Services Regulatory Authority (ESRA) was set up as an

independent "watchdog" in charge of the country's power sector, IPPs, and IWPPs (independent water and power projects). In early July 2005, Saudi Arabia's first IPP came online at Jubail, with a capacity of 250 MW. The cogeneration facility was built by Siemens, and the operator is the Jubail Energy Company joint venture.



Several recent projects have employed financing mechanisms that are new to Saudi Arabia's electric power sector. For example, the $1.7 billion, Ghazlan II power project was financed by an internationally syndicated, $500 million, commercial loan (the first such loan in Saudi history), and was built by a consortium led by Mitsubishi and Bechtel. Ghazlan II consists of four, 600-MW steam turbine units, the first of which came online in the summer of 2001. Combined with the existing 1,600-MW Ghazlan I facility located on the Gulf coast north of Dammam, the entire complex has a power generating capacity of 4,000 MW and supplies Saudi Arabia's Eastern Province.

In July 2002, the Supreme Economic Council passed a resolution setting out a framework for private sector involvement in developing IWPPs. Saudi Arabia reportedly is hoping to attract private sector investment for up to 60 percent equity in IWPP projects. Initial IWPP projects identified for development include a $1 billion, 900-MW, 176-million-gallons-per-day (mmg/d) oil-fired plant at Shuaiba on the Red Sea coast 70 miles southeast of Jiddah; a 700-MW, 23-mmg/d plant at Shuqaiq in the country's southwest; an 850-MW, 212-mmg/d plant at Shaqiq; and a 2,500-MW, 176-mmg/d plant at Ras Az Zour in the Eastern Province. Saudi Arabia's Saline Water Conversion Corp. (SWCC) has estimated that the country will need to spend $50 billion on water projects through 2020 in order to meet the Kingdom's rapidly growing water demand. In March 2004, *Gulf News* reported that Saudi Arabia planned to establish 10 IWPPs by 2016, at a total cost of $16 billion. In March 2005, the SEC selected Alstom and Saudi Archirodon Construction to build three new 400-MW oil-fired generators at Shuaiba. This should bring generating capacity at the plant to 4,400 MW by 2008.

On October 9, 2000, Saudi Arabia approved plans for setting up a new utility company in the twin industrial cities of Yanbu and Jubail. The company, named Marafiq, was founded by the Royal Commission, the Public Investments Fund, Saudi ARAMCO, and SABIC, with local investors also holding a stake. UCO may be privatized when it becomes profitable. In the meantime, UCO has begun several water and power projects in Yanbu and Jubail. In July 2004, Marafiq issued a request for proposals (RFP) for a $2.5 billion, 2,400-MW, 79-mmg/d (of water), gas-fired IWPP in Jubail.

Besides generation, Saudi Arabia also requires additional investment in power transmission. At present, around 20 percent of Saudis are not connected to the national power grid. Creating a unified national grid could require over 20,000 miles of additional power transmission lines. Currently, Saudi Arabia has around 150,000 miles of transmission lines.

COUNTRY OVERVIEW

Head of State: King Abdullah bin Abd al-Aziz al-Sa'ud (succeeded to throne on August 1, 2005)
Crown Prince: Sultan bin Abdul Aziz (named on August 1, 2005)
Independence: September 23, 1932 (unification)
Population (2005E): 26.4 million, including 5.6 million foreign nationals (growing around 2.3% per year)
Location/Size: Between the Arabian Gulf and the Red Sea/865,000 square miles (about 1/4 the size of the United States)
Major Cities: Riyadh (royal capital), Jeddah (administrative capital), Mecca, Medina, Dammam, Jubayl, Buraydah
Language: Arabic
Ethnic Groups: Arab (90%), Afro-Asian (10%)
Religion: Muslim (100%) - predominantly Sunni, with a minority Shi'ite population mainly concentrated in eastern Saudi Arabia

ECONOMIC OVERVIEW

Currency: Riyal
Market Exchange Rate (7/12/05): US$1 = 3.75 riyals
Gross Domestic Product (GDP - market exchange rate) (2004E): $247.2 billion
Real GDP Growth Rate (1993-2003 average): 2.0% **(2004E):** 5.2% **(2005F):** 5.7%
Inflation Rate (consumer prices) (1993-2003 average): 0.4% **(2004E):** 0.2% **(2005F):** 1.0%
Unemployment Rate (2005E): 13% among Saudi nationals (unofficial estimates are higher)
Current Account Balance (2003E): $27.8 billion **(2004E):** $49.5 billion **(2005F):** $59.1 billion
Major Trading Partners (2004): Japan, United States, European Union
Merchandise Exports (2005F): $144.6 billion (mainly crude oil and petroleum products)
Merchandise Imports (2005F): $48.6 billion (mainly industrial goods, metals, food)
Merchandise Trade Balance (2005F): $96.0 billion
Oil Export Revenues (2004E): $116 billion **(2005F):** $150 billion
Oil Export Revenues/Total Export Revenues (2005E): 90%-95%
Public Debt (2004E): $176 billion (note: external debt is estimated at $34 billion)
Reserves of Foreign Exchange and Gold (2004E): $24 billion (note the country has significantly more in total "foreign assets")

ENERGY OVERVIEW

Minister of Petroleum and Mineral Resources: Ali bin Ibrahim al-Naimi (since 8/95)
Minister of Water and Electricity: Abdallah al-Husayn (since 4/04)
Proven Oil Reserves (1/1/05E): 261.9 billion barrels (includes half of Divided/"Neutral" Zone)
Total Oil Production (Jan.-July 2005E; includes NZ): 10.9 million barrels per day (bbl/d), of which 9.6 million bbl/d was crude oil, 1.2 million bbl/d was natural gas liquids (NGLs), and 80,000 bbl/d was "other liquids" (including MTBE)
Total Oil Production (2004E; includes NZ): 10.4 million barrels per day (bbl/d), of which 9.1 million bbl/d was crude oil, 1.2 million bbl/d was natural gas liquids (NGLs), and 80,000 bbl/d was "other liquids" (including MTBE)
OPEC Crude Oil Production Quota (effective 7/1/05): 9.099 million bbl/d
Crude Oil Production Capacity (7/05E): 10.5-11.0 million bbl/d
Total Oil Consumption (2005E): 1.9 million bbl/d
Net Oil Exports (2002E): 7.0 million bbl/d **(2003E):** 8.3 million bbl/d **(2004E)**: 8.7 million bbl/d **(Jan.-July 2005E)**: 9.0 million bbl/d
Major Oil Customers (2004E; approximate net exports): United States (1.6 million bbl/d); OECD Europe (1.5 million bbl/d); Japan (1.3 million bbl/d); South Korea (844,000 bbl/d); India (around 350,000-400,000 bbl/d); China (over 200,000-300,000 bbl/d); Taiwan (over 200,000 bbl/d)
Crude Oil Refining Capacity (1/1/05E): 1.745 million bbl/d

Natural Gas Reserves (1/1/05E): 235.0 trillion cubic feet (Tcf) (includes half of NZ)
Natural Gas Production/Consumption (2003E): 2.1 Tcf
Electric Generating Capacity (2003E): 26.6 gigawatts (all thermal)
Net Electricity Generation (2003E): 145.1 billion kilowatthours

ENVIRONMENTAL OVERVIEW

Total Energy Consumption (2003E): 5.7 quadrillion Btu* (1.4% of world total energy consumption)
Energy-Related Carbon Dioxide Emissions (2003E): 327.4 million metric tons (1.3% of world carbon dioxide emissions)
Per Capita Energy Consumption (2003E): 235.0 million Btu (vs. U.S. value of 339.9 million Btu)
Per Capita Carbon Dioxide Emissions (2003E): 13.5 metric tons (vs. U.S. value of 20.0 metric tons of carbon dioxide)
Energy Intensity (2002E): 17,820 Btu/$ -- PPP (vs U.S. value of 9,348 Btu/$)**
Carbon Dioxide Intensity (2002E): 1.1 metric tons/thousand $ -- PPP (vs U.S. value of 0.55 metric tons/thousand $)**
Fuel Share of Energy Consumption (2003E): Oil (61%), Natural Gas (39%)
Fuel Share of Carbon Dioxide Emissions (2002E): Oil (64%), Natural Gas (36%)
Status in Climate Change Negotiations: Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified December 28th, 1994). Not a signatory to the Kyoto Protocol.
Major Environmental Issues: Desertification; depletion of underground water resources; the lack of perennial rivers or permanent water bodies has prompted the development of extensive seawater desalination facilities; coastal pollution from oil spills.
Major International Environmental Agreements: A party to Conventions on Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea and Ozone Layer Protection.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.
**GDP from OECD figures based on Purchasing Power Parity (PPP) exchange rates

OIL AND GAS INDUSTRIES

Organization: The Supreme Petroleum Council governs the nationalized oil industry, including Saudi Arabian Oil Co. (Saudi Aramco) crude production, refining and marketing; Saudi Basic Industries Corp. (SABIC) petrochemicals.
Major Oil Terminals: Ras Tanura (world's largest offshore oil loading facility, on the Persian Gulf; 6 million bbl/d capacity), Yanbu (on the Red Sea, fed by Petroline; 5 million bbl/d capacity), Jubail, Ras al-Ju'aymah (on the Persian Gulf northwest of Ras Tanura; 3 million bbl/d capacity), Jiddah (on Red Sea south of Yanbu), Jizan (on Persian Gulf, refined products), Ras al-Khafji (on Persian Gulf in the Saudi-Kuwaiti Divided/"Neutral" Zone, crude oil), Rabigh (on Red Sea, north of Jiddah, crude oil and refined products), Zuluf (offshore Persian Gulf, linked to Zuluf oil field)
Major Oil Fields: Abqaiq, Abu Saafa, Berri, Ghawar, Khursaniya, Najd, Qatif, Safaniya, Shaybah, Zuluf (in addition, Khurais and Manifa are partially developed but mothballed as of 12/04)
Major Pipelines (capacity - million bbl/d): Petroline (4.8), IPSA (1.65 -- closed since August 1990), Tapline (0.5 -- closed since 1984), Abqaiq-Yanbu NGL line (0.3)
Major Refineries (capacity, 1/1/05E): Aramco - Rabigh 400,000 bbl/d, Ras Tanura 300,000 bbl/d,

Yanbu 190,000 bbl/d, Riyadh, 120,000 bbl/d, Jeddah 60,000 bbl/d; Saudi Aramco/Mobil - Yanbu 340,000 bbl/d; Petromin/Shell - al-Jubail 305,000 bbl/d; Arabian Oil Company - Ras al-Khafji 30,000 bbl/d

Sources for this report include: Agence France Presse; Alexander's Gas and Oil Connections; APS Review Gas Market Trends; APS Review Oil Market Trends; Bloomberg; BBC Summary of World Broadcasts; Business Week; Cambridge Energy Research Associates; Chemical News and Intelligence; CIA World Factbook; Dow Jones; Economist Intelligence Unit (EIU) Business Middle East and ViewsWire; Energy Compass; Financial Times; Global Insight; Gulf News; Hart's Middle East Oil and Gas; International Market Insight Reports; LPG World; Middle East Economic Digest (MEED); Middle East Economic Survey (MEES); Middle East Newsfile; New York Times; Oil Daily; Oil and Gas Journal; Petroleum Economist; Petroleum Finance Company; Petroleum Intelligence Weekly; Power Engineering International; Reuters; The Times (London); U.S. Energy Information Administration; World Gas Intelligence; World Markets Analysis; World Oil.

LINKS

For more information from EIA on Saudi Arabia, please see:

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Links to other U.S. government sites:
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File last modified: August 2, 2005

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