



A Rocky Road: Kurdish Oil & Independence

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Robin Mills,
Qamar Energy,
Dubai, February 2018

1. Introduction

The referendum on independence for the hitherto autonomous Kurdistan Region of Iraq (KRI)¹, held on 25th September 2017, has brought global attention. It is well-understood that the region's oil and gas resources are a critical factor for its future and for its neighbourhood. Along with the referendum, there have been important recent political, military, economic and industry developments concerning the KRI. This report is therefore intended to build on my earlier study for the Oxford Institute for Energy Studies², and to bring the story up to date from the start of 2016. It should be read in conjunction with the earlier study, as I do not here cover all of the historical and background material.

Despite knowledge of the presence of oil dating back to ancient times, the history of the KRI's petroleum industry essentially goes back no further than 2005. The presence of larger oil-fields elsewhere in Iraq, and political problems, insurgency and repression in Kurdistan, particularly under the Saddam Hussein regime, prevented most hydrocarbon exploration and development. However, Kirkuk, where oil was discovered in huge quantities in 1927, though not part of the official KRI, also voted in the referendum. Various other outlying areas with petroleum resources also came under KRG control, particularly since the onslaught of ISIS³ in 2014 and the subsequent counter-offensive, and with Kirkuk, were then returned to federal government control in October 2017. These areas are also covered here.

Since 2014, the difficulties caused by lower oil prices, the KRI's economic crisis, ISIS and industry disappointments have quietened media discussion of the region's oil industry. Much good political analysis has been produced, but understanding the KRI's political future depends critically on its political economy and economic fundamentals and those, in turn rest primarily to date on hydrocarbons. The development of the region, and the recent survival of its government, has depended firstly on budget transfers from Baghdad, almost entirely sourced from oil exports, and subsequently on the region's own oil production.

¹ Often referred to as the 'KRG' (Kurdistan Regional Government) though strictly speaking this is the name of the government, not the territory; as 'Kurdistan', though this should apply to the broader area inhabited by Kurds, spread across several countries; or, by Kurdish nationalists, as 'South Kurdistan' (with 'North Kurdistan' in Turkey, 'West Kurdistan' in Syria, and 'East Kurdistan' in Iran. The euphemism 'North Iraq', used to avoid Turkish sensitivities, seems to be falling into disuse. In this paper, I restrict the use of the term KRG to the regional government and its apparatus. I use the informal term 'federal Iraq' to refer to those parts of Iraq not included in the KRI.

² 'Under the Mountains: Kurdish Oil and Regional Politics' (R. Mills), 1st January 2016, Oxford Institute for Energy Studies, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/02/Kurdish-Oil-and-Regional-Politics-WPM-63.pdf>

³ The so-called Islamic State in Iraq and Al-Sham [Syria], also known as ISIL or Da'esh (the derogatory Arabic acronym).

Consequently, the KRI's petroleum has become crucial for the fight to destroy ISIS, a fight of keen interest to the international community. Attracting almost as much international attention, it also strongly affects the future of the Kurds and other inhabitants of the KRI, the future of Iraq itself, the relations of the region with the neighbouring countries, and Kurdish minorities in Turkey, Syria and Iran.

The study of the KRI's oil industry also has wider significance for the global energy business. It is a rare recent case of the discovery and development of a major new onshore conventional petroleum province. Although not an enormous producer, it is, considered separately from federal Iraq, a significant and effectively non-OPEC producer. As a gas exporter it can play an important role in the energy balance and diversification of Turkey's energy market.

Its story illustrates the strategies and challenges of various species of oil companies – ranging from local private firms, smaller entrepreneurial companies, mid-size international firms up to super-majors, and internationalised national oil companies – and how they deal with technical and political risk. And it shows ways in which sub-national regions can use their natural resources to further autonomy and even independence. This may be relevant to other resource-rich territories, for instance eastern Libya, Yemen's Hadhramawt, or Western Sahara.

Section 2 of this paper outlines the recent history and development of the KRI's hydrocarbon resources, concentrating on new events in the 2016-17 period. Section 3 examines the petroleum industry, its current status and future potential. Section 4 considers the economic, legal, and political issues and debates, and the role of politicians, outside actors, and international oil companies. Section 5 covers the independence referendum and its potential significance for the KRI's petroleum industry. The study concludes with Section 6, discussing the wider implications of Kurdish oil and gas, the regional implications, and some lessons for other comparable territories.

2. Political and Petroleum History of the Kurdistan Region of Iraq

Since the removal of the Saddam Hussein regime, the KRG, in control of the Kurdistan Region of Iraq (KRI), has sought to increase its autonomy and move closer to potential independence. Hydrocarbon resources have been a key part of developing its economy and making the KRI important to its neighbours, particularly Turkey, and to powerful external actors such as the US and Russia. The development path taken has been influenced by the vagaries of its history, geology and geography, but also by institutional choices and those of international oil companies. In turn, the region's petroleum endowment has shaped its political and economy system, advantaging some political actors and disadvantaging others. Most recently, the dramatic events of late 2017 following the KRI's independence referendum have again cast the future of its oil business into doubt.

2.1. Political history

The Kurdish people are spread across north-eastern Iraq, north-eastern Syria, south-western Turkey and western Iran, with smaller groups in other parts of those countries and a growing diaspora in the West. They speak a number of closely-related languages or dialects of the North-West Iranian group, of which Sorani and Kurmanji are the most represented within Iraqi Kurdistan. Kurdish in Iraq and Iran is written in a modified Perso-Arabic script, but in Turkey in a version of the Latin alphabet. With a long historical pedigree, their distinct ethnic identity crystallised from the 12th and 13th centuries CE. Most recently, satellite television, social media, and the existence of the KRG have encouraged a sense of pan-Kurdish identity, but tribal and geographic distinctions remain strong.

Most Kurds are Sunni Muslims, with a Shi'ite minority, and other groups of non-Islamic religions, including the Yezidis, the syncretic Shabak, the Ahl-e Haqq and Christians. The Yezidis and Shabak do not always identify as ethnically Kurdish.

The KRG states its population at 5.2 million, apparently referring to 2004⁴, and only to the three KRG governorates, Erbil, Duhok and Sulaymaniyah (Halabja was split off from Sulaymaniyah in 2014). The number of Kurds in Iraq, not all of whom live in the KRI, is estimated at 15-20 per cent of the total, 5.9-7.8 million⁵. Iraq's overall population has grown 41 per cent since 2014, 2.9 per cent per year. If this applies also to the KRI, its population would now be around 7.35 million, 20 per cent of Iraq's total. Its population may even have grown more given the better security and the influx of internally displaced people, including Arab Syrians and Iraqis, since 2014. Other territories have since come under the

⁴ Website of Kurdistan Regional Government: www.gov.krd/p/p.aspx?l=12&p=214.

⁵ <https://www.cia.gov/library/publications/the-world-factbook/geos/iz.html>

control of the KRG, particularly around Kirkuk and in Ninewa, which contain significant non-Kurdish minorities, such as Arabs and Turkmen.

For comparison, Iran has 5–7.9 million Kurds, Turkey 12 million (or possibly up to 22.5 million⁶), and Syria 2–2.5 million.⁷

The history of the KRI since the First World War can be broadly divided into four phases: 1920-1991, 1991-2002, 2003-13 and 2014-present.

In the **first phase**, the Kurdish people were unsuccessful in obtaining their own state and were divided between various existing and newly-independent countries – Iraq, Turkey, Iran and Syria. Although the regional borders are often ascribed to the Sykes-Picot agreement of 1916, in fact the assignment of the wilayat (governorate) of Mosul, which included the modern KRI, to the new British mandate of Iraq was only determined after the San Remo conference of 1920, the Franco-Turkish agreement of October 1921, the Treaty of Lausanne of 1923, and the League of Nations judgement of December 1925⁸. The British wanted to secure the oil resources expected to exist in the Mosul area, and the French received in return a 25 per cent stake in the Iraq Petroleum Company.

Kurdish discontent with their governing states, and consequent repression, has occurred throughout the post-WW1 period. In the 1920s and again from 1984 under the PKK, Kurds in Turkey have waged a number of insurgencies against the Ankara government. In 1946, Kurds in Iran established the short-lived Republic of Mahabad, and the PKK has an offshoot in Iran, the Party for a Free Life in Kurdistan (PJAK). Many Kurds in Syria were stripped of their citizenship or dispossessed during the 1960s and 1970s.

Mulla Mustafa Barzani, father of current president Masoud Barzani, founded the Kurdish Democratic Party (KDP) to campaign for Iraqi Kurdish autonomy. Kurds were granted autonomy in March 1970, but fighting broke out again in 1974. At this time, Saddam Hussein reportedly offered Mustafa Barzani a deal to divide Kirkuk, with Baghdad administering the western part, containing the oil fields, but Barzani refused⁹. The Kurdish rebellion collapsed in 1975 after the Shah of Iran settled his differences with Saddam Hussein in the Algiers agreement and stopped his support for the Kurds. After this, Jalal Talabani and colleagues, including future Gorran leader Nawshirwan Mustafa and future Iraqi president Fuad Masum, established the Patriotic Union of Kurdistan (PUK) in 1975, following discontent with Mustafa Barzani's leadership and the failure of the revolt. From the 1960s onwards, successive Iraqi governments attempted to 'Arabise' Kurdish territories, particularly the key areas around Kirkuk, by forced population transfers. During the Iran-Iraq War, and the 1988 'Anfal' genocide campaign, Iraqi Kurdistan was devastated by scorched earth policies, atrocities and chemical weapons attacks.

⁶ The divergence may result from the desires of the Turkish government and Kurdish nationalists respectively to downplay or overstate the size of the Kurdish population.

⁷ CIA World Factbook.

⁸ 'A brief survey of The History of the Kurds', Kendal Nezan, President of the Kurdish Institute of Paris: www.institutkurde.org/en/institute/who_are_the_kurds.php.

⁹ <http://www.al-monitor.com/pulse/originals/2017/10/turkey-iraq-kirkuk-kurds-back-to-square-one.html>

The **second phase** of modern KRI history began after the 1990-91 First Gulf War, which was followed by mass uprisings against the Saddam Hussein regime by Kurds in northern Iraq and Shi'a in the south. After further atrocities and mass refugee movements, the establishment of a northern no-fly zone by the US-led coalition allowed the Kurdish region to establish a shaky *de facto* autonomy. The KDP and PUK established the Kurdistan Regional Government (KRG) in 1992, but they fought an intermittent civil war during 1994-7, with further intervention by the regime in Baghdad. The sanctions on Iraq allowed the development of a lucrative oil smuggling network through the region, which however remained poor and isolated.

The **third phase** opened after the US-led campaign of 2003 removed the Saddam regime, and a new Iraqi Constitution was ratified in 2005. The Kurdish region was formalised as a region within a federal state, with certain powers reserved to itself. Jalal Talabani, leader of the PUK, became president of Iraq, a largely ceremonial role but part of a tacit sectarian bargain wherein the Prime Minister would be a Shi'ite Arab and the Speaker of Parliament a Sunni Arab. The experience of the repressive Baathist regime and their desire to make the most of their autonomy led the Kurds to prefer a weak federal government, in which they were often the kingmakers between competing Arab parties.

From 2005-14, security in the KRI was good, unlike the rest of Iraq, and the KRG pursued a broadly investor-friendly and pro-American policy, as well as steadily improving relations with the Turkish government of Prime Minister (later President) Recep Tayyip Erdoğan. Turkey had initially been hostile to Kurdish autonomy, fearing it might encourage separatism in its own large Kurdish minority, but it came to believe it could influence the KRG more effectively by a policy of engagement, co-opt it and so forestall pan-Kurdish aspirations, and benefit economically.

With a share of the federal Iraqi budget, which rose steadily due to rising production and oil prices, as well as its own oil and gas exploration and development, the KRI enjoyed an economic boom and greatly improved its infrastructure and its people's quality of life. However, disputes with the federal government in Baghdad escalated into 2011-12, particularly over the disputed constitutional provisions concerning the governance of the hydrocarbon sector, revenue-sharing, disputed territories, and command of the military, with the Kurdish forces, the Peshmerga, remaining independent of the federal armed forces.

Article 140 of the Constitution specified that a referendum would be held by 31st December 2007¹⁰ to decide the future of the Kirkuk area. But this referendum has not been held, nor does it look likely to be held given the events of late 2017. The federal government did not wish to lose control of this vital city, economically important and also a powerful Kurdish nationalist symbol. The KDP was concerned about strengthening the rival PUK, which controls Kirkuk. Turkey has wished to preserve its leverage between Erbil and Baghdad, not strengthening the KRI too much, and to protect the Turkmen population in the area.

¹⁰ https://www.washingtonpost.com/news/monkey-cage/wp/2017/10/30/heres-what-old-constitutional-debates-tell-us-about-the-new-crisis-in-iraqi-kurdistan/?utm_term=.1e1e998a799b

From mid-2014, the KRI entered the **fourth phase** of its modern history, one of political and economic crisis.

In January 2014, the region's share of the Iraqi budget was cut, and stopped completely by March 2014. Attacks by ISIS (the so-called Islamic State of Iraq and Al Sham [Syria]) repeatedly shut down the pipeline from Kirkuk to Turkey during 2013, and January and February 2014. By March 2014, the pipeline was completely inoperable, and so a deal with the central government for the KRG to export 100 000 barrels per day from April could not be implemented. By May 2014, the KRG had completed its own pipeline to Turkey¹¹ and was able to export oil steadily on its own account.

ISIS steadily gained ground through 2014, taking Fallujah, Al Qaim and part of Ramadi. In June 2014, the organisation captured the city of Mosul, Iraq's third largest, as Iraqi army resistance collapsed, also seized Tel Afar, Tikrit and much of the province of Ninewa as well as parts of Diyala and Kirkuk, and entered the oil refining centre of Baiji.

As central government troops fled, the Peshmerga took control of Kirkuk, as well as other disputed territories in Gwer, Tuz Khurmatu and around Hawija and Dibis¹², on the way to the Bai Hassan oil-field.

In August, ISIS captured Sinjar (Shingal), threatening a genocide of the Yezidi people, and the town of Qaraqosh with its large Christian population. and advanced close to Erbil. This showed the military weakness of the lightly-armed peshmerga and the problem of their politically-divided command. The attack on Baiji led to fuel shortages across Kurdistan¹³. Eventually, with US air support, the Peshmerga and Iraqi army were able to halt the ISIS advances.

Since then, the Peshmerga, Iraqi army and Al Hashd Al Shaabi (Popular Mobilisation – largely Shi'ite militia) forces, backed by the US, have gradually driven out ISIS, declaring the recapture of Mosul in July 2017. In Syria, the Kurdish-led Syrian Democratic Forces (SDF), backed by the US and allies, has similarly expelled ISIS from much captured territory. However, during the campaign, clashes did occur, as in the disputed town of Tuz Khurmatu in November 2015¹⁴, between Al Hashd Al Shaabi forces and Peshmerga, despite their alliance in principle against ISIS. These disturbances may have had predominantly local roots or be related to indiscipline within Al Hashd Al Shaabi, but they do raise concerns over future political, or even armed, conflict between Baghdad and the KRG.

With the cut-off of the federal budget, the fall in the price of oil from June 2014, the interruptions to exports, and the costs of the war against ISIS and supporting displaced people, the KRI entered a fiscal and economic crisis, in which salaries to government workers and even the military, and cost

¹¹ <http://www.reuters.com/article/iraq-kurdistan-exports/update-2-iraqi-kurds-link-kirkuk-to-own-oil-pipeline-plan-more-exports-idUSL5N0OY2PI20140617>, <http://musingsoniraq.blogspot.ae/2014/04/iraqs-northern-kirkuk-oil-pipeline-down.html>

¹² <https://www.theguardian.com/world/2014/jun/12/kurdish-peshmerga-kirkuk-iraq-maliki>

¹³ <https://www.reuters.com/article/uk-iraq-security-kurdistan-fuel/fuel-shortages-in-iraqi-kurdistan-to-last-at-least-another-week-idUKKBN0EX0YT20140622>

¹⁴ 'Multiple dead in Kurd-Hashid fight in Tuz', Iraq Oil Report, 13 November 2015, www.iraqoilreport.com/news/multiple-dead-in-kurd-hashid-fight-in-tuz-17031.

reimbursement to the oil companies, went unpaid for months at a time. The KRG accumulated a huge debt, as described in section 3.8.1.

President Barzani's eight-year term expired in August 2013; the Kurdish parliament extended it by two years, but he refused to step down in August 2015. Protests in October 2015 against the KDP over unpaid salaries were blamed on the Gorran Party, which broke away from the PUK in 2009. The speaker of parliament, from Gorran, was denied entry into Erbil, Gorran parliamentarians and ministers were expelled from the KDP-controlled parts of the KRI¹⁵, and the parliament has not sat from October 2015 to September 14th 2017, when they reconvened before the referendum¹⁶. Gorran founder Nawshirwan Mustafa died in May 2017. Meanwhile the PUK has been further embroiled in internal disputes with former Kurdish prime minister Barham Salih (in office 2006-9) attempting to take control of the party in alliance with Peshmerga veteran Kosrat Rasoul, and away from Hero Talabani, wife of Jalal Talabani. Jalal Talabani's sons Bafel and Labur are other strong candidates for the leadership¹⁷.

2.1.1. The 2017 Independence Referendum

From 2014, Masoud Barzani had increasingly spoken of his intention to hold a referendum on independence, on the grounds that Iraq was effectively partitioned¹⁸ already after the ISIS advances. In June 2017, the date of the referendum was announced, and 25th September it was held. As well as the official KRG areas of the four governorates of Duhok, Erbil, Suleymaniyah and Halabja, Kirkuk and other KRG-controlled "disputed territories" were included in the vote.

The referendum result was, as expected, overwhelmingly in favour of independence. President Barzani's spokesman Hemin Hawrami quoted 3.9 million eligible voters of whom 3488759 voted: 726540 in Erbil, 994427 in Duhok, 608292 in Suleymaniyah (Slemani), 526492 in Kirkuk, 298988 in Ninewa, 39995 in Halabja and 158000 in Diyala¹⁹. The eligibility age was 18; 51 per cent of Iraqis are 19 or below²⁰, implying a total population in the three KRI governorates, if everyone eligible registered, of about 7.9 million. Registration and voting was likely less in Kirkuk, Ninewa and Diyala due to inaccessibility of polling stations and lack of support for the referendum from some non-Kurdish populations, though the official figures claimed very high turnout of 80-90 per cent.

The referendum was opposed by nearly all other powers involved: the US and EU fear that it could hamper the campaign against ISIS, and that the rump federal Iraq would be more susceptible to Iranian influence, with a built-in majority for Shi'ite Islamist parties; Baghdad is concerned about the

¹⁵ Iraq Oil Report, 12th October 2015.

¹⁶ <http://www.rudaw.net/english/kurdistan/100920171>

¹⁷ <https://kurdishpolicy.org/2016/12/28/the-second-coming-of-talabani-who-is-bafel-talabani/>

¹⁸ <http://www.bbc.com/news/world-middle-east-28103124>

¹⁹ <https://twitter.com/heminhawrami/status/912393373549563904>

²⁰ <https://www.populationpyramid.net/iraq/2016/>

break-up of Iraq and the future of the disputed territories; Turkey, Iran and the Assad regime in Syria²¹ are concerned about the impact on their own Kurdish populations.

The US State Department announced:

“The United States does not recognize the Kurdistan Regional Government’s unilateral referendum held on Monday. The vote and the results lack legitimacy and we continue to support a united, federal, democratic and prosperous Iraq.

We remain concerned about the potential negative consequences of this unilateral step. Prior to the vote, we worked with both the KRG and the central government in Baghdad to pursue a more productive framework and to promote stability and prosperity for the people of the Kurdistan region. These aspirations, ultimately, cannot be advanced through unilateral measures such as this referendum.

We urge calm and an end to vocal recriminations and threats of reciprocal actions. We urge Iraqi Kurdish authorities to respect the constitutionally-mandated role of the central government and we call upon the central government to reject threats or even allusion to possible use of force. The United States asks all parties, including Iraq’s neighbors, to reject unilateral actions and the use of force.”²²

It emerged subsequently to the referendum that US secretary of state Rex Tillerson had drafted a letter offering to support the KRG in time-limited talks on autonomy with Baghdad, if they would call off the referendum, but that it was rejected by the Kurds in discussions²³. Tillerson was, of course, chief executive of ExxonMobil in November 2011 when the US oil giant entered the KRI in express contravention of the wishes of both Baghdad and the American government.

Iranian foreign minister Javad Zarif said the independence bid risked “disaster” and was a “wrong, imprudent decision”. “An independent Kurdistan would lead to a break-up of Iraq. This would be disaster…You will have perpetual war in Iraq. I think we need to go back to respecting the constitution and territorial integrity of Iraq and to engage in serious dialogue.”²⁴ Iran’s construction of a dam on the Khas river, reducing flow into the Kurdish town of Qaladze in June 2017²⁵, was seen by some as a coded warning to the KRG. Kurds in Iran rallied in support of the vote, a concern for Tehran, while Kurdish regions in Syria held local elections in September 2017 as part of an attempt to move to a federal system. The Saudi government, despite its differences with Iran and the Iraqi government in Baghdad, also urged President Barzani to call off the referendum²⁶.

²¹ <https://www.reuters.com/article/us-mideast-crisis-kurds-referendum-syria/damascus-rejects-iraqi-kurdish-independence-referendum-idUSKCN1C00SV>

²² <https://www.state.gov/secretary/remarks/2017/09/274522.htm>

²³ <https://www.bloomberg.com/view/articles/2017-10-13/tillerson-letters-show-u-s-nearly-averted-kurdish-referendum>

²⁴ <https://www.ft.com/content/f65ab070-a513-11e7-9e4f-7f5e6a7c98a2?segmentid=acee4131-99c2-09d3-a635-873e61754ec6>

²⁵ <http://www.rudaw.net/english/business/24062017>

²⁶ <http://www.arabnews.com/node/1164416/middle-east>

On the other hand, Israel has supported the Kurds quietly, as part of its policy of engaging with non-Arab and non-Iranian groups in the region, but has avoided comment on the referendum. Russia has officially reiterated its policy favouring Iraq's territorial integrity, but has not commented on whether it would recognise the results of the vote. However, its foreign ministry statement included the line, "Moscow respects the national aspirations of the Kurds"²⁷. In August, the deputy head of the Russian consulate in Erbil, Evgeny Arzhantsev, said, "I think Moscow will support the decision made by the people of Kurdistan because it is a decision through referendum how can you not listen to what people's choice is...if the people of Kurdistan decided on independence we have to respect it."²⁸ As discussed below, via its oil investments in the region, Russia was practically the country most supportive of Kurdish moves towards independence in recent months. But following Iraq's subsequent moves against the KRG, Russia hurried to prop up its relations in Baghdad.

Israel was actually importing oil from the KRG, supporting their independent oil exports since 2014. They were purchasing oil from Turkey's Ceyhan port which was used domestically by Israeli refiners or stored in storage facilities for re-exports to Europe²⁹. This was convenient since Iraq could not take legal action against Israel, with whom it has no diplomatic relations. Other notable importers besides Turkey and Israel were Cyprus, Malta, Greece and Italy. Tanker data shows that Israel and European customers are still importing from the KRG in the months after the September 2017 independence referendum despite Baghdad's threats to traders purchasing KRG oil. In October Greece imported 148.3 kbpd; Israel 33.2 kbpd; Croatia 32.1 kbpd; UAE 32.6 kbpd (probably for storage at Fujairah and re-export); Spain 32.4 kbpd; Poland 27.8 kbpd; Cyprus 22 kbpd; Italy 17.1 kbpd³⁰. Total exports were 345.5 kbpd that month. November exports were lower at 269 kbpd to Israel and Europe. Haider al-Abadi accused the KRG of still exporting 550 kbpd oil through the KRG-Ceyhan pipeline in November which the KRG rejected as they had lost control of Kirkuk and surrounding fields on October 16, costing them at least 300 kbpd of output.

The response to the referendum by the KRI's neighbours was swift. It was roundly condemned by the surrounding countries, with Turkey closing the border and opening another crossing point not located at official KRG territory; and Iraq shutting down international flights into the KRI. However, Turkey did not immediately stop flows of Kurdish oil through its territory. Some discussions suggest that, despite public rhetoric, the Turkish government was actually more resigned to the result of the referendum and to managing its fall-out.

On 16th October 2017, on the orders of Prime Minister Haider Al Abadi, apparently with the encouragement of Iran, and by agreement with the PUK, Iraqi army forces and Hashd Al Shaabi began moving into key locations in Kirkuk, including the airport and the oil-fields. Peshmerga opposition was light and uncoordinated, and most withdrew, and the federal forces secured the city, advancing often to the 2014 lines and in many places beyond them to the 2003 lines. In addition to Kirkuk, they also retook Zumar and the nearby Ain Zalah field. They also advanced towards the Khurmala field, north-

²⁷ <http://www.al-monitor.com/pulse/originals/2017/09/turkey-russia-how-moscow-sees-ankara-response-referendum.html>

²⁸ <http://www.kurdistan24.net/en/interview/ca846290-2e60-428d-8088-631978d3e299>

²⁹ <https://www.reuters.com/article/us-iraq-kurdistan-oil/exclusive-how-kurdistan-bypassed-baghdad-and-sold-oil-on-global-markets-idUSKCN0T61HH20151117>

³⁰ Tanker Trackers

west of Kirkuk, and the Fishkhabour border crossing, signalling the possibility of taking control of the KRG's link to the oil export pipeline through Turkey, or cutting it off.

Since then, both sides have assembled substantial military forces around Fishkhabour, and fought some extended skirmishes. The KRG has constructed a defensive berm south of Fishkhabour, running from the Syrian border to the Mosul Dam lake. In January 2018, the Iraqi Parliament voted to remove KAR Group, the private Kurdish company, from operations at the Kirkuk fields (though it was not clear if this included Khurmala)³¹. The Ministry of Oil, though, said that it would continue working with some KAR employees at Kirkuk and would keep providing crude to KAR's refinery near Erbil, which supplies fuel to areas of Salahaddin, Ninewa and Anbar recently freed from ISIS³².

The two sides' concentration on each other has opened the way for a partial resurgence of ISIS, with attacks on remote villages and bombings. The rapid advance of federal forces after the Peshmerga's retreat has left a large area of inadequately-policed territory³³. There is a concern that the continuing Baghdad-KRG confrontation could open the way to a wider return of ISIS, or at least to an extended insurgency which would prevent reconstruction.

2.2. Politics in the KRI

Since the period of effective autonomy from 1991 onwards, and particularly following the overthrow of the Saddam Hussein regime in 2003, political power in the KRI has been divided between the Kurdistan Democratic Party (KDP) of Kurdish president Masoud Barzani, and the Patriotic Union of Kurdistan (PUK). The PUK was led by Jalal Talabani, its founder, and Iraqi president (2005-14), until he suffered a stroke in December 2012.

The parties have split control of key ministries, including the crucial Ministry of Natural Resources under KDP member Ashti Hawrami, and maintained their own Peshmerga forces. Barham Salih of the PUK was prime minister of the KRG from 2009-12, and was replaced by Masoud Barzani's nephew Nechirvan Barzani, who remains in office. The KRG's security chief Masrour Barzani is a son of Masoud Barzani, while the PUK is now under the control of Jalal Talabani's wife, Hero Ibrahim Ahmed. Deputy prime minister Qubad Talabani is the son of Hero and Jalal Talabani.

In 2009, campaigning against corruption and nepotism, Nawshirwan Mustafa split from the PUK to form the Movement for Change (Gorran), becoming for some time arguably the region's second-largest party. While the KDP, based in Erbil (Hewlêr in Kurdish) and Dohuk, is more tribally-oriented and conservative, the PUK, centred in the southern KRI around Suleymaniyah (Sleman), is more urban and socialist. Kirkuk governor Najmaldin Karim, though a PUK member, is a rival of Bafel Talabani's within the PUK, and maintained a somewhat independent role, until replaced by a temporary governor following Baghdad's takeover of the city in October 2017.

³¹ <http://www.worldoil.com/news/2018/1/8/iraq-wants-kurdish-kar-group-to-halt-oil-operations-in-kirkuk>

³² <https://www.iraqoilreport.com/news/oil-ministry-rebuffs-parliament-order-kar-27251/>

³³ <https://www.iraqoilreport.com/news/insurgency-exploits-baghdad-kr-g-conflict-26723>

In the 2013 elections, the KDP won 38 seats in the Kurdish parliament, Gorran 24, the PUK 18, the Kurdish Islamic Union 10, Kurdish Islamic Group 6, others 4 and 11 seats were reserved for minorities (Assyrian, Armenian and Turkmen). By comparison, in the 328-member Iraqi parliament, the KDP won 25 seats, the PUK 21 and Gorran 9, reflecting the PUK's strength in Kirkuk which was not part of the KRG's elections. There has not been a provincial election in Kirkuk since 2005.

The PUK has historically been closer to the PKK (Kurdistan Workers' Party) in Turkey, which has waged a long insurgent campaign against the government there, and its affiliate the PYD (Democratic Union Party) in Syria, the leading power in the now *de facto* autonomous Kurdish parts of Syria. It has also had closer relationships with Iran³⁴ and with the federal government in Baghdad, and has been more inclined to remain within a federal Iraq.

The KDP became aligned with President (previously Prime Minister) Erdoğan in Turkey and has been a stronger advocate of outright independence. Turkey has sought to encourage the KRG's autonomy, to gain influence within Iraq; to control the possible evolution of a separatist Kurdish region; to acquire economic opportunities in oil and gas, trading and construction, including for prominent Turkish individuals. Turkey also saw Masoud Barzani as a possible counterweight to the PKK and its leader Abdullah Ocalan.

However, all these political alignments have been greatly complicated by the Syrian civil war, the autonomy gained for now by the Syrian Kurds, the intervention of Turkey, and the operations of the US, Baghdad and Iran in alignment with the KRG against ISIS. The KDP's and PUK's Peshmerga cooperated with the YPG (militia of the PYD, closely linked to the PKK) in the recapture of Sinjar (Shingal) from ISIS but tensions arose during the operation. The referendum and the prospect of independence brought, as noted, opposition from most key regional actors.

Figure 1 shows the situation of the KRI as of April 2015, with the advance from the 1991 'Green Line' recognised in the 2005 Iraqi Constitution, which occurred mostly following the mid-2014 spread of ISIS; the outer limit of the territories disputed with Baghdad; the deployment of the PKK/YPG around Sinjar. The Ain Zalah, Avana Dome (part of Kirkuk) and Bai Hassan oil fields, taken over by the KRG, and the route of the Kirkuk-Ceyhan pipeline and KRG-Turkey oil pipelines are shown.

³⁴ http://www.al-monitor.com/pulse/originals/2017/09/turkey-iran-iraq-alignment-against-iraqi-kurdistan.html?utm_source=Boomtrain&utm_medium=manual&utm_campaign=20171002&bt_ee=V5xEnHAM3ovFy3e1Wjmu6MJXTcjJOS3+EDKr90Lblv1Sei2pymMH4bT30c9tR0&bt_ts=1506959464699

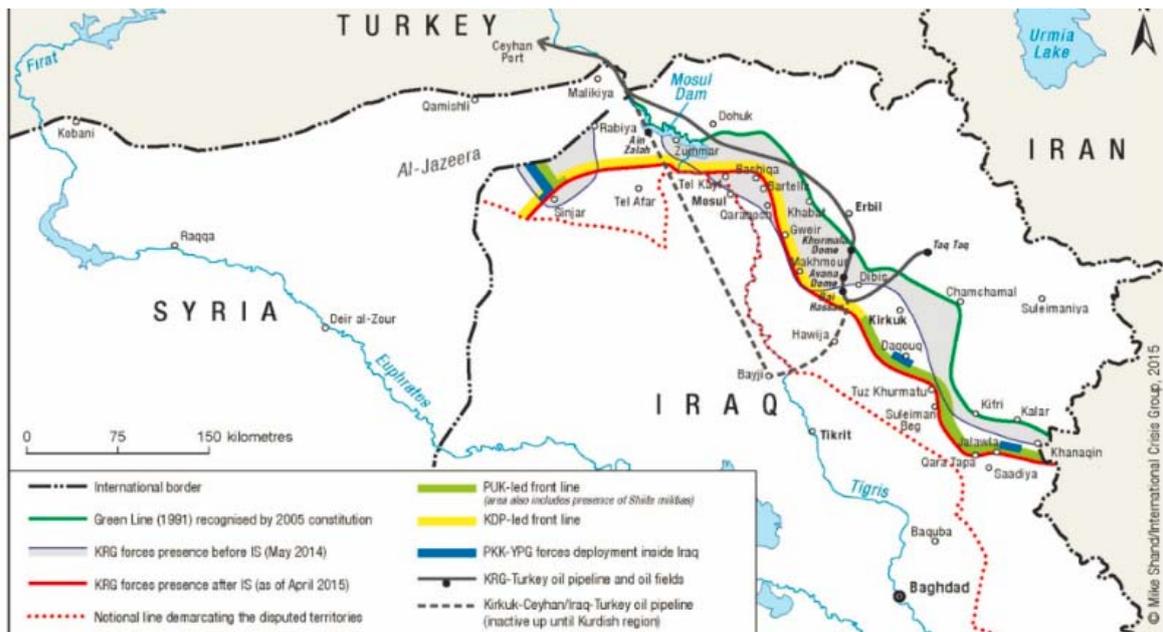


Figure 1 Political and military boundaries of the Kurdish region of Iraq (as of April 2015)³⁵

Following the referendum and the loss of control of Kirkuk to the central government in October 2017, Masoud Barzani announced that he would stand down as Kurdish president (or, more accurately, allow his term to expire). On 20th November, the Supreme Federal Court of Iraq ruled the referendum was unconstitutional, having earlier ruled that no region or province could secede and, although the KRG had previously challenged the court’s impartiality³⁶, it was in a weak negotiating position and said it would respect this verdict³⁷.

Baghdad’s five pre-conditions for negotiations were reportedly that: the KRG would officially state its nullification of the referendum (not just “respect” the court’s judgement), and not seek independence in the future; turn over all federal revenues, including oil sales and customs; that all Kurdish delegations to Baghdad would include representatives of all five major parties (KDP, PUK, Gorran, Kurdish Islamic Union and Kurdish Islamic Group); that the KRG would hand over control of the Turkish border crossings, Fishkhabour and Ibrahim Khalil; and that Baghdad would not pay the KRG’s debts (stated at \$4 billion to Turkey and \$1.5 billion to Rosneft, but not mentioning its debts to oil traders and others)³⁸.

The KRI was by this point effectively split into KDP- and PUK/Gorran-controlled areas. The KDP controlled the governorates of Duhok and Erbil and the PUK/Gorran those of Sulaymaniyah and Halabja. The KDP’s area includes most of the important oil-fields – Tawke, Taq Taq, Shaikan and Atrush

³⁵ (International Crisis Group, 2015).

³⁶ And former President Barzani did so again, and said that the Court was unconstitutional:

<http://www.kurdistan24.net/en/news/d9c6d07c-0d2e-4ab6-adc3-e3e218a7c25e>

³⁷ <https://www.reuters.com/article/us-mideast-crisis-iraq-kurds/iraqi-federal-court-rules-kurdish-referendum-unconstitutional-idUSKBN1DK0Q6>

³⁸ <https://www.al-monitor.com/pulse/originals/2017/12/baghdad-erbil-negotiations-iraq-kurdistan.html>

– and the Bina Bawi gas field. The PUK/Gorran area contains most of the major gas fields – Miran, Khor Mor, Topkhana and Chemchemical.

2.3. Petroleum history

The petroleum history of the KRI can be divided into five phases. The first four of these are described in more detail in Mills (2016).

Phase	Dates	Events	Fields discovered in and near to the KRI
Kirkuk to the First Gulf War	1920-1958	Wilayat of Mosul assigned to the British mandate of Iraq. Anglo-Persian (BP), Royal Dutch Shell, Compagnie Française des Pétroles (now Total), Standard Oil of New Jersey (later Exxon), Socony-Vacuum (later Mobil) and Calouste Gulbenkian (Partex) are shareholders of the Iraq Petroleum Company (IPC); Iraq not permitted to take up a promised 20 per cent share. Discovery of giant Kirkuk field starts the development of Iraqi oil.	Chia Surkh (1901), Naft Khaneh (1923) ³⁹ , Pulkhana (1927), Kirkuk (October 1927), Qaiyarah (heavy oil, 1927) ⁴⁰ , Chemchemical (gas, 1920s), Najmah (1934) ⁴¹ , Ain Zalah (1939), Butmah (1953), Khor Mor (gas, 1953), Bai Hassan (1953), Jambur (1954), Demir Dagh (1960)
	1958-1961	After the 1958 revolution overthrowing the monarch, 99.5 per cent of IPC's concession is nationalised in 1961 and it is prevented from further exploration ⁴²	
	1961-1991	Iraq National Oil Company is established in 1966 and IPC is fully nationalised in 1972	Taq Taq (1978) ⁴³ , Jebel Kand (1981)

³⁹

https://books.google.ae/books?id=0Ug0GdmopWMC&pg=PA471&lpg=PA471&dq=qaiyarah+field+discovered&source=bl&ots=yurevJPkuM&sig=GvnGV_MTeQfCODTsWqxkAvdtvTY&hl=en&sa=X&ved=0ahUKEwj4mviqjdDWAhVKWxoKHbYtBZAQ6AEIKzAB#v=onepage&q=qaiyarah%20field%20discovered&f=false

⁴⁰ <http://discovery.nationalarchives.gov.uk/details/r/C166723>

⁴¹ <http://www.iraqoilreport.com/news/sonangol-takes-najmah-3346/>

⁴²

https://books.google.ae/books?id=FqEOGhs_mzoC&pg=PA31&lpg=PA31&dq=qaiyarah+field+discovered&source=bl&ots=cdG9JhL0l2&sig=57fA43vbP6jwP_N7QgOPCmbtKaQ&hl=en&sa=X&ved=0ahUKEwj4mviqjdDWAhVKWxoKHbYtBZAQ6AEIOzAE#v=onepage&q=qaiyarah%20field%20discovered&f=false

⁴³ First drilled in 1960, but drilling was suspended in April 1961 due to the nationalization of most of IPC's concession

De facto independence	1991-2003	Small development of Taq Taq for local use from 1994–6, with KRG completing two wells. International companies unable to operate in the region. Smuggling of oil by Saddam Hussein regime through KDP areas. ⁴⁴ Kirkuk-area fields continued production, under the control of Baghdad.	
Arrival of international companies	2003-2007	Initial approaches by international companies. Ministry of Natural Resources (MNR) was established in 2006. KRI divided into exploration blocks. Genel Enerji signs for Taq Taq field in July 2002 and joined by Petoil of Turkey (Shakal and Pulkhana) in January 2003, and Addax in 2005; DNO signs PSC in 2004; Western Zagros signs Kalar-Bawanoor block in May 2006; Crescent Petroleum and Dana Gas sign service contract for Khor Mor and Chemchemical gas fields in 2007.	Tawke (April 2006)
	2007-11	Influx of small- and medium-sized oil companies including MOL, Gulf Keystone, GEP, Norbest, Sterling, Heritage in 2007; Hunt signs PSC for Ain Sifni (in 'disputed territories' in September 2007). Production begins from Tawke (June 2007), Khor Mor (August 2008), Taq Taq (end of 2008), Khurmala (July 2009, under contract with the local KAR Group, after peshmerga take control of the field from North Oil Company ⁴⁵) and Shaikan (October 2010); exports from Tawke start (June 2009). OMV and MOL join Dana Gas and Crescent in the Pearl Petroleum consortium in May 2011. Genel becomes Genel Energy in 2011 via reverse takeover with Tony Hayward becoming CEO.	Miran (May 2009), Shaikan (October 2009), Bardarash (2009), Shakal (2009), Kurdamir (November 2009), Sarqala (April 2011), Bina Bawi (June 2011), Swara Tika (August 2011), Benenan (2011), Topkhana (2011), Atrush (2011)

⁴⁴ (Pollack, 2003, p. 81)

⁴⁵ <http://www.iraqoilforum.com/?p=1994>, <http://www.iraqoilforum.com/?p=1166>

Entry of ExxonMobil and other large IOCs	2011-mid-2014	ExxonMobil signs PSCs for 6 exploration blocks (November 2011). Taqa, Total, Chevron, and Gazprom Neft sign PSCs during 2012. Exports via Kirkuk pipeline during 2011-December 2012 are halted from January 2013. KRG agrees strategic energy pact with Turkey (May 2013) ⁴⁶ . KRG begins to export oil independently via new pipeline to Turkey (from December 2013), and Baghdad initiates legal action ⁴⁷ . By November 2015, about ten countries are buying Kurdish oil. Baghdad budget payments to KRG are halted (January 2014).	Peshkabir (2012), Bakrman (February 2013), Tawke Jurassic (June 2013)
Conflict with ISIS to the Referendum	Mid-2014-October 2017	Discussed in detail below	Shewashan (4Q 2014), Peshkabir Cretaceous (January 2017)

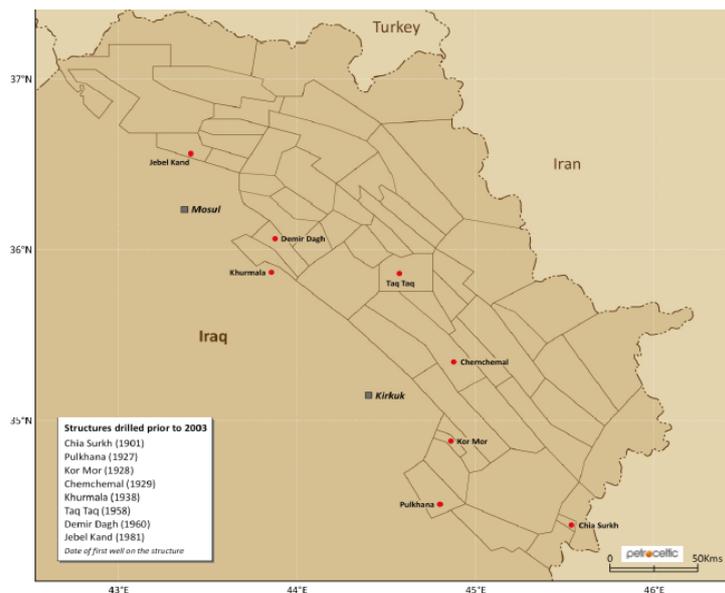


Figure 2 Early exploration in the KRI⁴⁸

⁴⁶ <http://www.hurriyetdailynews.com/turkey-iraqi-kurdistan-agree-on-50-year-energyaccord.aspx?pageid=238&nid=67428&newscatid=348>

⁴⁷ 'Exclusive: How Kurdistan bypassed Baghdad and sold oil on global markets', Dmitry Zhdannikov, Reuters.com, 17 November 2015, <http://mobile.reuters.com/article/idUSKCN0T61HH20151117>

⁴⁸ PetroCeltic

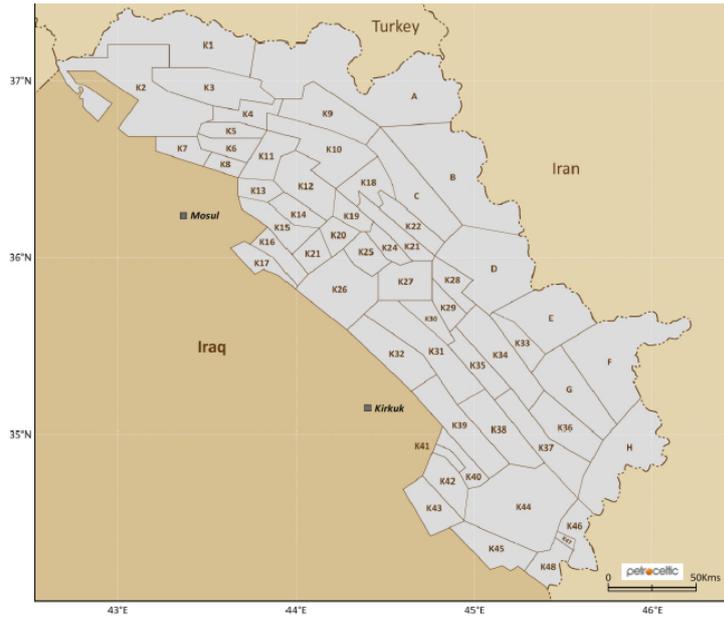


Figure 3 Division of KRI into exploration blocks⁴⁹

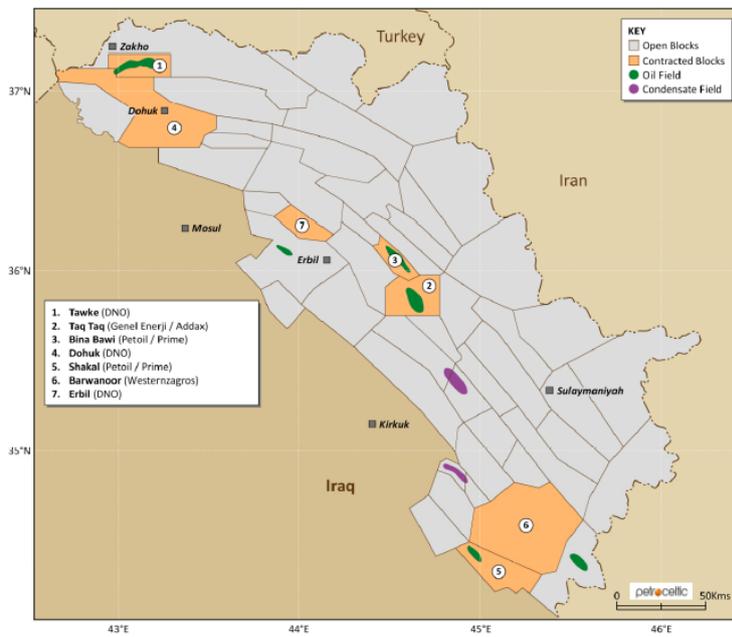


Figure 4 PSCs awarded in KRI by 2006⁵⁰

⁴⁹ PetroCeltic

⁵⁰ PetroCeltic.

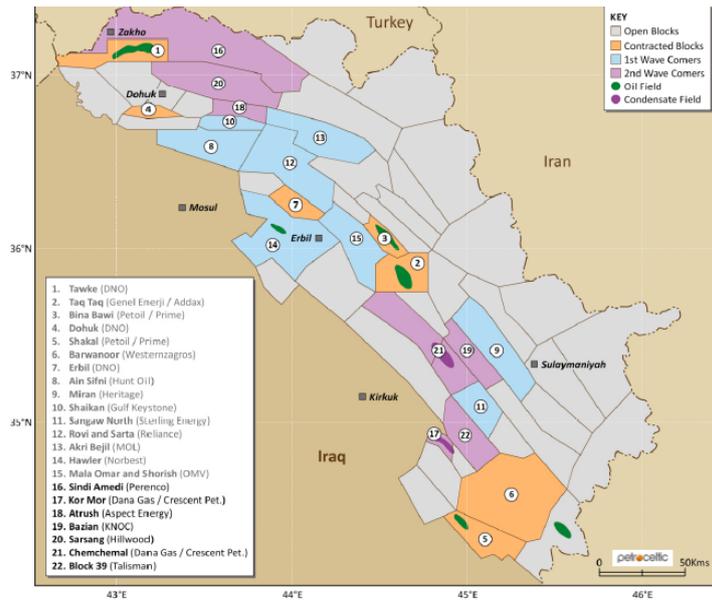


Figure 5 PSCs awarded in the KRI, end-2008⁵¹

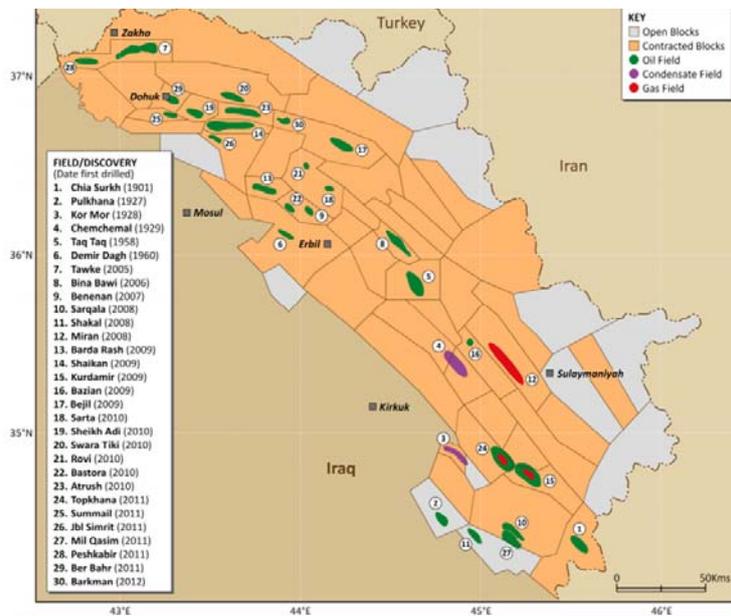


Figure 6 PSCs awarded in the KRI, December 2012⁵²

2.4. The onslaught of ISIS: 2014 and beyond

Following the fall of Mosul, Kurdish forces secured the city of Kirkuk and the surrounding oilfields of Kirkuk, Bai Hassan, and Jambur.⁵³ The MNR noted that this was done to protect them from ISIS, but

⁵¹ PetroCeltic.

⁵² 'The history of hydrocarbon exploration in Iraqi Kurdistan: 1901 to 2012', David Mackertich and Adnan Samarrai, PetroCeltic, www.petroceltic.com/~media/Files/P/Petroceltic-V2/pdf/Mackertich-Samarrai-2013-Geol-Soc-Zagros-conference-presentation.pdf.

also that it would produce from them to make up for the KRG's share of the federal budget that had been withheld⁵⁴.

ISIS's operations had been substantially funded by the Syrian oil fields it controlled around Deir Al Zor. During its mid-2014 offensive, ISIS captured a number of small Iraqi oil-fields while damaging others, adding to its oil smuggling revenues. The Khabbaz field, south-west of Kirkuk, with a production capacity of 15 kbpd, was repeatedly attacked during 2015 and 2016⁵⁵, and the organisation also attacked Bai Hassan as in August 2016⁵⁶. ISIS captured the Qayyarah heavy oil-field near Mosul in 2014, which had previously been under development by Angolan state firm Sonangol⁵⁷, and produced from it until it was retaken by Iraqi army forces in October 2016, but several oil-wells continued burning until March 2017.

In August 2014, ISIS captured the town of Zumar⁵⁸, the important Mosul Dam, the small Ain Zalah oil-field with about 10 kbpd capacity, and the undeveloped Butmah and Sufaiya fields, but were eventually driven out by the Peshmerga by October of that year. The director of Ain Zalah said that ISIS did not sell any oil from it, but destroyed it⁵⁹. After capturing it, the Kurds restarted production at 2000 bpd⁶⁰ and Kurdish news agency Rudaw reported that it was being linked by pipeline into the KRG's oil export system⁶¹.

In 2014, ISIS also seized the fields of Alas and Ajeel near Hamrin, with a capacity of 25 kbpd, and began selling oil, until driven out by Iraqi government forces in March 2015. The Baiji refinery, recaptured by government troops in October 2015, was damaged in the fighting but even more seriously by subsequent looting, making it inoperable by January 2016⁶².

The overall effect of the fighting, therefore, was to transfer from central government control to the KRG's forces the major fields around Kirkuk (the Avana Dome of Kirkuk itself, Bai Hassan, Jambur and

⁵³ 'Kurds take 2 vital oil fields near Kirkuk, increasing tensions with Iraqi gov't', 11 July 2014, CBSNews:

www.cbsnews.com/news/kurds-take-2-vital-oil-fields-near-kirkuk-increasing-tensions-with-iraqi-government/.

⁵⁴ <http://mnr.krg.org/index.php/en/press-releases/394-kr-g-statement-on-recent-events-at-oil-facilities-and-infrastructure-in-makhmour-district>

⁵⁵ <https://www.reuters.com/article/us-mideast-crisis-iraq-oil/explosions-hit-two-oil-wells-in-northern-iraqs-kirkuk-sources-idUSKCN0XV1YB>

⁵⁶ <http://www.rudaw.net/english/kurdistan/20082016>

⁵⁷ Sonangol stopped its operations here and at the nearby Najmeh field in February 2014:

<http://www.jeuneafrique.com/391738/economie/geant-angolais-sonangol-somme-de-revenir-a-mossoul/>

⁵⁸ <http://www.reuters.com/article/us-iraq-security/islamic-state-grabs-iraqi-dam-and-oilfield-in-victory-over-kurds-idUSKBN0G20FU20140803>

⁵⁹ <http://www.kurdistan24.net/en/news/2216420c-2e71-463c-8f24-c86c0d21f893/iraq%E2%80%99s-damaged-oil-field-needs-5m-to-restart>

⁶⁰ <http://www.gppi.net/publications/iraq-after-isil-zummar/>

⁶¹ See also 'KRG solidifies hold on Ain Zalah', Iraq Oil Report, 26 March 2015, www.iraqoilreport.com/news/kr-g-solidifies-hold-on-ain-zalah-14284/.

⁶² <http://gulfnews.com/business/analysis/the-wanton-dismantling-of-an-iraqi-refinery-1.1662932>

Khabbaz), and some other small fields – Ain Zalah and the undeveloped Butmah and Sufaiya fields. Baba Gurgur, the southern part of Kirkuk, remained under North Oil Company (NOC) operations, but with Kurdish supervision (Figure 7).

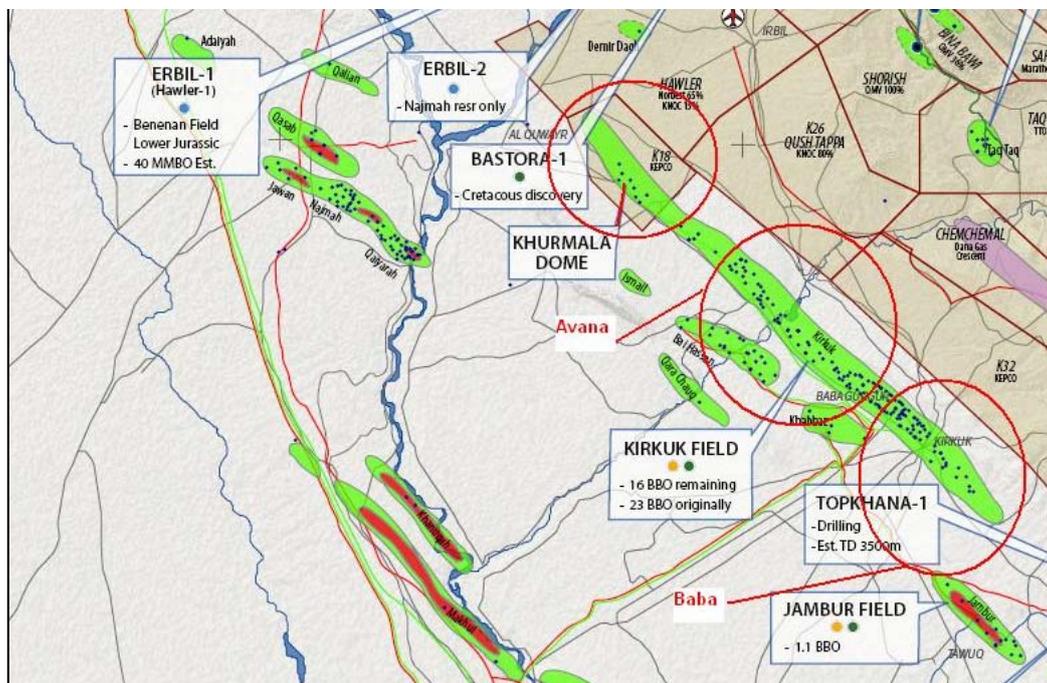


Figure 7 Location of sectors of Kirkuk-area fields⁶³

In June 2014, the KRG connected the Avana Dome of the Kirkuk field, which is also linked by pipeline to Bai Hassan, to Khurmala, allowing oil to enter the Kurdish pipeline and flow on to Turkey. Jambur and Khabbaz also export by pipeline into Bai Hassan.

The advance of ISIS made the federally-operated pipeline from Kirkuk to Turkey inoperable. As part of forming a US-brokered anti-ISIS coalition, with separate support from Iran, in November-December 2014, a short-lived deal was brokered to transfer 550 kbpd oil from the KRI to federal oil marketing firm SOMO, consisting of 250 kbpd of oil from fields in the KRI and 300 kbpd from Kirkuk and its surrounding fields⁶⁴, in return for a 17 per cent share of the state budget (after sovereign deductions), estimated at \$1.1 billion per month⁶⁵, plus additional payments to support the Peshmerga Kurdish military forces.

However, this arrangement did not function as intended, and quickly broke down by March 2015, followed by some attempts to revive it. Baghdad accused the KRG of transferring insufficient volumes of oil, while the KRG claimed it had received much less budget than agreed. The federal government paid \$200 million in January and about \$2 billion in total by June 2015. The KRG interpreted the

⁶³ Base map from Shamaran Petroleum, www.shamaranpetroleum.com/i/pdf/Kurdistan-Map.pdf

⁶⁴ 'Oil deal a sign of hope between Baghdad, Erbil', Mushreq Abbas, Al-Monitor, 5 December 2014, www.al-monitor.com/pulse/originals/2014/12/iraq-kurdistan-oil-agreement-relations.html#.

⁶⁵ 'Iraq: The Fragile Economy of a Fragile State', Nussaibah Younis and Sali Mahdy, Atlantic Council, 30 September 2015, www.atlanticcouncil.org/blogs/menasource/iraq-the-fragile-economy-of-a-fragile-state.

export target of 550 kbpd as an annual average, as volumes were intended to ramp up, not as a monthly figure. Nevertheless, it was exporting additional oil outside the remit of the agreement at this time. The federal government intended that its payments should be based on its actual expenditure, which was running below budget. Incurring a large deficit (20 percent of GDP in 2016) and liquidity problems during the conflict with ISIS, it was not inclined to rack up further debts supporting a region which was seeking independence, had large debts of its own and seemed unlikely to contribute to repaying federal debts. The agreement also did not specify the exact status of the Kirkuk-area fields, with the KRG claiming Avana and Bai Hassan as they fall within the Makhmur district.

By June, the KRG was selling almost all its oil itself.⁶⁶ Though central government exports through the KRG's pipeline began again in August 2015, by September 2015, none of the KRG's oil sales were conducted via the federal Ministry of Oil's SOMO.⁶⁷ The KRG's Deputy Prime Minister, Qubad Talabani, said in October 2015 that the KRG would no longer sell oil via SOMO, although it was open to a new revenue-sharing deal. In the same month, Ashti Hawrami, minister of Natural Resources for the KRG, announced that traders had agreed to advance \$850 million per month for 525 kbpd of oil exports⁶⁸, implying a price of \$52-54 per barrel, at a time that Brent crude prices were below this (\$48.12 per barrel). In addition to the substantial discount of Kurdish oil to Brent, this meant that the KRG was accumulating large and escalating debts to the traders, which were only sustainable as long as oil production was rising.

The rise of ISIS had profound political and military consequences across Iraq and Syria, and indeed the wider region. Drilling operations in blocks near the front lines were halted, though most expatriate staff later returned. The seizure of the Baiji refinery, and its subsequent near-destruction, caused widespread shortages of petrol (gasoline) and diesel across northern Iraq and the KRI, requiring emergency imports from Turkey. Various fields, particularly Qayyarah, Ajeel, Bai Hassan and Khabbaz, were attacked and sabotaged. The cost of military operations against ISIS and the need to care for large numbers of internally displaced people (IDPs) put a heavy burden on the KRG's budget, with the World Bank estimating the expenses of dealing with the IDPs at \$1.4 billion.⁶⁹ The KRG argued that the war costs

explained its failure to pay the IOCs on time and in full. However, during the period that it controlled the Kirkuk-area fields, the oil available for export increased, partly by sending Kirkuk oil to the KRI's refineries to free up other crude⁷⁰.

⁶⁶ 'Kurdistan ramps up independent oil sales', Humeyra Pamuk, Ahmed Rasheed, and Isabel Coles, Reuters, 29 June 2015, www.reuters.com/article/2015/06/29/iraq-kurdistan-oil-idUSL5N0ZF2YO20150629.

⁶⁷ 'Iraqi Kurdistan increases independent oil sales', Wil Crisp, MEED, 6 October, 2015, www.meed.com/newsletter/sectors/oil-and-gas/oil-upstream/iraqi-kurdistan-increases-independent-oil-sales/3215109.article.

⁶⁸ 'New details of KRG oil deals reveal latent risks', Patrick Osgood, Rawaz Tahir, and Ben Van Heuvelen, Iraq Oil Report, 29 October 2015, www.iraqoilreport.com/news/new-details-of-kr-g-oil-deals-reveal-latent-risks-16840; 'MNR: Setting the Record Straight on Oil Export and Revenue so that the People of Kurdistan Can Judge for Themselves', press release, Ministry of Natural Resources, Kurdistan Regional Government, 20 August 2015, <http://mnr.krg.org/index.php/en/press-releases/474-mnr-setting-the-record-straight-on-oil-export-and-revenue-for-the-people-of-kurdistan-to-judge-for-themselves>.

⁶⁹ (World Bank, 2015)

⁷⁰ 'Pipeline upgrade to boost Kurdish oil exports', Alexander Whitcomb, RÛDAW, 28 October 2014, <http://rudaw.net/english/kurdistan/281020142>.

ISIS also made use of oil fields to fund its activities, smuggling crude through Syria and Turkey, in a long-standing pattern dating back to the 1990s sanctions on the Saddam Hussein regime. ISIS and its predecessors had been smuggling and extorting oil from the Baiji refinery even prior to 2014. From 2014 onwards, most of the group's oil production came from the fields around Deir Al Zor in Syria which it had seized, but it also held some Iraqi fields for a time⁷¹. Kurdish traders, and possibly senior figures, were also reportedly complicit in this business⁷², though the KRG attempted to clamp down on it. The Syrian Kurds, under the PYD party, also produced some oil, mostly for local use, from the fields in the Hassakah district.

In 2015, the US-led anti-ISIS coalition launched Operation Tidal Wave II, which focussed on bombing tankers and makeshift oil refineries, and later turned to targeting fields directly. From a peak of \$50 million monthly revenues, ISIS's oil sales were cut to an estimated \$4 million by October 2017⁷³. In that month, the Iraq Ministry of Oil announced plans to rehabilitate the Qayyarah and Najmah fields and resume production⁷⁴, hence regaining some influence in this area.

Attempting to struggle through its financial crisis, in March 2016, the KRG approached Turkey⁷⁵, which had already lent it more than \$1 billion, and offered stakes in Tawke, Taq Taq and Shaikan in return for forgiving \$1.15 billion of loans and \$514 million of overdue pipeline transit fees. Other parts of the proposal offered stakes in the Miran and Bina Bawi fields and their linked gas export project, and 50% of the Khurmala field. An intermediary for Turkish energy minister Berat Albayrak showed interest in Tawke, Taq Taq and Shaikan, but at half the KRG's proposed price, and did not respond on gas or Khurmala. The Turks pressed the KRG for payment of its late pipeline tariffs, and apparently discussions did not progress after May 2016.

By late 2017, the KRG was taking a different tack. As ISIS was driven out of Mosul and its other main strongholds, and as the KRI moved towards its referendum, the KRG took a number of steps to resolve issues in its petroleum sector.

The catalyst was a set of export financing deals, worth \$3 billion in total, reached with Russian state oil giant Rosneft and trading companies including Trafigura and Petraco. Glencore stumped up \$300 million in March 2016⁷⁶. In February, September and October 2017, Rosneft agreed to extend \$1.2-1.5 billion in pre-financing for crude sales⁷⁷ (starting with \$280 million at the end of 2016 to \$1.2 billion in

⁷¹ e.g. 'Inside Islamic State's oil empire: how captured oilfields fuel Isis insurgency', *The Guardian*, 19 November 2014, www.theguardian.com/world/2014/nov/19/sp-islamic-state-oil-empire-iraq-isis; 'Isis Inc: how oil fuels the jihadi terrorists', *The Financial Times*, 14 October 2015, www.ft.com/intl/cms/s/2/b8234932-719b-11e5-ad6d-f4ed76f0900a.html#axzz3s7CJcNxo.

⁷² e.g. 'First Kurds arrested for smuggling ISIS oil', Alexander Whitcomb, RÛDAW, 13 November 2014, <http://rudaw.net/english/kurdistan/131120142>.

⁷³ <https://www.usatoday.com/story/news/world/2017/10/02/u-s-coalition-slashes-isis-oil-revenue-more-than-90/717303001/>

⁷⁴ <https://www.reuters.com/article/us-iraq-oil-nineveh/iraq-hopes-to-resume-production-from-nineveh-oil-fields-in-coming-months-idUSKCN1C81B5>

⁷⁵ <https://www.iraqoilreport.com/news/seeking-financial-rescue-kr-g-offered-turkey-major-oil-assets-20736/>

⁷⁶ <https://www.reuters.com/article/us-iraq-kurds-glencore/glencore-taps-into-iraqi-kurdistan-with-300-million-oil-deal-idUSKCN0WD1H9>

⁷⁷ <https://www.ft.com/content/205d0470-c910-11e7-ab18-7a9fb7d6163e>

February 2017⁷⁸), repayable over 3-5 years, expand the KRG's oil export pipeline from 700 kbpd to 1 million bpd capacity, to pay \$1.8 billion for a 60 per cent stake in the pipeline (KAR Group holding the balance)⁷⁹, and to contribute some \$1 billion towards constructing a 30 bcm per year gas pipeline to Turkey on a Build Own Operate Transfer (BOOT) basis. Rosneft was also said to be in talks to work on the Kirkuk field, which was previously under technical studies by BP.

Rosneft signed for five unnamed exploration blocks, said to have potential reserves of 670 million bbl, which should be taken with caution given recent large reserve write-downs across the KRI. The company registered five subsidiaries in Singapore, whose names suggest that the blocks taken were the former Blocks 8, 9, 10, 11 and 13, all of which are in the northern (KDP-controlled) part of the KRI. It intended to start pilot production in 2018 and full production in 2021, indicating that these blocks already have discoveries. Block 8, near to the Fishkhabour border crossing, partly comprises the former Sulevani block, and was explored earlier by PetroQuest (Turkey) and Murphy but without success. Parts of it may be in territory disputed with Baghdad. Block 9 contains the Ber Bahr (ex-Genel) and Sheikh Adi (ex-Gulf Keystone) oil-fields and the Summail gas field, which was relinquished by DNO after poor production results. Block 10 is mainly the former Rovi block, previously held by Chevron, which relinquished it at the end of 2015⁸⁰, and before that Reliance of India. Block 11 contains the Mirawa and Jisik light oil discoveries, made by Marathon in partnership with Total in the Harir block in 2013 and 2014, but relinquished in 2016⁸¹, and part of Akri-Bijeel which MOL relinquished after largely writing off its reserves. Block 13 holds the Barda Rash oil field which UK-listed Afren left after taking a major reserves writedown in January 2015.

In October 2013, Crescent Petroleum, Dana Gas and partners had brought an arbitration case over a demand for payment by the MNR relating to a transfer of interests in the Pearl consortium from Dana and Crescent Petroleum to OMV and MOL, which acquired 10 per cent each, and accusing the KRG of underpaying for NGL production. In November 2015, the London Court of International Arbitration ordered the KRG to pay \$1.96 billion for outstanding invoices for production, ruling that it did not have sovereign immunity as it was a region of Iraq and not a state. In January 2017, a further award ordered the KRG to pay \$121 million for condensate and LPG production, and found that the KRG had delayed Pearl's opportunity to develop Khor Mor and Chemchemical.

In a separate case brought in 2013 and settled in January 2015, Dana Gas and Crescent Petroleum had brought a case against RWE for alleged breaches of confidentiality, which resulted in a cash payment by RWE, and its taking a 10 per cent stake in Pearl Petroleum⁸².

In August 2017, the KRG reached a settlement of the arbitration, agreeing to pay \$1 billion, of which \$400 million is earmarked for future investments by the consortium, and to reclassify \$1.24 billion to

⁷⁸ <https://www.reuters.com/article/us-mideast-crisis-kurds-referendum-russi/russia-becomes-iraq-kurds-top-funder-quiet-about-independence-vote-idUSKCN1BV1IH>

⁷⁹ <https://www.cnbc.com/2017/10/20/reuters-america-update-2-russias-rosneft-to-take-control-of-iraqi-kurdish-pipeline-amid-crisis.html>

⁸⁰ <https://www.reuters.com/article/us-exxon-mobil-kurdistan/exxon-pulls-out-of-three-exploration-blocks-in-kurdistan-iraq-oil-report-idUSKBN13V0T0>

⁸¹ <http://files.shareholder.com/downloads/AMDA-DZ30I/5544986233x0xS101778-17-46/101778/filing.pdf>

⁸² <http://www.marasinews.com/legal-regulations/dana-gas-agrees-settlement-rwe-unit-iraq-dispute>

outstanding costs that Pearl would be able to recover from future revenues⁸³. Pearl was also awarded two new blocks. In return, Pearl has agreed to boost production from Khor Mor from the 3.4 bcm per year reached in 2012, to 8.3 bcm by late 2019-early 2020, of which 2.6 bcm would be devoted to exports. However, Pearl partner MOL expressed discontent with the settlement, and Crescent and Dana Gas started arbitration proceedings against it in September 2017⁸⁴.

The KRG also restructured the unpaid receivables held by DNO and Genel, the two largest foreign producers. At the end of 2016, DNO had \$1.14 billion outstanding (though \$1.05 billion of this was subject to audit), and Genel had \$253.5 million outstanding⁸⁵. Genel was assigned 4.5 per cent of Tawke gross revenues and DNO 3 per cent, the KRG's 20 per cent share of Tawke was transferred to DNO (which now holds a 75 per cent stake in the asset and Genel the remaining 25 per cent), and capacity-building payments and outstanding production bonuses were cancelled⁸⁶. DNO took an interest in the Bashiqa block held by ExxonMobil. Gulf Keystone, with \$36 million of receivables at the end of 2016, was still awaiting a contract amendment.

Monthly payments were made on 11th October 2017 to the main producers, DNO, Genel, Sinopec and Gulf Keystone⁸⁷. Despite the political crisis, it paid another \$100 million on 9th November 2017⁸⁸.

In the wake of the federal recapture of Kirkuk in October 2017, the federal Ministry of Oil claimed that Kurdish forces had removed equipment from the fields, and flows through the Kirkuk-Ceyhan pipeline fell from 550-600 kbpd to around 250 kbpd⁸⁹. Iraqi oil minister Jabbar Al Luaibi spoke of BP's returning to the Kirkuk field, on which it had previously conducted technical studies, in an attempt to restore production to 700 kbpd⁹⁰, and of reopening the direct Kirkuk-Ceyhan pipeline.

Iraq reached a deal with Iran to truck 15 kbpd of Kirkuk oil to the Kermanshah refinery in western Iran, to increase to 60 kbpd over time⁹¹. The refinery has a capacity of 20 kbpd, being upgraded to 40 kbpd, indicating that other refineries would be required to take the full 60 kbpd. This deal is intended to save Iran the costs of supplying relatively remote inland refineries and so freeing up its crude for export from the Gulf. At the same time, it will allow Iraq to restart production from Kirkuk without being dependent on the Kurds or waiting for the reopening of the Kirkuk-Ceyhan line. Such a project had previously been discussed with the PUK, which wanted to break the KDP's stranglehold over oil export routes.

⁸³ <https://www.reuters.com/article/us-dana-gas-arbitration/kurdistan-pays-1-billion-to-dana-gas-partners-to-settle-london-case-idUSKCN1BA272>

⁸⁴ <https://www.thenational.ae/business/energy/crescent-petroleum-dana-gas-file-arbitration-against-hungarian-partner-1.630373>

⁸⁵ Middle East Economic Survey, Volume 60 Number 35, 1st September 2017

⁸⁶ <http://www.genelenergy.com/media/2125/20171004-jpmc-conference-vf.pdf>

⁸⁷ http://www.theoilandgasyear.com/news/genel-dno-see-new-kurdistan-payments/?mc_cid=9a0461a1c3&mc_eid=76be0203d6

⁸⁸ <http://af.reuters.com/article/commoditiesNews/idAFL8N1NF6Z1>

⁸⁹ <https://www.ft.com/content/20765670-92ee-3171-b907-59ee55c184bd>

⁹⁰ <https://www.al-monitor.com/pulse/originals/2017/11/kirkuk-baghdad-kurdistan-somo-ceyhan.html>

⁹¹ <http://www.reuters.com/article/us-mideast-crisis-iraq-oil-insight/oil-seen-as-real-prize-of-irans-kurdish-adventure-idUSKBN1DE1UY>

Baghdad demanded that it should control all Kurdish oil exports⁹², and proposed a 2018 federal budget containing a 12.6 per cent share of revenues for the regional budget (down from 17 per cent, after federal expenses, in earlier budgets). Federal forces advanced on the border crossing of Fishkhabour near the Turkey-Iraq-Syria trilateral, which would allow Baghdad to control the metering point where the KRG's independent export pipeline connects to the Kirkuk-Ceyhan line. One problem of the Turkish government's handing over control of the storage tanks and export facilities currently used by the KRG at Ceyhan is that it might weaken its position in the ongoing arbitration initiated by Baghdad in 2014 over Turkey's alleged breach of the Iraq-Turkey Pipeline Treaty. Anyway, until Baghdad reconstructs the Kirkuk-Ceyhan pipeline or reaches a deal to use the KRG's pipeline, it cannot send Kirkuk crude to Ceyhan, making the point moot for now.

The change of control of exports, or indeed a possible cut-off of all Kurdish exports, would have some significant implications. Rosneft's loan to the KRG was predicated on using Kurdish crude in its German refineries. KRG exports had been an attractive alternative to other medium-sour crudes in Europe, including Saudi, Iraqi and Russian Urals grades, were not affected by the OPEC cuts, and did not come with destination restrictions, unlike standard SOMO sales. The interruption of a further 270 kbpd or so of Kurdish exports would further contribute to tightening the oil market, leading to Iraq over-complying on its OPEC commitments, at least until southern production capacity increases.

⁹² <http://www.argusmedia.com/news/article/?id=1557632>

3. The KRI's Hydrocarbon Sector

The specifics of the KRI's geology and geography are critical controls on the potential of its hydrocarbon sector. This section describes the regional hydrocarbon habitat, the reserves and resources, and the outlook for regional production, exports and finances.

3.1. Geography

The KRI's terrain is primarily hilly and mountainous, rising to high mountains along the Iranian border (Cheekha Dar at 3611 metres, Halgurd at 3607 m, Hajo Ebrahim at 3587 m, in the Qandil Mountains on the border, known as a sanctuary for the PKK), and falling to plains at Erbil and the Kirkuk embayment. Summers are hot and dry; winters relatively cold. Most of Iraq's indigenous river flow derives from the KRI (though this is still small compared to the volumes of the Tigris and Euphrates from Turkey and Syria).

The KRI is, of course, landlocked, which complicates the logistics both of importing oil-field equipment, supplies and refined products, and exporting oil and gas⁹³. The KRG's difficult political relations with all its neighbours, exacerbated following the September 2017 referendum, make its vulnerability even clearer. Its only reliable oil export route has been via Turkey, initially by truck and then by the link to the Kirkuk-Ceyhan pipeline. It has also exported some trucked oil to Iran, and explored the possibility of a pipeline connection. The Turkish market, which is large and has historically grown fast, is also the most logical destination for Kurdish gas exports, which could also transit to Europe.

Most of the KRI's gas resources are in the south, meaning a longer pipeline route to Turkey. These areas are controlled by the PUK, which is problematic as a pipeline would have to pass through KDP-controlled areas. An alternative, under the right political circumstances, could be to export gas (or electricity) to federal Iraq, to meet its severe power shortages. Iraq is currently buying high-priced gas from Iran, which it has had trouble paying for.

3.2. Petroleum geology

The geology of the KRI, though rather similar to the Iranian Zagros, is distinct from most of its regional peers and presents particular challenges. It is part of the Arabian Plate, the basement of which was consolidated in the Neoproterozoic. The KRI lies on this plate's northern and north-eastern passive margin, which formed after various microcontinental fragments rifted off the plate during the Late

⁹³ (Mills, Northern Iraq's Oil Chessboard: Energy, Politics and Power, 2013).

Permian as the local part of the Neo-Tethys Ocean opened⁹⁴. This passive margin accumulated a thick pile of sediments, primarily in tropical and subtropical latitudes and consisting mostly of shallow-water carbonates (limestones and dolomites) with subordinate evaporites and shales. The Arabian Shield-sourced deltaic sandstones of the Cretaceous of southern Iraq (Zubair and Nahr Umr formations, important oil reservoirs) did not reach this region.

In the Upper Cretaceous, ophiolites were emplaced in the high Zagros⁹⁵. From the Oligocene onwards, the Arabian Plate collided with the Central Iranian and Anatolian plates, closing the Neo-Tethys and forming the Zagros mountains. Reefal carbonates, evaporites and then thick molasse sediments accumulated. Increasingly complex structuration developed, with anticlines trending northwest-southeast in the southern part of the KRI and swinging round to east-west in the northern part, aligned with the Taurus Mountains of Turkey⁹⁶. The Lorestan salient, mostly within Iran, lies between the Dezful Embayment in south-western Iran, and the Kirkuk Embayment in north-eastern Iraq / KRI. The Kirkuk Embayment does not appear to be underlain by the regionally-widespread Hormuz Salt of Infracambrian age. Instead, the anticlines have developed over deep-seated NW-trending normal faults, now reactivated as reverse faults⁹⁷. The fold belt is also cut by faults trending north-south and northeast, and a set of east-west Neoproterozoic normal faults, now inverted.

Proved hydrocarbon plays exist from the Triassic to the Miocene. The Permo-Triassic Khuff-equivalent (Chia Zairi Formation in Iraq), a very important gas-prone play regionally, has not yet been tested in the KRI. Over the Mosul High, in the northern area of the KRI around Dohuk, Triassic and Jurassic reservoirs contain sour gas and light oil, with heavy oil in Cretaceous reservoirs. Around Erbil, Jurassic, Cretaceous and Tertiary reservoirs have been proved. In the southern part of the KRI, Tertiary reservoirs are most important. Kirkuk itself, south-west of Erbil, consists of highly fractured and karstified Oligo-Miocene reefal limestones of the Euphrates Group, with secondary reservoirs in Cretaceous carbonates of the Qamchuqa Formation. Source rocks include the Kurra Chine formation (Middle Triassic), the rich Sargelu formation (Middle Jurassic)⁹⁸, Naokelekan (Upper Jurassic), Chia Gara (Upper Jurassic-Lower Cretaceous), Balambo (Lower Cretaceous),⁹⁹ and the Kolosh-Aaliji and Jadala formations (Lower Tertiary). The contribution of the Triassic and Lower Tertiary is a feature of northern Iraq and the KRI, not so far found further south in Iraq, although Lower Tertiary rocks (Pabdeh formation) do provide some sourcing in Iran where sufficiently mature.

The distribution of hydrocarbon types across the KRI is complicated with numerous source rocks and reservoir-seal pairs, and structuration leading to different maturation and migration timings. For instance, the Shaikan field contains light oil and gas in the Triassic, heavy oil in the Jurassic and very

⁹⁴ (Geert Konert, 2001)

⁹⁵ (Majid Sudi Ajirlu, 2016)

⁹⁶ (Talebian & Jackson, 2004); (Hatzfeld, et al., 2011).

⁹⁷ (Kent, 2010)

⁹⁸ (Abdula, 2010)

⁹⁹ <http://www.ogj.com/articles/print/volume-115/issue-6/exploration-and-development/geochemistry-links-source-rocks-crude-distribution-in-northern-mesopotamian-basin-iraq.html>

heavy oil in the Cretaceous¹⁰⁰; Summail contains gas in the Upper Cretaceous and heavy oil in the Jurassic¹⁰¹. In general, the northern KRI is more oil-prone, including heavy oil, with gas and condensate in the centre and south, and light 34-35° API oil in Kirkuk. Gas is typically sour (containing hydrogen sulphide, which is corrosive and highly toxic), as in the Bina Bawi and Chemchemical fields, raising the expense of development; Western Zagros experienced a well control incident with sour gas in May 2010, taking nine months to bring under control¹⁰². The hydrocarbon geology is similar to north-eastern Syria, but rather different from federal Iraq and Iran, where the Jurassic and Triassic have not been major reservoirs to date.

The early discovery of Tawke, Taq Taq and Shaikan created great optimism over the KRI's potential. More recent exploration has been disappointing, with no large oil discoveries, and gas fields which are large but sour and still await commercialisation. ExxonMobil is reported to have made some modest finds, but has relinquished four of its six blocks: Qara Hanjeer, Arbat East and Betwata in December 2016¹⁰³, and Al Qosh in October 2017¹⁰⁴, leaving it with just Pirmam (on-trend with the Bina Bawi gas field) and a reduced stake in Bashiqa, an area now disputed with federal forces.

Most of the obvious surface anticlines have been drilled, and new exploration will have to test more complicated structural plays, and deeper reservoirs in known fields. Most exploration has concentrated on the plains areas and the mid-range mountains, with the high mountain areas generally seen to be non-prospective. Gazprom Neft relinquished its Halabja Block, which has an altitude up to 2000 m and contains mine-fields, in September 2017¹⁰⁵, considering it gas-prone but likely to be non-commercial. There is potential for significant discoveries in the 'disputed territories' of the Ninewa plains and Diyala, but the KRG's loss of control of these in October 2017 seems to rule out further exploration under its authority. Although some discovered oil fields are large by global standards for new fields, they are small compared to the major fields in federal Iraq and Iran. The gas fields are more significant in size, particularly as federal Iraq has little discovered non-associated gas (gas not produced as a by-product of oil production)¹⁰⁶.

Reservoir quality is very variable, with some fields (such as Tawke) having good matrix characteristics, while others, despite very prolific initial flow rates, rely mostly on fractures. Geological understanding and reservoir management of these fractured carbonate reservoirs has been inadequate. In the case of Genel's Taq Taq field, the main reservoir, the Shiranish formation, was eventually determined to have negligible matrix porosity, meaning all the recoverable oil was contained in fractures. With

¹⁰⁰ 'Competent Person's Report on Certain Petroleum Interests of Gulf Keystone Petroleum and its Subsidiaries in Kurdistan, Iraq', ERC Equipoise Ltd., September 2015, www.gulfkeystone.com/media/92461/erce_gkp_cpr_2015-09-30_final.pdf.

¹⁰¹ <http://www.oil.gov/articles/print/vol-110/issue-2/exploration-developmet/dno-and-tawke-in.html>

¹⁰² <http://www.westernzagros.com/2010/07/westernzagros-provides-update-on-kurdamir-1-operations-2/>,

¹⁰³ <https://www.reuters.com/article/us-exxon-mobil-kurdistan/exxon-pulls-out-of-three-exploration-blocks-in-kurdistan-iraq-oil-report-idUSKBN13V0T0>

¹⁰⁴ <https://www.mees.com/2017/10/20/geopolitical-risk/exxonmobil-relinquishes-fourth-krp-block-walking-away-from-al-qosh/4f5bab40-b59e-11e7-a647-d3e3ac6f7f68>

¹⁰⁵ <http://www.gazprom-neft.ru/press-center/lib/1158210/>

¹⁰⁶ Large gas resources could probably be found in federal Iraq by drilling deeper reservoirs and exploring the Western Desert, and by developing the high-pressure gas fields in Diyala.

fracture porosity only around 0.24-0.35%, as compared to normal reservoir rock with a porosity of 10-20%, the fractures only contain a small quantity of oil. They connect directly to the aquifer beneath the oil layer, and so excessively high production rates had led to rapid draining of the oil in fractures and to water breakthrough, causing production to collapse¹⁰⁷. Oil production declined to 19 kbpd in March 2017, down from 36 kbpd by the end of 2016 and peaks of 145 kbpd in April 2015¹⁰⁸.

Other companies have also had to write down reserves, as with Afren eliminating virtually all its reserves at Barda Rash in January 2015¹⁰⁹, and MOL at Akri-Bijeel in September 2015¹¹⁰. The Qamchuqa reservoir of the Shewashan field in the Khalakan block¹¹¹, and the Shiranish reservoir of the Summail gas field near Tawke, have also experienced problems with water influx, while Shewashan's tight (low-permeability) Shiranish and Kometan carbonate reservoirs have produced below expectations and may require hydraulic fracturing to achieve commercial rates. Apart from Atrush in June 2017, no significant new fields have been brought on-stream since Shaikan, with a gaggle of the smaller fields producing a few thousand barrels per day each.

3.3. Reserves and resources

The initial discoveries in the KRI, and the rapid licensing of most of its territory, encouraged one of the highest levels of onshore exploration in the world. Up to 2005, 20 exploration and appraisal wells had been drilled in the region. Another 160 were drilled in 2005 to December 2014, with a commercial success rate of 55–60 per cent, exceptional by global standards¹¹². Since then, exploration drilling and discoveries have been at much lower levels.

Views on the KRI's oil and gas resource base continue to evolve. The Ministry of Natural Resources (MNR) for the Kurdistan region has put its reserves at 45 billion barrels, increased to 70 billion barrels in May 2015¹¹³, but this figure, though it continues to be reported uncritically in media sources, has no real technical basis. It is clearly not 'reserves' in the sense of discovered, commercially viable oil, and the increased total must include disputed territories, probably Kirkuk (no longer under the KRG's control, of course).

For comparison, the US Geological Survey in 2000 estimated undiscovered resources in the Zagros fold-belt in Iraq (a large part of which, though not all, falls within the KRI) at a mean of 41 billion

¹⁰⁷ <http://www.genelenergy.com/media/2039/genel-energy-cpr-report-taq-taq-field-feb-2017-final.pdf>

¹⁰⁸ <https://www.iraqoilreport.com/news/critical-kurdistan-field-reserves-fall-21848/>

¹⁰⁹ 'Afren plunges amid Kurdistan writedown', Michael Kavanagh, *The Financial Times*, 12 January 2015, www.ft.com/intl/cms/s/0/b2b55bb0-9a79-11e4-8426-00144feabdc0.html.

¹¹⁰ 'MOL – MOL Downgrades Akri-Bijeel Block Potential', Kamil Kliszcz, mDomMaklerski.pl, 8 September 2015, www.mdm.pl/ds-server/19432?ticketSource=ui-pub.

¹¹¹ <http://www.worldoil.com/news/2018/1/11/gas-plus-khalakan-provides-update-on-shewashan-operations-in-iraq>

¹¹² Typical global success rates are around 30 per cent; e.g. 'International Mid-Cap Exploration Performance 2008 – 2009', Richmond Energy, Finding Petroleum Conference, London January 2010, www.findingpetroleum.com/files/etb1/richmond.pdf.

¹¹³ 'Kurdistan Oil Consolidation - Waiting for Godot?', 3 May 2015, LinkedIn.com, <https://www.linkedin.com/pulse/kurdistan-oil-consolidation-waiting-godot-joanna-southcott>.

barrels of oil and natural gas liquids, and 54 trillion cubic feet of gas¹¹⁴. However, as this estimate predates the modern period of exploration, it is highly out of date. The IEA's 2012 study of Iraq put the KRI's proved reserves at 4 billion barrels¹¹⁵, which excludes exploration potential and currently non-commercialised resources.

From company reports and public data sources, the total of reserves and contingent oil resources is about 6.7 billion barrels. This is down from about 8.1 billion barrels at the start of 2016, partly because of production and partly because of sizeable downgrades, particularly at Taq Taq where more than 500 million barrels was written off in 2016. The volume of oil prior to production, both recoverable and non-recoverable, the "stock-tank oil initially in place" (STOIP), is approximately 48 billion barrels.¹¹⁶ However, recent reserves downgrades have suggested that recovery of a significant amount of this oil-in-place may be economically unviable. Extensions and upgrades of existing fields, and discoveries in new structures or deeper reservoirs, should add additional reserves. The arrival of Rosneft, which took over a number of existing discoveries such as Barda Rash, may increase reserves if it can establish commercial production.

These figures exclude the Kirkuk area (Kirkuk, Bai Hassan, Jambur, and Khabbaz), with 4.4 billion barrels of remaining reserves as of 2016,¹¹⁷ which temporarily increased the KRG's oil reserves by 40 per cent.

The MNR estimated in 2015 that it had 25 trillion cubic feet of proved gas reserves and 99-198 Tcf of undiscovered gas resources (or alternatively a total of 177 Tcf)¹¹⁸. Discovered reserves and contingent resources (gas without an approved development plan) amount to 39.7 trillion cubic feet (1097 bcm)¹¹⁹, up from the start-2016 figure of 27.3 Tcf (773 bcm) which was roughly consistent with 25 Tcf of discovered 'reserves'. This upgrade is due to large increases in estimated resources at Khor Mor, Chemchemal, Miran and Bina Bawi, plus the inclusion of ExxonMobil's reported Pirmam discovery, and some other fields not previously evaluated. Most of this gas is non-associated and is located in the central and southern KRI. Another 2 Tcf of sales gas around Kirkuk, which could increase if flared gas were captured, is now out of KRG control¹²⁰.

These reserve figures could increase with further exploration, although the disappointing recent record and the loss of the disputed territories restricts the potential. The opportunity for significant new gas resources is probably greater than for oil. Improved recovery and field upgrades could increase reserves, but concerns remain about further reserve write-downs.

¹¹⁴ (United States Geological Survey, 2000).

¹¹⁵ (International Energy Agency, 2012).

¹¹⁶ Assuming a 35 per cent recovery factor for oil, for fields where oil-in-place figures are not available.

¹¹⁷ Mills (2016). Again, this could probably be increased by improved reservoir management and secondary and tertiary recovery.

¹¹⁸ 'KRG plans 10 bcm in natural gas exports to Turkey in two years', *Hurriyet Daily News*, 20 November 2015,

[www.hurriyetdailynews.com/kr-g-plans-10-bcm-in-natural-gas-exports-to-turkey-in-two-](http://www.hurriyetdailynews.com/kr-g-plans-10-bcm-in-natural-gas-exports-to-turkey-in-two-years.aspx?pageID=238&nID=91471&NewsCatID=348)

[years.aspx?pageID=238&nID=91471&NewsCatID=348](http://www.hurriyetdailynews.com/kr-g-plans-10-bcm-in-natural-gas-exports-to-turkey-in-two-years.aspx?pageID=238&nID=91471&NewsCatID=348).

¹¹⁹ Estimates from company reports.

¹²⁰ Mills (2016).

Reserves of major KRI fields are shown in Table 1.

Table 1 Reserves of major fields in the KRI¹²¹

Field	Oil ¹²² proved + probable reserves and contingent resources (million bbl)		Gas proved + probable reserves and contingent resources (trillion cubic feet)	
	January 2016	November 2017	January 2016	November 2017
Khurmala	2726	2516	3.69	3.46
Shaikan	1001	861	1.3	0.953
Atrush	854	389	0.1	0.066
Tawke	731	504123	0.1	
Taq Taq	579	59124	0.1	
Kurdamir	541	600	2.3	2.26
Sheikh Adi	531	112	0.4	0.4
Pulkhana	409	409	NA	1.8
Topkhana	55	55	1.7	1.665
Chemchemical	110	119	3.4	6.6
Khor Mor	138	191	4.4	8.5125
Miran	34	92	3.5	4.3
Bina Bawi	45	17	4.9	7.1
Summail	0	0	1.4	0
Shewashan		75		
Pirmam		4		0.88
Demir Dagh	169	108		
Ain Al Safra	NA	NA		
Banan	85	86		
Zey Gawra	112	117		
Taza		165.8		0.3659
Shakal		45		0.138
Sarqala		79126		0.24
Peshkabir		48		
Total	8,120	6,652	27.3	38.7

For comparison with other producing countries of similar production potential, Azerbaijan has 7.0 billion barrels of proved oil reserves, Colombia 2.0 billion bbl, Ecuador 8.0 billion bbl, Egypt 3.47 billion bbl, Oman 5.37 billion bbl, Yemen 3 billion bbl, and Syria 2.5 billion bbl. Federal Iraq, excluding the KRI, officially has 153.0 billion bbl of proved reserves.¹²⁷ The KRI's oil reserves would be the seventh-largest in the Middle East if it is considered independently.

¹²¹ From company reports; author's research. Other fields bring the total up to the reported 29 Tcf.

¹²² Includes condensate and natural gas liquids.

¹²³ End-2016; <http://www.genelenergy.com/media/2054/genel-energy-2016-annual-report-final.pdf>

¹²⁴ End-2016; <http://www.genelenergy.com/media/2054/genel-energy-2016-annual-report-final.pdf>

¹²⁵ <http://www.danagas.com/en-us/Investors/Dana%20Gas%20Investors%20Presentation%20March222016.pdf>;

<http://www.danagas.com/en-us/Investors/Dana%2026811%20AR%202016%20English%20web.pdf>

¹²⁶ Operator Gazprom Neft suggested 8 million tonnes (~58 million bbl) on the Garmian block as a whole <http://www.gazprom-neft.ru/press-center/lib/1158210/>

¹²⁷ All reserves figures from BP Statistical Review of World Energy (2015), and include crude oil and other petroleum liquids.

In gas, 38.7 Tcf represents a significant advance on a year earlier, but is still relatively modest - considerably more than Oman, and about half of Kuwait, but much less than its heavyweight neighbours federal Iraq and Iran. However, since the KRI's gas resources are mostly non-associated, they can be developed more flexibly than those in federal Iraq. There is substantial potential for new gas discoveries, including in deeper formations, probably more so than for new oil. The KRI's domestic gas demand is relatively small and so it has the potential to become a significant exporter.

There is also significant potential in the KRI for metallic and non-metallic minerals, particularly in the high mountain areas, but these have remained mostly undeveloped¹²⁸. The downgrade in the potential of the hydrocarbon sector may lead to a renewal of government interest in these minerals.

3.4. Production-sharing contracts

Under a PSC, the investor puts up the required capital for exploration and development, and receives a defined share of oil and gas revenues for cost recovery ('cost oil'). The contract is usually valid for 20-25 years. If the company is not successful in discovering commercial petroleum, it loses its investment. The remainder of revenues left after cost recovery, so-called 'profit oil' or 'profit petroleum', are shared with the government in another proportion. The shares of cost and profit oil may vary with production rate, profitability or other metric. A royalty may be paid (a share of gross revenues) directly to the government before calculating cost oil, and the company may also be liable for tax on its profit oil, and sometimes a 'capital gains tax' on transfer of an interest to another party. The investor can book the equivalent in barrels of its cost and profit oil as reserves. It has title to its contractual share of petroleum produced, but not to hydrocarbons in the ground. It does therefore not amount to 'giving away control' of national resources. The ministry, regulator or national oil company of the country granting the PSC usually retains the rights to approve field development plans, budgets and other matters.

Federal Iraq has promoted a service contract model, the Technical Service Agreement (TSA), where operators are remunerated for their costs and paid a fee per barrel of oil or cubic foot of gas extracted above a baseline. They do not have title to reserves, although it is possible in some interpretations for IOCs to 'book' as reserves the limited quantities of oil received in remuneration. This model is unusual globally and regionally. The new Iran Petroleum Contract is similar, while the model in Abu Dhabi is comparable economically though not legally. Kuwait has negotiated but never awarded TSAs for field investment.

In contrast, many other leading oil producers, globally and regionally, have adopted the PSC, including Indonesia (its originator), Nigeria, Azerbaijan, Kazakhstan, Brazil, Qatar, Algeria, Libya, Syria, Egypt, Oman and others.

The KRG's choice of the PSC was governed by the facts that it had no national oil company (unlike federal Iraq) to operate fields itself or partner with IOCs; and that to attract companies to a new,

¹²⁸ 'Monthly Export and Production Data', Ministry of Natural Resources, Kurdistan Regional Government, 25 August 2013, <http://mnr.krg.org/index.php/en/mining>.

politically and geologically risky area, it needed to offer a familiar and economically appealing framework. Comparisons to the Iraqi TSA and suggestions that it offers the government a “better deal” are simply absurd. Wildcatting in the Kurdish mountains cannot be compared to developing a large proved field such as Rumaila. In any case, the Iraqi TSAs have had little success in attracting exploration, and several companies such as Statoil and Shell have withdrawn from TSAs even for large, discovered, low-cost fields in southern Iraq, finding the terms economically unviable.

From the time of the first award to DNO, the KRG has favoured Production-Sharing Contracts (PSCs, sometimes referred to as Production-Sharing Agreements or PSAs) for assigning rights for hydrocarbon exploration and development to international oil companies. The exception is the service-type contract, with a fixed rate of return, signed with Crescent Petroleum and Dana Gas (later the Pearl Petroleum consortium) for the Khor Mor and Chemchemal gas fields¹²⁹. Most of the PSCs have been made available on the MNR’s website¹³⁰, though some are absent (e.g. those with ExxonMobil) and the public contracts do not necessarily reflect the full agreement between the parties.

By January 2015, the KRG had concluded 52 PSCs. These were all assigned by individual, bilateral negotiations, rather than by formal ‘bid rounds’ or auctions, as many (but not all) countries do. There is therefore some difference between the PSCs awarded, which have also undergone subsequent modification. This approach was followed because of the need for secrecy in the face of pressure from Baghdad; the few interested companies in the early days; and the changing negotiating balance between the parties as discoveries were made.

Nevertheless, the Kurdish PSCs are fairly simple and standard. A royalty (10 per cent) of gross revenues is paid directly to the government. 40-50 per cent of the remainder is available as cost oil. Profit oil is split 30 per cent to the IOC, reducing to 15 per cent as the ‘R-factor’ (ratio of cumulative revenues to cumulative costs, a rough measure of profitability) increases. In some cases, an up-front cash bonus was paid to the government, also a normal and legal feature of many PSCs worldwide. Subsequently, the KRG has introduced ‘capability-building payments’, intended, at least officially, to be used to develop infrastructure. These were typically around 30 per cent of profit oil which was reclaimed by the government. However, as part of the settlement of overdue payments to the IOCs, some of these capacity-building payments (such as that due from DNO) were cancelled.

Initially the KRG held a 20-25 per cent carried interest in most of the PSCs – it did not pay exploration costs but had the right to take a share in a commercial discovery. A 20 per cent stake was also typically reserved for future entrants, to keep the door open for larger companies. Most of these interests have now been assigned, and the KRG has sold its interest in many contracts or cancelled it as part of settling its dues.

¹²⁹ The Khurmala contract with KAR is not publicly available, but is also understood to reflect a service-type arrangement.

¹³⁰ ‘KRG Ministry of Natural Resources Production Sharing Contracts’, Kurdistan Regional Government, <http://cabinet.gov.krd/p/p.aspx?l=12&p=1>.

The changes in contract terms, and the lengthy delays in paying IOCs their costs (let alone profit oil), along with the geological disappointments, gave a more negative impression of the KRG to potential investors.

Table 2 compares the revenue split for the two contracts at low and high oil prices, for 100 barrels produced at a cost of \$10 per barrel in federal Iraq and \$20 per barrel in the KRI, allowing for quality and transport differentials for KRI and federal oil exports. At low oil prices, the contractor makes a loss under the PSC (being unable to recover the higher production and transport costs) while the contractor makes a profit under the TSA. At high oil prices, the PSC is much better for the contractor than the TSA even allowing for the higher costs. This is only an indicative comparison, because it should allow for the time value of money (discounting), the different production build-up rates, exploration risk, production bonuses, the changing profit split in both contracts, the carried government interest in most of the PSCs, and the delays in payment (with payments for the TSAs often 6-9 months behind schedule, but those in the KRI many years overdue). For exploration blocks, the TSAs awarded have had higher remuneration fees than for the discovered fields - \$6.24 for Block 9 in southern Iraq¹³¹ - which would bring the two contract types even closer, and is a fair comparison given that IOCs have discovered nearly all the KRI's current fields.

Table 2 Iraq TSA and KRG PSC comparison¹³²

	Brent \$40 per barrel		Brent \$100 per barrel	
	Federal Iraq TSA	KRG PSC	Federal Iraq TSA	KRG PSC
Revenues (100 barrels)	3720	2500	9720	8500
Royalty	0	250	0	850
Revenues available for remuneration	1860	1125	4860	3825
Costs	1000	2000	1000	2000
Revenues after cost recovery	860	1125	3860	5650
Profit to contractor	200	-706.25	200	847.5
Tax	50	0	50	0
Profit to contractor after tax	150	-706.52	150	847.5

When oil prices are low, the TSAs have the drawback for the government that it is obliged to reimburse contractors immediately for their costs, which puts a large burden on the budget.

The MNR has established the Kurdistan National Oil Company (KNOC), the Kurdistan Exploration and Production Company (KEPCO) and the Kurdistan Oil Marketing Organisation (KOMO) but these remain largely as paper entities. The MNR, and primarily the minister Ashti Hawrami, remain responsible for licence awards, regulation, strategy and policy. Unlike federal Iraq's Ministry of Oil (MoO), MNR does not have the ability to operate fields. It has relied on private Kurdish company KAR to operate Khurmala, Kirkuk (while it controlled it), and the intra-Kurdistan export pipeline.

¹³¹ <http://www.ogj.com/articles/2013/11/iraq-kuwait-energy-dragon-oil-to-drill-on-block-9.html>

¹³² Individual contracts vary slightly from the typical terms illustrated here. Assumes that the KRG project has reached the lowest profit-oil tranche of 15%, ignoring capacity-building payments; \$2 per barrel fee for Iraq TSA, with R-factor removed after renegotiation. Bonus payments and government equity excluded.

3.5. Infrastructure

When the KRG began serious development of its hydrocarbon resources from about 2005, both general and petroleum-specific infrastructure was very limited. Since then, it has undergone major development, to the point of being mostly sufficient for the energy industry’s current needs albeit with some weaknesses.

Figure 8 and Figure 9 show petroleum infrastructure in the KRI and the adjoining part of federal Iraq in about 2013-15. Not much has changed since then, given the hiatus in development imposed by the lack of budget and the conflict with ISIS.

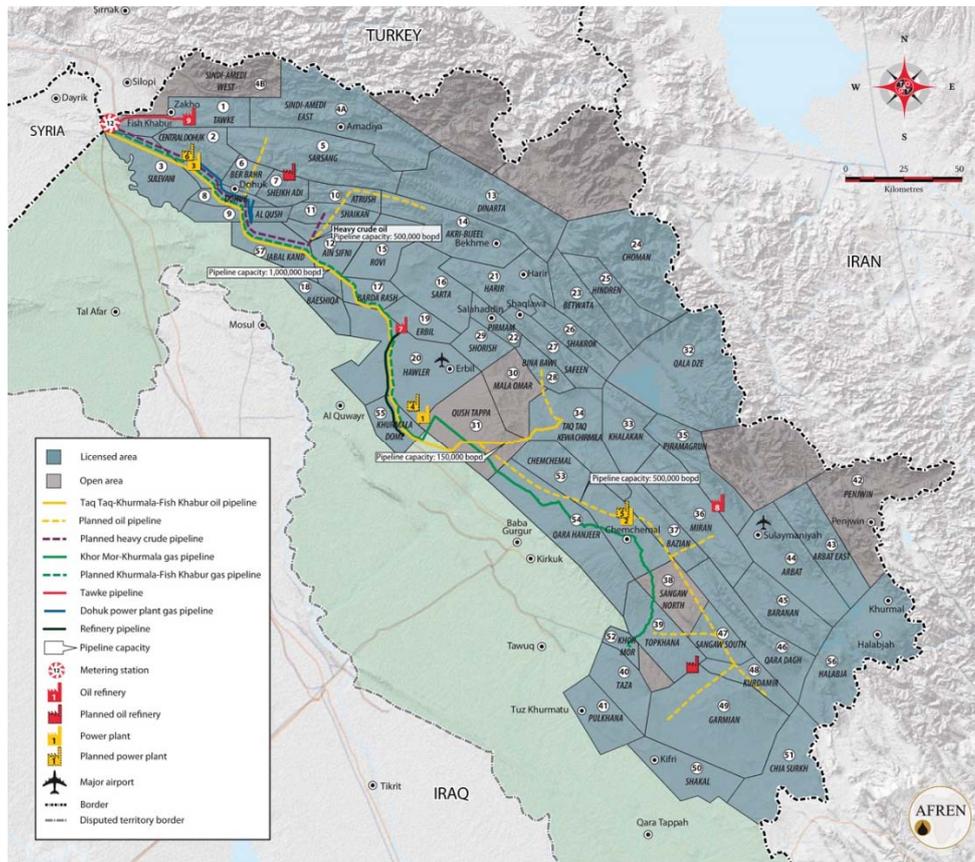
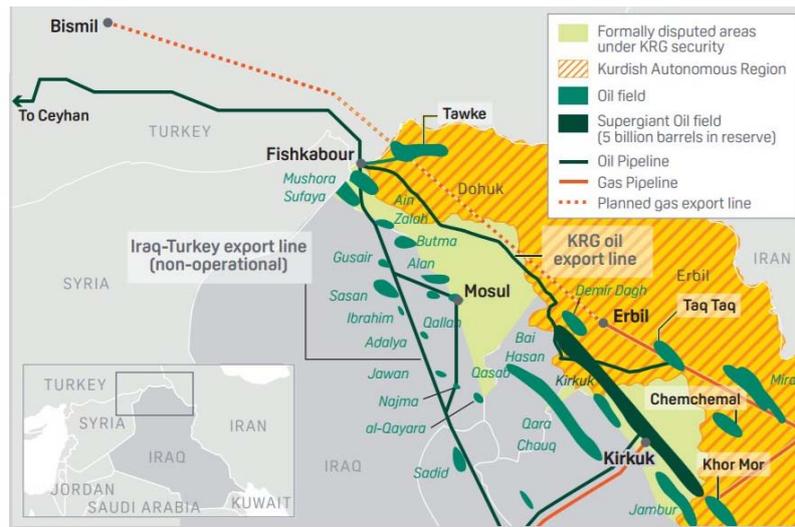


Figure 8 KRI oil and gas infrastructure (note that many of the block boundaries and names have changed subsequently)¹³³

shows the regional oil infrastructure in the adjoining parts of Iraq in more detail.

¹³³ Kurdistan Ministry of Natural Resources.



Source: Platt's

Figure 9 Oil infrastructure and political control in the KRG and northern Iraq¹³⁴

The key items of KRG petroleum infrastructure are pipelines, processing plants, refineries and power plants.

A gas pipeline was built from Khurmala to Dohuk in 2013 but, following the shut-off of federal exports, it was converted to a 700 kbpd crude oil pipeline, also linked to the Taq Taq field. A short line from the Tawke field joins it at the Fishkhabour border crossing, just downstream of the federal metering station on the Kirkuk-Ceyhan pipeline, hence preventing Baghdad from monitoring Kurdish export levels. The Turkish section of the Kirkuk-Ceyhan pipeline consists of two parallel lines, with total nominal capacity of 1.6 Mbpd. However, a lack of maintenance and frequent sabotage has reduced this to 500-600 kbpd. Repair would be required if volumes are to rise above this again, as is anticipated if output at Kirkuk is boosted and the Kurds continue to use the pipeline too. In July 2017, production began from the Atrush field which is connected by a spur line to the main export pipeline and has planned initial output of 30 kbpd. Shaikan oil, about 37 kbpd, was being trucked to Fishkhabour and injected into the pipeline, but a direct pipeline is under study. Sarsang, expanding production to about 10 kbpd, could also be tied in at some point.

An extension of this pipeline system to the southern KRG would be required to allow large-scale exports from fields such as Sarqala, Topkhana and Shakal. For now, these fields are reliant on local sales or trucking. Their relatively small production levels make a long-distance pipeline doubtfully economic. They can also truck oil to Iran, possibly as part of the recently announced deal to send Kirkuk crude to the Kermanshah refinery.

As noted, Rosneft signed in October 2017 to take 60 per cent ownership of the crude export pipeline and expand it to 1 million bpd. This capacity is unneeded at present. Even if the Kirkuk fields resume flowing through the pipeline by some agreement with Baghdad, and no oil is diverted to Iran or through the federal Kirkuk-Baiji-Fishkhabour pipeline, the exports would only be around 600 kbpd, and the Turkish section of the pipeline needs rehabilitation to handle more.

¹³⁴ (International Crisis Group, 2015).

For now, the region's oil pipelines are largely sufficient for its needs. Gas infrastructure is less developed. The pipeline to take gas from the Khor Mor field via the so-far undeveloped Chemchemical field to power plants near Sulaymaniyah (Bazian) and Erbil was completed in August 2008, and a plant to extract liquefied petroleum gas (LPG) at Khor Mor in January 2011¹³⁵, with capacity of 300 MMscfd of gas and 25 kbpd of condensate¹³⁶. In June 2012, an accidental explosion at the LPG plant stopped operations and took a year to repair¹³⁷. Another, unexplained explosion on the pipeline in January 2016 shut it down for a short while. A short pipeline runs from the Summail gas field to the Dohuk power plant, but Summail production has ceased due to geological problems.

The lengthy arbitration between the Pearl Petroleum Consortium and the MNR has prevented the planned expansion of the Khor Mor and Chemchemical fields to bring gas to other power plants in the KRI and save on expensive diesel. The settlement in this case could now allow these plans to go ahead.

The proposed exports to Turkey would require linking in a number of fields to an export pipeline. In 2013, Turkey was extending a 20 bcm per year gas pipeline from Bismil south to Mardin and then east to the border town of Silopi¹³⁸, which could then bring Kurdish gas into south-eastern Turkey, but in February 2015 it re-evaluated bids with plans to relaunch the tender in 2016¹³⁹.

The initial 20 bcm could come from Khor Mor, Chemchemical, Miran, Bina Bawi and possibly Khurmala, which could all be linked by a pipeline following the route of the current Khor Mor gas pipeline as far as Khurmala, and then parallel to the crude export line to the Turkish border. Later, Topkhana, Kurdamir and other fields, further south, could be connected. However Genel has indicatively shown another route which connects Miran and Bina Bawi near Taq Taq (with feeder lines from further south linking to Miran), with the line then running to Khurmala.

However, only Bina Bawi and Khurmala are in KDP-controlled areas, which the pipeline from the other fields would have to cross to reach Turkey. Rosneft can play the role as organiser, aggregator and financier for the network, possibly in combination with the Pearl consortium, and with Genel which had expressed a desire for a 10 per cent stake¹⁴⁰. Genel in 2015 has estimated \$2.5 billion of costs for the gas processing for Miran and Bina Bawi (about 10 bcm per year).

3.6. Oil production, demand, and exports

The MNR has not released oil production or export figures since November 2016¹⁴¹. In that month, production was reported as 597587 bpd plus 64102 bpd produced by NOC at Kirkuk, exports as

¹³⁵ <http://www.danagas.com/en-us/operations/iraq>

¹³⁶ <http://www.ramboll.com/projects/rog/iraq-khor-mor-lpg-recovery-plant-detailed-design>

¹³⁷ <https://www.thenational.ae/business/dana-gas-facility-in-iraq-repaired-1.328481>

¹³⁸ <https://www.brookings.edu/wp-content/uploads/2016/06/Turkeys-Energy-Aspirations.pdf>

¹³⁹ <https://euagenda.eu/upload/publications/untitled-6654-ea.pdf>

¹⁴⁰ <https://euagenda.eu/upload/publications/untitled-6654-ea.pdf>

¹⁴¹ http://mnr.krg.org/images/monthlyreports/EXPORTs/MNR_November_2016_Export_Report.pdf

587646 bpd, and local refining as 64102 bpd. Exports to Ceyhan averaged 583600 bpd up to September 2017¹⁴², but plunged in October 2017 due to the loss of the Kirkuk-area fields. They were 268575 bpd in November 2017 and 275575 bpd in December 2017, according to ship-tracking data¹⁴³.

Figure 10 shows recent KRG exports by destination. The sharp drop from October to November reflects the loss of the Kirkuk-area fields. The main markets are in southern Europe – Greece, Italy, Croatia (probably serving pipeline supplies into Hungary) and Spain. Deliveries to Cyprus (which has no refinery) and some of those to Israel are for transfer on to other vessels.

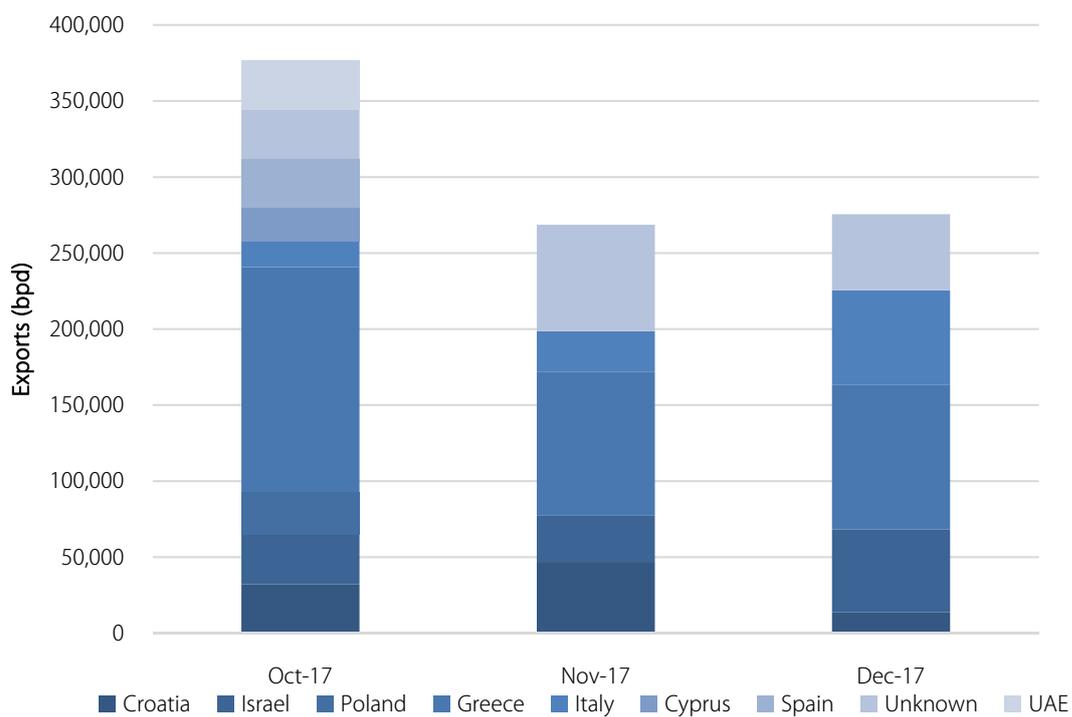


Figure 10 KRG oil exports by destination, October-December 2017¹⁴⁴

Prime Minister Nechirvan Barzani announced in January 2018 that an audit by Deloitte and E&Y, covering oil exports for the first six months of 2017 would be released “soon”¹⁴⁵. In response to statements by Iraqi prime minister Abadi that the KRG exported 550 kbpd in October 2017, and exported \$1.68 billion worth of oil during October-December 2017 (about 300 kbpd at an average Brent price of \$60 per barrel)¹⁴⁶, KRG spokesman Safeen Dizayee responded that exports from 16th October to the end of December 2017 had averaged 265970 bpd¹⁴⁷. Independent assessments¹⁴⁸

¹⁴² <https://www.bloomberg.com/news/articles/2017-09-20/iraq-s-kurds-seek-independence-what-impact-for-oil-markets>

¹⁴³ <http://tankertrackers.com/#/>

¹⁴⁴ <http://tankertrackers.com/#/>

¹⁴⁵ <http://www.kurdistan24.net/en/economy/b453283f-05a6-457b-bb5c-e56b3479c939>

¹⁴⁶ <https://www.iraqinews.com/features/abadi-kurdistan-oil-exports-usd1-billion-3-months/>

¹⁴⁷ <http://www.nrttv.com/en/Details.aspx?Jimare=18097>

suggested an average of 272 kbpd during November–December, down from about 530 kbpd prior to mid-October¹⁴⁹. Tanker-tracking services provide an estimate of exports but exclude oil sold domestically or exported by trucking, and it is also difficult to distinguish the changing levels of production from the different fields around Kirkuk.

In September 2016, the last month with detailed MNR figures available, Tawke produced 112.7 kbpd, Taq Taq 56 kbpd, Shaikan 27.3 kbpd, and Khurmala / Bai Hassan / Avana 347.8 kbpd. Smaller amounts have been produced from Sarqala, Sarsang, Hawler, Shewashan (operated by Gas Plus Khalakan), and Ain Sifni at around 19 kbpd. Total September 2016 production for KRI was 563 kbpd including Bai Hassan and Avana. The figures, however did not include production from Barda Rash, Swara Tika, Demir Dag, and Akri Bijeel. The Barda Rash development operated by Afren was put on hold in 2016 because high water cuts were making production uneconomical. The reserves for the field were also downgraded in January 2015 to 250 million barrels of oil from 1.24 billion barrels previously¹⁵⁰. Demir Dag production was 3.1 kbpd in Q4 2016 and Swara Tika around 9 kbpd¹⁵¹. Including Demir Dag and Swara Tika puts September production at 575 kbpd.

The Ministry of Oil in Iraq also released regional September 2016 production and consumption figures. They estimated KRG's production for that month at 595 kbpd excluding Baba Dome, and the smaller fields Jambur and Khabbaz controlled by NOC in Kirkuk (which were producing through the KRG's pipeline). They estimated Bai Hassan and Avana Dome production at 275 kbpd, implying Khurmala production at 75 kbpd in September¹⁵². Federal Iraq's Kirkuk production for that month including Bai Hassan and Avana was 434 kbpd. Deducting Bai Hassan and Avana (275 kbpd), puts Baba Dome, Jambur and Khabbaz production at 159 kbpd that month.

¹⁴⁸ <http://tankertrackers.com/>

¹⁴⁹ <https://www.reuters.com/article/us-mideast-crisis-iraq-kurds-oil/iraq-wants-control-of-kurdish-regions-oil-exports-state-firm-idUSKBN1D21G8>

¹⁵⁰ http://www.morningstar.co.uk/uk/news/AN_1421058223552495600/update-afren-shares-collapse-on-barda-rash-reserves-downgrade.aspx

¹⁵¹ WesternZagros – Kurdistan Operator Activity Map, February 2017 and July 2017

<https://www.scribd.com/document/335882575/160728-Operator-Activity-EXTERNAL>

¹⁵² <http://www.argusmedia.com/pages/NewsBody.aspx?id=1338380&menu=yes>

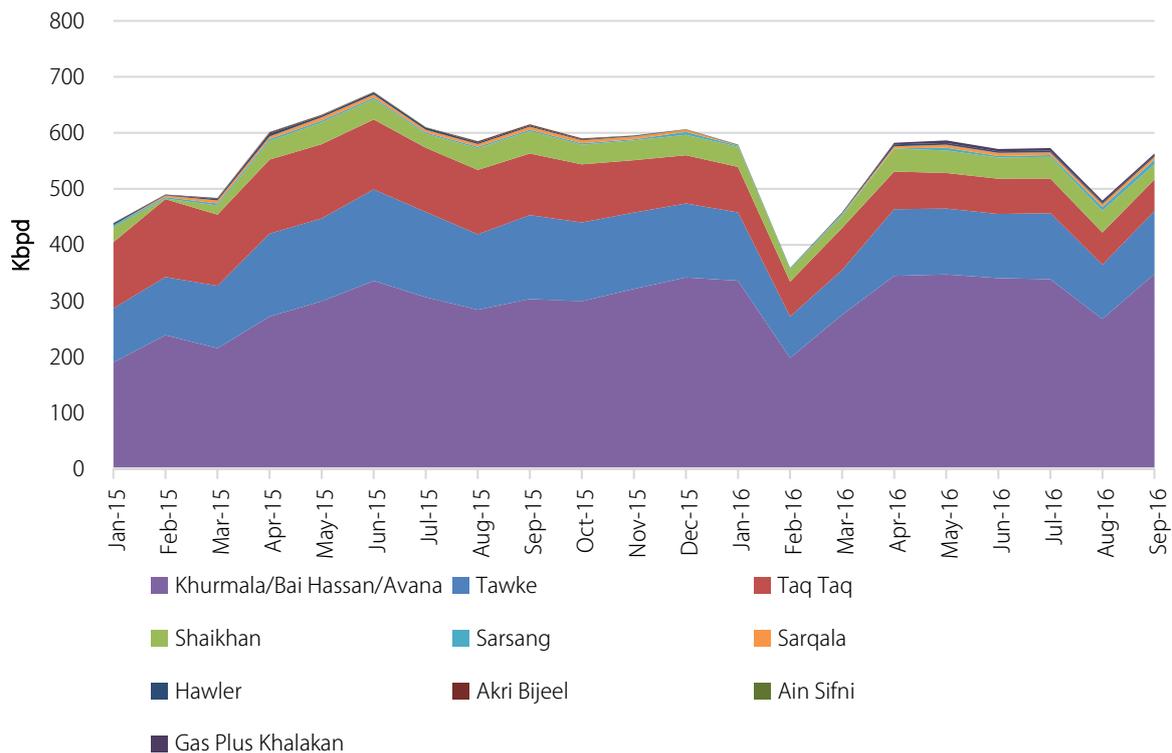


Figure 11 Oil production in the KRG from MNR reported figures (Jan-15 to Sept-16)¹⁵³

By October 2016, the MNR reported that it had exported 564.7 kbpd from its own fields, including Bai Hassan and Avana Dome (which were still notionally under federal government jurisdiction¹⁵⁴) to Turkey, and 49 kbpd from North Oil Company-operated fields (Baba Dome, and the smaller fields Jambur and Khabbaz). The gross value from exported oil in Ceyhan was \$636 million implying an export price of \$39/bbl. In October 2016, Brent oil price was \$46.57/bbl implying a discount of approximately \$7 to Brent. In previous deals with Baghdad, and under the December 2014 revenue-sharing deal, KRG oil sales by pipeline were handled by the federal State Oil Marketing Organization (SOMO), but by October 2015, no KRG oil had been delivered via SOMO.

Field developments have been held back by the threat of ISIS, the region's budgetary crisis, geological challenges, and the halt in IOC investment, with Tawke showing some declines, Taq Taq suffering much larger declines in production, and operations at Barda Rash being suspended entirely.

Production at the Tawke block (including the Tawke and Peshkibir fields) averaged 91.3 kbpd in 2014¹⁵⁵, 135.2 kbpd in 2015¹⁵⁶, 107.3 kbpd in 2016¹⁵⁷ and 110 kbpd in 2017¹⁵⁸. The decline in 2016 was

¹⁵³ http://mnr.krg.org/images/pdfs/Kurdistan_Oil_Production_Field_Operator_2015_2016_1.pdf

¹⁵⁴ It is not always clear which sectors of Kirkuk are included by MNR in its 'NOC-operated' total.

¹⁵⁵ <http://hugin.info/36/R/1891955/670060.pdf>

¹⁵⁶ <http://hugin.info/36/R/1985350/734054.pdf>

¹⁵⁷ <http://hugin.info/36/R/2077136/781338.pdf>

¹⁵⁸ <http://www.genelenergy.com/media/2150/genel-update-on-tawke-psc-final.pdf>

due to lower investment in the field by Genel Energy and DNO in 2015 because of lack of payments by MNR for oil sales. The field is also facing technical issues of natural decline and requires water injector at the shallow Jeribe reservoir¹⁵⁹. Once monthly payments by the MNR were agreed to in October 2015 and once the receivable settlement agreement has been reached with MNR in August 2017, the shareholders began growing investments at the Tawke field. They fast-tracked the development of the Peshkibir field and an early production facility is expected to be completed by the end of 2017 after they increased production to 15 kbpd with the Peshkibir-3 well. Drilling at the field was also stepped up from 4 new wells in 2016 to a drilling program of 10 production wells in 2017¹⁶⁰. Further investments to grow production with new wells and water injection is anticipated in 2018 if payments from MNR continue. The central processing facility was expanded from 70 kbpd to 200 kbpd in 2015, but production is tending to remain below 200 kbpd with the possibility to go slightly above the 2015 peak with the continued water injection and new wells.

Taq Taq production declined drastically due to reserve downgrades and excessive production in earlier years. In 1H 2017 production was 22 kbpd, down 68% from 1H 2016. Towards the end of 2017, the field was averaging 14.7 kbpd with a water cut of c.50%. This is from an average production of 116.1 kbpd in 2015. On the other hand, additional development wells are planned in the shallower Pilaspi reservoir¹⁶¹.

However, to give some examples of continuing production growth, the development of HKN's Sarsang block has been approved in November 2015 with an initial production capacity of 20 kbpd increasing to 50 kbpd once gas handling facilities are established. In February 2017 it was producing approximately 13 kbpd¹⁶² up from 9 kbpd in 2016 and 2015. Gulf Keystone's Shaikan field is planning the stabilization of production at 40 kbpd within the next 9-12 months (new wells, maintenance, debottlenecking), increasing to 55 kbpd after 1.5 years and eventually 110 kbpd for full field development (full development of Jurassic, first development of Cretaceous and Triassic reservoirs, additional processing facility, including gas re-injection, ~40 wells)¹⁶³. Taqa's Atrush field started production in July 2017 after a two-year delay (initially expected by 2015 and FDP approved in 2013) with initial production of 15 kbpd¹⁶⁴ and capacity to increase to 30 kbpd, soon overtaking Taq Taq.

Oryx Petroleum's Hawler block production in 2016 averaged 3.1 kbpd from Zey Gawra and Demir Dagh and 3.6 kbpd by November 2017 with 8 new wells planned in 2018 to increase production. Hawler block has two other discoveries, Banan and Ain Al Safra, with Banan (Cretaceous and Tertiary) expected to be evaluated in 2018 as no reserves are booked for the discovery yet¹⁶⁵. A development plan has been filed for Western Zagros's Kurdamir field in May 2016 with Phase 1 targeting 150 MMcf/d of gas and 20 kbpd of petroleum liquids between Kurdamir and Topkhana¹⁶⁶, with the KRG

¹⁵⁹ <http://www.genelenergy.com/media/2100/genel-hy-2017-results-final.pdf>

¹⁶⁰ <http://hugin.info/36/R/2128970/813135.pdf>

¹⁶¹ <http://www.genelenergy.com/media/2100/genel-hy-2017-results-final.pdf>

¹⁶² WesternZagros – Kurdistan Operator Activity Map, February 2017

¹⁶³ <http://www.gulfkeystone.com/media/110028/GKP-Smart-AR16.pdf>

¹⁶⁴ <https://www.iraqoilreport.com/news/july-production-passes-4-6-mbpd-25049/>

¹⁶⁵ http://www.oryxpetroleum.com/data/presentations/Oryx_Petroleum_Corporate_Presentation_20-11-2017.pdf

¹⁶⁶ <http://www.westernzagros.com/wp-content/uploads/2017/05/2017-Mar-WZR-Corporate-Presentation-Final.pdf>

responsible for the construction of a gas pipeline to Chemchemical, which would be an obstacle given the current financial strains of the government. Should they proceed, these developments will be funded by the international oil companies, though some of the smaller ones may need to raise additional capital in a difficult market.

Figure 12 shows a forecast for KRI oil production. It indicates the oil produced from the Kirkuk area (including NOC production through KRG facilities) while under KRG control, from mid-2014 to October 2017. Excluding the Kirkuk area, KRI production can step up in 2018 and thereafter. The ramp-up of Atrush and some smaller fields will also contribute.

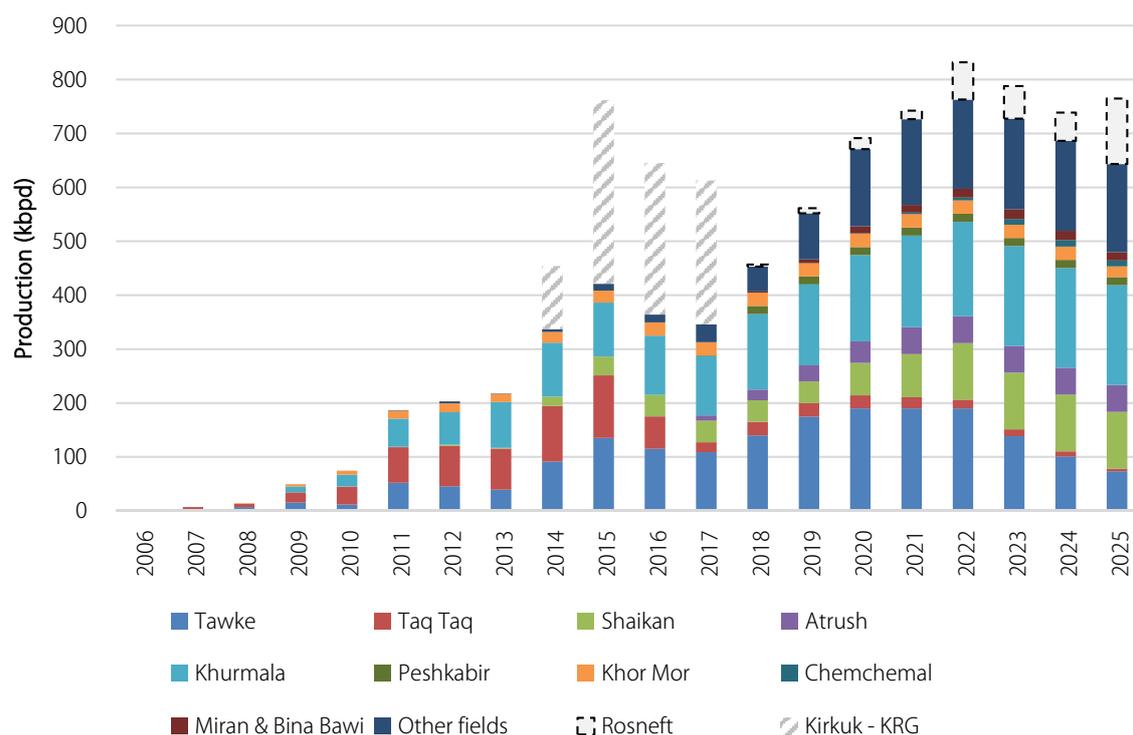


Figure 12 KRG production forecast¹⁶⁷

From 2018 onwards, the new areas assigned to Rosneft could start producing, but this remains speculative due to their uncertain geology. A few other discoveries (and possible new finds) could also contribute, such as Benenan, Banan, Sarta and Shakal, and upside on Kurdamir. However, the ability to increase KRI output significantly can only be realised if the KRG retains control of Khurmala and exports through Fishkhabour, if companies are paid their costs within a reasonable time, and if investment is sustained in increasing output at Khurmala, Tawke and Shaikan in particular. The increased volumes of condensate and LPG from the gas fields Khor Mor, Chemchemical, Bina Bawi and Miran is also dependent on beginning an export project to Turkey (or another market). Even then, the total production will easily be absorbed by the local market and existing pipeline export capacity. The expected decline in Tawke after 2022 will see overall output falling again unless there are sizeable new developments. As noted, the KRG's weak finances mean that it is not in a position to finance

¹⁶⁷ MNR; company reports; Qamar Energy research

required gas infrastructure (though Rosneft may do this), nor to pay the IOCs their costs and profit on time and in full, preventing them from investing in new production.

Given all these uncertainties, it is likely that actual production will be well below the levels shown here.

Oil exports were initially by truck to Turkey and Iran, and this has continued even with the start of pipeline exports to Turkey. In 2015, about 55 kbpd were reportedly trucked from fields to be injected in the export pipeline, while 10 kbpd of heavy oil (probably from Shaikan) were exported by truck to Turkey.¹⁶⁸ Trucks as well as pipelines from Khurmala and Taq Taq are used to feed the Kalak and Bazian refineries. Production from Sarqala, Khalakan, Ain Sifni, and Sarsang supplies the domestic market while there is potential too for pipeline tie-ins from Sarqala and Sarsang.

Since February 2017, MNR stopped Shaikan pipeline exports to Turkey because of its heavy crude and relatively high sulphur content affecting the quality of exports, a problem worsened by the steep decline in Taq Taq's light oil. The KRG agreed to shoulder the extra cost of transporting about 38 kbpd of Shaikan crude by truck to Turkey, probably to the port of Dörtüol in Turkey, and GKP will continue to receive a fixed payment of \$15 million per month (\$12 million net) for current and past exports¹⁶⁹. Previously Shaikan crude was trucked to Fishkhabour where the export crude was transferred to the pipeline.

In 1H 2017, Taq Taq sales were evenly split between exports through the KRI-Turkey pipeline and local sales to the Bazian refinery. During the same period, all of Tawke's field output was sold through the KRI-Turkey export pipeline¹⁷⁰.

The KRI contains two (moderately) large refineries: Kalak (near Erbil), with 100 kbpd capacity which was planned to be expanded to 175 kbpd by 2018, and Bazian with 34 kbpd, which was planned to be expanded to 100 kbpd by 2018. Both expansion projects are now on hold and no further revival plans are expected. Kalak is owned by KAR Group (operators of the Khurmala field) and Bazian by Qaiwan (another Kurdish local company). DNO operates a 5 kbpd refinery at its Tawke field, and there are numerous (around 150) small and rudimentary 'topping plants' run by local companies throughout the region with a capacity of 145 kbpd. With the topping plants, the region's total refining capacity is about 284 kbpd¹⁷¹. The MNR has a policy of closing unlicensed topping plants and consolidating others into larger units. In 2015 it tendered for the construction of three new refineries totalling 150 kbpd of capacity, in Sulaymaniyah, Dohuk, and Erbil,¹⁷² though these projects seem to be scrapped now. The region currently has a large surplus of naphtha and heavy fuel oil, but is short of

¹⁶⁸ 'The Movement of Oil and Refined Products by Trucking in the Kurdistan Region, A daily estimate of tanker journeys based upon current activities in the oil and gas sector', Ministry of Natural Resources, Kurdistan Regional Government, November 2015, http://mnr.krg.org/images/pdfs/The_Movement_of_Oil_and_Refined_Products_by_Trucking_in_the_KRG.pdf.

¹⁶⁹ <https://www.platts.com/latest-news/oil/dubai/analysis-iraqi-krq-faces-obstacles-to-maintain-26686863>

¹⁷⁰ <http://www.genelenergy.com/media/2100/genel-hy-2017-results-final.pdf>

¹⁷¹ <https://www.iraqoilreport.com/news/krq-to-tender-three-new-refineries-15378/>

¹⁷² 'KRG to tender three new refineries', Iraq Oil Report, 24 July 2015, www.iraqoilreport.com/news/krq-to-tender-three-new-refineries-15378/.

diesel and gasoline, the shortfall being imported from Turkey. The planned refinery expansions would make the region a significant net exporter of oil products, if they go ahead in the long-term, but for now the KRG has prioritised exporting crude oil for cash to supplying its domestic refineries. Oil sales to refineries by IOCs are based on the wellhead export netback price, as announced by the KRG in February 2016.

3.7. Gas production, demand, and exports

Gas production in the KRI stands at around 3–4 bcm annually,¹⁷³ and is currently entirely for domestic use; the Khor Mor field supplies power plants at Bazian and Erbil, while the Summail field, which was supplying the Dohuk power plant, has run into production problems.

The KRG has long had gas export ambitions to Turkey, with the 2013 energy pact foreseeing 4 bcm of exports in 2017 rising to 10 bcm by 2020 and eventually 20 bcm¹⁷⁴. However, this has been held up by a lack of development of the upstream anchor fields (Miran and Bina Bawi), the arbitration case with Dana Gas over the Khor Mor and Chemchemical fields (now settled) and the lack of processing and pipeline infrastructure.

Miran and Bina Bawi could produce about 11 bcm between them. Genel needs financing for this development, and the KRG would also need capital to construct the processing plant for the raw gas. Rosneft could participate in either or both of these segments of the project. As currently structured, Genel would require about \$1 billion for the initial upstream development and would be paid \$1.20 per MMBtu for the raw gas¹⁷⁵.

Under the settlement of the arbitration case with Dana Gas, Khor Mor would increase output from the 3.4 bcm per year reached in 2012, to 8.3 bcm by late 2019–early 2020, of which 2.6 bcm would be devoted to exports. Chemchemical could produce 6 bcm, flared gas from Khurmala could add another 2.1 bcm, and Topkhana and Kurdamir 1.6 bcm between them¹⁷⁶. Pirmam, near Bina Bawi and the only operated block retained by ExxonMobil, also has a reported 0.88 Tcf of gas resources, and Shaikan's Triassic gas reservoir could be developed along with capturing associated gas from some of the other fields. The addition of Kirkuk to the KRG's control added about 2.5 bcm annually, which could increase if more currently flared gas is captured. However, most of this gas is required for local power generation, and of course the KRG has now lost control over the area, with even Khurmala in doubt.

Production of about 29 bcm, with 5.7 bcm used domestically, is therefore possible, and initial export by Rosneft of around 20 bcm to Turkey, rising to 30 bcm eventually if more gas is developed, is plausible. Of course, this depends on timely development of all these fields, under difficult economic and political circumstances, and their linking into the export system. Major problems include federal

¹⁷³ Excluding production from the Kirkuk area and Khurmala, most of which is flared.

¹⁷⁴ 'KRG plans 10 bcm in natural gas exports to Turkey in two years', *Hurriyet Daily News*, 20 November 2015, www.hurriyetdailynews.com/krg-plans-10-bcm-in-natural-gas-exports-to-turkey-in-two-years.aspx?pageID=238&nid=91471&NewsCatID=348.

¹⁷⁵ <http://genelenergy.com/media/1950/genel-ir-presentation-apr-2016-vf.pdf>

¹⁷⁶ Middle East Economic Survey (22nd September 2017), Volume 60, Number 38

Iraq's moves to take control of the Fishkhabour border point, and its opposition to gas exports not under its control; and Turkey's likely uncertainty as to whether the KRG would be a reliable supplier.

MNR forecast 16 bcm of domestic gas demand by 2015, but this has not been reached because of lack of development of industrial demand, and lower electricity demand growth because of the economic crisis and delays in converting diesel-fired generation to gas. With about 8 bcm per year of current domestic KRI demand, there is a deficit, reflecting unmet electricity demand and oil-fired power generation that could be substituted with gas. Most gas is used for power, with some for industry (mostly cement). The region's economic crisis and the loss of certain areas will reduce demand. The conversion of open-cycle power plants to combined cycle would boost output without requiring more gas.

Turkey has been essentially the only target market for the KRI's gas. However, Ankara's latest energy policy, announced in early April 2017, puts the stress on developing indigenous resources (coal, renewables and, if more domestic resources can be discovered, oil and gas), building nuclear power, and diversifying gas supplies including LNG¹⁷⁷.

In 2016, Turkey imported 24.5 bcm from Russia, 7.7 bcm from Iran, 6.5 bcm from Azerbaijan, 4.3 bcm of Algerian LNG and 2.3 bcm of other LNG. It also had a minor amount of domestic production. The Trans-Anatolia Pipeline (TANAP) pipeline is meant to bring 16 bcm from Azerbaijan in early 2020, increasing to 31 bcm over time, of which 6 bcm will go to the Turkish market and the rest be transited by the Trans-Adriatic Pipeline (TAP) to Greece, Albania and Italy. The Turkstream pipeline (31.5 bcm) from Russia under the Black Sea is intended to begin in the fourth quarter of 2019. Turkstream will replace transit via Ukraine, but Russia will also continue using the 16 bcm capacity Blue Stream pipeline under the Black Sea. Iran could increase exports by 2.2 bcm through existing infrastructure¹⁷⁸, and Turkey has been expanding its LNG import capacity in 2017¹⁷⁹. Thus, even without importing any LNG, Turkey could import 70 bcm of pipeline gas from 2020 onwards.

Turkish gas consumption grew rapidly up to 2014, to 44.6 bcm, but has since fallen back, although growth was strong in the first half of 2017 and annual demand could reach 55 bcm. A paper from the Oxford Institute for Energy Studies in 2014 forecast that Turkish gas consumption could rise to 67-70 bcm per year by 2030. However, a more recent paper from the same institution saw gas demand stagnating, primarily because of diversification of the power generation mix. Demand was expected to reach 55-56 bcm by 2025 and 60-62 bcm by 2030¹⁸⁰.

Even if these estimates are somewhat pessimistic, it appears very unlikely that the Turkish market could absorb another 10 bcm of Kurdish gas in 2020, let alone the ultimate 20-30 bcm. Some gas could displace Iranian supplies in south-east Turkey, which are expensive and have been unreliable. But a large part of the Kurdish gas would have to transit to Europe, possibly via TANAP. To compete in

¹⁷⁷ <https://www.dailysabah.com/energy/2017/09/30/turkey-set-to-implement-national-energy-policy-with-diverse-resources>

¹⁷⁸ <http://www.iran-daily.com/News/170347.html>

¹⁷⁹ <https://www.dailysabah.com/energy/2017/09/28/second-floating-lng-terminal-to-be-operational-in-november>

¹⁸⁰ <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/04/Turkeys-gas-demand-decline-reasons-and-consequences-OIES-Energy-Insight.pdf>

the Turkish market or the rather stagnant European market, it will have to be very competitively priced.

This raises an interesting question as to Rosneft's strategy in committing to the Kurdish gas project, essentially in competition with its large state compatriot Gazprom which supplies Blue Stream and Turkstream. It is not clear if the two companies are acting as rivals, or if Rosneft is ensuring that Russia controls one of the major potential competitors to Russian gas in Turkey and south-east Europe, to slow down its development, ensure that it does not undercut Russian gas, and/or keep the geopolitical leverage of being the key supplier. Rosneft also became involved in 2017 in Egypt's giant offshore Zohr field, while compatriot Novatek has bid in Lebanon's offshore licensing round.

The southern, PUK/Gorran-dominated, KRI could also export gas to federal Iraq, or alternatively use the gas for electricity exports. Iraq is currently paying high prices to Iran for gas supplies. Fields such as Topkhana and Kurdamir are closer to Baghdad than the Turkish border. This would present an opportunity for constructive relations between Sulaymaniyah and Baghdad, and Baghdad might see this as a way to bypass the KDP.

3.8. Exports and finances

3.8.1. Budget and debt

Until 2014, about 80 per cent of the KRG's budget was provided by transfers from Baghdad (a percentage of the federal budget, plus transfers under the development project for the Iraqi governorates). In addition, autonomous oil exports, taxes, customs duties, fees and various payments from oil companies (bonuses and 'capacity-building payments') contributed. The federal budget, and hence the KRG's share, rose from 2010 to 2013 as oil prices and production increased, largely representing production in southern Iraq. The budgets stipulated required production from the KRG too, 250 kbpd in 2013 and 400 kbpd in 2014¹⁸¹.

KRG revenues increased from 11.4 trillion Iraqi dinars in 2010 (\$9.2 billion) to 18.4 trillion dinars in 2013 (\$15.0 billion). The allocation was notionally 17 per cent of the federal budget. In the 2014 budget, from a federal total of 139.6 trillion dinars, the KRG was allocated 16.5 trillion dinars, i.e. 11.8 per cent of the total, or 17 per cent of the amount remaining after deduction of 47.5 trillion dinars of sovereign and governance costs. The KRG also complained that historically it did not receive certain allocations, such as those for the Peshmerga, for fuel supplies and electricity production (289 billion dinars in 2012 and 302 billion dinars in 2013) and for the hajj (pilgrimage to Mecca).

David Petraeus, formerly commander of US forces in Iraq, was quoted¹⁸² as giving a CIA estimate that, for independence, the KRG would have to export 800 000 barrels of oil per day at \$105 per barrel, or revenues of \$2.3 billion per month, \$27.7 billion per year¹⁸³. However, it is not clear why so much would be required when the KRG coped in 2013 on just \$15 billion with only a small deficit.

¹⁸¹ <http://www.rudaw.net/english/kurdistan/01022014>

¹⁸² http://theconversation.com/david-petraeus-on-us-policy-under-donald-trump-the-generational-war-against-islamist-terrorism-and-dealing-with-china-80045?utm_source=twitter&utm_medium=twitterbutton

¹⁸³ Assuming \$10 per barrel of transport costs and quality discount

Federal budget-sharing is discussed further in Section 3.8.1.

The KRG ran a budget surplus in 2011 and a moderate deficit in 2012 and 2013. In 2013, from a total budget of 18.7 trillion dinars (\$15.2 billion), 7.6 trillion dinars went on wages, 3.5 trillion dinars on social security and 0.3 trillion dinars on subsidies (this is inconsistent with the World Bank figure of about 3 trillion dinars on food, water and electricity subsidies – but this figure may include implicit or opportunity cost subsidies, especially borne by the Ministry of Natural Resources). This indicates that about 76 per cent per cent of budget revenues were going on social benefits and subsidies, about \$420 million monthly¹⁸⁴. Since January 2016 the KRG has cut government salaries and benefits to \$420 million per month, down from around \$760 million per month¹⁸⁵.

Energy subsidies are a major fiscal drag, as in numerous other oil and gas exporters. Domestic consumption is small and does not weigh on exports much, but subsidies for electricity are particularly expensive. Diesel supplies for the Dohuk power station are said to cost \$100 million per month¹⁸⁶, a significant part of the current deficit, at a generation cost of 11 US¢ per kWh¹⁸⁷, for electricity sold to residential users for about 1.9 US¢ per kilowatt hour, which is often not paid at all. Attempts to bring domestic gas to Dohuk instead have so far foundered.

Despite its deficit, the KRG's accumulated debt was quite modest up to 2013, being a little over \$2 billion at the end of 2013, about 7.6 per cent per cent of GDP. But from 2014, the cut-off of the share of federal government revenues could not be compensated by independent oil exports and expenditure cuts. This was worsened by the collapse in oil prices from mid-2014, and the conflict against ISIS, the interruption to trade and the need to pay military expenses and care for large numbers of internally displaced persons (IDPs). The KRG suffered a severe economic and financial crisis, was unable to pay the salaries of its employees, and turned to borrowing from a variety of sources. Salaries were cut by \$2.8 billion during 2015, but this includes a portion that was deferred.

To meet its fiscal needs after the loss of the federal budget share, in March 2015, Todd Kozel, former CEO of Gulf Keystone, and Ian Hannam, an investment banker formerly fined for disclosing privileged information to oil minister Ashti Hawrami¹⁸⁸, tried to raise a private investment fund that would purchase the KRG's 'capacity building payments' from six fields¹⁸⁹. After this venture apparently did not take off, in June 2015, the KRG attempted to raise \$0.5 billion from an international bond offering, with an interest rate of 11-12 per cent and indicative tenor of 5 years¹⁹⁰. Baghdad was concurrently in

¹⁸⁴ All budget figures from (World Bank, 2015).

¹⁸⁵ <https://www.iraqoilreport.com/news/krq-oil-payments-sputter-low-revenue-18943/>

¹⁸⁶ (World Bank, 2015). This will be \$50 million per month or less following the fall in international oil prices.

¹⁸⁷ For generation running on diesel. Author's estimates.

¹⁸⁸ <https://uk.reuters.com/article/us-britain-insiderinfo-kurdistan/kurdish-minister-received-uk-market-abuse-emails-sources-idUSBRE8350AJ20120406>

¹⁸⁹ <http://www.iraqoilreport.com/news/private-investors-building-financial-life-raft-for-krq-14221/>

¹⁹⁰ 'Deutsche and Goldman ignite an oil war in Kurdistan', John Dizard, *The Financial Times*, 17 July 2015, www.ft.com/intl/cms/s/0/6b707e88-2c69-11e5-acfb-cbd2e1c81cca.html#axzz3s7CJCnXo.

the market for an Iraq sovereign bond. As the KRG was not a sovereign entity and did not have full control of its main revenue sources, the bond did not attract sufficient interest and was not launched.

Total KRG debt was estimated at \$17 billion in April 2015¹⁹¹, comprised of \$1.3 billion of overdue salaries, \$1.1 billion of governorates' debt, \$10 billion borrowing from private banks (local and Turkish), \$3 billion from the Turkish government, and at least \$1.6 billion to contractors and international oil companies. At the end of 2014, the KRG owed oil traders a further \$1.147 billion under pre-payment deals¹⁹² and by the start of 2016 that had probably reached \$1.5–1.8 billion. The World Bank came up with a similar estimate of \$17 billion at the end of 2015 plus \$2.3 billion of debt to oil traders. Emails from oil minister Ashti Hawrami in March 2016 put debts to oil companies and urgent obligations at \$3.7 billion, including \$688 million to KAR Group for its work at Khurmala¹⁹³, but some of this has been settled by the settlement with the Pearl Petroleum consortium and restructuring overdue payables to DNO and Genel.

Estimates provided by Ahmed Tabaqchali, allowing for accumulated interest on certain debts, suggest that, by end 2017, debts would be approximately as follows: \$6 billion owed to banks, \$4 billion to oil traders (payable over 3-5 years), \$1.4 billion to Turkey, \$8.4 billion of salary arrears (up from \$2.8 billion in 2015), and \$5.2 billion to contractors for various projects, for a total of \$25 billion. Some debts to oil companies and the Pearl Petroleum consortium arbitral settlement were cancelled by offsets against transfers in licence interests. This does not include unused cost recovery balances held by oil companies which will come due as and when they increase production.

The 'debt' situation is thus a complex one, comprising both formal debt and informal, some of which is interest-bearing and some not, some of which is owed to government employees, and some in the form of overdue payables.

If the KRG were to pay 11 per cent interest on its debts to Turkey, banks and oil companies (the lower end of its bond offering, which came at a more fiscally secure time), this would amount to \$1.25 billion per year. Amortisation of its debts to employees, contractors and oil traders over 4 years would total \$4.4 billion per year, or, if converted into a long-term (20-year) interest-bearing loan, \$2.1 billion per year.

3.8.2. Oil company payments

From 2014 onwards, as noted, the KRG was gradually more successful in finding buyers for its oil exports and avoiding Baghdad's legal cases. However, it still incurred a substantial discount for its oil sales, partly due to quality differentials and transport costs, and partly to the legal uncertainty from

¹⁹¹ 'Iraq's Kurdistan Regional Government (KRG) faces financial crisis with \$17B debt', Anadolu Agency, *Daily Sabah*. Economy, 11 April 2015, www.dailysabah.com/economy/2015/04/11/iraqs-kurdistan-regional-government-kr-g-faces-financial-crisis-with-17b-debt. Or \$22 billion according to other estimates: 'The KRG Bond: A Double-Edged Sword', *The Kurdistan Tribune*, 3 July 2015, <http://kurdistantribune.com/2015/the-kr-g-bond-a-double-edged-sword/>.

¹⁹² 'New details of KRG oil deals reveal latent risks', Patrick Osgood, Rawaz Tahir, and Ben Van Heuvelen, Iraq Oil Report, 29 October 2015, www.iraqoilreport.com/news/new-details-of-kr-g-oil-deals-reveal-latent-risks-16840.

¹⁹³ <https://www.iraqoilreport.com/news/seeking-financial-rescue-kr-g-offered-turkey-major-oil-assets-20736/>

buyers, amounting to \$10-15 per barrel. This partly explains why the KRG was willing to consider the December 2014 revenue-sharing arrangement with the federal government.

In 2014 and February 2015, the KRG made some irregular payments to the main operating IOCs. From September 2015, it attempted to regularise these, paying a sum of \$75 million to Genel, DNO and Gulf Keystone (and presumably Sinopec, Genel's partner in Taq Taq), and a further payment in October. The Taq Taq partners received \$30 million in October 2015, against estimated export revenues of \$140 million, of which \$50 million would have been available for cost recovery and \$16 million for profit oil. The KRG was thus only slowing the rate of accumulation of receivables. In February 2016, the KRG announced a new payment arrangement for IOCs based on PSC terms, with an additional 5 per cent of monthly netback revenue toward the backpay owed¹⁹⁴.

Payments to oil companies have been made on a monthly basis since October 2015, but with considerable delays due to the KRG's weak finances. A significant portion was made accessible from prepayment facilities by traders of more than \$3 billion: \$1 billion from Vitol, \$0.8 billion from Litasco (Lukoil), \$0.5 billion from Trafigura and \$0.85 billion from Glencore (\$0.3 billion in March 2016 and \$0.55 billion in November 2016), plus further amounts from Petraco¹⁹⁵. In February 2017, Rosneft prepaid \$1.2 billion to the KRG which will refinance about a third of the KRG's debt from oil sales deals with the international traders¹⁹⁶ after the first, but smaller, financing deal of \$280 million at the end of 2016.

Without regular payment, the smaller companies in the KRG were under considerable financial stress, notably Gulf Keystone which put itself up for sale in February 2015. It reported it had received 18 M&A proposals ranging from farm-ins to full sales, but political hurdles with Baghdad has stalled progress and probably the high uncertainty of MNR payments which at that time were irregular. Still under distress with \$575 million in bonds maturing in 2017, Gulf Keystone restructured its debt and swapped \$500 million of debt to equity in July 2016 and raised a further \$25 million in equity capital. After the bond swap Gulf Keystone's debt fell to \$100 million maturing in 2021¹⁹⁷. With the debt restructuring, new equity capital and payments by the MNR, Gulf Keystone announced it will continue investments in Shaikan to expand its production capacity, but putting itself up for sale again in the future is still a possibility that could be revisited.

2016 was a more financially stable time for the IOCs with the monthly payments from MNR and higher oil prices. Gulf Keystone's cash balance in April 2017 was \$112.7 million, against \$100 million of debt after receiving \$114 million net during 2016 from the MNR (receipt of ten monthly payments for December 2015 to September 2016 liftings: nine payments of \$12 million net each - \$15 million gross - and one of \$6 million net in February 2016 - \$7.5 million gross - reduced by pipeline disruption in Turkey). They further received three monthly payments of \$15 million gross by April 2017 for October

¹⁹⁴ <http://hugin.info/36/R/1985350/734054.pdf>

¹⁹⁵ <https://www.reuters.com/article/us-glencore-oil-kurdistan-exclusive/exclusive-glencore-seeks-550-million-to-raise-stakes-in-kurdish-oil-game-idUSKBN13D1O7>, <https://www.aei.org/publication/is-the-kurdish-spring-here/>

¹⁹⁶ <https://www.bloomberg.com/news/articles/2017-04-06/rosneft-said-to-prepay-about-1-billion-for-iraqi-kurdistan-oil>

¹⁹⁷ <https://www.reuters.com/article/us-gulf-keystone-restructuring/distressed-funds-set-for-big-stakes-in-gulf-keystone-after-debt-swap-idUSKCN0ZU1F6>

– December 2016 liftings, which show that the payments are still delayed by at least four months. Cash balances remained steady throughout 2017 with \$118.8 and \$133.8 million at hand in June and September respectively¹⁹⁸. Gulf Keystone continued to receive monthly payments from MNR in 2017, but with four-month delays. It received payment of \$12 million net in November for Shaikan crude oil export sales in July¹⁹⁹.

With these developments, and continued payments from MNR, though delayed, the company will invest an estimated \$58 million to \$68 million to stabilise production at Shaikan to 40 kbpd and a further \$25 million to \$45 million to increase production to 55 kbpd (including a 25 per cent contingency)²⁰⁰. The planned increase in production would yield about \$23 million in monthly revenues and hence would easily pay for itself within 1-2 months. The failure to move ahead shows how the KRG's fiscal crisis is hampering its longer-term production growth, which could quickly generate additional revenues.

Genel and DNO have larger financial resources than Gulf Keystone, but were still constrained from the lack of payments in 2015. Genel announced in October 2015 that it would reduce investment and production outlook until regular payments were established²⁰¹ and DNO announced in February 2015 that that they were not in any position to invest further unless they received structured payments²⁰².

Gross production from the Tawke field averaged 135.2 kbpd in 2015, from 91.3 kbpd in the previous year²⁰³, but production dropped to 107.3 kbpd in 2016²⁰⁴ from lack of investment in the field in 2015, with only one production well drilled that year (Tawke-30)²⁰⁵. In the first half of 2015, wellhead, processing and pipeline capacity at Tawke was doubled to 200 kbpd with peak production of 180 kbpd in May 2015. During the second half of 2015, however, production declined to 124 kbpd. The decline reflects the suspension of sub-surface investment during H2 2015 from irregular payments for oil exports²⁰⁶. Activity started to pick up in 2016 when four new production wells were drilled. DNO reported that it received payments totalling \$297 million in 2017 as of November, up from \$210 million in 2016 and now it plans to increase investments in Tawke and Peshkabir in 2018. Production at the Peshkabir field in the Tawke license already increased in December 2017 after the completion of the extended well production testing of Peshkabir-3. Output increased to 15 kbpd from 4.7 kbpd at the Peshkhabir-2 well²⁰⁷. DNO is planning to drill Peshkabir-4 by 2018²⁰⁸.

¹⁹⁸ <http://www.gulfkeystone.com/media/111377/gulf-keystone-petroleum-hy-results-vfinal.pdf>

¹⁹⁹ <http://www.iii.co.uk/stockmarketwire/459061/gulf-keystone-receives-shaikan-payment?context=LSE:GKP>

²⁰⁰ <http://www.gulfkeystone.com/media/110028/GKP-Smart-AR16.pdf>

²⁰¹ 'Genel hopes for better as Kurdistan troubles hit forecasts', *The Financial Times*, 20 October 2015, www.ft.com/intl/cms/s/0/0d2a44d6-7736-11e5-a95a-27d368e1ddf7.html.

²⁰² <https://www.offiziere.ch/wp-content/uploads-001/2017/08/In-payment-drought-oil-companies-pare-KRG-investment-Iraq-Oil-Report.pdf>

²⁰³ <http://hugin.info/36/R/1985350/734055.pdf>

²⁰⁴ <http://hugin.info/36/R/2077136/781338.pdf>

²⁰⁵ <http://www.genelenergy.com/media/1909/genel-energy-fy-2015-results-03-03-16-final.pdf>

²⁰⁶ <http://www.genelenergy.com/media/1909/genel-energy-fy-2015-results-03-03-16-final.pdf>

²⁰⁷ <http://hugin.info/36/R/2148379/824175.pdf>

Of the smaller companies, Gas Plus Khalakan, operator of the Shewashan field, received \$9 million up to September 2017²⁰⁹. In May 2017, MNR reported debts owed to oil companies had decreased by 25 per cent after paying IOCs an estimated \$1 billion over the past eight months, reducing the amount owed since 2014 to \$3 billion²¹⁰.

As mentioned in section 2.4, DNO and Genel Energy reached an agreement with the KRG in August 2017 to clear their historical outstanding receivables with the government from the Tawke license and restructured future oil payments. Since the deal, the companies received \$34.75 million in September and \$39.50 million in October towards June and July 2017 crude oil deliveries respectively. In October DNO also received first payment of \$4.02 million covering outstanding receivables for past crude oil deliveries. It represents 3 per cent of gross Tawke license revenues during August²¹¹ and Genel received \$6.03 representing 4.5 per cent of Tawke gross field revenues for August 2017²¹².

The deal with Genel and DNO in Tawke was a signal to other operators in the region that the MNR had been able to find creative and effective ways of reducing its arrears. The oil export deals with international traders and Rosneft were also a boost for IOCs in funding short-term oil payments. However, the long-term uncertainty remains a critical concern, even to companies in the exploration phase such as Komet Group in the Gwer-Hamdanya block (now under federal control) and Chevron in Qara Dagh. As discussed, the loss of the Kirkuk-area fields has greatly weakened a fiscal position which was on the way to improved stability before October 2017. Coupled with the current environment of lower, though improving, oil prices, even large companies are unlikely to proceed to full-scale development of their discoveries until the financial situation improves. Chevron for example halted all operations in the KRI after the federal government took back Kirkuk and surrounding fields, stating that it would resume operations when the political outlook is clearer. That in turn creates a vicious cycle in which the KRG accumulates more debt and obligations but, without rising oil production and exports, is unable to increase its revenues. That prevents it from reimbursing oil companies, slows the building of vital infrastructure, and also risks political unrest from a weaker and slowing economy. The situation is having a significant negative impact on the KRG's investor-friendly image.

With no other sizeable revenue sources, the future budget outlook depends primarily on oil prices, export levels and Federal Iraq's allocation of its budget share. Current exports of around 250 kbpd (after losing Kirkuk) receive a significant discount to the Brent benchmark because of oil quality, transport costs, and concerns over legal opposition from Baghdad, totalling around \$10 per barrel.²¹³

²⁰⁸ <https://www.pipelineme.com/regionalinternational-news/regional-news/2017/december/dno-triples-production-from-peshkibir-field-in-iraq>

²⁰⁹ <http://www.worldoil.com/news/2018/1/11/gas-plus-khalakan-provides-update-on-shewashan-operations-in-iraq>

²¹⁰ <http://www.rudaw.net/english/business/11052017>

²¹¹ <http://hugin.info/36/R/2148379/824176.pdf>

²¹² <http://www.genelenergy.com/media/2130/genel-energy-receipt-of-override-payment-final.pdf>

²¹³ 'New details of KRG oil deals reveal latent risks', Patrick Osgood, Rawaz Tahir, and Ben Van Heuvelen, Iraq Oil Report, 29 October 2015, www.iraqoilreport.com/news/new-details-of-krq-oil-deals-reveal-latent-risks-16840.

3.8.3. The post-referendum budget

The KRG's earlier 17 per cent per cent share of the federal budget was based on an estimate of the KRI's population share within Iraq. However, this is highly uncertain given that a census has not been conducted since 1987. The budget language included some hints that Baghdad might deal with the Kurdish governorates separately rather than the KRG as a whole, boosting the influence of the PUK and Gorran at the expense of the KDP²¹⁴.

The latest (2018) draft federal budget is said to trim allocations to the KRG to 12.6 per cent of spending²¹⁵, which would be about \$11.5 billion of the reported total of \$91.47 billion in the draft budget²¹⁶ (\$960 million monthly). However this is not excluding sovereign expenses or the KRG's being assigned any share of Iraq's debt, which are likely to reduce its allocation significantly, probably to around \$7 billion per year or \$580 million per month. The KRG is also likely to have lost most of its ability to levy customs fees due to the federal government taking control of border posts. It will also not be able to obtain other payments from oil companies, with Baghdad taking control of oil exports and sales, and the KRG having given up most of its equity stake in fields and pipelines. As Baghdad views the PSCs as illegal, the budget allocation made may cover their costs (as it would for the TSAs) but not any profit.

The draft budget also stipulates a 'petrodollar' allocation of 5 per cent per cent of revenue from crude produced or refined in a province, and 5 per cent per cent of revenue from gas produced. It is not clear whether this would apply to the KRG, and the provinces complain anyway that they do not receive their allocation. But very roughly, assuming full sales value for refined products with the main refineries running at capacity, and the domestic gas from Khor Mor, this could amount to another \$0.5 billion annually or about \$40 million per month.

Taking the portion of the federal budget after deduction of sovereign costs, plus the petrodollar allocation, and after interest payments on the KRG's priority debts, its budget would be about \$520 million per month, possibly enough to cover salaries and social payments (\$420 million in 2016 if costs, subsidies (saving \$200 million monthly), waste and fraud were cut substantially. Using increased gas output to replace diesel for power generation is one area for saving.

Allowing for amortisation of its other debts would reduce the remaining budget to \$340 million per month. This would leave very little for investment although it might be possible to raise financing from public-private partnerships, donors, soft international loans and other such methods. This budget level would be well below that of 2010 (\$750 million per month) when the KRG's population was smaller, the people's expectations were lower and it had very little debt.

Nevertheless, this budget figure would still be way in excess of what the KRG could raise from independent oil exports. 250 kbpd of Kurdish exports (as in the draft 2018 federal budget) at a Brent

²¹⁴ <http://www.atlanticcouncil.org/blogs/menasource/budget-politics-and-baghdad-kurdish-relations>

²¹⁵ <https://www.reuters.com/article/us-mideast-crisis-iraq-kurdistan-budget/iraq-cabinet-plans-to-cut-kurdistan-share-in-2018-federal-budget-idUSKBN1D627S>

²¹⁶ Middle East Economic Survey, Volume 60 Number 46, 17th November 2017

price of \$55 per barrel, minus \$15 per barrel of transport costs and quality differential, and \$8 per barrel of production costs (capital and operating), would yield about \$240 million per month. This could increase to some \$600 million per month if production could rise to 700 kbpd by the early/mid-2020s, though this would only be achieved with substantial IOC investment and hence reimbursement. Gas exports of 20 bcm annually, the likely ultimate figure under the deal with Rosneft, at a border price of \$3.50-5 per MMBtu, minus \$1.20 per MMBtu for raw gas from Genel (and assuming a similar deal for Pearl or other producers) would amount to \$130-220 million per month, and net earnings would be reduced by the costs for processing and internal pipeline construction. Gas exports would not start until 2020 at the very earliest.

Alternatively, if Baghdad were to reach a deal with the PUK/Gorran areas, it would pick up a budget of roughly 45% of the KRI total²¹⁷ (based on the population of Halabja and Sulaymaniyah governorates, and ignoring parts of the KRG lying outside these governorates, Erbil and Dohuk), or \$3.1 billion annually (\$260 million monthly), with the KRG continuing to export most Kurdish oil to meet the budgetary requirements for the remaining area. But the southern KRI would be unable to export much oil or gas without access to the route to Turkey, or construction of new infrastructure towards federal Iraq.

If Baghdad were able to resume exports of Kirkuk-area crude under the control of SOMO, through the KRG's pipeline, total exports could return again to around 550-600 kbpd, and the price differential would probably reduce too to around \$5 per barrel (\$2.85 per barrel quality differential to Brent, and \$2 per barrel for use of the pipeline within Turkey, ignoring any Kurdish pipeline tariffs²¹⁸), given that the legal uncertainty would be removed. In this case oil revenues after production costs would be around \$760 million per month. Iraqi prime minister Abadi has indicated that Kurdish government salaries, estimated at \$420 million per month by the KRG, could be paid by the central government. This indicates that, on purely economic grounds, there is a significant incentive for Baghdad and the KRG to come to a budget deal.

Raising Kurdish exports much further will be very difficult without an agreement with Baghdad, which would have to recognise the Kurdish PSCs or agree an alternative investment framework (itself likely to involve lengthy negotiation and litigation). Investor confidence is badly damaged by years of delayed payments followed by the KRG's budgetary, political and territorial crisis. The leading oil producers in the region will be reluctant to commit more capital, and unable to generate it from their own operations in the region. The large companies, such as ExxonMobil, Chevron, Sinopec and Gazprom Neft, can afford to sit and wait for an improvement in the political and economic situation. Rosneft might push ahead in the short term by using its political leverage with the various parties involved.

²¹⁷ <http://www.krso.net/Default.aspx?page=article&id=899&l=1&#krso2>

²¹⁸ Probably somewhat less in reality, since it would be diluted by some heavier Shaikan and Atrush crude, or that would have to be trucked separately at higher costs. This also ignores the possible earnings from trucking some Kirkuk crude to Iran. Emails from KRG oil minister Ashti Hawrami to Turkish counterpart Berat Albayrak put the pipeline fee at \$3.50 per barrel, but possibly this could be negotiated down, as federal Iraq pays \$1.18 per barrel (<https://www.iraqoilreport.com/news/seeking-financial-rescue-kr-g-offered-turkey-major-oil-assets-20736/>).

4. Politics and Petroleum in the KRI since 2005

The KRI's petroleum sector has been a key influence on the development of the region internally, within Iraq and with its neighbours, including important international powers such as the US and Russia. At the same time, these internal and external political actors have guided and constrained the development of the region's energy resources.

4.1. The KRI's political economy

Since 2003 and particularly since 2005, the KRG was able to make great strides in improving infrastructure and living standards. This was achieved primarily by deploying its constitutionally-mandated share of the federal Iraqi budget (the amount not being specified in the Constitution but being set by negotiation at 17 per cent, the estimated population share of the KRI, minus the sovereign expenses for the military and security, foreign affairs, etc. The Maliki government had, by its end in 2014, whittled this down to 11-13 per cent²¹⁹. The KRG supplemented this with customs duties, government fees and some of its own oil sales, but most of its budget was effectively provided from Basra's oil production. With better security and more control of corruption – which was extensive but better-organised than in federal Iraq – the money that was available went much further. More trust in the private sector, both local Kurdish and international, was necessary given the absence of the legacy of the centralised socialist state apparatus of Baghdad, and facilitated the issuance of PSCs for oil exploration, and the development of power generation and private-sector refineries. It also allowed the expansion of politically well-connected private Kurdish businesses such as KAR Group.

Nevertheless, the availability of these large, centralised revenues, alongside the absence of much other viable, taxable business not connected to the government or oil, allowed the KRI to establish quite quickly the classic features of a 'rentier state'²²⁰. Most formal employment is linked to the government, and is often low-productivity (or zero – with populations of 'ghost workers'), with popular support guaranteed by patronage, subsidies, welfare payments and pensions. The political system, formally democratic, has subsided into authoritarianism under the duopoly of the KDP and PUK (with some intervention from Gorran), featuring state-controlled media, harassment of independent journalists, and a failure to hold regular elections and observe term limits. The KDP has gained particularly from this system because of its control of the oil sector. As the KRG is not sovereign, it

²¹⁹ 'Determined to Grow: Economy', Kurdistan Region Review, Invest In Group, 7 October 2013, <http://investingroup.org/review/236/determined-to-grow-economy-kurdistan/>.

²²⁰ e.g. (Beblawi, 1987), (Mahdavy, 1970).

does not have the same economic tools a national government would do – such as devaluation, issuing its own currency or taking on sovereign debt. Even its continuing oil exports are not fully under its control, exposed to interdiction by Turkey and potentially Baghdad. It remains to be seen whether the region's political and fiscal crisis will open up the political space again, as the state's powers of patronage and coercion weaken, or whether the KRG will move further towards two largely independent regions, under the authoritarian control respectively of the KDP and PUK.

Protests by local communities and workers have affected operations by ExxonMobil, Gazprom Neft and others²²¹. The concerns over land use, environmental damage and requests for employment may in some cases be reflective of deeper political tensions between the Kurdish parties, and anger over corruption. The region has witnessed widespread and strengthening protests, mainly in the PUK areas, over unpaid salaries and the economic malaise, particularly since the loss of Kirkuk.

To satisfy some of the demands of such protesters, and in the longer run to break out of its revenue trap, the KRG would have to develop other revenue sources, and in turn this would depend on economic diversification. A full treatment of this is not possible here, but an obvious initial step would be the development of gas-based industry, such as power generation, cement, ceramics, chemicals, glass and metals. Given the KRG's landlocked position, the difficult terrain to its north and east, and the continuing Syrian civil war, export-oriented industries are difficult to make viable, and should probably concentrate on serving surrounding regional markets. Mining and quarrying, hydroelectric power and water, agriculture, transport, logistics, trade and tourism are other areas if political stability returns. The KRG now faces the problem that its diminished autonomy may curtail much of the flexibility it previously had on investor-friendly policies, such as avoiding Baghdad's cumbersome visa process. But the region also needs to clean house internally by cracking down on institutionalised corruption and patronage, and this appears unlikely under the current clan-based political leadership.

4.2. Constitutional and legal position of KRI oil

The Iraqi Federal Constitution, approved by referendum in 2005 and in force from 2006, is deliberately vague on a number of issues, including the oil sector. Both the KRG and Baghdad have used the Constitution, particularly the key relevant clauses 110-112, as a starting point for their legal battles (in domestic and international courts) and in the media, over oil and gas. These debates encompass several key issues, which go beyond just the sector itself to have implications for the availability and distribution of large financial resources, the control of territory and the shape of the post-Saddam Iraqi state. These issues include the rights to award oil exploration and development contracts, and what form they should take; to manage the petroleum sector; to export oil and gas and receive payment; and to produce oil in the 'disputed territories', particularly Kirkuk. Although most salient for

²²¹ 'Kurdish residents' protests stop Exxon Mobil work in Kurdistan Region', *Shafaq News*, 16 July 2014, <http://english.shafaq.com/business/10551-kurdish-residents-protests-stop-exxon-mobil-work-in-kurdistan-region.html>, 'Protesters Force Gazprom Neft to Quit Halabja Block', Osamah Golpy, RÛDAW, 5 October 2014, <http://rudaw.net/english/business/05102014>, 'Ministry of Natural Resources statement on HKN Energy incident in Kurdistan Region', 2 April 2013, Press Release, Ministry of Natural Resources Kurdistan Regional Government, <http://mnr.krg.org/index.php/en/press-releases/152-ministry-of-natural-resources-statement-on-hkn-energy-incident-in-kurdistan-region>

the KRG, these issues are also relevant for other oil-rich (or potentially oil-rich) areas such as Basra, Wasit, Salahaddin and Ninewa, which have sought to gain more control over their revenues or to award oil exploration contracts independently of Baghdad.

The situation up to 2014 is dealt with in my earlier paper. Since then, it has become even more apparent that, in the absence of any neutral body respected to rule on the Constitution and able to enforce its judgements, the oil sector relations between the KRG and Baghdad would be based on negotiations (mostly tactical and short-termist), the relative balance of power between the parties, their attention span when other issues have been more pressing, and, most recently, military and economic force.

Given its greatly strengthened position since October 2017, it is likely that Baghdad will push to rebalance the oil sector towards its interpretation of the constitution: that all oil exports should be handled by SOMO, with revenues held centrally and then distributed; and that the federal level should be in charge of awarding contracts. There may be some more flexibility on contract types, given Baghdad's own openness to new models for its 5th licensing round, and, although it has considered the PSCs illegal²²², this could include retrospectively approving the Kurdish PSCs after auditing their costs.

Article 112, stating that production from 'present fields' (those producing at the time of the Constitution's ratification) should be managed by the federal government "with the producing governorates and regional governments", and "this shall be regulated by a law", can be taken as indication that the long-delayed federal Oil and Gas Law should govern the sector, and it might finally be that such a law could be passed after May 2018's elections. A draft of the law was approved by the Council of Ministers on 25th August 2011 but was not then approved by the federal parliament²²³. The KRG does not now control any fields that would be considered 'present fields' in this definition and the change of control of Kirkuk simplifies at least this issue. The 'black-listing' of companies active in the KRI from bidding for federal oil contracts seems to have been relaxed, with Crescent Petroleum being qualified by MoO for the 5th bid round while it remains in the Pearl Petroleum Consortium in the KRI (its long-running dispute with the KRG may have helped it regain credibility in Baghdad, though). Chevron, which retains two exploration blocks in the KRI and was blacklisted in 2012²²⁴, has also been talked of in connection with taking over Shell's contract for the Majnoon field in southern Iraq and qualified for the 5th bid round, as did ExxonMobil, Total, Sinopec, Gazprom Neft, Bashneft (a subsidiary of Rosneft) and Dana Gas.

Baghdad has also sought to regain the sole control over pipeline exports that it held up to late 2013. Order 1075 of the Revolutionary Command Council of 1986 gave the State Oil Marketing Organisation (SOMO), part of the federal Ministry of Oil a unit of the Ministry of Oil (federal government), the right

²²² e.g. 'Iraq reaffirms Kurdish oil contracts are illegal until ministry ratification', *Hurriyet Daily News* 10 June 2009, www.hurriyet.com.tr/english/finance/11837103.asp?scr=1.

²²³ (Abul Failat, 2013).

²²⁴ 'Iraq blacklists Chevron for Kurdish oil deals', Reuters, 24 July 2012, www.reuters.com/article/us-iraq-chevron-idUSBRE86N12A20120724.

to market oil.²²⁵ Baghdad has considered furthermore that international trade is by its nature a sovereign matter. The KRG passed in 2013 its Law Number 5, granting it the right to export oil if this were required to meet budget shortfalls from Baghdad. Not surprisingly, this has carried little weight with the federal government.

The 2013 KRG-Turkey energy pact and the completion of the Kurdish pipeline link to at Fishkhabour to the Kirkuk-Ceyhan pipeline allowed the KRG to export oil independently (having previously been limited to trucked exports and use of the Kirkuk-Ceyhan line under Baghdad's aegis). Baghdad has claimed sole rights over use of the Kirkuk-Ceyhan line by virtue of the 1973 Iraq-Turkey pipeline treaty, updated by the 30th July 1985 Iraq-Turkey Pipeline Expansion Agreement²²⁶ and renewed in September 2010²²⁷, at which point a joint declaration by the Iraqi and Turkish energy ministers affirmed that they:

"... confirm their commitment that the sole sovereign authorities for the exploration of Iraqi hydrocarbon resources are the Iraqi Federal Ministry of Oil and (SOMO)."

Nevertheless, after the KRG began its independent exports on 12th December 2013, the federal government sought to block them, firstly offering that exports would be allowed but only with SOMO carrying out the sales and revenues being passed through the Development Fund for Iraq with later distribution to the KRG. The KRG's suggestion of a separate KRG-controlled account at the DFI was rejected by Baghdad.²²⁸ The federal government then largely cut off the KRG's budget (paying just a limited amount in March 2014) and began taking legal action against buyers or unloaders of Kurdish oil, as discussed in 2.4. It also launched an arbitration case against Turkey on the ground that its actions violated the Iraq-Turkey Pipeline Treaty.

The 2005 Iraqi Constitution does not explicitly state what territories are part of the KRI. It was understood at the time that the KRG's remit would cover the areas it controlled as of March 2003, but its influence and control gradually extended, particularly in mid-2014, before being rolled back in October 2017. The future of Kirkuk was, according to Article 140 of the Constitution, to be decided by a referendum to be held by 31st December 2007 but, as noted, this never occurred. The KRG argued that its independence referendum of September 2017, being held in Kirkuk and other disputed territories, addressed this lacuna, but various minority communities complained of discrimination when under KRG rule, and referendum turnout in these areas was reportedly low; similar abuses have been reported in territories where Baghdad has restored its control. Article 119, allowing a province to

²²⁵ 'Trouble or promise in the pipeline?', Richard Devine and Patricia

Tiller, Baker Botts, March 2014, http://files.bakerbotts.com/file_upload/documents/PetroleumEconomistArticle3.12.pdf.

²²⁶ 'Trouble or promise in the pipeline?', Richard Devine and Patricia

Tiller, Baker Botts, March 2014, http://files.bakerbotts.com/file_upload/documents/PetroleumEconomistArticle3.12.pdf.

²²⁷ 'Iraq, Turkey sign renewed oil pipeline accord', Reuters, 19 September 2010, <http://uk.reuters.com/article/2010/09/19/iraq-turkey-pipeline-idUKLDE68I04V20100919>.

²²⁸ 'The fracturing of Iraq', Petroleum Economist, 20 August 2014, www.petroleum-economist.com/Article/3371513/The-fracturing-of-Iraq.html.

become a federal region, could be applied to Kirkuk but other disputed areas are parts of provinces such as Ninewa, Salahaddin and Diyala and could not take this route²²⁹.

Other Iraqi provinces have sought to emulate the KRG's initial success in developing its petroleum resources and gaining control of their revenues. There have been attempts by Wasit and Ninewa to sign PSCs with IOCs²³⁰, but these have not been practical given Baghdad's strong opposition. Basra, the site of most of Iraq's oil, has periodically raised the possibility of greater autonomy or even of being declared a federal region²³¹. The reversal of the KRG's fortunes, and the crushing of ISIS and reassertion of central control in north-western Iraq, is likely to dampen such claims.

4.3. The IOCs

With the arguable exception of the Turkish Energy Company and Rosneft, IOCs have been motivated by the pursuit of profitable opportunities rather than 'strategic' considerations. This is a contrast with federal Iraq where IOCs bid very stringent terms, feeling they could not afford to be left out of the competition for giant, low-cost discovered oilfields.

Early entrants into KRI were small and opportunistic companies some of whom were set up specifically for entry to Kurdistan such as the Turkish Genel Enerji. It was the first IOC that signed a PSC in the region in 2002, and since then a range of small to large cap companies have been signing contracts with the MNR. The year with the most contracts signed was in 2007, the year the Oil and Gas Law of the Kurdistan Region was issued, a year of rising oil prices, and a year after DNO discovered 230 MMbbl oil at Tawke-1 and began a fast-track development in April 2006.

Small sized IOCs in KRI have initially aimed to make substantial discoveries and then sell out to a larger company. Addax, which was acquired by Sinopec in 2009, is the most successful examples. A much larger company, Talisman, was acquired by Repsol in 2014 (though Talisman had a wide range of other assets and had been considering selling its Kurdish blocks). Other smaller companies like Western Zagros, Shamaran, and Oryx have not yet been sold despite some buyer interest. Gulf Keystone, on the other hand, put itself up for sale in 2015, but did not get an attractive proposal. Gaps in expectations, and the difficulty in valuing their assets given continuing export and payment hurdles, have so far prevented any deals for the companies. Other companies have withdrawn after discoveries were found to be inconclusive or non-commercial, such as Vast and Niko (Qara Dagh), and PetroCeltic (Dinarta), Afren (Barda Rash), and Hess (Dinarta, Shakrok).

²²⁹ https://www.washingtonpost.com/news/monkey-cage/wp/2017/10/30/heres-what-old-constitutional-debates-tell-us-about-the-new-crisis-in-iraqi-kurdistan/?utm_term=.71e859b29164

²³⁰ 'Nujaiifi begins IOC talks in Ninewa', Ben Lando and staff, Iraq Oil Report, 18 September 2013, www.iraqoilreport.com/news/nujaiifi-begins-ioc-talks-ninewa-11314/.

²³¹ 'Basra, Iraq's Economic Capital, Wants Southern Federal Region', Ahmad Wahid, Al-Monitor, 13 September 2012, www.al-monitor.com/pulse/politics/2012/09/basra-federal-region.html, 'Basra moving toward independence', Ali Mamouri, Al-Monitor, 30 December 2014, www.al-monitor.com/pulse/originals/2014/12/iraq-division-federal-regions-basra-independence.html; 'Basra leaders threaten independent oil deals', Ali Abu Iraq and Ben Lando, Iraq Oil Report, 9 November

Other small/medium-sized companies, notably DNO and Genel, have invested in more than one asset. Genel in particular has expanded its interests beyond Taq Taq and Tawke by taking shares in other blocks, notably Miran and Bina Bawi (making it the proponent of a gas export strategy), and Chia Surkh. In June 2009, Heritage Oil, which had discovered the Miran field, entered a merger agreement with Genel Enerji (the Turkish predecessor of Genel Energy) but, after an investigation was launched by the UK's Financial Services Authority (FSA) into suspected insider trading by Genel CEO Mehmet Sepil, who was later fined, the merger collapsed²³². DNO is operating the Tawke and Erbil licenses, but relinquished the Summail discovery on the Dohuk block in May 2016 after sharp declines in gas production causing one well to completely shut-in. Meanwhile, Crescent and Dana Gas, which were early entrants (2007) and had a gas monetization and export strategy based on the Khor Mor and Chemchemical fields, have been unable to progress due to their dispute with the KRG. OMV and MOL, partners in the Pearl Petroleum consortium and holders of other blocks (OMV in Sarta and MOL in Shaikan and was in Akri-Bijeel, but relinquished in January 2016), may have hoped to supply gas to their Nabucco pipeline, which was intended to bring Middle Eastern and Caspian gas to central Europe, but that project was cancelled in 2013.

Mid-sized companies Repsol and Maersk Oil, saw the KRI as an area offering reasonably sized low-cost opportunities on good fiscal terms, where they could capitalize on their technical skills without the intense competition from the larger IOCs that they encounter in most of the rest of the Middle East. Repsol invested in 4 blocks, Topkhana, Kurdamir, Qala Dze, and Piramagrün; however it relinquished the last two, in which Maersk Oil was also a 40% participant, after disappointing results. Qala Dze and Piramagrün were particularly difficult to operate in as they were mountainous. After these relinquishments, Maersk remained in the Sarsang development which has the potential to further increase production and tie-in to the Kurdistan Export Pipeline as production rises. Maersk has now been acquired by Total, which is open to selling the Kurdish assets. It is unlikely that either Total or Repsol will expand their asset base in KRI further and would likely just focus on their current assets to increase their production.

The IOCs with a substantial asset base outside the KRI, and particularly companies such as ExxonMobil and Chevron (and previously Total) can afford to explore at a measured pace and only proceed to development when the payment situation is clarified. Chevron for example, suspended operations on its Sarta and Qara Dagh blocks due to the post-referendum disruption. Large-cap companies could ultimately consolidate the interests of smaller companies to build up a dominant position, but appear in no hurry to do so. Other IOCs, such as Shell, are reported to have considered entering the KRI, but decided against it because of the relatively small size of the opportunities and the difficulties it would cause them in relations with the federal government. Along with the increased domestic focus of North American E&P players such as ConocoPhillips, Anadarko, Apache and Occidental, this leaves the KRG with a shrinking list of large IOCs who might be able and willing to enter the KRI, which is problematic for the large-scale investments it needs in gas infrastructure in particular.

Unlike southern Iraq, state-owned international companies have played only a minor role in the KRI. Sinopec, as noted, entered via its purchase of Addax, while the other two leading Chinese state firms,

²³² <https://uk.reuters.com/article/us-britain-insiderinfo-kurdistan/kurdish-minister-received-uk-market-abuse-emails-sources-idUSBRE8350AJ20120406>

CNPC and CNOOC, have major positions in federal Iraq and did not consider investing in KRI as not to upset the federal government. The Korea National Oil Corporation (KNOC) has had poor technical results in Sangaw South and Bazian, relinquishing both blocks, and has even been dogged by allegations of corruption. Russia's Gazprom Neft, which also operates in federal Iraq (Badra field), has made relatively low-profile progress on the development of the Garmian, Kurdamir, and Shakal blocks and relinquished the Halabja block in September 2017 after seismic results were unpromising and gas-prone. Despite Halabja's difficult terrain and lack of oil and gas infrastructure in the south in general, Gazprom Neft still invested in the KRI hoping to be a part of the region's gas strategy, but that may prove difficult to attain in the near future. Taqa, partly owned by the Abu Dhabi government, is developing the Atrush block which started initial production in 2017, two years behind schedule due to difficult mountainous terrain and lack of infrastructure. Connecting the field to the Kurdistan Export Pipeline was also delayed due to the same reasons and to government hold-ups. Overall, state-owned international company progress has also been slow, similar to the large-cap international companies. Expansions into other assets by Taqa or Gazprom Neft is also not likely in the short-term, unless it were to acquire a smaller, already established and producing company in the region

Since the surge of PSCs being signed in 2007, a lot has changed. There have been 21 relinquishments by 2017. When oil prices were high, mid-size and large companies invested diversified their asset base, investing in high risk assets, expecting high rewards. But after the decline in oil prices in 2014, disappointments in geological expectations, an unstable political and economic environment, companies started to reconsider their portfolios and let go of the high risk and low-reward (at least in the short-term) assets. The biggest detractor to confidence was the relinquishment of assets by Total, Chevron and ExxonMobil. ExxonMobil relinquished its Qara Hanjeer, Arbat East, and Betwata blocks exploration blocks, Chevron relinquished interests in the Rovi block, and Total relinquished its Baranan and Safeen exploration blocks.

Blocks currently in the exploration phase are Qara Dagh operated by Chevron, Pirmam, Al Qosh, Bashiqa operated by ExxonMobil, Gwer operated by Komet, and Pulkhana, Arbat and Jabal Kand operated by TEC. As mentioned above, the larger companies, ExxonMobil and Chevron are in no hurry to make any further commitments in the KRI as they have significant assets outside the region, but they could relinquish the blocks if the outlook remains uncertain or they could keep any further investments on hold. TEC will probably stay for the long-term as they could be involved in future gas export strategies to/via Turkey.

With the possible exception of the founders of the Pearl Petroleum consortium, Crescent and Dana Gas – and they only after lengthy arbitration - no IOC has profited in the KRI except by selling out at an opportune time. This will deter future entrants. On the other hand, the *de facto* end of Baghdad's blacklist does open up the field of investors somewhat and, under the right conditions, a major company might be able to kick-start development by buying a company such as Genel, Gulf Keystone or Western Zagros.

4.4. Oil, gas, and external relations

For most of its modern petroleum history, the KRG attempted to use its oil diplomacy to establish its political position, giving it leverage against the federal government and gaining support or at least

acquiescence from neighbouring countries and relevant great powers. This went in hand with an effective public relations campaign, in Washington DC and the international media, and its military role in supporting the anti-ISIS campaign.

Oil diplomacy was used in at least four ways. Firstly, exploration blocks were awarded in strategic locations. In September 2007, Hunt was awarded the Ain Sifni block in the 'disputed territories', the company being viewed as close to then president George W. Bush, though the arrangement was in conflict with stated US policy and hence embarrassing to him. In late 2011, the deal with ExxonMobil, seen as a politically influential US company, covered Penjwin on the Iranian border (though later relinquished), Qara Hanjer (near Kirkuk) and Al Qush and Bashiqa in disputed territories near Mosul.²³³ This deal also gave a negative impression of Baghdad, as it embroiled ExxonMobil in a dispute there. In 2017, Rosneft was invited to work on Kirkuk, before the field's return to Baghdad's control.

Secondly, the KRG sought to attract a range of companies, particularly inclining towards those that seemed politically connected as time went on and the region became more attractive. American companies were the priority but Chinese, Russian, South Korean, British, French, Spanish, Australian, Canadian, Emirati and other firms also entered. Turkish companies, particularly Genel Enerji initially and then the state-established Turkish Energy Company, were crucial because of the KRG's need to build up relations with Turkey, create financial incentives to key individuals and develop its export infrastructure. Iran was economically involved with the KRG in other ways but did not have capable oil companies that could participate, and would anyway have been constrained by sanctions. In 2017, there was a policy shift towards Russia, as noted, with Rosneft being awarded exploration blocks and pipeline deals as part of financing oil sales.

Thirdly, the KRG created an image as a secure, business-friendly and pro-Western enclave, with oil and gas projects, and oil-funded spending on infrastructure, hotels and malls an important part. At least up until 2014, the development of the KRI stood in stark contrast to the very limited progress in federal Iraq on improving living conditions.

Fourthly, the KRG sought to make itself important to Turkey. This involved several dimensions, but on the petroleum side it included exploration block awards (as noted above), oil exports, refined product purchases and plans for gas exports. Oil exports through Turkey financially benefited some key individuals in the ruling AKP apparatus²³⁴ and contributed some transit revenues, but also ensured that Turkey had its foot on the KRG's economic lifeline.

Gas exports, when and if they eventuate, would be more strategic. They would reduce Turkish dependence on Russian and Iranian gas and, being at a lower price, would reduce the import bill. They would support Ankara's objective of developing a gas hub, able to benefit from importing and exporting gas, not simply being a transit state. However, Turkey, oddly, was also concerned not to undermine the position of state pipeline monopoly BOTAŞ by signing gas contracts at too low a price. Gas exports would also give the KRG some leverage over Turkey given the threat or risk of supplies

²³³ 'Exxon, Kurdistan visit disputed Iraqi oil block', Ahmed Rasheed, Reuters, 1 February 2013, www.reuters.com/article/2013/02/01/iraq-exxon-idUSL5N0B0HPU20130201.

²³⁴ <http://foreignpolicy.com/2016/12/07/latest-wikileaks-dump-sheds-light-erdogan-turkey-berat-albayrak-redhack-hackers-oil/>

being shut down in winter. The relevant oil and gas pipelines pass, or would pass, through the largely Kurdish south-east of Turkey, creating a complicated dynamic between the PKK, which has frequently attacked pipelines as part of its struggle against the Turkish state, the main Iraqi Kurdish parties, and Ankara. A ceasefire between the PKK and the Turkish government started in 2013, but ended in July 2015.

The vulnerability of these pipelines remains a weakness of the Kurdish export strategy: the Kirkuk-Ceyhan pipeline was attacked within Turkey, which ended the ceasefire²³⁵, with the PKK claiming responsibility. The federal Iraqi government could also move on Fishkhabour to cut off oil and gas exports. The KRG has few alternatives unless it repairs relations with Baghdad. Iran would be unlikely to agree to large-scale imports (some small-scale oil imports for local refining are in prospect, and the KRG has exported significant quantities by truck). Syria is a viable route to the Mediterranean geographically but not while the civil war continues, particularly with the north-eastern oil-bearing part of Syria controlled by the Kurdish-dominated SDF, which has a complicated relationship with the KRG and with the Assad regime, and is opposed by Turkey.

The use of oil policy was, of course, also a response to the opportunism of companies in seeing and negotiating their way into petroleum arrangements that suited the KRG, and in particular the KDP apparatus given its control of the sector. Notably, although there was uneasy cooperation between the KRG authorities and NOC over the management of the Kirkuk field while it was controlled by Kurdish forces, and Baghdad and Erbil reached tactical deals over pipeline exports a number of times, there was no strategic energy interaction. The Kurdish bloc was, though, active in its role in the federal parliament in Baghdad in blocking legislation such as the National Oil Law.

The weaknesses of this petro-diplomacy have been exposed by the KRG's referendum and subsequent events. Russia hedged its bets while the other key players, the US, Turkey, Iran and EU, expressed strongly negative opinions on the referendum and did not support the KRG during its subsequent loss of control over Kirkuk and the other areas. The KRG may have over-estimated the political influence of the companies it attracted, particularly in regards of the Americans ExxonMobil and Hunt, which have not been able, even should they have wished, to overturn the longstanding US policy on the unity of Iraq. China, represented through Sinopec, has far more assets and interest in southern Iraq, particularly since Kurdish exports mostly head to Mediterranean markets. Since gas exports to Turkey are still some way off, Ankara has lost only the Kirkuk share of oil exports through its territory, and that probably just for a limited time. The KRG has little leverage over Baghdad, that gas or electricity exports to federal Iraq, or joint field development, might have achieved. Its main playing card remains, though, its pipeline which could be used to restart Kirkuk exports by agreement with the federal authorities.

The wisdom of Russia's move into the KRG via the Rosneft deal has been cast into doubt by subsequent events, requiring some hasty back-tracking by Moscow to patch up relations with Baghdad. But the Russians' geopolitical logic is clear: gaining further leverage over Turkey and to

²³⁵ 'Striking Pipeline, Kurdish Militants Deal Blow to Fellow Kurds', Keith Johnson, *Foreign Policy*, 30 July 2015, <http://foreignpolicy.com/2015/07/30/kurdish-militants-strike-pipeline-deal-blow-to-fellow-kurds/>; though the PKK later blamed this on a local unit acting without authorization.

some extent Iran; boosting influence in a hitherto strongly pro-American state; and giving Russia more regional chips to play in general. Russia has boosted its regional weight significantly in recent years, particularly through its involvement in Syria and its cooperation with Iran, and also by moves such as backing General Haftar in Libya, hosting King Salman on the first ever visit by a Saudi monarch to Russia, deepening ties with Egypt, and being the key instigator of OPEC-non-OPEC cooperation.

5. Conclusions: The Future of the KRI's Hydrocarbon Industry

The fortunes of the KRI's hydrocarbon industry have swung sharply in recent years. From a period in which its promising geology and investor-friendly policies attracted great interest, it then entered into fiscal and political crisis and a near-halt in investments. Its control over the Kirkuk-area fields during the conflict with ISIS helped exports but was offset by plummeting oil prices. The KRG's desperation for money led it to strike questionable, short-termist deals, and seemingly to forget the business-friendly policies that had served it well before. Geological disappointments, reserve writedowns and the collapse of production at Taq Taq were unlucky, but the KRG failed at this time to move beyond reliance on three big fields (Taq Taq, Tawke and Khurmala) and one big customer and export route (Turkey), or to develop its gas resources. It also did not address systemic economic issues of corruption, subsidies, an over-stuffed public sector and a lack of diversification.

An infusion of Russian money and the resolution of several long-standing payment issues and disputes promised brighter times, but immediately afterwards, the failure to resolve internal political divisions and the ill-fated decision to hold the independence referendum caused the loss of the Kirkuk area and other disputed territories. The limitations of the KRG's petroleum-based diplomacy were revealed sharply, when all major players condemned the referendum and even Russia chose not to provide useful backing. Corruption and political dysfunction had cost the KRG international sympathy, while the end of the main phase of the struggle against ISIS meant that, coldly put, it was no longer that important to the US, Europeans or Iran, and Baghdad's hands were free to move against it.

The KRG's desperate financial situation has manifested itself in widespread protests, which have for now been suppressed. Serious negotiations with federal Iraq will be difficult while the KRG continues to be so sharply divided politically, and while Baghdad is in the run-up to the May 2018 elections. Compliance, though limited, with the OPEC deal during 2018, and rising oil prices means that additional production from Kirkuk is not essential for Baghdad for now. This leaves the KRG with few cards to play. But elements of an initial deal could include: the KRG's publication of its oil production, exports, earnings and accounts with traders (including the Deloitte/EY audit for 1H 2017, but also for more recent months); cooperation on increasing production from Kirkuk and restarting exports through the Kurdish pipeline, with oil metered at Fishkhabour (monitored by both parties) and marketed by SOMO; continuing marketing of oil from the KRG's own fields, transparently metered and accounted, with the KRG responsible for meeting its commitments to traders as far as possible; interim approval for payment of IOC costs under the Kurdish PSCs; and continuing (possibly increasing) supply of products from refineries in the KRI to northern federal Iraq. The federal government would commit not to attempt to take over Khurmala or Fishkhabour.

A longer-term deal could see the KRI integrated more into the national Iraqi energy system, though ideally preserving (and returning to) its business-friendly approach. If it becomes a mere adjunct of the federal petroleum industry, it will be neglected since Baghdad's focus is inevitably on the giant oil resources in the south. Areas of cooperation include electricity supply using the KRI's gas and refurbished hydropower; water resource management; gas supply to industries in federal Iraq; cooperation on beginning gas exports to Turkey when the national supply-demand balance permits; agreement on migrating existing petroleum contracts to an approved new model while preserving investor returns; and expanded oil exports through the northern pipeline system.

At the same time, the KRG would need to ring-fence oil revenues so that the IOCs could again invest with confidence. This is complicated by the other claims on the budget, the heavy debts to traders and other parties, and the commitments made to Turkey and Rosneft.

The region has the technical potential to return to being a significant oil exporter and to become a gas exporter, with production of about 700 kbpd of oil and exports of 20 bcm of gas by the mid-2020s. However this is constrained by the lack of finance, a loss of investor confidence, likely increased involvement and opposition from Baghdad, and by the competitive gas market situation in Turkey. The KRG needs to get its own political house in order, and then rebuild relationships with Baghdad, Turkey and the US. Rosneft's involvement gives the KRG the ability to play the Russia card, but more likely, given the KRG's weak position, it would end up serving Russian interests.

The failure, for now, of the Kurds' bid for greater autonomy and ultimate independence has important implications for neighbouring Kurdish populations, particularly the Syrian Kurds given their success for now in carving out a *de facto* mini-state with oil resources of its own. Both the Iraqi and Syrian Kurds' situations, though, are reminders of the difficulty faced by landlocked new states in establishing true independence. Azerbaijan and Turkmenistan succeeded in the post-Soviet sphere, while South Sudan so far, dependent on Sudan for its pipeline export route, has not. The Kurdish example will, for now, dampen moves by other parts of Iraq, such as Basra or the Sunni Arab-majority north-western provinces, to leverage their own oil resources towards increased autonomy.

Kurdish national aspirations have collapsed before. If the region's hydrocarbon resources are to lead to a better life for its people, under whatever political structure emerges, it needs to get back to basics. The patient groundwork of internal accord, investor confidence, infrastructure and constructive relations with all neighbours has to be laid again.

6. References

- Abdula, R. (2010). *Petroleum Source Rock Analysis of the Jurassic Sargelu Formation, Northern Iraq*. Golden, Colorado: Colorado School of Mines.
- Abul Failat, Y. (2013). The Iraqi Federal Oil and Gas Law 2011: Exploration, Exploitation and Expropriation. *International Energy Law Review*(4), 141-153.
- Beblawi, H. (1987). The Rentier State in the Arab World. *Arab Studies Quarterly*, 9(4), 383-398.
- Coll, S. (2012). *Private Empire: ExxonMobil and American Power*. Penguin.
- Geert Konert, A. M. (2001). Paleozoic Stratigraphy and Hydrocarbon Habitat of the Arabian Plate. *GeoArabia*, 6(3), 407-442.
- Hatzfeld, D., Authemayou, C., Van der Beek, P., O., B., J., L., B., O., . . . F., Y.-F. (2011). The kinematics of the Zagros Mountains (Iran). In P. Leturmy, & C. Robin, *Tectonic and Stratigraphic Evolution of Zagros and Makran during the Mesozoic-Cenozoic* (pp. 19-42). London: London Geological Society.
- International Crisis Group. (2012). *Iraq and the Kurds: the High-Stakes Hydrocarbon Gambit*.
- International Crisis Group. (2015). *Arming Iraq's Kurds: Fighting IS, Inviting Conflict*. Brussels: International Crisis Group.
- International Energy Agency. (2012). *World Energy Outlook Special Report: Iraq Energy Outlook*.
- Iraqi Kurdistan: The Essential Briefing. (2015). *Strategic Comments*, 21(2).
- Kent, W. N. (2010). Structures of the Kirkuk Embayment, northern Iraq: Foreland structures or Zagros Fold Belt structures? *GeoArabia*, 15(4), 147-188.
- Mahdavy, H. (1970). The Patterns and Problems of Economic Development in Rentier States: the case of Iran. In M. Cook, *Studies in the Economic History of the Middle East* (pp. 37-61). London: Oxford University Press.
- Majid Sudi Ajirlu, M. M. (2016). Tectonic evolution of the Zagros Orogen in the realm of the Neotethys between the Central Iran and Arabian Plates: An ophiolite perspective. *Central European Geology*, 59(1-4), 1-27. doi:10.1556/24.59.2016.001
- Mills, R. (2013). Northern Iraq's Oil Chessboard: Energy, Politics and Power. *Insight Turkey*, 15(1), 51-62. Retrieved from http://file.insightturkey.com/Files/Pdf/20130107123353_insight_turkey_vol_15_no_1_comm entaries_05_mills.pdf
- Mills, R. (2016). *Under the Mountains: Kurdish Oil and Regional Politics*. Oxford Institute for Energy Studies. Retrieved from <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/02/Kurdish-Oil-and-Regional-Politics-WPM-63.pdf>
- Moss, T. (2012). *The Governor's Solution: How Alaska's Oil Dividend Could Work in Iraq and Other Oil-Rich Countries*. CGD Books.
- Muttitt, G. (2012). *Fuel on the Fire: Oil and Politics in Occupied Iraq*. The New Press.
- Pollack, K. (2003). *The Threatening Storm: What Every American Needs to Know Before an Invasion in Iraq*. Random House.
- Talebian, M., & Jackson, J. (2004). A reappraisal of earthquake focal mechanisms and active shortening in the Zagros mountains of Iran. *Geophysics Journal International*, 156(3), 506-526.
- United States Geological Survey. (2000). *World Petroleum Assessment*.

- Vernon, R. (1971). *Sovereignty at Bay: The Multinational Spread of US Enterprises*. New York: Basic Books.
- Widerquist, K., & Howard, M. W. (2012). *Exporting the Alaska Model: Adapting the Permanent Fund Dividend for Reform Around the World*. Palgrave Macmillan.
- World Bank. (2015). *The Kurdistan Region of Iraq: Assessing the Economic and Social Impact of the Syrian Conflict and ISIS*. World Bank Publications.
- Zedalis, R. J. (2012). *Oil and Gas in the Disputed Kurdish Territories*. Routledge.



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