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COUNTRY ANALYSIS BRIEFS

Iraq

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Background

Iraq's economy finds itself in a period of uncertainty, with the future of the critical oil sector still in limbo and the country's security situation holding back development.

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. On May 3, 2005, the new transitional government was sworn in, with a new Prime Minister. A constitutional referendum was held in October 2005, with the constitution being approved overwhelmingly. Elections for a permanent government were held in mid-December 2005. After six months of debate, a national-unity government emerged, replacing the former prime minister with Nuri al-Maliki. The constitution (articles 108-111) addressed the control and distribution of oil resources in general terms, but many details (e.g., exactly how oil revenues will be distributed) were not spelled out exactly. Another question that remains outstanding is whether or not Iraq will form a new Iraqi National Oil Company (INOC).

Although Iraq's unemployment rate remains high (27-40 percent), the overall Iraqi economy appears to be recovering after more than a decade of economic stagnation, sanctions, and war. However, it is important to note that estimates of economic growth vary widely. For instance, Iraqi real GDP growth is estimated by *Global Insight* at 34 percent growth for 2005 and 22 percent for 2006. In contrast, the International Monetary Fund (IMF) recently lowered its Iraq GDP growth forecast to just 3.7 percent, citing "the continuing sabotage of oil installations," with forecast growth of 17 percent for 2006.

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 1,470 NID per $U.S. by mid-December 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. In late November 2005, the World Bank approved a $100 million loan (for education projects) to Iraq, the first such loan in 30 years.

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 late October 2005, only around 79 percent of that total had been committed to projects. About $2 billion reportedly had been spent on oil projects and over $4 billion on power projects, with mixed results.

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.

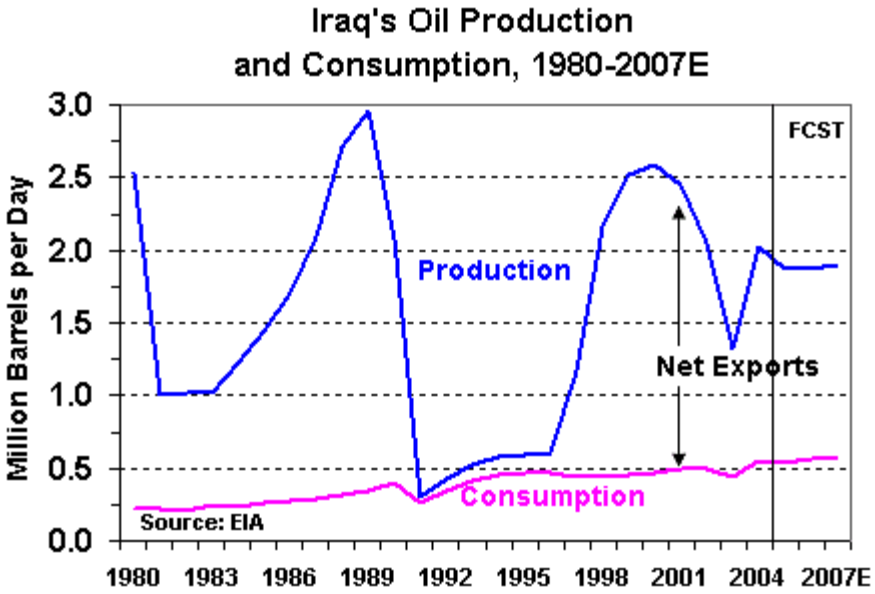
Oil

Iraq is estimated to hold 115 billion barrels of proven oil reserves, and possibly much more undiscovered oil in unexplored areas of the country.

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, and to re-establish an Iraqi National Oil Company (INOC) by the end of 2005 (this did not happen).

Iraqi oil reserves vary widely in quality, with API gravities in the 22º (heavy) to 35º (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 34ºAPI); Basra Medium (normally 30º API, 2.6 percent sulfur); and Basra Heavy (normally 22º-24ºAPI, 3.4 percent sulfur). Basra Blend normally averages around 32º API, 1.95 percent sulfur, but reportedly has become heavier and more sour recently at around 31.5º 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 35º 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 32º - 33º API, while sulfur content had risen above 2 percent.



Note: Production includes crude oil, lease condensate, natural gas liquids, ethanol, and refinery gain.

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 during 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 and the Maysan fields 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, 23º API oil as well as 30 million cubic feet per day (Mmcf/d) of associated natural gas.

Iraqi production is currently around 1.9 million bbl/d, well below pre-war levels of around 2.6 million bbl/d.

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 2006, Iraqi production (net of reinjection) was averaging around 1.9 million bbl/d, with "gross" production (including reinjection, water cut, and "unaccounted for" oil due in part to problems with metering) of about 2.1 million bbl/d. Most analysts believe that there will be no major additions to Iraqi production capacity for at least 2-3 years, with Shell's Vice President recently stating that any auction of Iraq's oilfields was unlikely before 2007.

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). As of November 2005 Iraq's Qarmat Ali water injection facility reportedly was operating at only 70 percent of capacity, holding back 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 Iraq's Northern Oil Company (NOC) and Southern Oil Company (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. 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.

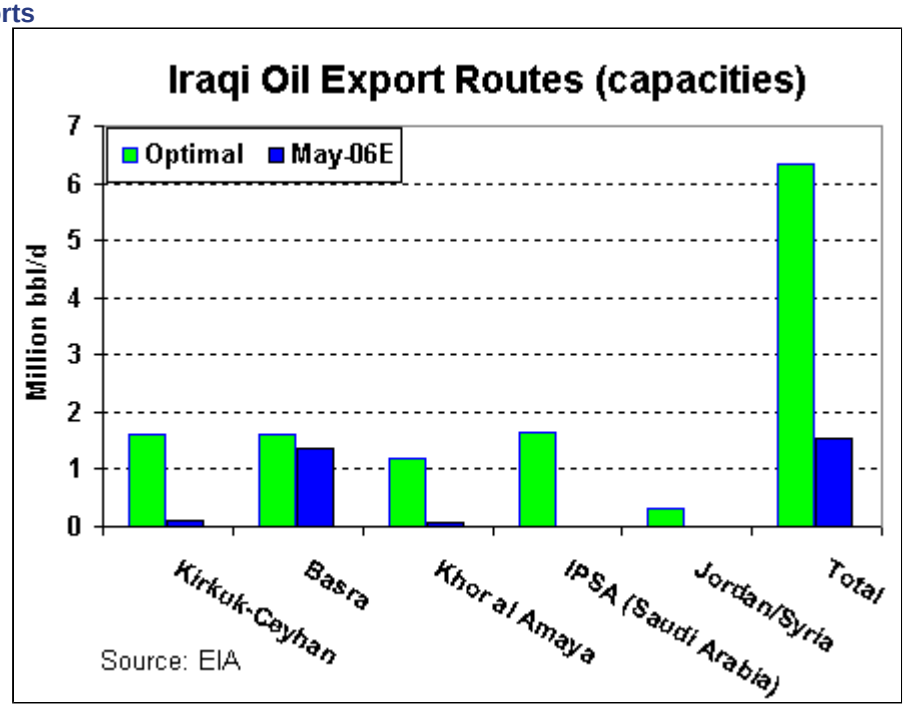
Iraq's southern oil industry was decimated in the 1990/1991 Gulf War, with production capacity falling to 75,000 bbl/d in mid-1991. That war resulted in destruction of gathering centers and

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.

In October 2005, the SOC re-issued a tender for drilling in southern oil fields. Reportedly, SOC offered improved payment and other terms. Included in the tender was the chance to drill 20 wells in the Mishrif formation of the West Qurna fields (see below). In other news, in September 2005, the US Project and Contracting Office cancelled cancelled part of a contract with Halliburton to refurbish 60 wells in southern Iraq. The contract was then awarded to SOC.

Iraq's oil exports go overwhelmingly through the southern port of Basra. Since the war, Iraq's northern route to Turkey has been largely inoperable due to war damage and frequent sabotage.

Exports



Crude oil exports during May 2006 averaged 1.5 million bbl/d. Increased production impact on exports will be partially moderated by a fire that destroyed 70 percent of the Khor al-Amaya port facility at the end of May. The facility handled about 5 percent of oil exports, but with the northern export route frequently threatened by attack and the Basra terminal near capacity, this will hurt the prospect of increased oil exports from the country. Repair work will probably take up to four months, according to Iraqi oil officials.

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.

Between April 2003 and June 2006, there were an estimated 315 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 800,000 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 (reportedly, that work was complete by late 2005). 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. In June 2006, Iraq is expected to launch its first Kirkuk-Ceyhan (northern export route) crude oil tender since August 2005, after two weeks of on-off pumping. Flow rates have been reported between 150,000 and 550,000 bbl/d and have successfully lifted stocks at Ceyhan to just under 5 million barrels.

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 July 2005, Iran and Iraq signed an MOU on a swap agreement involving construction of a 24-mile, 350,000-bbl/d oil pipeline from Basra to the Abadan refinery in southwestern Iran. In exchange, Iran would ship refined products back to Iraq. In addition, Iran could allow Iraq to export crude through the Kharg Island terminal and to import refined products through the Iranian port of Bandar Mahshahr. One potential problem with this deal revolves around the ability of the Abadan refinery to process Basrah Light in significant volumes. Another is the fact that Iran already faces a severe shortfall in its own domestic gasoline supplies, making exports of gasoline problematic.

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 early June 2005, Bakkaa was replaced by Musib al-Dujaili as SOMO director.

The status of Iraq's deals with foreign oil companies remains much in doubt, given uncertainty over legal legitimacy, a permanent constitution, and security.

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/constitutional 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 May 2006, Iraq's new Oil Minister, al-Shahristani, announced his intention to promote transparency throughout the country's oil industry. In addition, al-Shahristani plans to formulate an investment law with a legal and regulatory framework that is conducive to multinational oil companies.

Reportedly, dozens of companies have signed MOUs (memoranda of understanding) with Iraq, mainly on EPC (engineering, procurement and construction). The MOUs generally cover the training of Iraqi staff (often for free), consulting work, and reservoir studies (also often for free). The MOUs generally are 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 could help companies establish relationships that could be useful in the future, when Iraq is ready to start awarding major oil and natural 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, but is currently producing only 180,000 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. 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. In February 2006, Lukoil announced its desire to renew work on West Qurna and the company hopes negotiations with the new Iraqi government will allow for that work to begin.

In January 2005, Iraq awarded contracts to several companies (Anadarko, Dome, and Vitol) to evaluate the 50,000 bbl/d Subba-Luhais in southern Iraq, which has an estimated 2 billion barrels of oil reserves. In December 2005, Iraq awarded a $200 million development contract to Ireland's Petrel, with the goal of increasing production at the fields from 50,000 bbl/d to 150,000 bbl/d. In January 2006, Petrel formed a 50:50 joint venture with Iraq's Makman Oil and Gas to carry out the engineering and construction on the fields. Petrel has indicated that the project is proceeding according to plan and could be completed in 2008. Petrel also signed a deal to conduct a technical study of the Merjan block in western Iraq.

In January 2005, 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. Khurmala development is aimed at increasing production at the field from 35,000 bbl/d to 100,000 bbl/d, helping to compensate for declines in output at the mature Kirkuk field. As of June 2006, it is unclear as to whether any work on the project has taken place.

In addition to Khurmala, SCOP reportedly granted a $180 million contract to Canada's OGI Group in March 2005 to help develop the Hamrin field, located southwest of Kirkuk. Hamrin has estimated production potential of 60,000 bbl/d or higher. OGI originally estimated the development work to take 18 months to complete; however, as of June 2006, OGI had made little progress due to security concerns in the region.

Another large oilfield slated for development is Majnoon, discovered by Braspetro of Brazil in 1975, and containing reserves of 11-30 billion barrels of 28º - 35º 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 600,000 bbl/d or more at an estimated (according

to Deutsche Bank) cost of $4 billion. In the short term, there is work underway to increase Majnoon production capacity to 100,000 bbl/d from the current 50,000 bbl/d (June, 2006).

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 CNPC made no progress while sanctions remained in place. Iraq's new government will have to clarify the validity of CNPC's contract before the company can proceed.

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 have received interest from foreign oil companies. These fields included Nasiriya (Eni, Repsol), Tuba (Japan's AOC signed an MoU on the field in June 2005), Ratawi (Shell, Petronas, CanOxy), Gharaf (TPAO, Japex), Amara (PetroVietnam), and Noor (Syria).

On December 1, 2005, the Kurdistan Regional Government announced that Norway's DNO was drilling for oil at the Tawke well in the Kurdish region, near the Turkish border. According to *Middle East Oil and Gas Monitor*, the Kurds believe they were authorized to sign the deal (a Production Sharing Agreement, or PSA) without the central government's permission "[b]ased on a disputed clause in the constitution." As of June 2006, DNO has determined from test results that its oil reservoir contains 100 million barrels of recoverable reserves. DNO now plans to install production facilities with the intention of bringing first oil onstream in the first quarter of 2007. In addition to DNO, the Kurds reportedly have signed separate deals with Heritage Oil (Canada), Al-Aabar Petroleum (UAE), and PetroPrime (Turkey).

Aside from the issue of control over oil resources, the DNO deal with the Kurds was significant in that it was a PSA. Reportedly, the Iraqi Oil Ministry would like to proceed with PSAs as rapidly as possible on undeveloped fields. PSAs have been controversial in other countries, with some analysts (e.g, a recent report, by a group of non-governmental organizations, called "Crude Designs – The Rip-off of Iraq's Oil Wealth") believing that they are too favorable to oil companies and that they give up too much control by the country's government.

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 slightly higher than May 2006 capacity of about 62,500 barrels per hour (around 1.5 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, during Operation Desert Storm in 1991, and most recently in May 2006 (see above). 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.

Iraq's refining sector is operating far below optimal capacity, requiring Iraq to import large volumes of refined products at great cost.

Refining

According to the *Oil and Gas Journal,* Iraq's refining capacity was 597,500 bbl/d as of January 1, 2006, 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.

In 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 had been priced under 10 cents per gallon prior to December 2005 (violent demonstrations broke out in that month after steep price increases were announced). 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.

Iraqi Refined Product Balance, *2004*

	Unit	Consumption	Production	Deficit
LPG	tons/day	4,600	4,000	600
Gasoline	cubic meters/day	16,500	11,500	5,000
Kerosene	cubic meters/day	8,200	6,300	1,900
Gasoil (Distillate)	cubic meters/day	20,000	16,500	3,500

Source: Iraqi Oil Ministry, Akram Akrawi presentation 6/2006

In early December 2005, construction began on two new refineries – a 140,000-bbl/d facility in Karbala province and a 30,000-bbl/d plant at Diwaniya (south of Baghdad). The two plants are expected to cost around $1.5 billion and $300 million, respectively, and to be completed within three years. Iraq has also issued tenders for a 70,000-bbl/d refinery at Koya in the Kurdish region, and a 140,000-bbl/d facility at Nahrain, south of Baghdad.

Natural Gas

Iraq contains large reserves of natural gas, but development of the gas is being delayed by the same factors – legal, security, etc. – affecting the oil sector.

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 2004, Iraq produced 62 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 flared off due to a lack of sufficient infrastructure to utilize it; according to Iraq's oil ministry, 60 percent of all natural gas production is flared off. Significant volumes of gas also are used for power generation and reinjection for enhanced oil recovery efforts.

Exploration and Production

The main sources of Iraqi associated natural gas production 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 (Bcf/d). Prior to the war, natural gas gathered from the North and South Rumaila and Zubair fields was carried via pipeline to a 575-million-cubic-foot-per-day (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. Iraq is looking at plans for increasing associated natural gas processing capability in Zubair and West Qurna and to reduce gas flaring.

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 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.

Pipeline Systems

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 sulfur to power stations and industrial plants. Iraq also has a Southern Gas System, which came online in 1985.

Potential Exports

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. Prior to the 1990/1991 Gulf War, Iraq exported significant volumes of natural gas to Kuwait. The gas came from Iraq's southern Rumaila field through a 40-inch, 100-mile, 300 Mmcf/d pipeline to Kuwait's central manifold at Ahmadi. The gas was used in Kuwaiti electric power stations and liquefied petroleum gas (LPG) plants. Currently, Kuwait and Iraq are making plans to restart the pipeline. A memorandum of understanding between the two governments was concluded in December 2004. The first phase of the project is modest, involving only 35 Mmcf/d, which would be transported through the existing pipeline. The second phase would involve an $800 million investment in refurbishment of the pipeline and associated pumping stations, which would allow the volume to increase to 200 Mmcf/d. For the time being, though, the security situation in Iraq has prevented even the first phase of the plan from being implemented.

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.

Electricity

Iraq's electricity demand is well above its power generating capacity, resulting in intermittent power supplies to customers. The country needs an estimated $20 billion in investment by 2010 to boost capacity to 18,000 MW.

On paper, Iraq has around 7,000 megawatts (MW) of electric generating capacity. However, it appears that Iraq's current, operable power generating capacity is only around 5,000 megawatts (MW), well below projected peak summer demand of 8,000 MW. This includes power imports from neighboring countries like Iran and Syria. As a result, Iraqis face continual power outages, with the electricity reportedly off more than on in Baghdad. By the end of 2005 or early 2006, available Iraqi power generating capacity could reach 6,000 MW, but most of the electricity plants in the country are still being fuelled by residual fuel oil. In contrast to scarce diesel fuel, residual fuel is not an ideal source of fuel for the current generator types, and it increases the carbon intensity and therefore the maintenance frequency of power plants. Projects that could be completed fairly quickly reportedly include 630-MW plants at Hararíya and Yusufiya, plus a 250-MW facility at al-Najaf.

Iraq's shortage of electric generating capacity 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. Also, routine natural gas flaring could potentially produce up to 10,000 MW of electricity if current infrastructure is reformed or if new infrastructure could be built, according to some analysts. In early March 2005, then-Electricity Minister al-Sammara'i said that unless $5 billion were allocated to Iraq's electricity sector, the situation could become disastrous. Also, in late September 2005, Iraq's new electricity minister, Mohsen Shlash, said that the 2005 budget for power projects had been used up, and that $20 billion would be needed by 2010 to boost Iraqi capacity to 18,000 MW.

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. 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.

In 2005, work began 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 Baghdad. Another project aims to restore 400 MW of baseload generating capacity at the Hartha power plant, units 2 and 3.

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.

Profile

Country Overview

President	Jalal Talabani
Prime Minister	Nuri al-Maliki
Location	Middle East, bordering the Persian Gulf, between Iran and Kuwait
Independence	3 October 1932 (from League of Nations mandate under British administration); note - on 28 June 2004 the Coalition Provisional Authority transferred sovereignty to the Iraqi Interim Government
Population (2005E)	26,074,906
Languages	Arabic, Kurdish (official in Kurdish regions), Assyrian, Armenian
Religion	Muslim 97% (Shi'a 60%-65%, Sunni 32%-37%), Christian or other 3%
Ethnic Group(s)	Arab 75%-80%, Kurdish 15%-20%, Turkoman, Assyrian or other 5%

Economic Overview

Minister of Finance	Ali Allawi
Currency/Exchange Rate (12/14/05)	1,470 Dinars per $U.S.
Inflation Rate (2005E)	11.2%
Gross Domestic Product (GDP, 2005E)	$97.6 billion
Real GDP Growth Rate (2005E)	3.7% (IMF)-34% (Global Insight)
Unemployment Rate (2005E)	27%-40%
External Debt (2005E)	Estimates range upwards from $100 billion, depending on what is counted
Merchandise Exports (2005E)	$25.2 billion
Exports – Commodities	crude oil (83.9%), crude materials excluding fuels (8.0%), food and live animals (5.0%)

Exports - Partners (2004E)	US 51.9%, Spain 7.3%, Japan 6.6%, Italy 5.7%, Canada 5.2%
Merchandise Imports (2005E)	$36.5 billion
Imports - Commodities	food, medicine, manufactures
Imports - Partners (2004E)	Syria 22.9%, Turkey 19.5%, US 9.2%, Jordan 6.7%, Germany 4.9%
Current Account Balance (2005E)	$1.2 billion

Energy Overview

Minister of Oil	Hussein Shahristani
Proven Oil Reserves (January 1, 2006E)	115 billion barrels
Oil Production (2005E)	1,899 thousand barrels per day, of which 99% was crude oil.
Oil Consumption (2005E)	540 thousand barrels per day
Net Oil Exports (2005E)	1,359 thousand barrels per day
Crude Oil Distillation Capacity (2005E)	597.5 thousand barrels per day
Proven Natural Gas Reserves (January 1, 2006E)	112 trillion cubic feet
Natural Gas Production (2004E)	62 billion cubic feet
Natural Gas Consumption (2004E)	62 billion cubic feet
Recoverable Coal Reserves (2003E)	None
Coal Production (2004E)	None
Coal Consumption (2004E)	None
Electricity Installed Capacity (2004E)	2.76 gigawatts
Electricity Production (2004E)	29.3 billion kilowatt hours
Electricity Consumption (2004E)	27.3 billion kilowatt hours
Total Energy Consumption (2004E)	1 quadrillion Btus*, of which Oil (94%), Natural Gas (6%), Coal (0%), Nuclear (0%), Hydroelectricity (0%), Other Renewables (0%)
Total Per Capita Energy Consumption (2003E)	38.8 million Btus
Energy Intensity (2003E)	44,117.7 Btu per $2000-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2003E)	68.2 million metric tons, of which Oil (93%), Natural Gas (7%), Coal (0%)
Per-Capita, Energy-Related Carbon Dioxide Emissions (2003E)	2.7 metric tons
Carbon Dioxide Intensity (2003E)	3.1 Metric tons per thousand $2000-PPP**
Environmental Issues	government water control projects have 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 inhabited these areas for thousands of years, has been displaced; furthermore, the destruction of the natural habitat poses serious threats to the area's wildlife populations; inadequate supplies of potable water; development of the Tigris and Euphrates rivers system contingent upon agreements with upstream riparian Turkey; air and water pollution; soil degradation (salination) and erosion; desertification
Major Environmental Agreements	party to: Law of the Sea signed, but not ratified: Environmental Modification

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 Ports	Basra, Khor al-Amaya, Khor az- Zubair
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)
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)
Major Pipelines (capacity, Mmcf/d)	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)
Major Refineries (capacity, bbl/d)	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)

* 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 figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

Links

EIA Links

Iraq Chronology: 1980-2005

U.S. Government

CIA World Factbook - IraqU.S. Office of Foreign Assests Control (for information on Iraqi Sanctions)

Other Links

BBC "After Saddam" page
Washington Post "War in Iraq" page

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