Energy Memo

Iraqi Oil Industry

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Basic figures

Iraq has vast and relatively undeveloped oil resources, spread over 66 oil fields, including nine 'super-giant' fields. It has the highest reserve life (proven reserves/annual production) of all conventional oil producers. Iraq also has a large southwestern desert territory that has not yet been fully explored and is estimated to contain up to 100 billion barrels of additional oil reserves. Iraq's national oil companies have been recovering reserves at a rate of 25-31%, but the rate is increasing with the participation of international oil companies (IOCs), which are expected to bring the rate up to 80%. The IOCs are the key piece to the Iraqi government's goal of quintupling production by 2017. Oil production decreased from 2.42 million bpd in 2008, to 2.39 million bpd in 2009, but Iraq's rank increased from 14th to 12th. Meanwhile, exports increased by 10,000 bpd, moving Iraq up by one rank.

Oil Proven Reserves: 115 billion barrels (rank: 4, after Saudi Arabia, Canada and Iran)

Oil Production: 2.39 million bpd (rank: 14, after Venezuela)

Oil Exports: 1.91 million bpd (rank: 11, after Canada)

Source: CIA Factbook: figures are estimates from 2009

Preliminary figures for 2010 and 2011 show a rise across all of these metrics:

- In October 2010, the Iraqi government announced a 25% increase in proven reserves, to 143 billion barrels, overtaking Iran. This figure does not include Kurdish oil reserves, which Kurdistan's regional government estimates to total 45 billion barrels.
- Production in January 2011 reached its highest level since 1990, peaking at 2.66 million bpd.
- Exports also reached a record high in February 2011, climbing to 2.2 million bpd as exports from Iraq's Kurdish region restarted. On February 3, Iraq's central government and Kurdish authorities reached a temporary agreement over revenue sharing between the central and provincial governments, and oil companies. After a year off the market, Kurdish exports have resumed at 75,000 bpd, and are expected to rise to 100,000 bpd in March.

Distribution

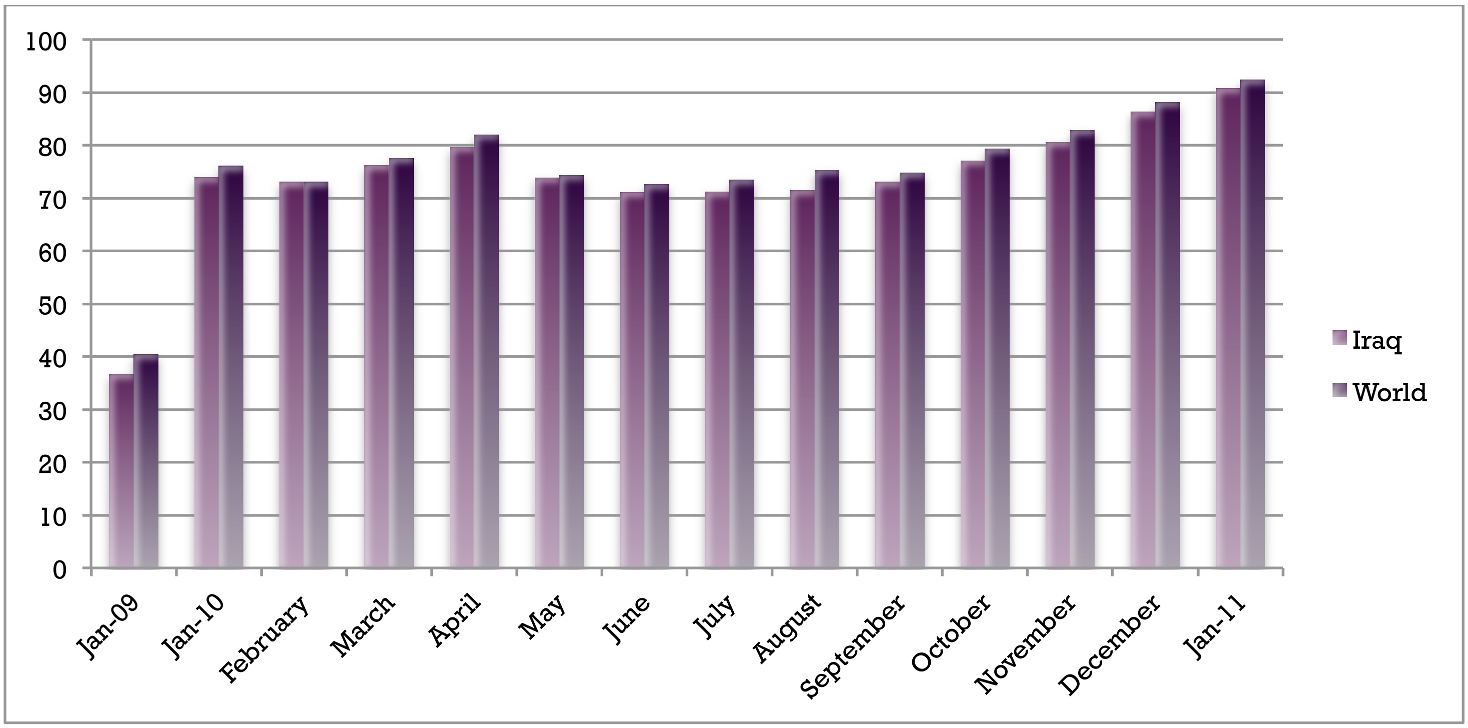
Iraq's oil resources are concentrated in the southeastern part of the country (80%). The Basrah blend produced in this area is exported from the Al-Basrah Oil Terminal* (1.5 million bpd effective capacity) and the neighboring Khora al-Amaya Terminal (300,000 bpd effective capacity). Iraq's second blend – Kirkuk – is exported along the Ceyhan/Botas pipeline through Turkey (1.1 million bpd effective capacity, of which half is used) or via tanker trucks to Jordan (10,000 bpd). In September 2010, Iraq and Turkey agreed to a 15-year extension of their pipeline arrangement and committed to upgrade capacity by 1 million bpd within this timeframe. Iraq's third Syria-Lebanon pipeline has been closed since 2003 due to disrepair; a fourth Saudi Arabian pipeline was closed in 1991 and expropriated by the Saudis in 2001. Iraq also has an internal strategic pipeline between Haditha, Rumaila and Basra (200,000 bpd effective capacity), allowing for the transportation of Kirkuk oil to the South for export, or vice versa (Basrah oil to the northern Ceyahan-Botas pipeline).

*Formerly Mina al-Bakr

Quality

Both the Basrah and Kirkuk are high-grade oils – light and with average sulphur content. They are most similar to the Arab Light grade from Saudi Arabia. The Kirkuk variety is slightly lighter (35.8 API) and sweeter (2.06% sulphur) than the Basrah (34.4 API and 2.10% sulphur)[1]. Basrah crude, which accounts for 80% of Iraqi oil exports, sells for around 2.7% less than Kirkuk crude.

Export Prices (2009-2011 per barrel in $)



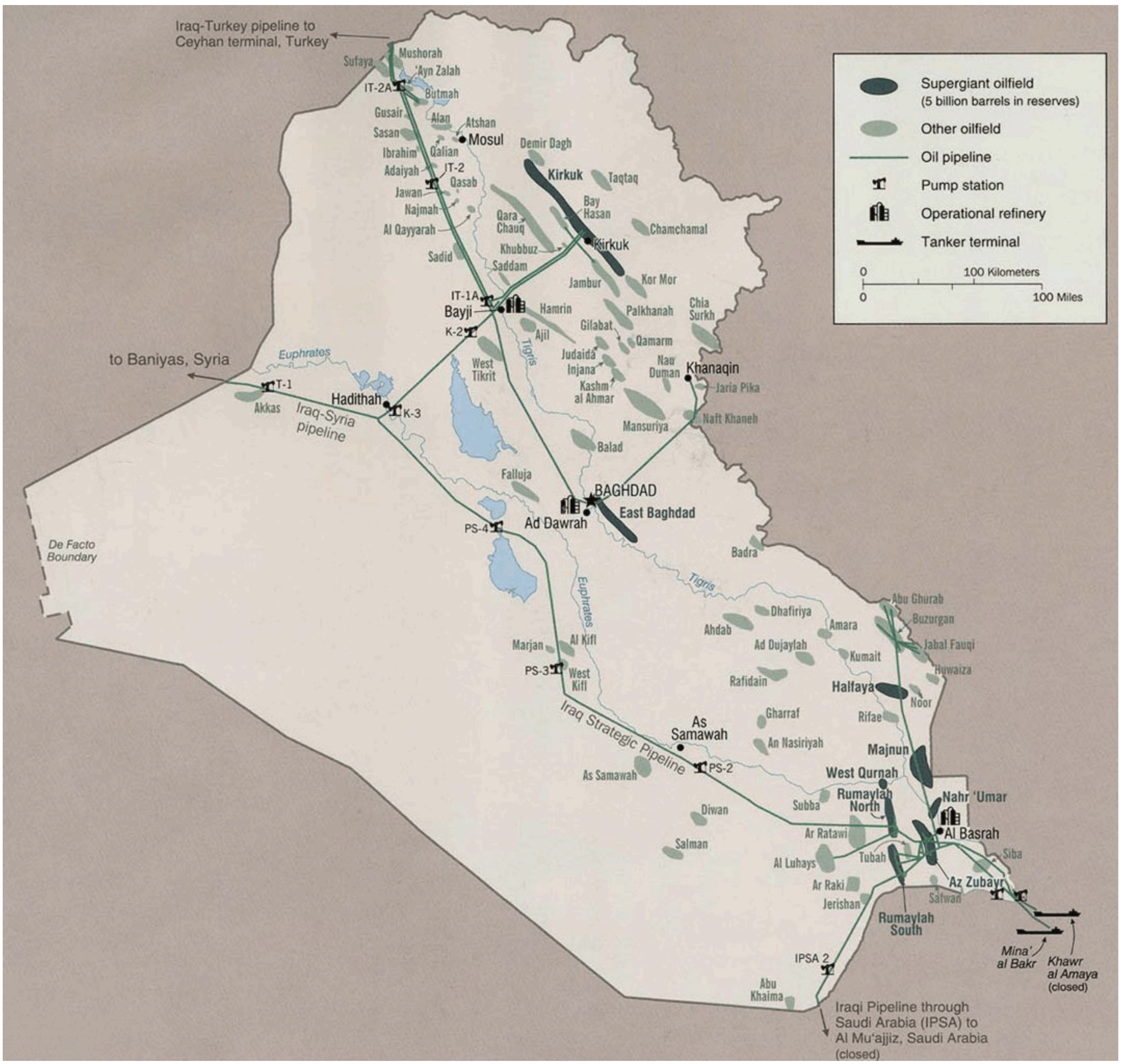
Sources: Iraqi Ministry of Oil and EIA

Refining

Iraq has four refineries spread throughout its territory: Baji, which accounts for almost half of total capacity, Basrah, Daura, and the newly built Erbil. In addition, Iraq has seven small distillation units. The refineries' total capacity of around 700,000 bpd is theoretically more than enough to supply local demand. However, the refineries are only operating at 40-60% of capacity; the refineries use simple hydro-skimming technology (around 2 on the Nelson complexity index) and are inefficient and/or partially damaged. Furthermore, they do not produce enough gasoline and gasoil, relative to other oil products. As a result, Iraq imports 30% of the former and 17% of the latter.[2] The State Oil Marketing Company has awarded contracts to three foreign companies to supply 880,000 metric tons of gasoline and 230,000 tons of gasoil for the first semester of 2011.[3]

[1] Energy Intelligence
[2] EIA
[3] Bloomberg

Map of Iraqi Oil resources and pipelines



Source : EIA

Oil Contracts

State Companies

Iraq's former national oil company was not restored as a whole, but brought back in the form of three oil companies operating under the aegis of the Ministry of Oil: the North Oil Company (NOC), South Oil Company (SOC) and Misan Oil Company (MOC). All Iraq's oil-related infrastructure is state-owned and operated by companies that are part of the Ministry of Oil, including the Oil Project Company (SCOP), Oil Exploration Company (OEC), Oil Tanker Company (IOTC), Oil Pipelines Company (PLC), Oil Marketing Company (SOMO), Oil Products Distribution Company (OPDC), Iraqi Drilling Company (IDC), North Refineries Company (NRC), Midland Refineries Company (MRC), and South Refineries Company (SRC).

International Oil Companies

Iraq has sought to involve a broad range of IOCs in the development of its oil fields, while maintaining a 25% share for its state companies in each project. Iraq launched two licensing rounds in 2009 to award oil contracts to IOCs. The first one took place on June 29-30 with the participation of 32 IOCs (about a fourth of the 120 companies that applied to bid). It only yielded one deal – for the supergiant Rumaila field near Basra – out of eight tendered licenses. The second round on December 11-12 included 45 participants and was more productive, yielding 7 deals – for the supergiant Halfaya, Majnoon, and West Qurna 2 fields, and the Badra, Gharraf, Najmah, and Qaiyarah fields – out of 10 tendered licenses. Three of the remaining concessions from the first round – for the supergiant West Qurna 1 and Zubair fields, and the Missan fields (Fakka, Buzurgan, and Abu Ghrab) – were eventually awarded outside of the rounds. A third round was launched in October 2010 to award gas contracts, yielding three concessions. Prior to the three hydrocarbon auctions, post-Saddam Hussein Iraq had only awarded one contract, to CNPC for the development of the Ahdab field; a different contract for Ahdab had already been awarded to China in 1997, but was then suspended when UN sanctions came into effect. The Iraqi government has announced plans for a fourth licensing round in the last quarter of 2011 that would include 12 oil and gas concessions. In the interim, it is also considering a bidding round for the giant Nassariyah oil field that would be coupled with a requirement to build a 300,000 bpd refinery nearby; the field had garnered an unsuccessful bid in 2009 from a consortium led by JX Nippon Oil & Energy.

All of the deals concluded under the aegis of Iraq's central government are 20-year service contracts. This is in contrast to Kurdistan's production-sharing agreements, which are more lucrative for IOCs; a company's share of profit oil varies according to the area's risk assessment – low, medium, or high. The Kurdish Regional Government (KRG) granted two major oil concessions to IOCs before the central government initiated its licensing rounds: Tawke in 2004 (the first involvement of an IOC in Iraq since the 1970s) and Taq Taq in 2007. Kurdistan has since licensed thirty-five additional oil concessions, of which eight yielded major oil reserve discoveries in 2009 and 2010. In each case, the KRG has maintained a 20-25% share option. The central government has not approved any deals signed between Kurdish authorities and 40 foreign companies operating in Kurdistan, and has furthermore barred the latter from partaking in its oil licensing rounds.

The following table lists all of the energy companies that have bid for central government-issued oil contracts in the first column. The following three columns indicate whether they qualified for the first or second licensing rounds and made winning bids, and whether they secured deals outside of the licensing rounds or inside Kurdistan.

Energy Company		1st Round Qualified		2nd Round Qualified		Other	
Addax now Sinopec	(CA) (CN)	No		No		Yes	Kurdistan
Anadarko	(US)	Yes	withdrew	Yes			
BG Group	(UK)	Yes	withdrew	Yes			
BHP Billiton	(AU)	Yes		Yes			
BP	(UK)	Yes	1 winning joint bid	Yes			
Cairn Energy	(IE)	No		Yes			
Calibre	(US)	No		No	temporarily	Yes	Kurdistan
Chevron	(US)	Yes		Yes			
CNOOC	(CN)	Yes		Yes		Yes	1 winning joint bid
CNPC	(CN)	Yes	1 winning joint bid	Yes	1 winning joint bid	Yes	1 winning joint bid
ConocoPhillips	(US)	Yes		Yes			
DNO	(NO)	No		No		Yes	Kurdistan
Edison	(IT)	Yes		Yes			
Eni	(IT)	Yes		Yes		Yes	1 winning joint bid
ExxonMobil	(US)	Yes		Yes		Yes	1 winning joint bid
Gazprom	(RU)	Yes		Yes	1 winning joint bid		
Heritage	(CA)	No		No		Yes	Kurdistan
Hess	(US)	Yes		Yes			
Inpex	(JP)	Yes		Yes			
Japex	(JP)	Yes		Yes	1 winning joint bid		
JOGMNC	(JP)	No		Yes			
KazMunaiGas	(KZ)	No		Yes			
Kogas	(KR)	Yes		Yes	1 winning joint bid	Yes	1 winning joint bid
Lukoil	(RU)	Yes		Yes	1 winning joint bid		
Maersk	(DK)	Yes		Yes			
Marathon Oil	(US)	Yes		Yes			
Mitsubishi	(JP)	Yes		Yes			
Mitsui Oil	(JP)	No		Yes			
Nexen	(CA)	Yes		Yes			
Nippon Oil	(JP)	Yes		Yes			
TatNeft	(RU)	No		Yes			
Occidental	(US)	Yes		Yes		Yes	1 winning joint bid
Oil India	(IN)	No		Yes			
OMV	(AT)	No		No		Yes	Kurdistan
ONGC	(IN)	Yes		Yes			
Pakistan Petro	(PK)	No		Yes			
PT Pertamina	(ID)	Yes		Yes			
Perenco	(FR)	No		No		Yes	Kurdistan
Petrovietnam	(VN)	No		Yes			

Energy Company		1st Round Qualified		2nd Round Qualified		Other	
Petronas	**(MY)**	Yes		Yes	4 winning joint bids		
Premier Oil	**(UK)**	Yes		No			
Reliance	**(IN)**	No		No		Yes	Kurdistan
Repsol	**(ES)**	Yes		Yes			
Rosneft	**(RU)**	No		Yes			
SK Energy	**(KR)**	No		No		Yes	Kurdistan
Shell	**(NL)**	Yes		Yes	1 winning joint bid	Yes	1 winning joint bid
Sinochem	**(CN)**	Yes		Yes			
Sinopec	**(CN)**	Yes		Yes, then barred (Addax)		Yes (via Addax)	Kurdistan
Sonangol	**(AO)**	No		Yes	2 winning bids		
StatoilHydro	**(NO)**	Yes		Yes	1 winning joint bid		
Total	**(FR)**	Yes		Yes	1 winning joint bid		
TPAO	**(TR)**	No		Yes	1 winning joint bid	Yes	1 winning joint bid
Wintershall	**(DE)**	Yes	withdrew	Yes			
Woodside	**(AU)**	Yes		Yes			

Sources: Energy Business Review, MarketWatch, Reuters

This table shows that Chinese companies were the biggest winners in the Iraqi oil field licensing process, securing shares in four official concessions. Taking Sinopec's Kurdish contract into account, all four Chinese companies that bid in Iraq were granted a concession*, with CNPC winning a record three joint bids. Deutsche Bank estimates that CNPC has, by far, the highest net present value of any oil company in Iraq (close to $3 billion)[4].

Meanwhile, of the eight US companies that attempted to bid in one or both rounds, only two were awarded official contracts. ExxonMobil is the only major American oil company with a share. In contrast – and despite US State Department objections to deals with the KRG absent a national oil law – the US has the numerically strongest foothold in Kurdistan, with seven companies holding shares in nine concessions.

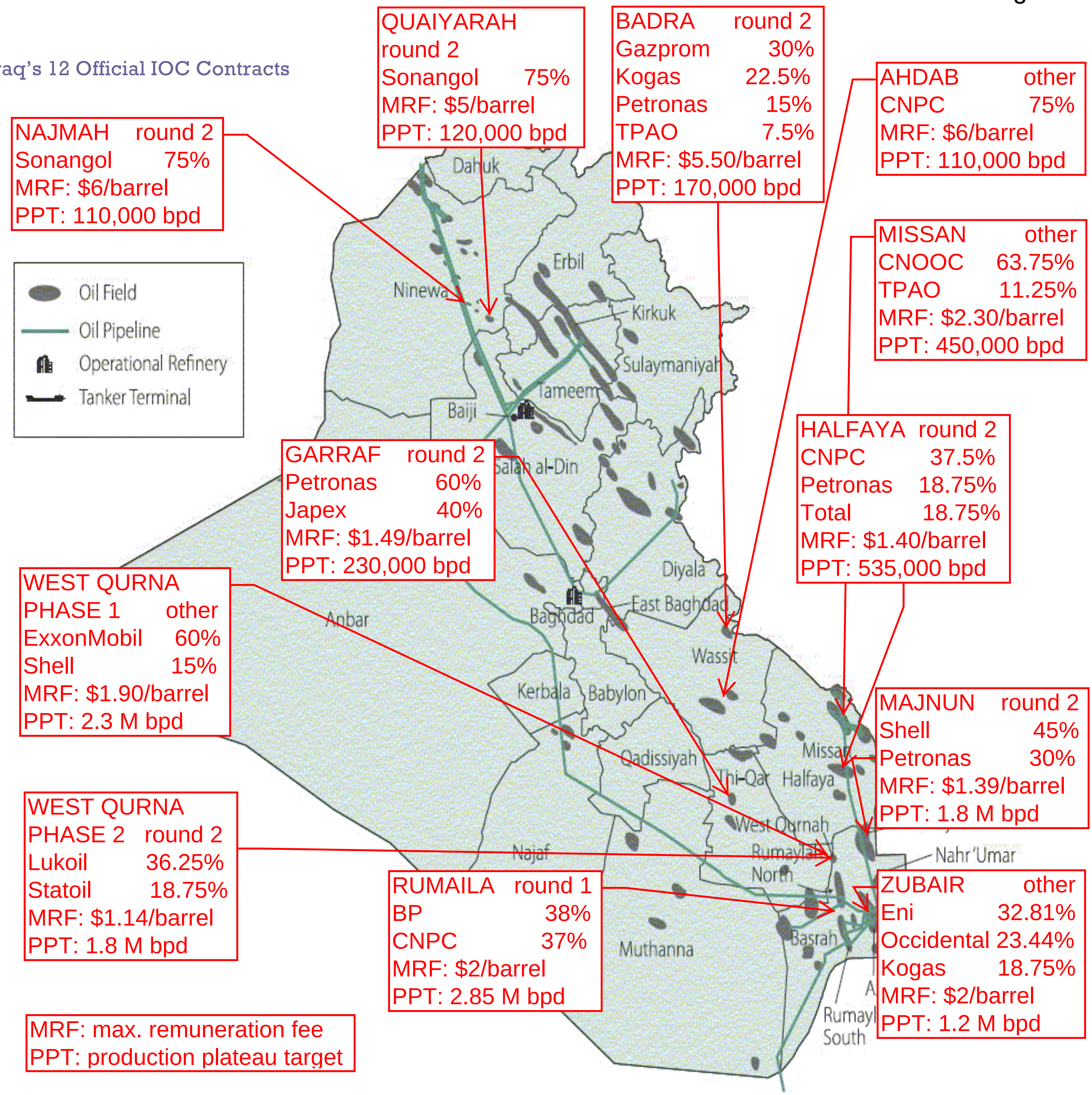
The IOCs with licenses to Iraq's brownfield supergiant fields – Rumaila, West Qurna 1, and Zubair - all reached their initial output targets in the first quarter of 2011 (by increasing production by 10% and sustaining the increase for thirty days). This means that they now qualify to be reimbursed for their development costs, and to be paid remuneration fees. The Iraqi central government also recently announced that these oil concessions are to benefit from the first phase of a $15 billion water injection plan to enhance oil recovery; the initial phase involves supplying the fields with 2 million barrels of water per day.

The following two maps provide additional details on the companies, fields, and terms of Iraq's twelve official IOC contracts, and of the Kurdish Regional Government's contracts.

* Sinochem jointly won the bid with CNOOC for the Missan fields, but then chose to withdraw after CNOOC accepted a lower remuneration fee

[4] Deutsche Bank Global Markets Research on Iraq (10/04/10)

Iraq's 12 Official IOC Contracts



Sources: Iraqi Oil Report, Petroleum Economist, Energy Intelligence, Deutsche Bank, Global Data & company websites

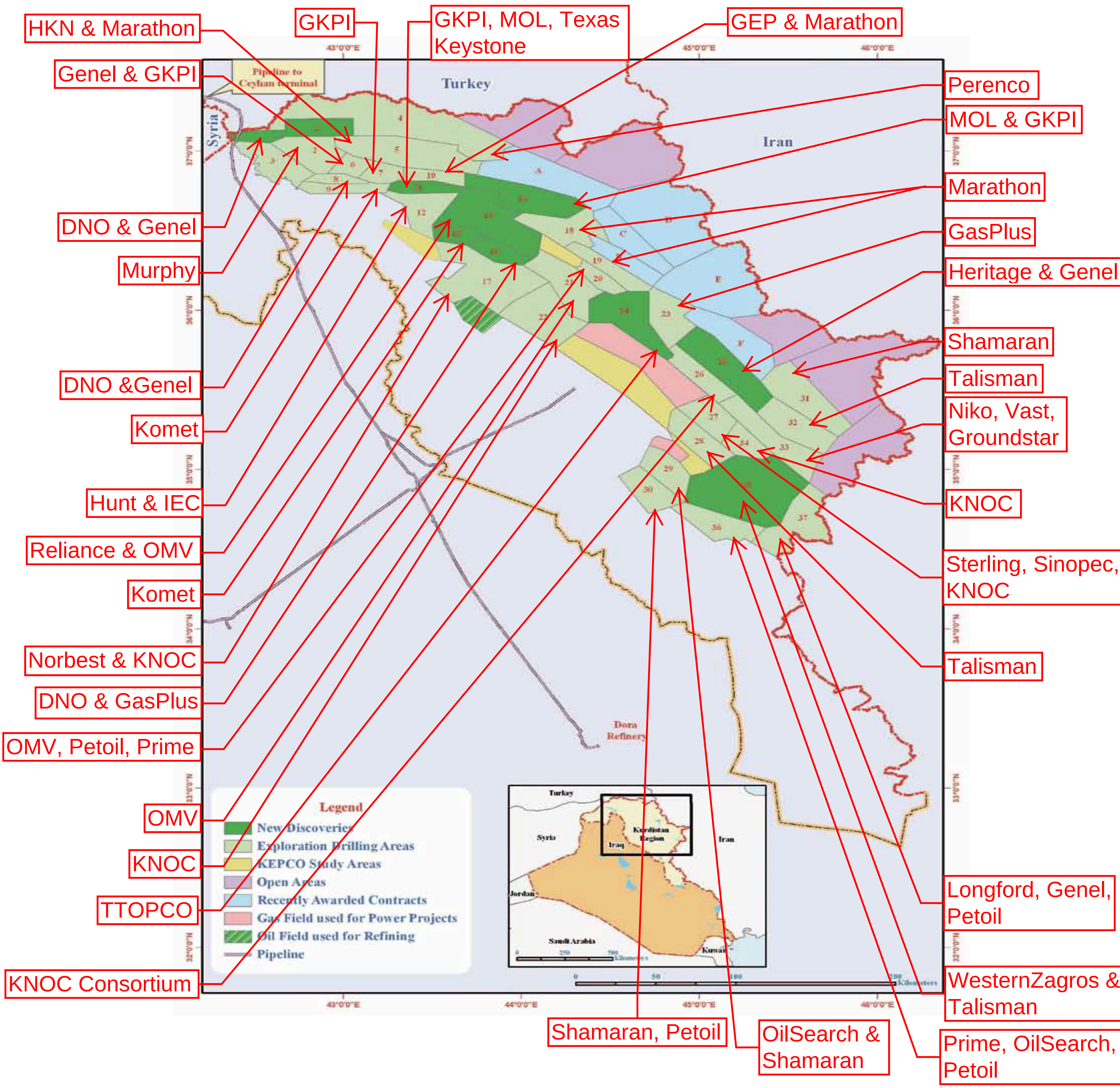
IOC Contracts with the Kurdish Regional Government

Oil Field/Concession		Energy Company		Share	Notes
				PRODUCTION PHASE	
Taq Taq	**K24A**	TTOPCO*		80%	Producing 35,000 bpd
		- Genel	(TR)	44%	TTOPCO is a joint venture
		- Sinopec (via Addax)	(CN)	45%	between Genel & Sinopec
Tawke	**K1**	DNO*	(NO)	55%	Producing 50,000 bpd
		Genel	(TR)	25%	
				DISCOVERY PHASE	
Akri-Bijeel	**K13**	MOL* (via Kalegran)	(HU)	80%	2.4 BB proven oil in place
		GKPI	(UK)	20%	*Medium risk concession*
Bazian	**K26**	KNOC Consortium	(KR)	80%	1.27 BB barrels estimated reserves
		- KNOC*		50.5%	
		- UI Energy			
		- SK Energy			
		- Daesung			
		- Samchully			
		- Bum-Ah			
		- GS Holdings			
		- Majuko			*Low risk concession*
	K15	Komet* (Ascom Group)	(MD)	80%	
Kalar-Bawanoor	**K35**	WesternZagros*	(CA)	40%	260 MB estimated reserves
		Talisman	(CA)	40%	
Miran	**K25**	Heritage*	(UK)	75%	744 MB estimated reserves
		Genel	(TK)	25%	*Low-medium risk concession*
Rovi & Sarta	**K14**	Reliance*	(IN)	80%	1 BB estimated reserves
		OMV	(AT)	20%	*Low risk concession*
Shaikan	**K11**	GKPI*	(UK)	75%	31,000 bpd proven capacity
		MOL (via Kalegran)	(HU)	20%	
		Texas Keystone	(US)	5%	*Low risk concession*
				EXPLORATION PHASE	
Ain Sifni	**K12**	Hunt*	(US)	60%	
		IEC*	(US)	20%	
Arbat	**K31**	Shamaran*	(CA)	60%	
Atrush	**K10**	GEP*		80%	General Exploration Partners
		- Aspect	(US)	66.5%	(GEP) is a joint venture
		- Shamaran	(CA)	33.5%	between Aspect & Shamaran
		Marathon	(US)	20%	*Low risk concession*
Baranan	**K32**	Talisman*	(CA)	60%	
Ber Bahr	**K6**	Genel*	(TR)	40%	
		GKPI	(UK)	40%	*Low risk concession*
Bina Bawi	**K20**	OMV*	(AT)	36%	Calibre Energy (US) failed to
		Petoil	(TR)	23%	raise enough in a flotation to
		Prime	(US)	21%	remain involved

Chia Surkh	**K37**	Longford* (CA) Genel (TR) Petoil (TR)	40% 20% 20%	The previous operator was Forbes and Manhattan (CA)
Duhok	**K8**	DNO* (NO) Genel (TR)	40% 40%	*Medium risk concession*
Duhok – Central	**K2**	Murphy* (US)	50%	
Duhok – Southern	**K9**	Komet* (Ascom Group) (MD)	80%	
Erbil	**K16**	DNO* (NO) GasPlus - Dogan (TR) - New Age - Range Oil (CA) - Black Gold (AE)	40% 40% 50% 50% 49.9% 50.1%	GasPlus is a joint venture between Dogan and New Age, which is a joint venture between Range Oil and Black Gold (a subsidiary of Al Zarooni)
Harir	**K18**	Marathon* (US)		
Hawler	**K17**	Norbest* (TKN-BP) (RU) KNOC (KR)	85% 15%	*Low-medium risk concession*
	K28	Talisman* (CA)	60%	
	K 29	Oil Search* (PG) Shamaran (CA)	60% 40%	Shamaran was previously known as Bayou Bend
Kew Chirmila	**K24B**	TTOPCO* - Genel (TR) - Sinopec (via Addax) (CN)	80% 44% 45%	TTOPCO is a joint venture between Genel & Sinopec
Khalakan	**K23**	GasPlus* - Dogan (TR) - New Age - Range Oil (CA) - Black Gold (AE)	80% 50% 50% 49.9% 50.1%	GasPlus is a joint venture between Dogan and New Age, which is a joint venture between Range Oil and Black Gold (a subsidiary of Al Zarooni)
Mala Omar & Shorish	**K21**	OMV* (AT)	80%	*Low-medium risk concession*
Pulkhana	**K30**	Shamaran* (CA) Petoil (TR)	60% 20%	
Qara Dagh	**K33**	Niko* (CA) Vast (CA) Groundstar (CA)	37% 37% 6%	Vast is a subsidiary of Forbes and Manhattan Group (CA)
Qush Tappa	**K22**	KNOC* (KR)	60%	
Safen	**K19**	Marathon* (US)	80%	
Sangaw North	**K27**	Sterling* (UK) Sinopec (CN) KNOC (KR)	53.33% 26.67% 20%	*Low risk concession*
Sangaw South	**K34**	KNOC* (KR)	60%	*Low risk concession*
Sarsang	**K5**	HKN* (Hillwood Energy) (US) Marathon (US)	56.25% 18.75%	*Medium risk concession*
Shakal	**K36**	Prime* (US) Oil Search (PG) Petoil (TR)	45% 18.75% 11.25%	*Low risk concession*
Sheikh Adi	**K7**	GKPI* (UK)	80%	*Low risk concession*
Sindi-Amedi	**K4**	Perenco* (FR/UK)	80%	*High risk concession*

* Denotes operator

Sources: Kurdistan Regional Government press releases, Arabian Oil & Gas, company websites


HKN & Marathon
GKPI
GKPI, MOL, Texas Keystone
GEP & Marathon
Genel & GKPI
Perenco
MOL & GKPI
Marathon
GasPlus
Heritage & Genel
Shamaran
Talisman
Niko, Vast, Groundstar
KNOC
Sterling, Sinopec, KNOC
Talisman
Longford, Genel, Petoil
WesternZagros & Talisman
Prime, OilSearch, Petoil
OilSearch & Shamaran
Shamaran, Petoil
DNO & Genel
Murphy
DNO &Genel
Komet
Hunt & IEC
Reliance & OMV
Komet
Norbest & KNOC
DNO & GasPlus
OMV, Petoil, Prime
OMV
KNOC
TTOPCO
KNOC Consortium
Pipeline to Ceyhan terminal
Turkey
Iran
Syria
Dora Refinery
Legend
New Discoveries
Exploration Drilling Areas
KEPCO Study Areas
Open Areas
Recently Awarded Contracts
Gas Field used for Power Projects
Oil Field used for Refining
Pipeline
Kurdistan Region
Iraq
Jordan
Saudi Arabia
Kuwait

Investment Risks

Infrastructure deficiencies

Iraq's roads, pipelines, terminals, and other oil-related infrastructure are in a parlous state. The Al-Basrah Terminal (ABOT), which handles 80% of Iraqi oil exports, was designed to load 4 million barrels per day through its fourth berths: two berths for the largest tankers available – Ultra Large Crude Carriers (ULCC) with an up to 400,000 DWT capacity – and two for Large Range 2 tankers (85,000 DWT). The Iraqi government awarded large reconstruction projects in 2004 to boost ABOT's capacity from 1.2 million bpd to its pre-war 3 million bpd. However, according to a 2007 Office of the Inspector General for Iraq Reconstruction report, the pipelines feeding into ABOT are so dilapidated that despite the upgrades only 2 berths can now simultaneously load, yielding a maximum capacity of 1.6 million bpd (of which 1.4 million bpd is currently used). Thus, a ULCC tanker takes up to 96 hours to fully load.

The Iraqi central government had initially announced plans to increase capacity to 8 million bpd by 2011 through massive investment in new pipelines and terminals, but has only reached a quarter of this objective to date. The government has revised its target to tripling export capacity to 6.6 million bpd. Meanwhile, its official production target is to reach 12.5 million bpd by 2017. These goals would be ambitious ones for any developed country to achieve, let alone Iraq with its general infrastructural, water (for enhanced oil recovery) and skilled manpower shortcomings. Industry sources and analysts estimate that the country will achieve around a third of this goal, and the International Energy Agency estimates it will take Iraq until 2020 to achieve even this fraction. IOCs will have to plan and budget on meeting most of their logistical needs themselves. This has included, first of all, de-mining their contracted oil fields; Iraq's estimated 25 million landmines are clustered around the country's oil and gas resources.

Contractual uncertainty

The legal standing of IOC contracts is precarious. Iraq's central government has driven a tough bargain with IOCs to secure its primary source of revenue – the government depends on oil export revenues for 90% of its budget – and garner public support for the licensing rounds. However, Iraqi political parties have still not reached the consensus necessary to pass a national oil law. By the time that many of the IOCs' oil fields become commercially viable (as late as 2017 according to Oxford Analytica) Iraq will have cycled through several administrations; some opposition factions have filed lawsuits challenging the IOC contracts, and have claimed they will not honor the current administration's oil deals if they come to power.

IOCs that signed deals with the Kurdish Regional Government have already been hamstrung by political vicissitude. The companies will not be authorized to participate in any national licensing bids until the central government and Kurdish region have reached a revenue-sharing agreement. Although the Iraqi government has allowed oil exports from Kurdish fields since February 2011, it has not yet reached agreement with the KRG over how the foreign companies will be paid. The central government has signaled that it may recognize KRG deals with IOCs, but only if they are redrafted according to its guidelines.

Political instability

Iraq joined in the wave of protests convulsing the Arab world in 2011. Tens of thousands of Iraqis across ten cities took to the streets at the end of February in a "day of rage" over inadequate government services, corruption, and lack of jobs, echoing Iraqi demonstrations in the summer of 2010. Current Prime Minister Nuri Kamal al-Maliki, who continues to maintain control of the army and policy, has shut down the offices of several opposition groups; Maliki is widely considered to be consolidating his grip on power. What these movements portend for Iraq's fragile democracy is still unclear.

In another incident this month with important ramifications, insurgents bombed Iraq's largest refinery, Baiji, shutting it down for two weeks and causing damage that will take months to repair. Another refinery's pipeline was bombed a couple of weeks earlier. The Iraq Pipeline Watch counts 470 attacks on Iraq's oil infrastructure from 2003 through March 2008, when the number of incidents started to markedly fall. The Baiji bombing is the worst attack on Iraq's oil infrastructure since 2003.

Notwithstanding the risks, given Iraq's large and relatively untapped reserves of easy-access and high-grade oil, and the relatively higher political volatility overcoming some of the other oil-producing countries in the region, non-participation is not an option for most IOCS.

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