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Natural Gas in The Republic of Iraq

BY

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ABOUT THE STUDY

Some of the most dramatic energy developments of recent years have been in the realm of natural gas. Huge quantities of unconventional U.S. shale gas are now commercially viable, changing the strategic picture for the United States by making it self-sufficient in natural gas for the foreseeable future. This development alone has reverberated throughout the globe, causing shifts in patterns of trade and leading other countries in Europe and Asia to explore their own shale gas potential. Such developments are putting pressure on longstanding arrangements, such as oil-linked gas contracts and the separate nature of North American, European, and Asian gas markets, and may lead to strategic shifts, such as the weakening of Russia's dominance in the European gas market.

Against this backdrop, the Center for Energy Studies of Rice University's Baker Institute and the Belfer Center for Science and International Affairs of Harvard University's Kennedy School launched a two-year study on the geopolitical implications of natural gas. The project brought together experts from academia and industry to explore the potential for new quantities of conventional and unconventional natural gas reaching global markets in the years ahead. The effort drew on more than 15 country experts of producer and consumer countries who assessed the prospects for gas consumption and production in the country in question, based on anticipated political, economic, and policy trends. Building on these case studies, the project formulated different scenarios and used the Rice World Gas Trade Model to assess the cumulative impact of country-specific changes on the global gas market and geopolitics more broadly.

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Introduction

Natural gas has been playing an increasingly significant role in the energy mix of the Middle East and North Africa region over the last decade. Middle Eastern energy consumption is steadily growing—beyond 10 percent per annum in some cases—driven by economic and population growth. Gas is also becoming the main feedstock for power generation in the MENA region, meeting 67 percent of the regional demand for electricity. Among the current and potential regional gas producers, Iraq is better positioned than many countries that recently experienced the "Arab Spring" and its troubling dynamics. The country also benefits from being located in the middle of a gas-thirsty region—a potential gas market that comes with its own challenges as a heavy consumer and as a critical transit territory.

Political events since January 2011 have greatly influenced plans for strategic gas pipelines. Before the Arab Spring, Iraq was expecting to play a pivotal role in the planned Nabucco Pipeline from the northern corridor of Iraq and the Arab Gas Pipeline linking the western part of Iraq to regional and European markets. Yet due to the rising local demand in the MENA region and to the current political uncertainties, European gas markets are now putting their plans for countries such as Iraq on the back burner while exploring more sustainable suppliers.

Even if Iraq's regional plans have been called into question, Iraq's local demand for gas has grown beyond the forecasts of the initial master plans adopted by the various Iraqi administrations that governed Iraq after Saddam Hussein's fall in 2003. Iraqi policymakers now believe that Iraqi gas, if developed, can serve as a unique economic multiplier and enable the much-needed reconstruction of Iraq's ravaged economy and devastated infrastructure.

Estimates of Iraq's proven gas reserves vary. Some independent agencies rank the country at number 13 for world gas reserve-holders,³ while others rank it 11th.⁴ These rankings may not be definitive, as many experts believe estimates of reserves could easily double once Iraq starts its gas exploration campaign; however a gas exploration campaign is yet to be scheduled and is

¹ Facts Global Energy, 2010.

² EIA International Energy Outlook, 2010.

³ World Energy Outlook, IEA, 2012.

⁴ EIA Statistics 2013, and BP Statistical Report 2012.

subject to successful bidding processes. Even without additional targeted efforts to find more Iraqi gas, output is set to rise considerably, as over 80 percent of Iraqi gas is in associated form, and the country is in the midst of an aggressive effort to double or triple its current oil production. As much of Iraq's gas is associated and will be a by-product of oil production—unlike other Middle Eastern countries—its production could be cost effective and competitive to regional markets; the development cost of gas is linked to capturing, processing, and transportation, with no cost required for exploration and production. However, due to the lack of infrastructure facilities, 55 percent of current gas production is flared, leaving very little to feed the deprived national grid and industry.

Iraq's ability to fulfill its gas ambitions and potential is, however, linked to politics. Currently, Iraq's strategy to develop its oil and gas potential is split into two practices running in parallel, one by the federal government of Iraq ("Baghdad" for short) and the other one by the Regional Government of Kurdistan (KRG), with the latter constituting the three northern provinces of Erbil. Sulaimaniya, and Duhok. This dual track is the result of a persistent inability on the part of Baghdad and the KRG to agree upon a unified federal hydrocarbon law (HCL) and policy to manage the country's vast natural resources. The dispute dates back to 2006; years of futile debates between the conflicting parties have resulted in a legal vacuum with no agreement reached at the time of writing this paper. This stalemate has forced the federal and regional administrations to go their independent ways and engage with international oil companies (IOCs), launching licensing processes through direct negotiations and signing dozens of longterm agreements based on different fiscal regime and legal framework, justified by their own interpretations of the constitution and legislation. During this time, Baghdad continued its commercial practices based on legacy laws and legislation, while the KRG passed its regional hydrocarbon law in August 2007, even though it was not recognized by Baghdad. The federal government "blacklisted" all IOCs operating in the Kurdistan Region for not seeking prior approval from Baghdad and has denied them the right to participate in the competitive bid rounds organized by the federal Ministry of Oil (MOO). This has created further tension, which

⁵ Iraq Petroleum Plan, Ministry of Oil, 2011.

⁶ World Bank, Global Gas Flaring Reduction (2010), and Ministry of Oil (2012-2013) data.

⁷ Erbil is the capital of the KRG.

has fueled the ongoing argument between the MOO and the KRG's Ministry of the Natural Resources (MNR) over oil and gas developments.

This dispute between Baghdad and the KRG over how to develop Iraq's oil and gas riches must now be resolved against the backdrop of worsening regional political dynamics and rising civil unrest and sectarian strife in Iraq. This paper highlights the political dynamics surrounding Iraq's gas development. It outlines two speculative scenarios in the light of current affairs and the many energy scenarios for meeting local demand and monetizing gas from potential exports. Moreover, the paper answers the question of growing local demand for gas based on the Ministry of Electricity (MOE) and MOO plans. It also examines the production scenarios proposed by the International Energy Agency (IEA) and Iraq National Energy Strategy (INES) to 2030; the central scenario for both outlooks seems challenging to achieve, while the prospect for gas exports remains low due to many conditional requirements, including infrastructure development, reforming legislative and commercial policies, establishing a gas price mechanism, and achieving national reconciliation for long lasting peace in Iraq.

Background⁸

Gas Reserves

Irag's current proven gas reserves are estimated at 126.7Tcf, which represents 1.7 percent of total global gas reserves. To date, natural gas deposits in Iraq are predominantly found in an associated form with oil, constituting approximately 81 percent of the total reserves, leaving 2 percent as associated (cap gas) and 17 percent as non-associated gas. ¹⁰ Thus, it is clear that levels of overall gas production will be heavily linked to the oil production profile, due to the large percentage of associated gas. However, many experts claim that gas prospects in Iraq could be as high as double the current estimate (7.5Tcm), of which 3Tcm is in associated form, while 4.5Tcm is in "free gas" form. 11

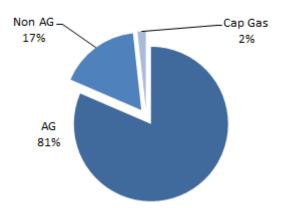
⁸ The following survey of the current state of the natural gas sector in Iraq is predominantly based on data made available in the public domain by the MOO, KRG, and operating IOCs.

⁹ BP statistical report and the MOO (2012).

¹⁰ MOO data, Gas Master Plan, Iraq Energy Institute analysis.

¹¹ Thamir Ghadhban, chairman of the Prime Minister's Advisory Commission and former oil minister of Iraq.

% of Total Gas Reserves in Iraq
Associated Gas (AG), Non AG, and Cap Gas



Source: Ministry of Oil and Iraq Energy Institute analysis

Geographically, Iraq's proven gas reserves are concentrated in the south, mostly at the large associated gas reserves in the giant fields of Rumaila, West Qurna, Majnoon, Nahr Umr and Zubair. The composition of the gas from the southern fields is richer in natural gas liquids (NGL) and is less contaminated with sulfur, compared to the reserves in the north of the country. The composition is of particular relevance to the downstream industry, as the southern gas could find a further market in the petrochemical sector, helping to diversify national revenue streams and placing less emphasis on oil revenues.

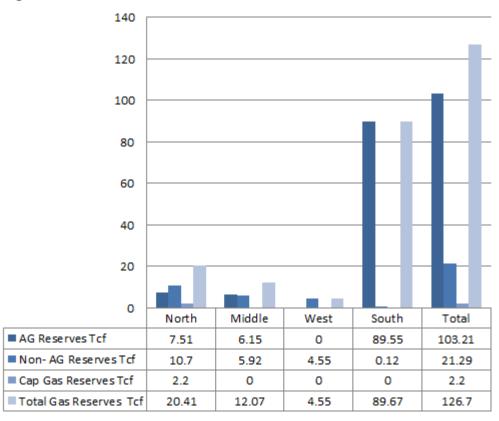
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¹² Iraq's oil and gas proven reserves are concentrated along the eastern parts of the country, as the western parts remain largely underexplored. Iraq has seventy-nine discovered fields (nine gas fields), of which only twenty-three are producing. Out of these fields, nine are super-giants, each containing over 5 billion barrels, while twenty-two other fields are giants, containing over 1 billion barrel per field. Ghadhban, CWC Iraq Petroleum (2009).

¹³ Natural gas in the southern fields contains 22.6 percent of NGLs, 1.5 percent of CO2, and trace amounts of sulfur, while their northern counterparts contain 13.1 percent of NGLs, 4.3 percent of CO2, and 7.2 percent of hydrogen sulfide, according to Ghadhban.

The regional distribution of Iraq's proven gas reserves are as follows in Figure 2.

Figure 2.



Source: Ministry of Oil and Iraq Energy Institute analysis

In the north of Iraq, the KRG has conducted its own survey to assess gas reserves in the region. The KRG Ministry of Natural Resources (MNR) has announced potential gas reserves above the current federal estimate stating 165Tcf gas is in place, including 38Tcf that is recoverable, though this estimate is not recognized by the MOO. However, the most promising gas deposits in the north are those of Khor Mor (1.8Tcf, MOO estimate) and Chemchemal (2.07Tcf, MOO estimate); the MNR estimates reserves in these fields could be as much as ten times the initial figures established by the MOO.

Gas Production

In January 2013, Iraq's gas production reached 2.234Bcf/day.¹⁴ The MOO gas production reached 1.9Bcf/day of mostly associated gas produced from the southern fields. Currently, only 400MMcf/day is captured from the south and 300MMcf/day is captured from the north (outside the Kurdistan Region), leaving 1.2Bcf/day wastefully flared because of the lack of infrastructure and other persistent challenges.¹⁵ In addition to the gas produced by MOO, 340MMscf of free gas (non-associated gas) was commercially produced from the MNR-controlled northern field of Khor Mor.



Figure 3.

Source: Ministry of Oil, World Bank data, and Iraq Energy Institute analysis

The MOO's projections for gas production are heavily linked to the oil production profile, as mentioned, due to the reserves being associated gas. According to the initial plans of the MOO, gas production by 2020 is expected to reach 8.5bcf/day from both associated gas producing fields and free gas fields. This estimate was initially based on expectations that Iraq would produce 13.5 million barrels of oil per day once the contracts resulting from bid rounds one and

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¹⁴ According to MOO data, MNR data, and Iraq Energy Institute analysis.

¹⁵ According to MOO data, World Bank data, and Iraq Energy Institute analysis.

two, and bid round three of the free gas fields were fully executed. However, in January 2013, the MOO began its plan to reduce the contracted production plateaus of the first and second bid rounds to bring expected total production down to 9mb/day 17 by 2020 in order to sustain a longer production plateau. As of summer 2013, the review of the contracted production plateaus was still under negotiation with the operating IOCs. Although these revisions will affect the initial forecasted gas production profile, the gas target is still higher than the mid-case scenario forecasts by the IEA on Iraq Outlook 2012 and the INES scenario of gas projection, which suggest total gas production may only reach 7Bcf/day in 2020 subject to wide scale development of infrastructure required for local consumption and export options.

Infrastructure

Iraq has a national gas pipeline network extending from Basra in the south to Mosul in the north (1775km), connecting several power plants and industrial plants along the way. There is also an LPG pipeline extending over 1400km. Both networks are operated by the state-owned Pipeline Company. However, due to wars, sanctions, civil unrest, terrorist attacks, and aging infrastructure suffering from a lack of maintenance, most of the pipeline network is either non-operational or operational well below nameplate capacity. Furthermore, there are two main gas pipeline projects currently under construction. The first is a new 24-inch pipeline running parallel to the damaged 18-inch pipeline from PS-1 in Basra to Haditha with a nameplate shipping capacity of 350mcf/d of gas. The second is a new 42-inch pipeline from PS-1 in Basra to Baghdad, with an 850mcf/d of gas transport capacity.

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¹⁶ The federal Ministry of Oil plan, 2011.

¹⁷ According to federal Ministry of Oil data and Iraq Energy Institute analysis, January 2013.

¹⁸ According to Ministry of Oil data.

¹⁹ According to Iraq Oil Pipeline Company data.

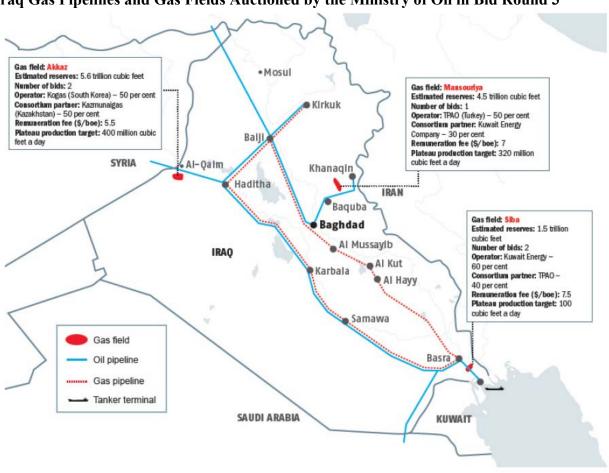


Figure 4.

Iraq Gas Pipelines and Gas Fields Auctioned by the Ministry of Oil in Bid Round 3

Source: Ministry of Oil and Iraq Energy Institute analysis

Currently, Iraq has four main gas processing facilities, three of which operate well below nameplate capacity. Before 2003, processing capacity stood at 2.08bcf/d of associated gas, 1.56bcf/d of dry gas, and 5.5M tonnes annually of LPG, along with 2.28 million tonnes per year of natural gasoline and 500,000 tonnes annually of sulfur. However, by 2004, production capacity had fallen to 1.27bcf/d, with actual throughput thought to have dropped to as low as 500mcf/d; all new projects are pending the realization of Basra Gas Company projects and an end to flaring by 2015.²⁰

²⁰ According to North Oil Company, South Oil Company, Ministry of Oil, and Iraq Energy Institute data.

The Kurdistan Regional Government also has ambitions to export gas to Turkey by 2016. While there are currently pipelines inside the KRG that move gas from the Khor Mor Gas Field to power stations to the north, as of yet, there is no infrastructure to transport gas from the KRG to Turkey.

North and South Gas Companies—State Owned Operators

The Kirkuk-based North Gas Company operates twenty-three degassing stations at oil and gas fields across central and northern Iraq. Twelve gas-compressor stations collect associated gas before feeding it to a gas processing plant at Kirkuk to produce LPG, dry gas, natural gasoline, and sulfur. The Kirkuk gas processing plant consists of two trains with a nameplate capacity of 1.2M tonnes annually of LPG.²¹

The Basra-based South Gas Company is responsible for gathering and processing associated gas from twelve degassing stations in the southern oil fields to produce dry gas and natural NGLs, as well as operating LPG storage facilities and export terminals. The company operates on four main sites: the North Rumaila NGL plant, the Khor al-Zubair NGL/LPG plant, the Iraqi Storage Terminal and Iraqi Receiving Terminal, and the LPG shipping terminal at Umm Qasr. The North Rumaila NGL plant had a nameplate capacity of associated gas processing of 680mcf/d, but is currently operating at 20-35 percent of that capacity due to the lack of gas supplies. The Khor Al-Zubair NGL/LPG plant separates liquids from raw gas to produce propane, butane, gasoline, and dry gas and has the capacity to produce 4M tonnes per annum of propane and butane, plus 1.5M tonnes annually of gasoline.²² The decline in processing rates at both North Rumaila and Khor al-Zubair are largely due to the need for rehabilitation; there is an insufficient number of compressors at the oil fields and an absence of gas pipelines from the West Qurna and Zubair fields to the processing units. In 2008, the State Company for Oil Projects awarded contracts to the Italian division of GE Oil & Gas to renovate the existing compressors, as well as to build new ones and construct gathering stations in the West Qurna and Zubair fields.

According to North Oil Company data.According to South Oil Company data.

Iraqi Gas and International Commitments

Since 2005, Baghdad has signed a number of agreements to explore potential projects for the development, export, and import of gas. For the most part, little has been done to make these agreements operational, but they are important indicators of how Iraq sees gas linking it to the rest of the region. The one exception is the Iraq Gas Master Plan, under which the MOO commissioned Shell in 2005 to develop the blueprint plan and strategy for Iraqi gas. Although the plan began as an independent strategic plan for Iraqi gas, Shell entered into direct negotiations with Baghdad in 2008 to sign an exclusive heads of agreement (HOA) with the state owned South Gas Company to develop all associated gas produced from the southern fields in Iraq. In 2011, this HOA became a twenty-five-year contract to monetize associated gas produced from three southern fields only (Rumaila, West Qurna-1, and Zubair) to feed local demand. The deal also includes an option to export LNG to Asia. The joint venture is known as the Basra Gas Company.

More recently, Iraq signed a series of agreements to connect to neighboring countries through various energy trades. In January 2010, Baghdad also signed an MOU for Strategic Partnership between the European Union and Iraq to develop Iraqi gas for export to Europe. The MOU was based on an Energy Policy Action Plan adopted by the European Council in March 2007. The focus of the MOU was on the Euro-Arab Mashreq Gas Market Project and the development of the Arab Gas Pipeline in a way that made Iraq a key gas supplier to Europe. Iraq also signed, in 2011, a contract with the Iranian company ACG to extend the pipeline bringing gas from Iran to keep Iraq's power stations producing electricity. The pipeline will stretch 130 km from al-Mansuriay field to the Sadr, Quds and South Baghdad power plants and will cost US\$365 million. When finished, it will conduct 25 million cubic meters of gas daily for power generation. Moreover, in February 2013, the Iraqi cabinet authorized the minister of oil to sign a contract for a gas pipeline from Iran, through Iraq and Syria, and on to Europe. However, many analysts believe that the plan will be hindered by various geopolitical challenges that make it impossible to realize in the short to midterm prospect. Finally, in April 2013, Iraq and Jordan signed a deal to extend an \$18 billion, 1700-kilometer pipeline from Basra to the Red Sea city of

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²³ It is worth noting that this project was promoted by interested IOCs.

Aqaba to export crude and supply Jordan with 850,000 barrels of oil as well as 100MMscf of gas a day by 2017.²⁴

Projections

There are two sets of projections commonly referred to by experts and policymakers: the Integrated National Energy Strategy, which was put out by the Iraqi government in June 2013, and the International Energy Agency's World Energy Outlook 2012, which devoted a section to Iraqi resource development. The reports differ as they relate to the timing and volume of potential gas exports. The INES outlook expects gas flaring to stop by 2015, resulting in surplus capacity. This capacity will be sustained by additional gas production of 2-3Bcf/day from new gas fields. The surplus gas could be used for export or for investing it as feedstock for projects to generate maximum netback from byproducts for international markets.

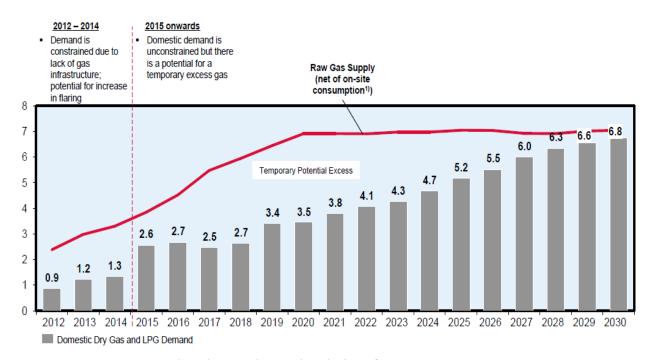


Figure 5.

Source: INES Iraqi Gas Supply and Demand, Annual Outlook (Bcf)

²⁴ The designs and technical studies, which are currently being conducted by the Canadian company SNC, are scheduled to be done by the end of 2013.

²⁵ Subject to concluding the fifth licensing round on gas in December 2013 and uninterrupted fields development.

In the IEA's central case scenario, ²⁶ possible gas exports rise from 450MMscf/day in 2020 to 1.95Bcf/day by 2035, subject to adding new producing discoveries; at the same time, peak demand climbs to 6.75Bcf/day, with total production at 8.7Bcf/day. The realization of this central scenario depends upon mammoth contributions to the development of infrastructure, together with the development of non-associated gas fields across Iraq. This is specifically true for the development of gas resources in the Kurdistan Region of Iraq, as most of the associated gas in the south would be unable to meet local demand.

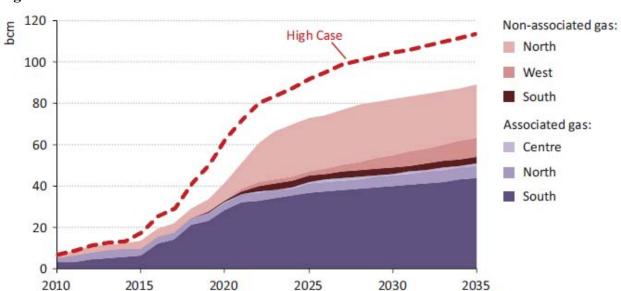


Figure 6.

Source: IEA Iraqi Gas Production-Central Case Scenario, Annual Outlook (Bcm)

Political Trends

The regime change of April 2003 radically transformed Iraq from a centralized state to a federal one and from a one-party dictatorship to a multiparty democratic electoral system; Iraq is also attempting to move from a state-controlled economy to a market economy. Although the evolution of this change is not fully achieved in practice, constitutionally, it is a reality. However, some discontented factions still resist this paradigm shift and even view it as reversible. The constitution ratified in December 2005 defines Iraq as a federal state with a

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²⁶ International Energy Agency, *Iraq Energy Outlook* (Paris: International Energy Agency, 2012).

democratically elected parliament (Council of Representatives) that appoints a president and council of ministers. The state consists of 18 provinces (also known governorates), each one having an elected local council and governor, who is chosen by the council. The only constitutionally recognized federal region to date is the KRG, which has its own elected regional parliament, regional government, and president. According to the constitution, one or more governorates has the right to call for a referendum to change its status from a "province" to a "region," thereby securing more autonomy from Baghdad. Despite the evolution of politics over the past decade, Iraq's politics are still largely based on ethnic or sectarian identities. The government generally adheres to an un-codified ethno-sectarian formula that divides positions between Shi'a, Sunni, and Kurds.

More than a decade after the removal of Hussein from power, Iraqis still struggle with a number of political issues. Of the most fundamental and pressing are the debate over federalism, continued sectarian competition and strife, and the interference of outsiders in Iraqi politics. Each has a significant impact on how and when Iraq will develop its natural gas resources.

The Question of Federalism and Centralization

As mentioned, Iraq today is technically a federal state, as declared in the constitution. However, this form of government sits uneasily on Iraq, as it is a dramatic departure from the country's history of a strong central government and is still resisted by many. The reason Iraq is a federal country is its Kurds, who have enjoyed virtual complete autonomy since the 1991 uprising following Iraq's invasion of Kuwait and the twelve-year implementation of a no-fly zone by the international community. During that time, the Kurds built their own institutions of self-government, out of the reach and control of Iraq's central government. These dozen years of semi-independent self-rule allowed the main Kurdish parties to evolve; this process, while not free from severe internal struggle, helped the Kurds gradually resolve their own differences and establish their own institutions.

Being a different ethnic group, having their own language and culture, and building on their twelve years of autonomous rule, the Kurds made their continued existence inside of Iraq contingent on Iraq being a federal state. While many Arab Iraqis were willing to concede this to

the Kurds, they remained uncomfortable with the concept of federalism, seeing federal regions as nothing more than precursors to independent states. While the Kurds would have been content with an asymmetric federalism, some Arab Iraqis insisted that any privileges given to the Kurds should be available to other parts of Iraq. Hence, the provision in the constitution that allows provinces to morph into regions with greater powers was agreed upon.

Until 2010, the Arab suspicion and bias against federalism prevailed, and the Kurds largely remained the only Iraqis exercising or desiring federalism. There were, however, attempts by the political party ISCI (then-SCIRI) to transform the nine provinces of the south into one region, and an effort by another party, Fadilah, to make the energy-powerhouse Basra into a region.

New and even greater pressures, however, have arisen in recent years, as alienation from Baghdad has grown and politics have become even more polarized along sectarian lines. The failure of Baghdad to recognize and meet the immediate needs and basic services for Shiadominated provinces in the south and Sunni provinces in the west has pushed hydrocarbon resource holder provinces to call for more recognition and rights. The failing nature of Iraq's state²⁷ has encouraged a movement of change calling for economic reform in many provinces and seeking more recognition and autonomy from Baghdad, while the 2013 local elections have introduced a paradigm shift in the political coalitions ruling local provinces. The shift has made provincial council more representative at the local level and more politically independent from the dictation in Baghdad. This change will undoubtedly enlighten the new ruling provinces to review their constitutional rights and have a say on the signed contracts between Baghdad and the IOCs. According to the constitution, the central government must consult the provinces in the development of their resources; legally speaking, ²⁸ producing provinces could seek to alter a contract or even revoke them, given that they were not involved in the licensing process conducted by the MOO.

A move to more federal regions will affect the development of oil and gas in Iraq. Even without any formal change in the status of provinces, local powers are claiming they have rights to be involved in the decision-making accompanying the development of their natural resources; lack

²⁷ Iraq is ranked 9th in *Foreign Policy*'s 2012 "Failed States Index."

²⁸ This is according to Article 112 of the Constitution of Iraq.

of clarity on this point has already led to delays and problems with international companies.²⁹ If more regions do form, the implications will be much greater. Nevertheless, the continued disputes between Baghdad and the KRG over their relative roles and responsibilities in developing resources obscure how autonomous other regions are likely to be in the future; how the Baghdad-KRG standoff is resolved will have implications for the whole country.

Sectarianism and the Lack of National Reconciliation

Iraq endured a devastating sectarian civil war from 2006-2008, after which the country climbed out of the abyss and began to stabilize itself. The promising developments of 2010, however, did not mark a new trajectory for Iraq; the parliamentary election of that year, in which political parties competed on a non-sectarian basis, did not usher in a period of issue-based politics, but the opposite. Since the departure of American forces at the end of 2011, Iraq's politics have become more fragile, and its security situation more tenuous. In the month of May 2013, fatalities exceeded 1,000, recalling the large death tolls of previous years. There are several reasons for the deteriorating situation, most rooted in resurgent sectarianism and the lack of national reconciliation.

First, the tendency of Prime Minister Nouri al-Maliki to consolidate his personal power has fueled opposition and violence. Iraq's political parties came together in an uneasy coalition after the 2010 election, pledging cooperation on the basis of an agreement forged in Erbil to share power along specific lines. The prime minister has failed to implement key parts of the agreement and instead has maintained personal control of the army and police. Moreover, commitments from both Baghdad and Erbil to resolve outstanding differences remain unfulfilled—and tensions along ambiguous territorial borders have led to military clashes. In the past year, al-Maliki has sought to further marginalize his political "partners" in other movements—the Sunnis in particular—through a series of arrests and accusations. It was these actions that initially stirred the protests in the Sunni-dominated provinces, which have grown in scope and depth. The use of force against these protests further catalyzed political opposition to the government and has encouraged some Sunni groups to once again take up arms against the

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²⁹ For example, the Akkas free gas field in the West and associated gas in the South.

federal government. Such discontent is further exacerbated by the corruption and bloated bureaucracy in Baghdad, which has fueled broader dissatisfaction with al-Maliki.

In addition, these domestic developments—and the failure to resolve long-standing issues about how power will be shared among communities—have been aggravated by the deterioration of the situation in Syria. The sectarian divisions in Syria closely mirror those in Iraq, and the explosion of violence in Syria has placed further strain on the sectarian pressures that only began to heal after the 2006-2008 violence. Despite some ongoing efforts to bridge the widening gulfs between parties, there is little evidence that true national reconciliation in Iraq is in the offing.

How and whether Iraq's political elite can overcome these divisions and the violence they fuel is central to Iraq's energy development. Such political polarization compromises the smooth functioning of the government, which is essential to a country seeking to expand energy exploration and production, and associated infrastructure. Even more critically, the violence and political insecurity will inhibit further IOC investment and impede the development of critical infrastructure—all of which is necessary for Iraq to develop its gas potential.

Regional Interference

The deterioration in security and the escalation in violence is partly the result of continuous and rising interference from countries bordering Iraq. Regional influence in Iraq's internal affairs varies from one neighboring country to another. The situation is exacerbated by the lack of any real "Iraqi" foreign policy; the country's foreign policy is essentially based on the personal relationships of different Iraqi political and sectarian groups with neighboring countries. The following is a brief summary of how key regional players are influencing national politics inside Iraq and their interests in Iraq's development of its oil and gas.

Iran

The Islamic Republic of Iran wields much of its influence through the relationships it has with Shi'a political parties. Iran's primary objective has been to preserve the unity of the Shi'a political groups in order to ensure Shi'a dominance in the Iraqi political system. Iran has been very effective in this regard, as—with the 2010 general election as a notable exception—the

Shi'a have held together as a political bloc (now termed the National Alliance). Iranian support has helped mobilize the Shi'a population behind a unified leadership against all the political odds and despite the poor performance of the government. Within the National Alliance, Iran wields influence over sub-groups and individuals, and uses this influence to marginalize Iraq's economic progress and to guide Iraq's energy policies so they do not compete with those adopted by Tehran. Iran sees Iraq's federal constitution as a threat because it allows Iraqis to adopt decentralization in the economic and political process; it also considers IOCs' entry to Iraq as a threatening factor, given their ability to help Iraq far exceed oil production of Iran's besieged sector.

Turkey

Iraq's northern neighbor has played a role on many different fronts. Economically, it has become one of Iraq's most important trade and investment partners. This is primarily, but not exclusively, in the KRG, where commercial trade has risen to US\$10 billion per year and may reach US\$20 billion by 2020.³⁰ Politically, Ankara's role has shifted dramatically over the last five years from one that was generally supportive of Baghdad to one focused primarily on development of ties with the KRG.

Beyond Turkey's substantial commercial investments in the KRG, Ankara has focused on the potential for energy trade to improve its energy security. Much to Baghdad's chagrin, Ankara has developed close, direct ties with the KRG and is believed to be in the final stages of an energy deal that could involve the direct export of Kurdish oil via a pipeline to Turkey. Substantial energy investments by Turkish companies are also anticipated in the KRG energy sector. Partially as a reaction to these developments, Baghdad has accused Turkey of meddling in Iraq's foreign affairs; without the prospect of exporting energy to Turkey, landlocked KRG would be much more dependent on Baghdad's goodwill. Relations between Baghdad and Ankara have soured even further, as each has taken the opposite side of the civil war in neighboring Syria. Finally, the two countries have issues to resolve over water supplies, an increasingly urgent issue in Iraqi eyes. The relationship between Ankara-Baghdad-KRG will greatly determine how and in what quantities and over what period of time oil and gas will flow from Iraq's northern corridor.

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³⁰ Turkish commercial attaché Matin Kerken, interview, *Alsumaria News*, June 19, 2011.

Saudi Arabia

The relationship between Saudi Arabia and Iraq is also tense, like that between Turkey and Iraq, although with different irritants (except for opposing views on Syria). Since the 2003 regime change, the Kingdom has resisted the Shi'a dominated government in Baghdad, and al-Maliki in particular. It has refrained from providing any support, political or otherwise, to him, thereby undermining his leadership by dismissing him as a sectarian leader. Even more damaging to Iraq's stability, Saudi Arabia has turned a blind eye to the influx of al-Qaeda and Salafi radicals entering Iraq through its borders as well as via Syria before the Arab Spring (when the regime in Damascus stood against the US presence in Iraq). Saudi support to Iraqiya, a largely Sunni based political party, has also emerged as a major obstacle to narrowing the gap between Riyadh and Baghdad. These differences have stoked harsh words between Baghdad and Riyadh about the growing violence and increased number of suicide bombers of Saudi origin. The Iraqi government now sees Saudi Arabia, like Qatar and Turkey, as sponsors of sectarian conflict in the region by proxy. Moreover, Saudi Arabia has no interest in seeing Iraq as a growing energy hub or a swing producer that could threaten its historic role as the OPEC leader and the world super producer of oil.

Syria

After many years of a deplorable relationship between Baghdad and Damascus, the recent civil war has brought the two governments closer than ever before. Both share what they perceive as the growing danger of al-Qaeda and its branches spreading between their countries and infiltrating into the Sunni dominated provinces in western Iraq. These events have encouraged many regional countries such as Qatar, Turkey and KSA (which happen to be at odds with al-Maliki's policy) to further interfere in internal issues by financing Sunni opposition groups in Iraq as well as granting them a platform to hold joint conferences in support to the Free Syrian Army (FSA). The introduction of the regional sectarian conflict has dramatically complicated the situation in Iraq, especially after the key regional clerics of the Salafi trend gathered in Cairo to declare jihad in Syria against the Shi'a of Hezbollah and Iran for their involvement in Syria. These developments will undoubtedly influence the sectarian violence inside Iraq and empower Sunni opposition groups in the western provinces of Anbar and Mosul, while rendering all gas

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³¹ Shadia Nasralla, "Sunni clerics call for jihad against Assad, allies," *Reuters*, June 13, 2013.

upstream development and gas pipelines crossing from Iraq to Syria and Jordan difficult to realize. Most analysts do not see a quick end to this conflict, and the division in Syria into three states of Sunnis, Alawites, and Kurdis is becoming more likely by the day. The developments in Syria will significantly impact the regional geopolitics and will redefine the future pathways for oil and gas pipelines while all upstream development will be put on the backburner for years.

Economic and Legal Factors and Their Impact on Gas Development

Just as political and regional events will have significant impacts on how and when Iraqi gas is developed, economic and legal factors will also shape the context in which Iraqi gas development either languishes or moves ahead smartly. The most significant factors to consider are the legal and fiscal framework, the dispute between the KRG and Baghdad over the development of KRG resources and revenue sharing, gas pricing policy, and domestic demand.

The Legal and Fiscal Framework

The federal and regional laws governing the petroleum sector in Iraq are multi-layered and complex; they are a mix of laws remaining from Hussein's time and a new constitution implying new legal framework. Moreover, the collective treatment of oil and gas in the constitution is ambiguous, leading the contesting parties (Baghdad and the KRG primarily) to conflicting interpretations. There are three key articles affecting oil and gas in Iraq. Article 111 states clearly, "Oil and gas are owned by all the people of Iraq in all the regions and governorates." Article 112 refers to the management of resources and policy implementation. Article 130 validates all legacy laws until they are annulled or amended by new legislation. The main points of dissension between Baghdad and the KRG are what entity has the right to engage with IOCs in the interest of developing new resources, what mechanisms are needed to gain approval, who has the authority to market and sell production, and how revenues are distributed. Baghdad believes only the MOO should manage all these operations. Despite multiple efforts, Baghdad and the KRG have been unable to come to agreement on new legislation governing the oil and gas sector. In the absence of such legislation, Baghdad and the KRG have moved ahead with very different approaches. Baghdad has adopted service contracts as the form of the long-term commercial arrangement between the state and IOCs interested in bidding for upstream assets. In contrast, the KRG has opted for production sharing contracts validated by its own regional hydrocarbon law to regulate its upstream practice. Thus far, Baghdad has refused to recognize the regional hydrocarbon law passed by the KRG, therefore rendering all upstream contacts signed by KRG illegal in the eyes of Baghdad.³²

This lack of an agreed upon legal framework—and resulting dual approaches to developing the energy sector—has already been a crimp on investment. While the KRG has done well in attracting even the majors to its region, some companies have avoided the area because of the opposition of Baghdad and corresponding political risk. Future investments could also be in jeopardy as companies increasingly wonder how they will export their eventual production in the absence of some accord between Baghdad and the KRG. Until now, Baghdad has controlled the country's export infrastructure, including a pipeline that runs from Kirkuk northward through KRG territory and through Turkey to the Mediterranean. Kurdish oil exports have flowed through that pipeline only erratically under a series of tenuous agreements with Baghdad. These ad-hoc arrangements have left the KRG-signed companies with only occasional payments, much less than what their PSCs promise. Some payments have come on the back of political deals, but those deals have tended to fall apart quickly. While, thus far, Baghdad has vehemently objected to any effort to sell oil or gas without its approval, the Kurds and the Turks seem increasingly close to reaching an agreement for such export without of the approval of Baghdad.³³

Whether the Kurds are able to secure a reliable export—and reliable payments—for their oil will likely be determined within 2013; the pipeline should be completed by year's end, forcing the issue. The outcome of this standoff will set the stage for whether and how gas will be exported from the KRG in the years ahead. At the moment, gas production in the KRG has been steadily

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³² Since 2007, there have been a number of attempts to pass a federal hydrocarbon law. The most recent was in August 2011 when the Ministerial Energy Committee and the Parliamentary Energy Committee both tabled two contesting versions under consideration for the Presidency of Council of Representatives. The parliamentary draft made it to the first reading, but was hindered by the ruling party's walkout in support of the Council of Ministers' draft. The core dispute between the two drafts revolves around the structure and the authority of the Federal Oil and Gas Council. It is meant to house all regulators at a state level—including the federal government—producing regions or governorates and regulating the process of approving the signed contracts by Baghdad and KRG with IOCs.

³³ It is worth noting that just prior to Erdogan's trip to Washington, DC, in May 2013, he told reporters that a Turkish company had an "agreement in place" to develop KRG oil and gas resources with ExxonMobil. Since the trip, Yildiz has made several public statements indicating that Turkey intends to proceed with its Kurdistan plan, in partnership with American and Russian companies, although the timing and sequence of those steps is still unclear.

developed for local power generation, and modest surplus is "exported" to the three neighboring Iraqi provinces. Gas production is anticipated to increase to 1.5Bcf/day by 2020, whereby exports to Turkey become feasible; however, this is subject to the availability of a gas pipeline connecting the KRG to Turkey and the clearing of the legal grounds for gas purchasers to acquire import license.

The uncertainty over some of the provisions in the constitution is beginning to affect oil and gas developments in other parts of the country as well. Provincial governments in Basra, Anbar, Kirkuk, and Diyala are insisting on their right to be involved in processes surrounding the award of contracts in their domain. Their exclusion has led some to protest the legitimacy of the contracts. A failure to resolve this issue and put forward a unified, uncontested legal framework for oil and gas will continue to be a drag on investment in and development of these resources.

Gas Pricing Policy

Similar to other countries in the region, Iraq finds its gas pricing policies to be an inhibitor of growth and development of its gas sector. Iraq currently heavily subsidizes it gas usage; industry and citizen end users pay \$1.20 per mn Btu, while Iraqis are only charged \$0.60 for gas going into the production of fertilizer. Such subsidies put a tremendous fiscal burden on the government. Moreover, while most of the gas currently produced by Iraq is associated gas, and therefore involves no cost of production, the infrastructure to transport and process the gas scarcely exists, making such low end cost still hardly profitable for producers.

The Iraqi government could simultaneously increase the incentive to invest in gas and ease its fiscal burden by raising the price of gas. Like other governments in the region, it has refrained from doing so, most likely on account of exacerbating sensitive politics. Instead, the government has negotiated individual arrangements with companies to ensure them a certain price from gas they produce in Iraq and seek to sell into the domestic market. For instance, the deal that created the Basra Gas Company (BGC) offers the entity a price linked to the price of oil, somewhere in the range of \$3.20 to \$4.30 per mn Btu. This obviously requires the Iraqi government to bear the burden of the differential between the low domestic price and the slightly higher price negotiated with the Basra Gas Company.

The very existence of this deal draws attention to the problem of not having a single regulator who can impose a common price across deals, opening the door to endless bargaining. Moreover, while the price negotiated by BGC may work due to the fact that the company will be mostly dealing with associated gas from large fields in the south, it may prove too low to incentivize the development of more expensive unassociated gas, a key component of an Iraq that can both meet ambitious domestic needs and export.

Similarly, the price of gas garnered in other countries will in part determine whether and where Iraq exports gas. As of today, most of Iraq's neighbors charge scanty prices for gas, and exporting to them may have political benefits, but few economic ones. In contrast, capturing part of the European or Asian markets could prove lucrative for Iraq if they are able to build the infrastructure and secure the contracts based on different price mechanisms.

Investment Terms

Whether or not Iraq's gas gets developed aggressively also depends on the attractiveness of the terms offered to international actors to get involved. Iraq has held four oil and gas licensing rounds, with the third and fourth including gas offerings. Unlike the first and second bid rounds, which involved already discovered and producing oil fields, these gas bid rounds were for exploration. The results of the bid rounds were poor, as the terms offered were hardly sufficient to entice investors into this activity. In particular, international companies balked at the service contract model, feeling that activity as risky as gas exploration in Iraq needed a framework with greater upside to the firms. In addition, an odd stipulation potentially placing a seven-year moratorium on any gas that was found was an additional deterrent to involvement. Iraq is planning for its fifth bid round at the end of December 2013. The Iraqi government has pledged to make the terms of this round, which is centered on gas, more attractive in order to garner greater interest.

Domestic Demand

According to INES,³⁴ gas flaring in Iraq will be phased out by 2015, creating a surplus capacity of 8Bcm/annum that can be made available for export. However, local demand for gas will increase substantially, and it could consume all available gas as power generation increases to 42GW by 2030. Current estimates suggest 82 percent of gas will be used as main feedstock to fuel Iraqi power plants and industry.

Moreover, the November 2012 IEA report *Iraq Energy Outlook* indicated in its central scenario that export of natural gas may start by 2020. The same report shows it is possible that by this time approximately half of the county's fossil fuel burning electricity generators will have been converted to gas fired plants. According to IEA Report, the process of shifting to gas generators will continue through to 2035. Parsons Brinkerhoff (PB), the electricity consultancy, was credited with participation in the IEA report. In their 20-year Iraq Electricity Master Plan, launched in February 2011, PB foresees full conversion of all Iraq's fuel burning electricity generators to gas power generators by 2017.35 Further analyses and calculations of the IEA conclusions and PB's electricity forecasts suggest that Iraq's present and projected potential for natural gas production will hardly be enough to satisfy the country's electricity industry for the foreseeable future. Other industries may also have calls on the country's natural gas, a factor not considered in the projections mentioned. With the information available to date, export of Iraq's natural gas will not be economically feasible before 2020. To satisfy gas export commitments planned by Iraq's Government.³⁶ the country will have to keep running a great part of its electricity industry on expensive fuels with other harmful implications. The economic losses to Iraq of such an approach are almost certain.

Although projects here and there are taking off, the significant call on gas will be felt when the Ministry of Electricity starts seriously implementing its master plan. If this is to happen, full coordination is required with the Ministry of Oil to secure the power feedstock, of which it will be mostly gas. According to the Ministry of Electricity's consultant (PB), domestic demand will increase to 36GW by 2030, with an additional 6GW for the region of Kurdistan. The master plan

³⁴ Iraq's Integrated National Energy Strategy was released on June 12, 2013, by the Council of Ministers Advisory Commission. It was sponsored by the World Bank and conducted in cooperation with Booz & Company.

³⁵ Parsons Brinckerhoff is a consultant to the federal government of Iraq on the Electricity Master Plan.

³⁶ Planning is underway to export gas in 2017 via floating LNG from the southern corridor of Iraq.

also suggests a shift from liquids to gas by at least 95 percent, which will require a significant amount of gas to fuel the turbines, a situation mirrored in the IEA's central scenario.

Iraq Energy Institute (IEI)³⁷ further analyzed the potential of available gas volumes for three oil production scenarios, while taking into consideration the implementation of the power master plan adopted by the Ministry of Electricity. IEI arrived at a conclusion that commercial volumes for export could only be available during the interim phase of plateau buildup 2017-2027, however such a surplus capacity in gas will disappear after 2030.

Table 1.

Scenario Analysis	2015	2020	2030
Oil Prod. Plateau (Mb/day)	4.5	7	10
Dry Gas Prod. Plateau (Bcf/day)	4	6.3	9
Total Power Gen. (GW)	18	23	37
Power Gen. by Dry Gas (GW)	8.5	16.5	32
Dry Gas Volume for Power Gen. (Bcf/day)	2.2	4.2	8
Dry Gas Volume for Industry, Oil Installations (Bcf/day)	1	1.3	1.5
Total Local Dry Gas Demand (Bcf/day)	3.2	5.5	9.5
Surplus Dry Gas Bcf/day	0.8	0.08	-0.5

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³⁷ Iraq Energy Institute is a London-based think tank and has been the official advisor to the Oil and Energy Committee at the federal Council of Representatives since 2009.

Figure 7. Iraq National Energy Strategy: Three Gas Supply Scenarios Based on Three Production Oil Scenarios

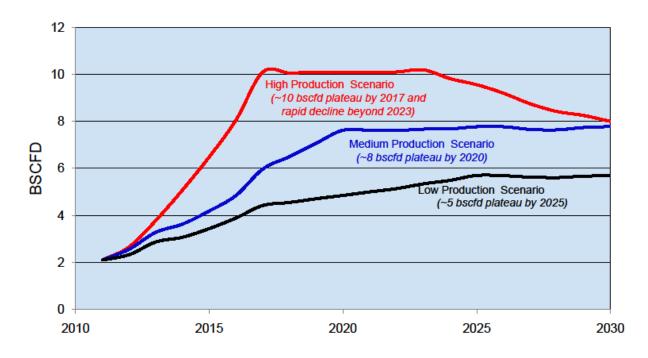
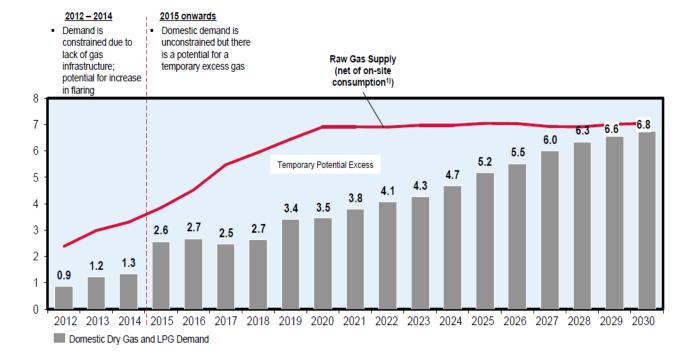


Figure 8. Iraq National Energy Strategy: Raw Gas Supply vs. Consumption (Bcf/day)



bscfd Incremental Supply from 9 Non-Associated Gas 8.6 Gas Exports Fields 8.1. Demand - Industries (Export) 7.8. 8 7.6. Demand - Industries (Domestic) 7.2-Demand - Power 6.9. -6.8 7 6.4 6.3 6.2 5.9 5.8 6 5 C1 / Methane Supply (High Scenario) 4 3.0 3 2 2012 2017 2023 2030

Associated and Non-Associated Methane (C1) Supply Profiles vs. Demand

Figure 9. Iraq National Strategy Scenario on Methane Production

Effect of Political Trends on Gas Development

Based on the political trends, it is becoming clearer than ever that three variables will certainly decide the fate of Iraq beyond 2014: the outcomes of the conflict in Syria, the protest movement and civil unrest in Iraq, and the next general elections of April 2014. The following are the possible consequences of political factors upon the gas sector in the main three geographic sections of Iraq.

Northern Gas Development

The development of gas in Kurdistan is less politically sensitive than oil, as gas production has some way to go to satisfy domestic demand before politically sensitive exports are considered. There would have to be significant investment in gas exploration and production before there are gas reserves available for export. However, as a transit region, KRG offers a safe corridor passage to Europe for surplus gas produced from the south or the western parts of Iraq, enabling it to bypass troubled territories. Nonetheless, Turkey's energy demand has reached US\$60 billion

in 2012,³⁸ and Ankara is very much hoping to secure a sustainable gas supply from Iraq to help diversify it gas dependency. It is looking to the KRG to help facilitate this policy. Although Turkey's present attention is focused on exploring opportunities to legally import oil from KRG—an effort exemplified by TPAO's Erdogan-supported partnership with ExxonMobil—the current Turkish administration is also cautiously monitoring the political dynamics impacting Iraq. Turkey hopes to witness a significant change after Iraq's 2014 general elections, which would allow the government to redefine its strategy with Baghdad. Subject to US support, the developments in the North will likely be determined by the Kurds and Turkey's political and economic ambitions, and thereby their relationships with Baghdad.

Midland Gas Development

This part of the country will face the most challenging scenarios on all fronts. There are two issues facing the pipeline projects in this region. The first will hit Iraq/Iran's signed agreements on pipelines to either have Iranian gas to meet Iraq's local demand for electricity, and/or Iran's plan to establish a strategic gas pipeline to feed regional countries seeing Iraq and Syria as key transit territories for the export of Iranian gas to Europe. Their plan could be seen as rather ambitious because of the unrealistic commercial and political factors involved. The second issue is the security obstacle that could face those advancing gas exports from the South, which require establishing pipelines in critical territories as well as the running and further development of the gas fields of Akkas in Anbar (a Sunni province) and Mansoriya in Diyala (a Sunni-dominated province). Furthermore, the security challenge will undoubtedly hit prospective pipelines such as the Arab Gas Pipeline to Jordan and Iraq and Jordan's strategic oil pipeline designed by SNC, since the civil unrest in the western part of Iraq will probably be hindering developments for many years.

Southern Gas Development

In light of the current security deterioration in the country and the likelihood of continuing protests and civil unrest in the Midlands and the western corridor, the only promising corridor for potential surplus export of gas is in the South via LNG or connecting pipelines to the GCC gas

³⁸ International Energy Agency, *World Energy Outlook 2012*, (Paris: International Energy Agency, 2012).

network. The gas development in the South will face less interruption with fewer security threats, being far from the critical fault-lines. The source of surplus gas would be mainly from associated gas produced from green fields that could yield around 1Bcf/day, which would be enough commercial quantity for the development of the floating LNG plant proposed by Shell for the Basra Gas Company. However, this could affect the availability of gas surplus from southern fields to meet the demand for gas for the generation of Iraq's electricity.

Political Scenario Analysis and Impact on Gas

Most commentators on Iraq seem to see the country as divided and ravaged by political and sectarian fear, mistrust, and score settling, all of which seems unlikely to lead to a unified federal Iraq. A minority are more hopeful, pointing to the positives; Iraqis have truly adopted democracy and the government has become more inclusive (compared to before 2003). Politicians belonging to different sects appear in different parties, showing a degree of progress toward establishing good governance within a loose federal system. Economically, Iraq has experienced the highest rate of economic growth of all Arab countries, with GDP rising 10.5 percent in 2012, well above the expectations of most economic forecasters. Iraqi economic growth over the next few years is now predicted to be one of the highest in the world.

Economic and social development opportunities are abundant, but Iraq's political fragility raises the question of whether Iraq will avoid the resource curse in which a minority of the population benefits while the majority remains in relative poverty.

Predicting the future political landscape is still difficult as both internal and external influences create a confusing picture that seems to alter with each new dawn. What is clear is that the status quo is not sustainable over the long term, as the chaos threatens the economic development of the country. Every political scenario will have some bearing upon oil and gas development, which is the government's major and—in reality—only income stream. Analyzing two extreme scenarios might help us consider Iraq's potential gas future development.

Scenario One: United Federal Iraq—A National Reconciliation Scenario

The first scenario rests on the notion that the anticipated 2014 general parliamentary election ushers in a new understanding between all parties in Iraq to produce a government with broader political backing than one sectarian group. In this scenario, the elections might produce a new prime minister, who is acceptable to the key political parties and international community. Alternatively, Prime Minister al-Maliki, who seems inclined to take on a third term despite his unpopularity among the political elite, could move from his current, increasingly exclusionary practices to form a post-election government. In either instance, a national reconciliation scenario would require the main parties (potentially the National Alliance) to reach out to the KRG and resolve disputes, including the status of the Kurdish Peshmerga military forces, disputed borders and territories, the federal revenue sharing and hydrocarbon laws, and the legal status of KRG-signed contracts with IOCs. Reconciliation between the Shi'a-dominated National Alliance and the Kurds alone would not be sufficient to create a welcoming playing field for further gas development; reconciliation between the governing class and the Sunni-Arab population, which has increasingly turned its back on the government of al-Maliki, would also be required.

If such a broad accord between Shi'a, Sunni, and Kurd can be forged in the wake of the 2014 elections, based on decentralization of authority and constitutional power sharing, the prospects for the realization of ambitious gas projects would be greatly enhanced. It would restore the confidence of regional and neighboring countries and the IOC's in the new political system and the federal administration. All deals would eventually be handled by a Federal Oil and Gas Council that would include representatives from the producing provinces and regions and operate according to a new hydrocarbon law. New future regions within Iraq, if formed, would abide by the federal laws and regulations of federal institutions; such a formation would be based on geographic federal administration settings and not on sectarian principles. This scenario would be in accordance with the current constitution, which grants significant levels of autonomy to the Kurds, while also giving considerable autonomy to future regions.

Gas fields, gas exploration blocks, and the gas pipeline network would witness fast-track development across the country. Secure gas outlets from the south and north of Iraq to Turkey

via Jordan would be developed in parallel to the development of Akkas field in Anbar Province and Mansoriya field in Diyala Province, thereby making gas exploration in Iraq more appealing than ever to IOCs. This scenario would make Iraq's gas future even more promising in terms of exports from the levels exported by INES. This is a production scenario that could only happen under absolute reconciliation, regardless of how the Syrian outcome may play.

Under this scenario, the number of outlets for exporting Iraqi gas would increase and become more diversified. There would be the northern corridor via KRG to Turkey, then to Europe; the western corridor via Anbar Province to Jordan, Egypt, and Europe; and the southern corridor to the GCC via pipelines or LNG to Asia. Any gas production above 5Bcf/day before 2020 or 7+Bcf/day after 2025 could be considered as potential for export to monetize dry gas surplus or for use to create electricity, which could itself be exported.

Increased gas production would provide the energy needs of a policy of economic reconstruction and diversification similar to developments seen in GCC countries. It would meet the inevitable growth in domestic energy consumption, and exports to neighboring countries would increase both its economic and political status in the region.

Scenario Two: The De-facto Breakup of Iraq Scenario

In the second scenario, the failure to reach a national accord on many issues leads to the gradual empowerment of regions, the diminution of the importance of Baghdad, and an overall increase in the insecurity and foreign interference in the country. In this case, the National Alliance fails to secure an agreement with its political partners (Sunni and Kurdish parties) and petroleum policy remains vague and centralized in the current legal vacuum. Domestic civil unrest and political upheavals continue to hold the country to ransom. The disintegration of Syria puts enormous strains on Iraq, as the new Sunni-Islamist government in Damascus supports groups challenging the Shi'a dominated government in Baghdad. Sectarian mistrust and score settling continues with local militias gaining strength and the rule of the gun pervades across the land.

The unfolding of this scenario could encourage the KRG to plan an early secession in close coordination with Washington, D.C., and Ankara, announcing final departure from Iraq around

2020. In parallel to this, the provinces of Anbar, Mosul, and Salahadin would form their own semiautonomous regions as a preparation to final separation. This could encourage Basra province to form the first semiautonomous region in the South. The future of Syria would pose further threat to the stability of the western part of Iraq, while the many regional countries would increase their influence in Iraq's domestic politics, as a broken Iraq could have political and economic benefits for several of its neighbors. These developments may eventually turn Iraq into a chaotic confederation.

The failure of a democratic Iraq, the attraction of export revenues, and the control over the northern export corridor and water resources would make secession tempting to the KRG. To what extent Washington would welcome this scenario—which undermines their plan for the region—is hard to predict, but at the moment of writing, its support is with Baghdad. Turkey would obviously welcome the much-needed oil and gas imports from KRG if the administrations of Recep Tayyip Erdogan, the prime minister of Turkey, and al-Maliki continue to rule on both sides of the fence. To what extent Baghdad would react to this scenario is hard to predict, but tensions in and around Kirkuk between Peshmerga forces and the Iraqi army have been increasing, especially as the Iraq-Turkey oil pipeline through Kirkuk seems to be a constant target for terrorists seeking to disrupt Baghdad's income stream.

In the South, the Basra governorate would encourage the Basra Gas Company (BGC) to further develop the associated gas (within its provincial boundaries) and any surplus would more than likely go to Asia or the GCC markets at a more reasonable premium than could be obtained in the rest of anarchic Iraq. The pipeline market could extend to other GCC countries as their thirst for gas grows. Furthermore, the floating LNG terminal proposed by Shell may be an option for monetizing surplus gas production associated with the southern fields for Asian markets. This project is more likely to happen under local autonomy than under an anarchic central administration.

Under this scenario, gas development will be limited to two regions: Kurdistan and the southern part of Iraq. The associated gas opportunity will be developed to a certain extent, leaving very little for export or—at a best-case scenario—to feed LNG terminals with a maximum of

1Bcf/day by 2020. The Kurdistan Region will develop its gas assets separately from Baghdad and reach an agreement with Turkey on export; its surplus gas could reach 1Bcf/day after 2020. As for the western part of Iraq, oil and gas exploration and development will be postponed until the political and security situation settles; this includes all pipeline initiatives crossing to western neighbors. This scenario would inevitably lead to stunting the economic growth potential within the greater Iraq by limiting the availability of gas, its usage, and its passage. Economic diversification and the associated job growth would be negligible. Only Kurdistan and the Basra regions would benefit financially.

Markets such as food and fuel would remain heavily subsidized, and substantial economic investments in both infrastructure and the private sector would probably be slow to materialize. Economic underperformance will cheat the masses, as the 30 percent currently in poverty will probably increase, especially in provinces such as al-Muthana, al-Qadesia, and Maysan; these and other regions in the West will be left underdeveloped. Uncontrollable instability and security threats will further develop over fault-lines, disputed borders, and water resources between the three main regions (Kurdish North, Sunni West, and Shi'a South). Baghdad would have lost its influence and most of its revenue if devolution took place on this scale. The likelihood of more terrorist activity and sectarian violence would be high, threatening the developments in all areas of the former Iraq.

Conclusion

The lack of a stable and realistic federal policy on gas utilization required to support the reconstruction of Iraq and the monetization of surplus production is hampering the economic and social development of Iraq. As the country is increasingly dependent upon neighboring countries for fuel imports, the need to generate electricity from gas is growing. The initial contractual production targets set by the MOO, along with the vision of INES and IEA's High Case Scenarios, could only be considered possible subject to very promising conditions. Hence, many experts—particularly in a climate of turbulent political tensions, not to mention the underestimation of the significant commercial and infrastructural challenges—consider them unrealistic. Although the MOO has a plan to review the initial plateau targets soon and many are

optimistically anticipating the possibility of realizing the central scenarios, both the ministry's revision and the IEA's central scenario require significant commitments, sustained by commercial and political stability if they are to be realized.

The unanswered question of federalism, the lack of national reconciliation, and the vacuum of a constitutionally compliant legal framework all pose serious threats to most energy agreements. Failures to involve producing provinces and regions in the process of licensing rounds and the South Gas agreement could render these deals illegal in the eyes of provincial governments, which are theoretically independent from central political controls.

Iraq's gas potential remains heavily under-explored, with reserves thought to be double that of the current estimates. However, the country's domestic energy requirements are on the increase due to reconstruction activities and population growth. As Iraq continues to develop its infrastructure and makes use of its gas, commercial quantities for export may be limited, only emerging for a limited window between 2020 and 2030 (subject to political stability, sensible budget management, and comprehensive energy policy reform). However, projected production levels beyond 2020, coupled with increased demand, may not commercially justify the near- to mid-term LNG commitments, especially when Iraq is surrounded by gas thirsty consumers who could be more easily serviced with pipeline gas at competitive international prices. Iraq needs to secure at least 1Bcf/day surplus of gas before considering an LNG facility for export. This will require further exploration and gas development to exceed the 8Bcf/day of gas production required for future local demand.

Thus, associated gas represents a valuable commodity and economic multiplier for Iraq's reconstruction and infrastructure development. However, according to the low-case scenarios of the INES and IEA outlook on Iraq's energy, the reconstruction needs will leave sparing little feedstock gas for the industrial sectors for the foreseeable future. Limited quantities may be available in the Kurdistan Region of Iraq for export, but this scenario will be subject to a viable federal policy between the federal government and the various regions and provinces on one hand and a sustainable foreign policy with transit countries on the other. Unless a radical change occurs within the present administration to alter its approach to energy policy, Iraq will continue

to struggle to meet local demand and is unlikely to ever be a reliable gas supplier to the Middle East, Europe, or Asia.

In conclusion, there are many variables that could define the energy play in Iraq and its gas sector, but most notable are the political dynamics within the country and whether a sustainable national reconciliation among all factions can be achieved. This is coupled with Iraq's desperate needs for a viable foreign gas policy to serve the long-term interest of regional neighbors and to look further afield at other transit markets, such as Europe. Syria's future and the relationship between Ankara, Baghdad, and Erbil will further define the absolute direction of Iraq's surplus gas for export in the long-term.

The energy policy status quo is likely to remain in Iraq until 2018, unless a drastic change in circumstances takes place, such as administration change or the enactment of a federal hydrocarbon law. The vacuum created by the lack of federal hydrocarbon and revenue sharing laws has led Baghdad to push for centralized control and to use pressure tactics, Meanwhile, KRG conducts its operations solo using its relations with Turkey and American oil firms as a retaliatory tactic. The resulting anarchic state of affairs has become the norm. Perhaps it is the price Iraq has to pay on the journey to a sustainable, united federal Iraq. Or it may be part of the spiral downwards to a broken Iraq, encouraged by neighboring vultures who eye its assets.

Appendix

Joint Venture Companies

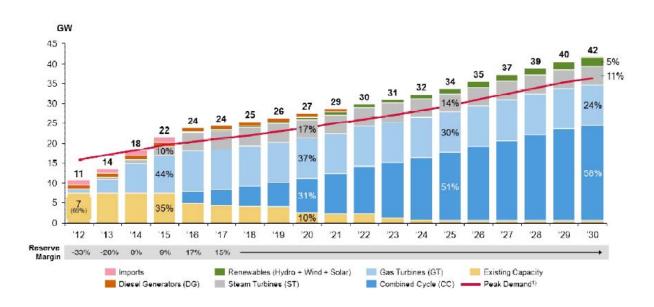
Since 2007, both the federal Ministry of Oil and the Ministry of the Natural Resources of the KRG have signed various long-term contracts through bid rounds and have had direct negotiations to form Joint Ventures (JV) with IOCs. The following table outlines in a chronological order the formation and structure of each JV.

Table 1A.

Gas Field Territory	JV Operator	Type of License	Notes
Kor Mor Field, 1.8 Tcf proven reserve Sulimaniya Province KRI	Pearl Petroleum: Crescent Petroleum (40%), Dana Gas (40%), MOL (10%), OMV (10%)	20-year service contract awarded by the MNR, April 2007	Produces 350MMscf+ 15K per day condensates
Chemchamal Field, 2.07 Tcf proven reserve Sulimaniya Province KRI	Pearl Petroleum: Crescent Petroleum (40%), Dana Gas (40%), MOL (10%), OMV (10%)	20-year HOA-based service contract awarded by the MNR, April 2007	Under dev. Expected PPT 200MMscf/day
Akkas, Anbar Province	100% KOGAS	20-year based service contract awarded by the MOO, LR3, 2010	Under dev. Expected PPT 400MMscf/day
Mansuriya, Diyala Province	50% TPAO, 30% Kuwait Energy, and 20% KOGAS	20-year based service contract awarded by the MOO, LR3, 2010	Under dev. Expected PPT 320MMscf/day
Siba, Basra Province	60% Kuwait Energy and 40% TPAO	20-year based service contract awarded by the MOO, LR3, 2010	Under dev. Expected PPT 100MMscf/day
Flared Gas Capture, Basra Province, Rumaila, West Qurna-1, and Zubair	South Oil Company (51%), Shell (44%), Mitsubishi (5%)	25-year based service contract awarded by the MOO through direct negotiation, 2011	Under dev. Expected PPT 2 to 3 Bcf/day for power gen. and F-LNG
Block-8 Gas Exploration Block	100% Pakistan Petroleum	25-year based service contract awarded by the MOO, LR4, 2012	Under dev.

Source: Iraq Energy Institute Analysis based on MOO and MNR public data

Figure 1A. Planned Expansion of Iraq's Generation Capacity—Peak Demand at Consumer Level, Including Transmission and Distribution Technical Losses



Source: MOE Master Plan, Booz & Company analysis

1st Round Oil Fields TURKEY To Ceyhan Terminal, Turkey 2nd Round Oil Fields 3rd Round Gas Fields 4th Round Gas Fields Iraq-Turkey Pipeline Other Oil Fields Seperate Awards Vajma / 2 Daiyarah SYRIA Iraq-Syria Pipeline Crude Oil Pipeline To Baniyas, Syria (not in use) Operational Refinery Mansuriya **Tanker Terminal** Akkas⁷ IRAN Badra IRAQ ,Ahdaba JORDAN Missanb West Qurna Phase 2 Garraf' Halfaya West Qurna Phase 1 Majnoon Iraq Strategic Pipeline Kaaot SAUDI ARABIA KUWAIT Abot To Saudi Arabia (not in use)

Figure 2A. Major Oil and Gas Fields Controlled by the Ministry of Oil

Source: Ministry of Oil

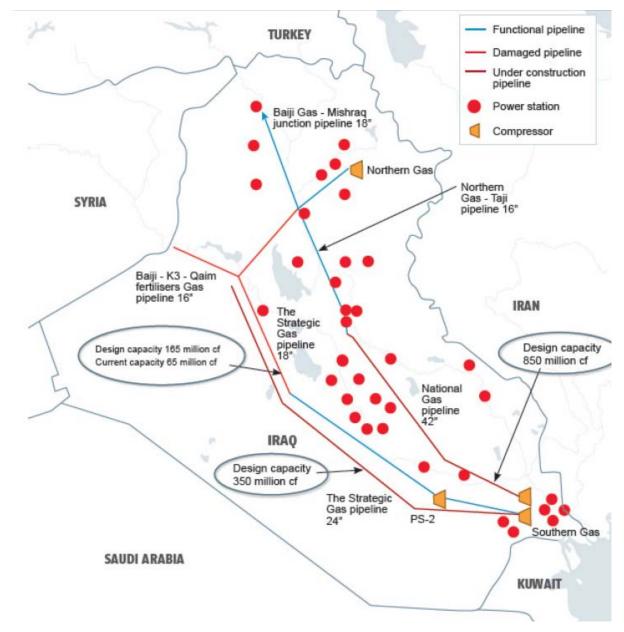


Figure 3A. Current Dry Gas Pipelines Controlled by the MOO

Source: Ministry of Oil

Figure 4A. The Commercial Outcome of the Winning Bidders from the Third Licensing Round on Non-associated Gas Fields

Field/ Province	Winning Consortium	Share in Field	Service Fee (\$ per Barrel)	PPT Mscf/day	Estimated Reserves
Akkas field Anbar	KOGAS	100%	5.50	400 for 13 years	2.1-5.6 Tcf
Mansoriya field Diyala	TPAO, Kuwait Energy, KOGAS	50%, 30%, 20%	7	320 for 13 years	3.3-4.5 Tcf
Siba field Basra	Kuwait Energy, TPAO	60%, 40%	7.50	100 for 9 years	1.5-3.0 Tcf

Source: Ministry of Oil

Table 2A. Iraqi Gas and International Commitments

Since 2005, the federal government of Iraq has engaged with various parties in exploring potential gas projects for development, export, and import. The following is an outline of the key agreements signed or planned.

Gas Initiative	Details
Iraq Gas Master Plan: Commissioned by the MOO to Shell to develop the blueprint plan and strategy for Iraq	The plan started in 2005 as an independent strategic plan for Iraqi gas. In 2008, Shell entered direct negotiations with the FGI to sign an exclusive Heads of Agreement (HOA) with the state owned South Gas Company to develop all Iraqi associated gas produced from all southern fields in Iraq. This HOA became a 25-year contract in 2011 to monetize associated gas produced from three southern fields only (Rumaila, West Qurna-1, and Zubair) to feed local demand. The deal also includes an option to export LNG to Asia. The project is known as the Basra Gas Company (mentioned above).
MOU for strategic partnership between the EU and FGI to develop Iraq gas/energy export to Europe	The MOU was based on an Energy Policy Action Plan from 2007-2009, adopted by the European Council in March 2007 and concluded in Baghdad in January 2010. The focus was on the Euro-Arab Mashreq Gas Market aiming to develop the Arab Gas Pipeline and thereby making Iraq a key gas supplier to Europe. It is worth noting that this project was promoted by interested IOCs.
Iran-Iraq gas pipeline for electricity	In 2011, Iraq signed a contract with Iranian company ACG to extend the pipeline bringing gas from Iran. The gas is needed to keep Iraq's power stations producing electricity. The pipeline will stretch 130 km from al-Mansuriay field to the Sadr, Quds, and South Baghdad power plants. It will cost US\$365 million. Its construction will take 18 months and will conduct 25 million cubic meters of gas daily, which in turn will produce 2500 MW.
Iran-Iraq-Syria- Lebanon gas pipeline to the Middle East and Europe	In April 2013, the Iranian Minister of Oil, Jewad Ochy, stated the aim was to export 40 million M3 of gas to Iraq daily by summer 2014, pointing out that Iraq and Iran had reached an agreement that stipulates exporting Iranian natural gas to Iraq through two separate ways. A gas pipeline construction project between Iraq, Syria, and Iran was mooted in 2012, and the gas pipeline was designed to deliver natural gas from Iran to other neighbor countries such as Jordan and Lebanon. On February 19, 2013, the Iraqi Council of Ministers authorized the Minister of Oil to sign the project of the gas pipeline across Iran, Iraq, Syria, and Europe.
Iraq-Jordan oil and gas pipeline	In April 2013, Iraq and Jordan signed a deal to extend an \$18-billion pipeline to the Red Sea city of Aqaba (from Basra Province to Anbar Province, then to Jordan) to export crude and supply Jordan with oil and gas. The agreement is to build a 1,700-kilometer pipeline from Basra to Aqaba. The designs and technical studies, which are currently being conducted by the Canadian company SNC, are scheduled to be done by the end of this year. Under the deal, which is expected to be operational in 2017, Jordan will get 850,000 barrels of oil as well as 100MMscf of gas a day.

Source: Iraq Energy analysis, Ministry of Oil, Ministry of Electricity, and Ministry of Foreign Affairs

Table 3A. Political Coalitions

Leading Party	Main Sub-Groups
National Alliance: 159 Seats,	State of Law: 89
mainly Shi'a, South, and Midland	-Dawa Party (Nouri al-Maliki)
Party Leader: Ibrahim al Jafari	-Mustaqiloon (Hussain al-Shehristani)
State Rep: Prime Minister Nouri al-	-Dawa al Iraq (Abdul Karim al-Enizi)
Maliki	National Iraqi Alliance: 70
	-Ahrar-Sadrists (Muqtada al-Sadr)
	-ISCI: Ammar al-Hakim and Badr of Hadi al-
	Amiri
	-Fadhila (al-Yaqoobi)
	-Tayar al-Eslah (Ibrahim al-Jafari)
	-Iraqi National Congress (Ahmed al-Chalabi)
Iraqiya Bloc: 91 Seats,	Iraqiya Wataniya (Allawi)
secular and predominantly Sunni	Iraqyion – Usama al-Nujaifi
Midland, West, and South	Dialogue – Salih al-Mutlaq
Leader: Ayad Allawi	Tajdeed – Tariq Hashimi
State Rep: COR Speaker Usama Nujaifi	National Future – Rafi Essawi
Kurdistan Alliance: 57 Seats,	KDP – Masoud Barzani
Kurds, North, Kurdistan Region of Iraq	PUK – Jalal Talbani
Leader: Masoud Barzani	Goran – Nosherwan Mustafa
	Kurdistan Islamic Union
	Islamic Group of Kurdistan
Others: 20 Seats	Minorities: 8 Seats
Across Iraq: Christian, Turkmen, Sunni	Tawafuq: 6 seats
Islamic Party, and other minorities	Union Alliance of Iraq: 4

Source: Iraq Energy analysis on Iraqi political coalitions

Table 4A. Key Legislation

The Legal Component	Description
Law #80 – 1961, #97/123/130 –	Iraq National Oil Company law – the regulated/operator
1967	
Law #101 – 1976	The Ministry of Oil law – the regulator
Law #113 – 1983	Income tax (this was amended by Law #19 – 2010)
Law #84 – 1985	Preservation & protection of hydrocarbon endowment
Law #3 – 1997	Protection of the environment
Law #22 – 1997	Public companies
Law #13 – 2006	Investment law
Law #64 – 2007	Refineries investment law (amended in 2011)
Law #22 – 2007 (KRG specific)	KRG hydrocarbon law (disputed by the FGI)
Law #21 – 2008	Law on provincial powers

Source: Iraq Energy analysis on key legislation affecting the oil and gas sector in Iraq

Table 5A. Service Contracts Signed with the MOO for Non-Associated Gas Fields in the Third Licensing Round

Field /	Winning	Share	Service Fee	PPT	Estimated
Province	Consortium	in	per Barrel	Mscf/day	Reserves
		Field	\$	_	
Akkas	KOGAS	100%	5.50	400 for 13	2.1-5.6
field Anbar				years	Tcf
Mansoriya	TPAO, Kuwait	50%,	7	320 for 13	3.3-4.5
field	Energy, KOGAS	30%,		years	Tcf
Diyala		20%			
Siba field	Kuwait Energy,	60%,	7.50	100 for 9	1.5-3.0
Basra	TPAO	40%		years	Tcf

Source: MOO, the commercial outcome of the winning bidders from the third licensing round on non-associated gas fields

Table 6A. Regional Markets Depicting Highest Netback of Pipelines and LNG Exports to Regional Markets and ${\bf Asia}^{39}$

Gas Export Pipeline	Market Price Range	Transport- ation Costs	Net- back	Assumptions
Options To Kuwait	\$/mmbtu 10-15	~0.2	Price ~10-15	§Market price equivalent to 80 – 120 \$/bbl oil at a discount of 30% (similar to current LNG import prices) §Rehabilitation of the existing pipeline to Kuwait (0.4 bscfd)
To Syria	4-5	~0.6	~3-4	§Market price aligned to the cost of developing own non-associated gas fields §Development of a greenfield pipeline to Der El-Zor (0.5 bscfd)
To Turkey	7-11	~0.6	~6-10	§Market price aligned with average European imports §Development of a greenfield pipeline to Antakiyah (1.4 bscfd)
To Jordan	10-15	~0.9	~9-14	§Market price equivalent to 80 – 120 \$/bbl oil at a discount of 30% §Development of a greenfield pipeline to Risha (0.3 bscfd)
To KSA	5-12	~0.4	~5-12	§Market price aligned with the development cost of non-associated sour gas fields §Development of a greenfield pipeline to Qurayyah (0.8 bscfd)
To Europe (via Nabucco)	7-11	~2.0	~5-9	§Market price aligned with average European import prices (Germany, Italy, Spain, and UK) taking 2008-2011 period and for oil prices between 80–120 \$/bbl §Greenfield pipeline to Erzurum (0.8 bscfd) connecting to the Nabucco network onward to Vienna
To Asia To Europe	11-13 7-11	~ 3.0 ~ 3.1	~ 8-10 ~ 4-8	§Asian market price equivalent to Japan LNG import prices taking 2008-2011 period and for oil prices between 80 – 120 \$/bbl §European market price aligned with average European import prices (Germany, Italy, Spain, and UK) taking 2008-2011 period and for oil prices between 80 – 120 \$/bbl §Development of the BGC facility (0.6 bscfd)

³⁹ Prime Minister's Advisory Council and Booz & Company, *Integrated National Energy Strategy* (June 2013)