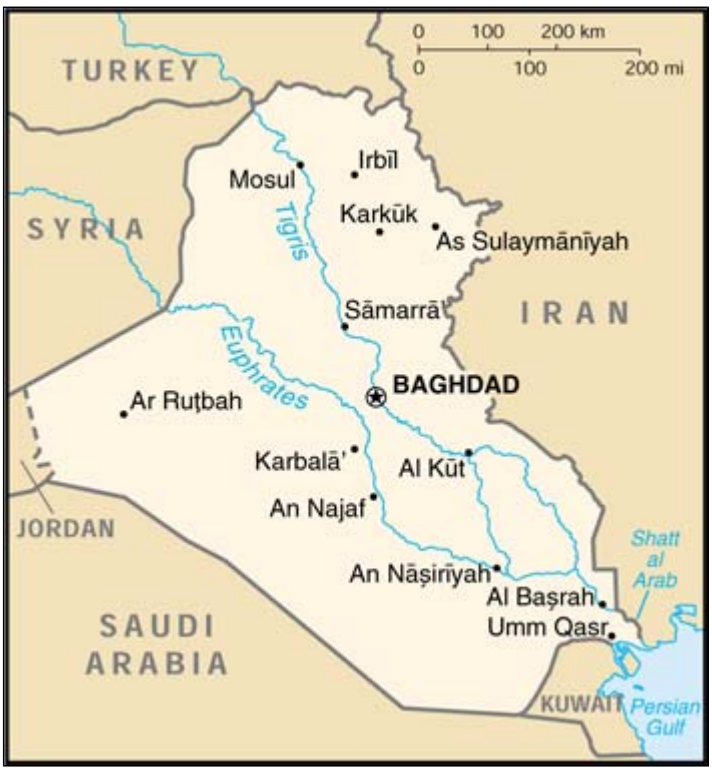
June 2005

Background | Oil | Natural Gas | Electricity | Profile | Links | Chronology

Iraq

Iraq is estimated to hold 115 billion barrels of proven oil reserves, and possibly much more undiscovered oil in unexplored areas of the country. Iraq also is estimated to contain at least 110 trillion cubic feet of natural gas. The country is a focal point for regional and oil security issues.

Note: The information contained in this report is the best available as of June 2005 and is subject to change. Please click here for a complete chronology of events pertaining to Iraq from 1980 through March 2005.



GENERAL BACKGROUND

Iraq now finds itself in a period of uncertainty and transition after more than three decades of Ba'ath party rule. Following the end of Saddam Hussein's rule in the spring of 2003, Iraq was governed for a year by the "Coalition Provisional Authority (CPA)" led by the United States and the United Kingdom. On June 28, 2004, the CPA transferred power to a sovereign Iraqi interim government, with national elections held on January 30, 2005. A permanent constitution is to be written by October 2005, with elections for a permanent government scheduled for December 2005. On May 3, 2005, the new transitional government was sworn in, with Ibrahim Jaafari as Prime Minister.

Although Iraq's unemployment rate remains high (perhaps 30 percent or more), the overall Iraqi economy appears to be recovering rapidly from its condition just after the war, fueled in large part by U.S. and international reconstruction aid. For 2004, Iraqi real GDP growth was estimated by *Global Insight* at 54 percent, with 34 percent growth forecast for 2005. This follows a 21.2 percent decline in 2003, on top of more than a decade of economic stagnation and decline. On October 15, 2003, a new Iraqi currency -- the "New Iraqi Dinar" (NID) -- was introduced, replacing the "old dinar" and the "Swiss dinar" used in the north of the country. Since then, the NID has appreciated sharply, from around 1,950 NID per $U.S. in October 2003 to around 1,538 NID per $U.S. by mid-May 2005. In early February 2004, Iraq was granted observer status at the World Trade Organization (WTO). In late September 2004, Iraq sent the WTO a formal request for membership.

Total, long-term Iraqi reconstruction costs could run to $100 billion or higher, with an October 2003 donors conference in Madrid resulting in pledges of $33 billion (channeled partly through the International Reconstruction Facility Fund for Iraq -- IRFFI). In mid-October 2004, donor countries meeting in Tokyo agreed on the need to speed up the disbursement or promised assistance to Iraq. To date, only a small fraction of the money pledged in Madrid has been disbursed.

On May 22, 2003, the U.N. Security Council passed Resolution 1483, lifting sanctions on Iraq, phasing out the 6-year-old U.N. oil-for-food program over six months (the program ended on November 21, 2003), and designating a U.N. "special representative" to assist Iraq in its reconstruction efforts. On May 27, 2003, the U.S. Treasury Department lifted most U.S. sanctions on Iraq, thereby implementing U.N. Security Council Resolution 1483. In November 2003, the U.S. Congress authorized $18.4 billion for Iraq in a "supplemental allocation" aimed at boosting Iraqi reconstruction and economic development. As of early 2005, however, much of this money - perhaps 40 percent or more -- reportedly was being spent on providing security, not on actual reconstruction.

Iraq assumed a heavy debt burden during the Saddam Hussein years, around $100 billion if debts to Gulf states and Russia are counted, and even more if $250 billion in reparations payment claims stemming from Iraq's 1990 invasion of Kuwait are included. Under U.N. Security Council Resolution 1483, Iraq's oil export earnings are immune from legal proceedings, such as debt collection, until the end of 2007. In November 2004, the Paris Club group of 19 creditor nations agreed to forgive, in stages, up to 80 percent on $42 billion worth of loans. The relief is contingent upon Iraq reaching an economic stabilization program with the IMF.

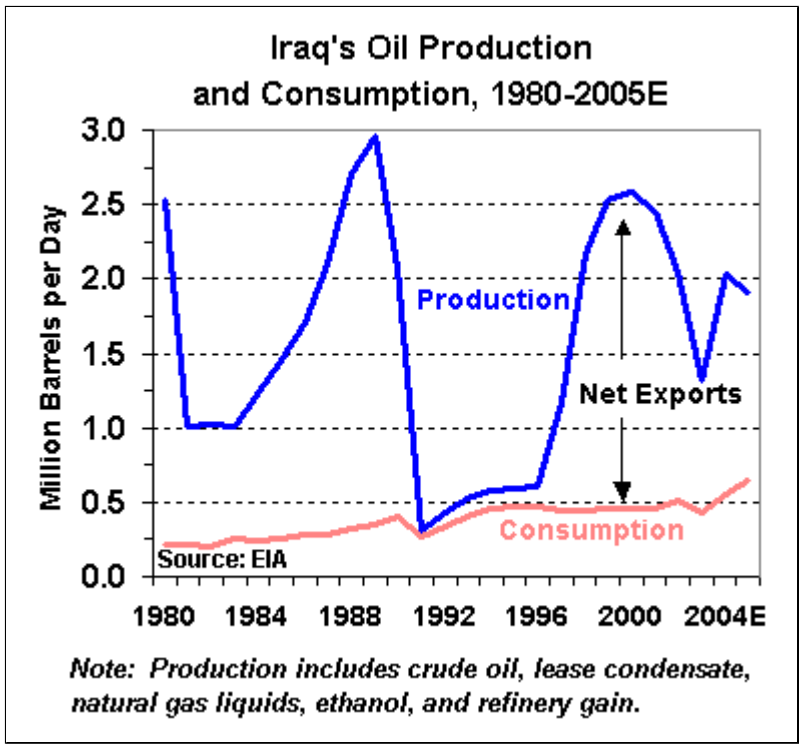
OIL

According to the *Oil and Gas Journal*, Iraq contains 115 billion barrels of proven oil reserves, the third largest in the world (behind Saudi Arabia and Canada), concentrated overwhelmingly (65 percent or more) in southern Iraq. Estimates of Iraq's oil reserves and resources vary widely, however, given that only about 10 percent of the country has been explored. Some analysts (the *Baker Institute, Center for Global Energy Studies, the Federation of American Scientists,* etc.) believe, for instance, that deep oil-bearing formations located mainly in the vast Western Desert region could yield large additional oil resources (possibly another 100 billion barrels or more), but have not been explored. Other analysts, such as the U.S. Geological Survey, are not as optimistic, with median estimates for additional oil reserves closer to 45 billion barrels. In August 2004, Iraqi Oil Minister Ghadban stated that Iraq had "unconfirmed or potential reserves" of 214 billion barrels. In early May 2005, Ibraihim Bahr al-Uloum was named to replace Ghadban, stating that his main goals were to reduce corruption in the oil sector, to improve fuel availability, to reduce attacks on oil infrastructure (Ghadban had cited 642 such attacks in 2004 at a cost of $10 billion), and to re-establish an Iraqi National Oil Company (INOC) by the end of 2005.

Iraqi oil reserves vary widely in quality, with API gravities in the 22^{o} (heavy) to 35^{o} (medium-light) range. Iraq's main export crudes come from the country's two largest active fields: Rumaila and Kirkuk. The southern Rumaila field, which extends a short distance into Kuwaiti territory, has around 660 wells and produces three streams: Basra Light (normally 34^{o} API); Basra Medium (normally 30^{o} API, 2.6 percent sulfur); and Basra Heavy (normally 22^{o}-24^{o} API, 3.4 percent sulfur). Basra Blend normally averages around 32^{o} API, 1.95 percent sulfur, but reportedly has become heavier and more sour recently at around 31.5 ^{o} API and 2.7 percent-2.8 percent sulfur content.

The northern Kirkuk field, first discovered in 1927, forms the basis for northern Iraqi oil

production. Kirkuk, with an estimated 8.7 billion barrels of remaining reserves, normally produces 35° API, 1.97 percent sulfur crude, although the API gravity and sulfur content both reportedly deteriorated sharply in the months just preceding the war. Kirkuk's gravity, for instance, had declined to around 32°-33° API, while sulfur content had risen above 2 percent.



Declining crude oil qualities and increased "water cut" (damaging intrustion of water into oil reservoirs) were likely the result of overpumping. Production from Kirkuk reached as high as 680,000 bbl/d, well above the field's estimated optimal production rate of 250,000 bbl/d, as Iraq attempted to sell as much oil as possible in the months leading up to the March/April 2003 war. In addition, some analysts believe that poor reservoir management practices during the Saddam Hussein years -- including reinjection of excess fuel oil (as much as 1.5 billion barrels by one estimate), refinery residue, and gas-stripped oil -- may have seriously, even permanently, damaged Kirkuk. Among other problems, fuel oil reinjection has increased oil viscosity at Kirkuk, making it more difficult and expensive to get the oil out of the ground. In order to better understand the state of the Kirkuk reservoir, a contract was signed in early 2005 for Exploration Consultants Ltd. and Shell to carry out an integrated study on Kirkuk, with work scheduled to be completed by early 2006. This will mark the first such study in three decades for Kirkuk, and is significant in that it will use the latest technology. A separate study of Rumaila will also be conducted at the same time.

Besides Kirkuk, other fields in northern Iraq include Bay Hassan, Jambur, Khabbaz, Ajil (formerly "Saddam"), and Ain Zalah-Butmah-Safaia. An estimated 60 percent of Northern Oil Company's (NOC) facilities in northern and central Iraq were damaged during the Gulf War.

Another major Iraqi oil field is the 11-billion barrel East Baghdad field, which came online in April 1989. Prior to the war, this centrally-located field currently produced around 50,000 bbl/d of heavy, 23° API oil as well as 30 million cubic feet per day (Mmcf/d) of associated natural gas.

Production

Historically, Iraqi production peaked in December 1979 at 3.7 million bbl/d, and then in July 1990, just prior to its invasion of Kuwait, at 3.5 million bbl/d. From 1991, when production crashed due to war, Iraqi oil output increased slowly, to 600,000 bbl/d in 1996. With Iraq's acceptance in late 1996 of U.N. Resolution 986, which allowed limited Iraqi oil exports in exchange for food and other supplies ("oil-for-food"), the country's oil output began increasing more rapidly, to 1.2 million bbl/d in 1997, 2.2 million bbl/d in 1998, and around 2.5 million bbl/d during 1999-2001. Iraqi monthly oil output increased in the last few months of 2002 and into early 2003, peaking at around 2.58 million bbl/d in January 2003, just before the war.

As of May 2005, Iraqi production (net of reinjection) had reached perhaps 1.9 million bbl/d, with "gross" production (including reinjection, water cut, and "unaccounted for" oil due in part to problems with metering) of around 2.1 million bbl/d. Most analysts believe that there will be no major additions to Iraqi production capacity for 2-3 years, but that 4.0 million bbl/d is possible by the end of the decade.

According to Tariq Shafiq, a founding Vice President of the Iraq National Oil Company (INOC), Iraq's oil development and production costs are among the lowest in the world, ranging from as low as $750 million for each additional million bbl/d day in Kirkuk, to $1.6 billion per million bbl/d near Rumaila, and as high as $3 billion per million bbl/d for smaller fields in the northwestern part of the country. In contrast, Cambridge Energy Research Associates (CERA) estimates an average cost for Iraqi oil development of $3.5 billion per million bbl/d for the country as a whole, which is higher than Tariq Shafiq's estimates, but still relatively low by world standards. Either way, Iraq is considered a highly attractive oil prospect, with only 17 of 80 discovered fields having been developed, and few deep wells compared to its neighbors. Overall, only about 2,300 wells reportedly have been drilled in Iraq (of which about 1,600 are actually producing oil).

Throughout most of the 1990s, Iraq did not generally have access to the latest, state-of-the-art oil industry technology (3D seismic, directional or deep drilling, gas injection, etc.), sufficient spare parts, and investment. Instead, Iraq reportedly utilized sub-standard engineering techniques (i.e., overpumping), obsolete technology, and systems in various states of decay in order to sustain production. In the long run, reversal of all these practices and utilization of the most modern techniques, combined with development of both discovered fields as well as new ones, could result in Iraq's oil output increasing by several million barrels per day.

In spite of the fact that little damage was done to Iraq's oil fields during the war itself, looting and sabotage after the war ended was highly destructive, accounting for perhaps 80 percent of total damage. Starting in mid-May 2003, the U.S. Army Corps of Engineers -- which had the lead in restoring Iraq's oil output to pre-war levels -- began a major effort to ramp up production in the country. On April 22, 2003, the first oil production since the start of the war began at the Rumaila field, with the restart of an important gas/oil separation plant (GOSP). In May 2004, Iraq's Qarmat Ali water injection facility reportedly was 75 percent operational again, helping boost production from Rumaila and other southern oil fields.

Prior to the recent war, oil industry experts generally assessed Iraq's sustainable production capacity at no higher than about 2.8-3.0 million bbl/d, with net export potential of around 2.3-2.5 million bbl/d (including smuggled oil). Approximately 2 million bbl/d of Iraq's production pre-war capacity came from southern oil fields and 1 million bbl/d from northern oil fields, with the breakdown roughly as follows:

Southern Iraq	Northern/Central Iraq
South Rumaila (0.8 million bbl/d)	Kirkuk (around 550,000-700,000 bbl/d)
North Rumaila (0.5 million bbl/d)	Bay Hassan (100,000-150,000 bbl/d)
West Qurnah (250,000 bbl/d)	Jambur (75,000-100,000 bbl/d)
Az Zubair (200,000-240,000 bbl/d)	Khabbaz (30,000 bbl/d)
Misan/Buzurgan (100,000 bbl/d)	Ajil (25,000 bbl/d)
Majnoon (50,000 bbl/d)	East Baghdad (20,000 bbl/d)
Jabal Fauqi (50,000 bbl/d)	'Ayn Zalah/Batmah (17,000-20,000 bbl/d)

Abu Ghurab (40,000 bbl/d)	
Luhais (30,000-50,000 bbl/d)	

One major challenge in maintaining, let alone increasing, oil production capacity, was Iraq's battle with water cut, especially in the south. In 2000, Saybolt International had reported that NOC and SOC were able to increase their oil production through use of short-term techniques not generally considered acceptable in the oil industry (i.e., injection of refined oil products into crude reservoirs). The Saybolt report now appears to have been largely accurate. In addition, a U.N. report in June 2001 said that Iraqi oil production capacity would fall sharply unless technical and infrastructure problems were addressed. Others have pointed to the need for water injection in order to maintain pressure and to avoid reservoir damage in the southern fields. Already, U.N. oil experts have estimated that some reservoirs in southern Iraq have been so badly managed that their ultimate recovery rates might be only 15 percent-25 percent, well below the 35 percent-60 percent usually seen in the oil industry.

Iraq's southern oil industry was decimated in the 1990/1991 Gulf War, with production capacity falling to 75,000 bbl/d in mid-1991. That war resulted in destruction of gathering centers and compression/degassing stations at Rumaila, storage facilities, the 1.6-million bbl/d (nameplate capacity) Mina al-Bakr/Basra export terminal, and pumping stations along the 1.4-million bbl/d (pre-war capacity) Iraqi Strategic (North-South) Pipeline. Seven other sizable fields remain damaged or partially mothballed. These include Zubair, Luhais, Suba, Buzurgan, Abu Ghirab, and Fauqi. Generally speaking, oilfield development plans were put on hold following Iraq's invasion of Kuwait, with Iraqi efforts focused on maintaining production at existing fields.

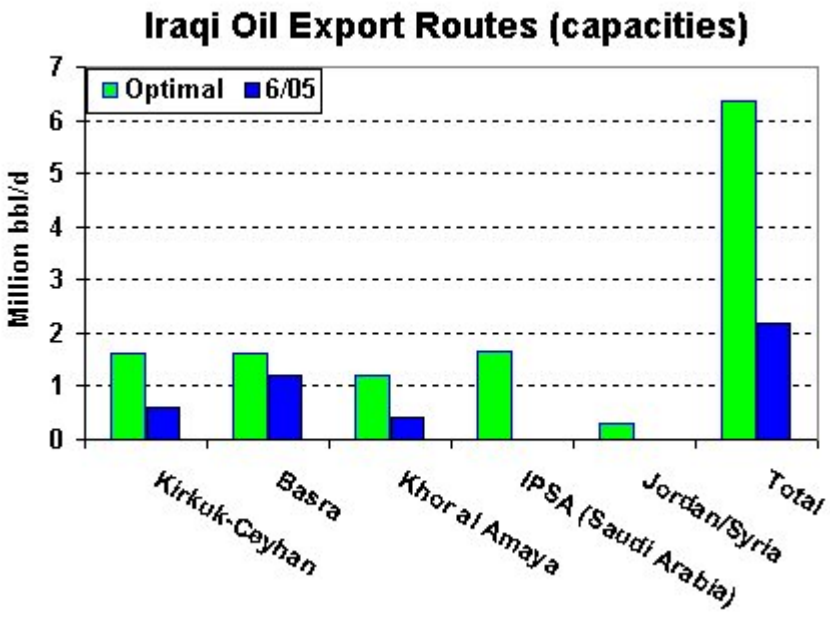
Exports

Under optimal conditions, and including routes through both Syria and Saudi Arabia that are now closed or being utilized for other purposes, Iraq's oil export infrastructure could handle throughput of more than 6 million bbl/d (2.8 via the Gulf, 1.65 via Saudi Arabia, 1.6 via Turkey, and perhaps 300,000 bbl/d or so via Jordan and Syria). However, Iraq's export facilities (pipelines, ports, pumping stations, etc.) were seriously disrupted by the Iran-Iraq War (1980-1988), the 1990/1991 Gulf War, the most recent war in March/April 2003, and periodic looting and sabotage since then. Currently, Iraq's export capacity is theoretically as high as 2.5 million bbl/d (around 2.0 via the Gulf and 0.3-0.5 via Turkey). As of late 2004, about 40 percent of Iraq's oil exports were going to Asia, with over 30 percent going to North America and 25 percent to Europe.

Overall, between April 2003 and late September 2004, there were an estimated 123 attacks on Iraqi energy infrastructure, including the country's 4,350-mile-long pipeline system and 11,000-mile-long power grid. In response to these attacks, which have cost Iraq billions of dollars in lost oil export revenues and repair costs, the U.S. military set up Task Force Shield to guard Iraq's energy infrastructure, particularly the Kirkuk-Ceyhan oil pipeline. In August 2003, a South African security company, Erinys International, won a $40 million contract to train 6,500 armed guard to protect Iraqi oil wells, pipelines, refineries, and power plants, mostly in southern Iraq. Until late 2004, when the Iraqi Oil Ministry took charge of security at oil facilities, Erinys operated as part of a $100 million joint contract with approximately 14,000 guards (mainly Iraqi nationals). In support of Erinys, Florida-based AirScan Inc. provides aerial surveillance of Iraqi pipelines. Under Saddam Hussein, Iraqi pipelines were guarded in part by local tribes, and in part by two army divisions.

The 600-mile, Kirkuk-Ceyhan (Turkey) dual pipeline is Iraq's largest crude oil export line. The 40-inch line has a fully-operational capacity of 1.1 million bbl/d, but reportedly could handle only around 900,000 bbl/d pre-war. The second, parallel, 46-inch line has an optimal capacity of 500,000

bbl/d and was designed to carry Basra Regular exports. Combined, the two parallel lines have an optimal capacity of around 1.6 million bbl/d. Unfortunately, Kirkuk-Ceyhan has been a main target for sabotage since June 2003, and is open only sporadically. Capacity on the line is believed to be as high as 600,000 bbl/d, with significant repairs still required. Among other problems, the line was damaged by a bridge ("Al Fatha," located near Baiji) that collapsed on it after being bombed by U.S. planes during the war, requiring major repairs, including the drilling of a new tunnel under the Tigris River. In addition, the IT-1 pumping station on the Kirkuk-Ceyhan line was damaged by looters, but reportedly is operable manually. The IT-2 pumping station on the same line reportedly was looted and destroyed.



Between 2001 and March 2003, Iraq and Syria utilized the 50-year-old, 32-inch Banias oil pipeline in violation of U.N. sanctions. The Banias line, from Iraq's northern Kirkuk oil fields to Syria's Mediterranean port of Banias (and Tripoli, Lebanon), reportedly was being used to transport as much as 200,000 bbl/d of Iraqi oil, mainly from southern Iraq, to Syrian refineries at Homs and Banias. The oil was sold at a significant price discount and freed up additional Syrian oil for export. Iraq and Syria also had talked of building a new, parallel pipeline as a replacement for the Banias line. In March 2003, flows on the pipeline were halted, although the U.S. Defense Department denied that its forces had targeted the line. In early March 2004, it was reported (by Dow Jones) that the Iraq-Syria pipeline was ready for use at 250,000 bbl/d.

During the Iran-Iraq War, Iraq also built a pipeline through Saudi Arabia (called IPSA) to the Red Sea port of Mu'ajiz, just north of Yanbu. IPSA has a design capacity of 1.65 million bbl/d, but was closed after Iraq invaded Kuwait in August 1990. In June 2001, Saudi Arabia expropriated the IPSA line, despite Iraqi protests. In June 2003, Thamir Ghadban said that he hoped Iraq would be able to use the IPSA line again. However, the Saudis have stated that they are not willing to do this, having converted the line to carry natural gas to the Red Sea industrial city of Yanbu for domestic use.

In order to optimize export capabilities (i.e., to allow oil shipments to the north or south), Iraq constructed a reversible, 1.4-million bbl/d "Strategic Pipeline" in 1975. This pipeline consists of two parallel 700,000-bbl/d lines. The North-South system allows for export of northern Kirkuk crude from the Persian Gulf and for southern Rumaila crudes to be shipped through Turkey. During the 1990/1991 Gulf War, the Strategic Pipeline was disabled after the K-3 pumping station at Haditha as well as four additional southern pumping stations were destroyed. In June 2003, the NOC estimated that it would take "a long time" to repair the K-3 pumping station and resume operations on the Strategic Pipeline. The whole system also reportedly is in need of modernization.

In February 2004, there were reports that Iraq was negotiating with Iran on the possible construction

of a 250,000-bbl/d oil pipeline to the Abadan refinery in southwestern Iran. In exchange, Iran would export a similar volume of refined products in a so-called "swap" arrangement. The pipeline was discussed by former Iraqi Oil Minister al-Uloum when he visited Tehran in December 2003 and met with Iranian Oil Minister Zanganeh. In early August 2004, Iran and Iraq agreed to a framework crude oil swap and transit agreement.

Iraqi oil sales and exports currently are being handled by the State Oil Marketing Organization (SOMO). The war and its aftermath seriously disrupted SOMO operations, but the organization has now been reconstituted and has resumed many of its operations. On June 5, 2003, SOMO issued its first oil sales tender since the war started, for 8 million barrels of Kirkuk crude stored in tanks at Ceyhan and 2 million barrels stored at Basra. On July 3, 2003, SOMO issued its second spot tender, for 8 million barrels of Basra Light. In late July 2003, SOMO signed its first long-term contracts since the war, for Basra Light oil from Iraq's southern fields. As of January 2005, however, SOMO was forced to cut long-term contract volumes by 10 percent from February to June due to operational problems throughout the system. In April 2005, SOMO's then director-general, Dhiaa al-Bakkaa, said that Iraq could be exporting up to 2 million bbl/d by the third quarter of this year, an extremely ambitious target given that gross oil exports are running at only about 1.4-1.5 million bbl/d now. In early June 2005, Bakkaa was replaced by Musib al-Dujaili as SOMO director.

Status of Oil Development Deals with Foreign Companies

Prior to the toppling of Iraq's Ba'athist regime, Iraq reportedly had negotiated several multi-billion dollar deals with foreign oil companies mainly from China, France, and Russia. Deutsche Bank estimated that $38 billion worth of contracts were signed on new fields -- "greenfield" development -- with potential production capacity of 4.7 million bbl/d if all the deals came to fruition (which Deutsche Bank believed was highly unlikely). Now, the legal status of these agreements is up in the air, increasing the uncertainty level for companies interested in doing business with Iraq. Besides legal issues, companies are also looking for a relatively stable security situation, a functioning government, and other conditions to be in place before they move heavily into the country. In February 2004, Iraqi Interim Trade and Investment Minister, Ali Allawi, announced that negotiations with potential investors in Iraq's upstream oil sector would be left for an elected, sovereign government, possibly delaying such deals until 2005 or 2006. In early June 2005, Iraq Oil Minister al-Uloum announced the formation of an inter-ministerial committee to review oil contracts signed under the Saddam Hussein government.

As of May 2005, around 30 companies reportedly had signed MOUs (memoranda of understanding) with Iraq. The contracts mainly on EPC (engineering, procurement and construction). They generally cover the training of Iraqi staff (often for free), consulting work, and reservoir studies (also often for free). The MOUs are generally considered to be a way for oil companies to show their interest in future Iraq work, gather technical data, and to demonstrate their capabilities. In addition, the MOUs can help companies establish relationships that could be useful in the future, when Iraq is ready to start awarding major oil and gas development projects.

Russia, which is owed billions of dollars by Iraq for past arms deliveries, has a strong interest in Iraqi oil development. This includes a $3.7 billion, 23-year deal to rehabilitate Iraqi oilfields, particularly the 11-15 billion barrel West Qurna field (located west of Basra near the Rumaila field). West Qurna is believed to have production potential of 800,000-1 million bbl/d. In mid-December 2002, the Iraqi Oil Ministry had announced that it was severing its contract with the Lukoil consortium on West Qurna due to "fail[ure] to comply" with contract stipulations. Specifically, the Iraqis had cited Lukoil's failure to invest a required $200 million over three years. Two other, smaller, stakes in West Qurna by Russian companies Zarubezhneft and Mashinoimport apparently were left intact. During the summer of 2004, Lukoil began training Iraqi oil specialists at facilities

in western Siberia, an initiative reportedly aimed at saving Lukoil's West Qurna contract. The company also announced that it aimed to begin oil production from West Qurna in 2005 (although this seems highly unlikely).

As of May 2005, Russia's Soyuzneftegaz reportedly was talking to several other companies about developing the 100,000-bbl/d Rafidain field, with work unlikely to begin before the end of the year. In May 2003, Russia's Tatneft set up a joint venture with Germany's MRH in order to win work in Iraq's oil sector. According to Tatneft's President, the company had been close to reaching a deal on exploring Block 9 in Iraq's Western Desert region prior to the war.

In January 2005, Iraq awarded contracts to several companies (Anadarko, Dome, and Vitol) to evaluate the 2-billion-barrel Suba-Luhais in southern Iraq. Eventually, a development contract is to be signed, with the goal of increasing Suba-Luhais production from 50,000 bbl/d to 190,000 bbl/d.

In December 2004, Iraq's State Company for Oil Projects (SCOP) awarded a $150 million contract -- the first post-Saddam era upstream deal -- to Turkey's AvrAsya Technology Engineering, for development of the Khurmala dome. Development of Khurmala is aimed at increasing Khurmala production from 35,000 bbl/d to 100,000 bbl/d, helping to compensate for declines in output at the mature Kirkuk field. In addtion to Khurmala, in April 2005, SCOP reportedly granted a contract to Canada's OGI Group to help develop the Hamrin field, located southwest of Kirkuk, and with a production potential of 60,000 bbl/d or higher. Work is scheduled to take 18 months to complete.

Another large oilfield slated for development is Majnoon, discovered by Braspetro of Brazil in 1975, and containing reserves of 11-30 billion barrels of 28^{o}-35^{o} API oil. Majnoon is located 30 miles north of Basra on the Iranian border. In the 1990s, French company Elf Aquitaine (now merged with Total) negotiated on a possible $4 billion deal with Iraq on development rights for Majnoon. In 1999, however, TotalFinaElf declined to sign a 23-year production sharing agreement (PSA) with Iraq on Majnoon. Following this, the field reportedly was brought onstream (under a "national effort" program begun in 1999) in late 2003 at 50,000 bbl/d. Future development on Majnoon ultimately could lead to production of 450,000 bbl/d within two years or so at an estimated (according to Deutsche Bank) cost of $4 billion. Prior to the 2003 war, Majnoon reportedly had production capacity of 350,000 bbl/d.

In early June 2003, China's National Petroleum Company (CNPC) refuted a comment by Thamir Ghadban that CNPC's contract on the 90,000-bbl/d al-Ahdab development was now "void by mutual agreement." CNPC agreed in 1997 to spend $1.3 billion on Al-Ahdab, located in southern Iraq, but no progress was made while sanctions remained in place.

The 4.5-billion-barrel Halfaya field is the final large development in southern Iraq. Prior to the war, several companies (BHP, CNPC, Agip/ENI) reportedly had shown interest in Halfaya, which ultimately could yield 200,000-300,000 bbl/d in output at a possible cost of $2 billion. In January 2005, a consortium of Shell, BHP Billiton, and Tigris Petroleum signed a deal with Iraq's oil ministry to increase output from the Missan area, which included Halfayah. Smaller fields with under 2 billion barrels in reserves also had received interest from foreign oil companies. These fields included Nasiriya (Eni, Repsol), Tuba (ONGC, Sonatrach, Pertamina), Ratawi (Shell, Petronas, CanOxy), Gharaf (Mashinoimport, Rosneftegasexport), Amara (PetroVietnam), Noor (Syria), and more.

In May 2003, Thamir Ghadban stated that three exploration agreements for blocks in Iraq's Western Desert were still valid. These included Indonesia's Pertamina on Block 3, Russia's Stroitransgas on

Block 4, and Indian's Oil and Natural Gas Corp. for Block 8. In January 2003, Stroitransgas signed a $33.5 million contract for exploration on Block 4, and in July 2003, it indicated its interest in winning post-war business in Iraq. In September 2003, Pertamina announced that it planned to begin oil and gas exploration in Block 3, investing around $24 million over the next three years. The small Irish company, Petrel Resources, also has expressed interest in exploring and developing oil resources in western Iraq. In May 2004, Pertamina suspended its exploration activities in the Western Desert region due to security concerns.

Oil Terminals

In the Persian Gulf, Iraq has three tanker terminals: Basra port (formerly known as Mina al-Bakr), Khor al-Amaya, and Khor az-Zubair (which mainly handles dry goods and minimal oil volumes, plus natural gas liquids and liquefied petroleum gas). Basra is Iraq's largest oil terminal, with two pipelines (48-inch and 41-inch), plus four 400,000-bbl/d capacity berths capable of handling very large crude carriers (VLCCs). Gulf War damage to Basra appears to have been repaired in large part and the terminal reportedly was handling around 1.6 million bbl/d in mid-October 2004. Basra's nameplate loading capacity is 85,000 barrels per hour (around 2 million bbl/d), which is significantly above current capacity of about 50,000 barrels per hour (around 1.2 million bbl/d), suggesting that potentially higher volumes of oil than the nameplate capacity could be shipped out of the port. On April 24, 2004, a suicide attack against Basra port damaged one tanker berth in the first such attack on Iraq's Persian Gulf export terminals since the onset of war in March 2003. On September 22, 2004, the Iraqi Oil Ministry signed a $15 million contract with Sinopec to build eight oil storage tanks, with a total capacity of 350,000 barrels, on the Faw Peninsula in southern Iraq.

Iraq's Khor al-Amaya terminal was heavily damaged by Iranian commandos during the Iran-Iraq War and also during Operation Desert Storm in 1991. In early March 2004, Khor al-Amaya reopened for oil exports, with initial capacity of 12,000 barrels per hour (300,000-400,000 bbl/d). Upon full completion of repairs, Iraq projects Khor al-Amaya's capacity is expected to reach 1.2 million bbl/d.

Refining

According to the *Oil and Gas Journal*, Iraq's refining capacity was 597,500 bbl/d as of January 1, 2005, compared to a nameplate capacity of 700,000 bbl/d. Overall, Iraq has eight refineries, none of which were damaged during the March-April 2003 war itself. The three largest refineries are the 310,000-bbl/d Baiji, 150,000-bbl/d Basra, and 110,000-bbl/d Daura plants.

Iin May 2005, two small companies - Hydrocarbon Supply Ltd. of Texas and Prokop of the Czech Republic -- signed contracts to upgrade Daura at a cost of $110 million. Capacity at the plant is to be increased to 170,000 bbl/d. Also, on April 1, 2005, Iraq also announced plans to build a new oil refinery in Basra, with a capacity of 250,000-300,000 bbl/d. Reportedly, eight companies have bid to build the refinery.

According to former Oil Minister Issam Chalabi, Iraqi refineries currently are operating at only 50 percent-75 percent of capacity, forcing the country to import around 200,000 bbl/d of refined products, at a cost of $200-$250 million per month. This does not include the additional cost of steep government subsidies on the consumer price of gasoline, which runs at under 10 cents per gallon. It is estimated that, overall, direct and indirect oil subsidies cost Iraq $8 billion per year. Subsidies also encourage illegal smuggling of oil out of Iraq, and exacerbate shortages within the country. In order to reduce Iraq's need for oil product imports, significant investment will be needed to perform refinery upgrades (Iraq had identified dozens of such projects prior to the war) and possibly to build new refineries.

NATURAL GAS

According to the *Oil and Gas Journal*, Iraq contains 110 trillion cubic feet (Tcf) of proven natural gas reserves, along with roughly 150 Tcf in probable reserves. About 70 percent of Iraq's natural gas reserves are associated (i.e., natural gas produced in conjunction with oil), with the rest made up of non-associated gas (20 percent) and dome gas (10 percent). Until 1990, all of Iraq's natural gas production was from associated fields. In 2002, Iraq produced 83 billion cubic feet (Bcf) of natural gas, down sharply from 215 Bcf in 1989. Since most of Iraq's natural gas is associated with oil, progress on increasing the country's oil output will directly affect the gas sector as well. Most associated gas is simply flared off. Significant volumes of gas also are used for power generation and reinjection for enhanced oil recovery efforts.

Main sources of Iraqi associated natural gas are the Kirkuk, Ain Zalah, Butma, and Bay Hassan oil fields in northern Iraq, as well as the North and South Rumaila and Zubair fields in the south. The Southern Area Gas Project was completed in 1985, but was not brought online until February 1990. It has nine gathering stations and a larger processing capacity of 1.5 billion cubic feet per day. Prior to the war, natural gas gathered from the North and South Rumaila and Zubair fields was carried via pipeline to a 575-Mmcf/d natural gas liquids (NGL) fractionation plant in Zubair and a 100-Mmcf/d processing plant in Basra. At Khor al-Jubair, a 17.5-million-cubic-foot LPG storage tank farm and loading terminals were added to the southern gas system in 1990. After the 2003 war, gas gathering and treatment facilities in southern Iraq reportedly deteriorated to the point that most gas produced in the area was simply flared off. The North Rumaila gas plant was scheduled to start up in December 2003 and to boost gas utilization by around 500 Mmcf/d. In addition, Iraq is looking at plans for increasing associated natural gas processing capability in Zubair and West Qurna and to reduce gas flaring, which is wasteful and dangerous.

Iraq's only non-associated natural gas production is from the al-Anfal field (200 Mmcf/d of output) in northern Iraq. Al-Anfal production, which began in May 1990, is piped to the Jambur gas processing station near the Kirkuk field, located 20 miles away. Al-Anfal's gas resources are estimated at 4.5 Tcf, of which 1.8 Tcf is proven. In December 2001, Russia's Gazprom reportedly was negotiating possible development of al-Anfal. In November 2001, a large non-associated natural gas field reportedly was discovered in the Akas region of western Iraq, near the border with Syria, and containing an estimated 2.1 Tcf of natural gas reserves. It is not clear whether the field is associated or non-associated.

Besides al-Anfal, Iraq has four large non-associated natural gas fields (Chemchamal, Jaria Pika, Khashm al Ahmar, Mansuriya) located in Kirkuk and Diyala provinces. In February 2000, Iraq's Oil Ministry named Agip and Gaz de France as leaders on a $2.3 billion PSA (production sharing agreement) project to develop these fields, which reportedly have total recoverable reserves of more than 10 Tcf.

Currently, Iraq has a major natural gas pipeline with the capacity to supply around 240 MMcf/d to Baghdad from the West Qurna field. The 48-inch line was commissioned in November 1988, with phases II and III of the project never completed due to war and sanctions. The last two phases of the pipeline project were meant to supply Turkey (which now has little need for the gas due to an oversupply in that country). Iraq's Northern Gas System, which came online in 1983, was damaged during the Gulf War as well as by the Kurdish rebellion of March 1991. The system supplied LPG to Baghdad and other Iraqi cities, as well as dry gas and sulphur to power stations and industrial plants. Iraq also has a Southern Gas System, which came online in 1985.

Iraq plans to increase its natural gas output in order to reduce dependence on oil consumption, to use for petrochemicals production, and possibly for export at some point. In December 2003, Iraq

renewed a natural gas supply agreement with Kuwait that dates back to the 1980s, under which Iraq was to supply natural gas to Kuwait via an overland pipeline. Natural gas used to be pumped from Rumaila into northern Kuwait via a 40-inch, 105-mile pipeline. The gas was used to supply Kuwaiti power stations and LPG plants, but was halted following Iraq's invasion of Kuwait in August 1990. Current plans call for Iraqi gas exports to Kuwait of 50 million cubic feet per day (Mmcf/d) initially, possibly rising to 250 Mmcf/d, when the pipeline is recomissioned. In addition, Iraq and Kuwait have discussed joint development of the Siba natural gas field which straddles the two countries border near Iran. Prior to the war, Iraq had even been developing plans to build a liquefied natural gas (LNG) terminal. In late September 2004, Iraq reportedly agreed to join the Arab Gas Pipeline project linking Egypt, Jordan, Syria and Lebanon.

ELECTRIC POWER

As of late May 2005, reports indicated that Iraq had around 4,000-5,000 megawatts (MW) of available, operable power generating capacity, well below projected peak 2005 summer demand of 8,000 MW. As a result, Iraqis are likely to face shortages this summer, even if capacity increases by the 1,700 MW Electricity Minister Ayham al-Samarra'i has indicated is possible if adequate fuels can be made available. The shortage of electric generating capacity in Iraq has been caused by numerous problems, including sabotage, looting, lack of security for workers, disruptions in fuel supplies for the plants, difficulty in procuring replacement parts at the aging stations, lack of training for workers, and obsolete technology. In early March 2005, Samarra'i said that unless $5 billion were allocated to Iraq's electricity sector, the situation could become disastrous.

The World Bank estimates that restoring and improving Iraq's electric power sector will require about $12 billion in investment, more than double the $6 billion that the U.S. Congress appropriated in the fall of 2003. Iraqi Electricity Minister al-Sammara'i reportedly has drawn up a list of 200 power projects that he hopes to start by 2006, at a cost of $6 billion. Overall, Iraq's power ministry has cited figures as high as $35 billion as the overall cost of rebuilding the country's power sector. In addition, Iraqi power demand is increasing as people buy new air conditioners and other electrical appliances.

As of early May 2005, work was proceeding on rehabilitation of the 640-MW Daura power plant in southern Baghdad. Currently, the plant is operating at perhaps half of its optimal capacity. In addition to Daura, Iraq's Infrastructure Rehabilitation program is upgrading eight of Baghdad's power distribution substations. Overall, Baghdad accounts for about 40 percent of Iraq's total power load. In March 2005, Halliburton subsidiary KBR announced that it had completed work on the Al Ameen substation, which is to supply up to 1,000 MW of power to Baghdad.

In January 2004, Electricity Minister al-Samarra'i said that Iraq intended to allow independent power projects, on both Build-Own-Transfer (BOT) and Build-Own-Operate (BOO) bases. In April 2005, al-Samarra'i gave a presentation in which he indicated that two BOO projects were underway, with three others out for bid. Combined, the projects represent a total generating capacity of 1,000 MW. In addition, according to al-Samarra'i, a 500-MW gas turbine project is underway in al-Musaib south of Baghdad, with a 340-MW diesel-fired project in Samara, north of Bagdhad.

Around 85 percent-90 percent of Iraq's national power grid was damaged or destroyed in the 1990-1991 Gulf War. In addition, existing generating capacity of about 9,300 megawatts (MW) in December 1990 was reduced to only 340 MW by March 1991. Transmission and distribution infrastructure destroyed in the war included the 10 substations serving Baghdad and about 30 percent of the country's 400-kilovolt (kV) transmission network. By early 1992, Iraq had restarted 75 percent of the national grid, including the 1,320-MW Baiji and Mosul thermal plants, as well as the Saddam Dam.

Sources for this report include: Agence France Presse; APS Review Oil Market Trends; Associated Press; BBC Summary of World Broadcasts; Business Week; CIA World Factbook; Deutsche Bank; Dow Jones; The Economist; Economist Intelligence Unit (EIU) Viewswire; Energy Compass; Energy Intelligence Briefing; Financial Times; Global Insight; Gulf News; Hart's Africa Oil and Gas; Heritage Foundation; Interfax News Agency; Janet Matthews Information Services (Quest Economic Database); Los Angeles Times; Middle East Economic Digest (MEED); Middle East Economic Survey (MEES); Nefte Compass; New York Times; Oil & Gas Journal; Oil Daily; Petroleum Economist; Petroleum Finance Company (PFC); Petroleum Finance Week; Petroleum Intelligence Weekly; Platt's Oilgram News; Reuters; Russian Oil and Gas Report; Stratfor; U.N. Office of the Iraq Programme; U.S. Energy Information Administration; Washington Post; Weekly Petroleum Argus; World Markets Research Centre.

COUNTRY OVERVIEW

President: Jalal Talabani
Prime Minister: Ibrahim al-Jafari
Independence: October 3, 1932
Population (2005E): 26.1 million
Location/Size: Middle East/168,709 square miles, slightly more than twice the size of Idaho.
Major Cities: Baghdad (capital), Basra, Mosul, Karbala, Kirkuk
Languages: Arabic, Kurdish
Ethnic Groups: Arab 75-80%, Kurdish 15-20%, Turkmen, Assyrian, or other 5%
Religions: 97% Muslim (Shi'a 60-65%, Sunni 32-37%), Christian or other (3%)

ECONOMIC OVERVIEW

Currency: New Iraqi Dinar (NID)
Exchange Rate (6/7/05): US$1=ID 1,529, compared to around US$1=ID1,950 following the launch of the NIC in mid-October 2003
Gross Domestic Product (at market exchange rates) (2003E): $26.4 billion **(2004E):** $63.9 billion **(2005F):** $98.0 billion
Real GDP Growth Rate (Global Insight: Base Case Scenario) (2003E): -28.5% **(2004E):** 54% **(2005F):** 34%
Inflation Rate (Global Insight: Base Case Scenario) (consumer prices) (2003E): 10.7% **(2004E):** 14.9% **(2005F):** 11.2%
Major Export Products (2005): Crude oil and oil products
Major Import Products (2005): Food, medicine, manufactures
Merchandise Exports (2004E): $18.1 billion **(2005F):** $23.2 billion
Merchandise Imports (2004E): $16.4 billion **(2005F):** $21.1 billion
Merchandise Trade Balance (2004E): $1.7 billion **(2005F):** $2.1 billion
Current Account Balance (2004E): $7.2 billion **(2005F):** -$3.2 billion
Oil Export Revenues (2003E): $9.8 billion **(2004E):** $20.0 billion **(2005F):** $21.3 billion
Oil Export Revenues/Total Export Revenues: 90% or more
External Debt (2004E): estimates range upwards from $100 billion, depending on what is counted

ENERGY OVERVIEW

Minister of Oil: Ibrahim Bahr al-Uloum (as of May 8, 2005)
Minister of Electricity: Muhsin Shalash
Proven Oil Reserves (1/1/05E): 115.0 billion barrels (around 75 billion barrels of which has not yet been developed; "probable" and "possible" reserves are as high as 220 billion barrels)
Oil Production (6/05E; net): 1.9 million bbl/d (gross production is around 2.1 million bbl/d, including 200,000 bbl/d of "reinjection" and other "unaccounted for" oil); **(2004E):** 2.0 million

bbl/d
Pre-War Oil Production (January-February 2003E): 2.58 million barrels per day (bbl/d), with around 2.1 million bbl/d of exports
Pre-war Oil Production Capacity, Maximum Sustainable: 2.8-3.0 million bbl/d (declining by about 100,000 bbl/d per year)
Current Oil Production Capacity, Maximum Sustainable (5/05E): 1.9 million bbl/d
Oil Export Routes: Kirkuk-Ceyhan pipeline; Mina al-Bakr port; to Jordan and Turkey via truck; reportedly to Syria via the Kirkuk-Banias pipeline; smuggling by boat along the Gulf coast
Oil Consumption (2004E): 550,000 bbl/d **(2005F):** 650,000 bbl/d
Net Oil Exports (2004E): 1.45 million bbl/d **(2005F):** 1.25 million bbl/d
U.S. Oil Imports from Iraq (2004E): 652,000 bbl/d **(January-February 2005E):** 499,000 bbl/d
Crude Oil Refining Capacity (1/1/05E): 597,500 bbl/d (according to the *Oil and Gas Journal*)
Natural Gas Reserves (1/1/05E): 110 trillion cubic feet (Tcf)
Natural Gas Production/Consumption (2003E): 53 billion cubic feet (Bcf)
Electricity Generation Capacity (2002E): 4.3-4.4 gigawatts (90% thermal) **(7/04E):** around 5 gigawatts
Net Electricity Generation (2002E): 34.0 billion kilowatthours

ENVIRONMENTAL OVERVIEW

Minister of Environment: Nermin Othman
Total Energy Consumption (2002E): 1.16 quadrillion Btu* (0.3% of world total energy consumption)
Energy-Related Carbon Dioxide Emissions (2002E): 78.4 million metric tons (0.3% of world total carbon dioxide emissions)
Per Capita Energy Consumption (2002E): 47.2 million Btu (vs U.S. value of 339.1 million Btu)
Per Capita Carbon Dioxide Emissions (2002E): 3.2 metric tons (vs U.S. value of 20.0 metric tons)
Energy Intensity (2002E): 39,838 Btu/ $1995-PPP (vs U.S. value of 10,613 Btu/ $1995-PPP)**
Carbon Dioxide Intensity (2002E): 2.7 metric tons/thousand $1995-PPP (vs U.S. value of 0.6 metric tons/thousand $1995-PPP)**
Fuel Share of Energy Consumption (2002E): Oil (92%), Natural Gas (8%); Hydroelectric (<1%)
Fuel Share of Carbon Dioxide Emissions (2002E): Oil (92%), Natural Gas (8%)
Status in Climate Change Negotiations: Iraq is not a signatory to the United Nations Framework Convention on Climate Change or to the Kyoto Protocol.
Major Environmental Issues: Under Saddam Hussein, government water control projects drained most of the inhabited marsh areas east of An Nasiriyah by drying up or diverting the feeder streams and rivers. A once sizable population of "Marsh Arabs," who have inhabited these areas for thousands of years, were displaced, while the destruction of the natural habitat harmed the area's wildlife populations. Other problems include inadequate supplies of potable water, development of Tigris-Euphrates Rivers system contingent upon agreements with upstream riparian Turkey, air and water pollution, soil degradation (salination) and erosion, and desertification.
Major International Environmental Agreements: A party to the Law of the Sea and the Nuclear Test Ban.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power.
**GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

OIL AND GAS INDUSTRY

Organization: The Supreme Oil and Gas Council has overall authority, along with the Oil Ministry. The North Oil Company (NOC) and South Oil Company (SOC) are the two main

upstream oil companies, with the North Gas Company (NGC) and South Gas Company (SGC) being the equivalents on the natural gas side. Other important entities include the Iraq Drilling Company, Oil Exploration Company, Oil Pipelines Company, Oil Products Distribution Company, the State Company for Oil Projects (SCOP), and the State Oil Marketing Organization (SOMO).
Major Oil Fields (proven reserves - billion barrels, 2004E): Majnoon (12-30), West Qurna (11.3-15.0), East Baghdad (11+), Kirkuk (10+), Rumaila (10+), Bin Umar (6+), Rattawi (3.1), Halfaya (2.5-4.6), Nassiriya (2-2.6), Suba-Luhais (2.2), Tuba (1.5), Khurmala (1.0), Gharaf (1.0-1.1), Rafidain (0.7), Amara (0.5)
Oil Refineries (crude refining capacity bbl/d, 2005E): Baiji (310,000), Basra (150,000), Daura (110,000), Khanaqin (12,000), K-3/ Haditha (7,000), Mufthiah (4,500), Qaiyarah Mosul (2,000), Kirkuk (2,000)
Major Ports: Mina al-Bakr, Khor al-Amaya, Khor az- Zubair
Major Pipelines (nameplate capacity): *Kirkuk-Ceyhan (Dortyol) Pipeline* - around 1.5-1.6 million bbl/d (currently, around 0.6 million bbl/d capacity); *Iraq-Saudi Arabia Pipeline* (IPSA1, 2) - possibly 1.65 million bbl/d (closed by Saudi Arabia in 1990 and now being used for domestic natural gas shipments); *Banias/Tripoli Pipeline* - possibly 0.3 million bbl/d (currently closed); *Iraq Strategic Pipeline* - less than 1.4 million bbl/d (reversible, internal transportation only)
Oil Exploration and Development Contracts with the former Iraqi Regime and Foreign Companies (source: World Markets Research Centre): West Qurna Phase 2 (Lukoil); Majnoon (Total); Bin Umar (Zarubezhneft); Nasiriya (Eni, Repsol); Halfaya (BHP, South Korean consortium, CNPC, Agip); Ratawi (Shell); Tuba (ONGC, Sonatrach); Suba-Luhais (Slavneft); Gharaf (TPAO, Japex); Al-Ahdab (CNPC); Amara (PetroVietnam); Western Desert (ONGC, Pertamina, Stroitransgaz, Tatneft)

LINKS

For more information on Iraq, see these other sources on the EIA web site:
Iraq Chronology: 1980-2005
EIA - Country Information on Iraq

Links to other U.S. government sites:
CIA World Factbook - Iraq
CIA Iraq Oil Map
GAO Report: "Rebuilding Iraq" (June 2004)
Coalition Provisional Authority Home Page
U.S. Dept. of Commerce Iraq Reconstruction Task Force
U.S. State Dept. Iraq Reconstruction Contracts Page
U.S. State Dept. International Information Programs: Iraq
U.S. Office of Foreign Assests Control (for information on Iraqi Sanctions)
House Committee on Energy and Commerce: Department of Defense Iraq Contracts
U.S. State Department's Consular Information Sheet - Iraq
State Dept. Iraq information
U.S. Agency for International Development Iraq page
Library of Congress -- Iraq Country Study

The following links are provided solely as a service to our customers, and therefore should not be construed as advocating or reflecting any position of the Energy Information Administration (EIA) or the United States Government. In addition, EIA does not guarantee the content or accuracy of any information presented in linked sites.

U.N. Office of the Iraq Program U.N. Security Council Resolutions Relating to Iraq

International Atomic Energy Agency (IAEA) and Iraq
University of Texas at Austin -- Iraq Page
Perry Castaneda Collection: Iraq Maps
University of Pennsylvania -- Middle East Center
Baker Institute/Council on Foreign Relations Iraq Study
U.N. Joint Logistics Centre -- Iraq
BBC "After Saddam" page
Washington Post "War in Iraq" page
Guardian Special Report: Iraq
Iraq Daily
BBC Iraq Oil Map
AME Info Middle East Business Information
CSIS: Electric Power Sector in Iraq (presentation by Major General Robert Griffin)

You may be automatically notified via e-mail of updates for this or other country analysis briefs. To join any of our mailing lists, go to http://www.eia.doe.gov/listserv_signup.html, and follow the directions given.

Return to Country Analysis Briefs home page

File last modified: June 8, 2005

Contact:

Lowell Feld
lfeld@eia.doe.gov
Phone: (202)586-9502
Fax: (202)586-9753

EIA Home
Contact Us

URL: http://www.eia.doe.gov/emeu/cabs/iraq.html