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# **The Kurdistan Region of Iraq's Gas-Export Potential: Deja Vu All Over Again**

**By Ahmed Tabaqchali**



## **Iraq Initiative**

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# **The Kurdistan Region of Iraq's Gas-Export Potential: Deja Vu All Over Again**

**By Ahmed Tabaqchali**

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Cover: Khor Mor Gas Infrastructure. *Source:* Crescent Petroleum.

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# Contents

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<b>Executive Summary .....</b>	<b>1</b>
<b>History Does Not Repeat Itself. But It Rhymes .....</b>	<b>2</b>
<b>The KRI’s Gas Reserves .....</b>	<b>5</b>
<b>Current Gas Production and Infrastructure .....</b>	<b>7</b>
<b>The Pathways to Gas Exports .....</b>	<b>9</b>
<b>Hurdles to Overcome .....</b>	<b>12</b>
The Constitutionality of KRG Decisions on Oil and Gas Licensing.....	13
Genel Energy’s Pending Arbitration Claim .....	14
What Role, if Any, For Rosneft? .....	15
<b>Challenges and Opportunities .....</b>	<b>17</b>
<b>About the Author .....</b>	<b>20</b>
<b>Acknowledgments.....</b>	<b>21</b>
<b>Abbreviations/acronyms .....</b>	<b>22</b>

## Executive Summary

Europe's quest to minimize, and ultimately eliminate, its critical dependence on Russian gas following the invasion of Ukraine, and the changed world order, raised hopes in the Kurdistan Region of Iraq (KRI) that the region's sizable gas assets would translate into gas exports to replace some of the 161 billion cubic meters (bcm) of gas that Europe imported from Russia, or 37 percent of Europe's total 2021 imports of 431 bcm.<sup>1</sup> These hopes, while realistic and achievable, resonate with the hype that surrounded the KRI's gas-export potential during the region's boom years 2008–2015, when the KRI was considered “one of the most promising frontiers in the Oil and Gas Sector.”<sup>2</sup>

The Kurdistan Region of Iraq's (KRI) proved and probable gas reserves have the potential to nearly triple its gas production by 2030 and more than sextuple it by 2040. The KRI has proved gas reserves of 25 trillion cubic feet (tcf)—or 20 percent of Iraq's proved gas reserves of 124.6 tcf at the end of 2021—and 9.6 tcf of probable reserves. Its current gas production of 5.4 billion cubic meters per annum (bcma) could increase to 15.4 bcma by 2030 and 36.6 bcma by 2040. This increase would be enough to meet current and future domestic KRI demand, and to generate exports of 5.4 bcma by 2030 and peak exports of 15.5 bcma by 2040.

However, this potential production increase is highly dependent on the dynamics and economics of production

that, thus far, have not gone beyond the aspirational stage. The world order—changed as a consequence of the invasion of Ukraine—and the medium-term outlook for sustained high gas prices have fundamentally altered these dynamics and economics, adding strategic and security dimensions. However, a number of significant hurdles need to be overcome including: the impact of the Federal Supreme Court (FSC) ruling on the unconstitutionality of an oil and gas law adopted by the Kurdistan Regional Government (KRG); the dynamics of the development of Miran and Bina Bawi, which have a peak production potential of 12.1 bcma (33 percent of total peak production); and the possible role of Russian company Rosneft in the planning and development of the expansion and extension of KRI's gas pipeline network.

The confluence of Europe's need to find alternatives to Russian gas and the FSC's ruling present an opportunity to resolve the core issue in the conflict over the development of oil and gas resources in the country. The path to such a resolution requires an acceptance and understanding (that's so far lacking) among Iraq's political class, international partners, and stakeholders of the conundrums that have prevented the resolution of these issues. However, the solution will not be easy, as Iraq's recent history is littered with agreements and understandings that sacrificed clarity and sustainability for short-term political compromises.

1 Maha El Dahan and Riham Alkousaa, “Iraqi Kurdistan Has Energy Capacity to Help Europe, Says Iraqi Kurdish PM,” Reuters, March 28, 2022, <https://www.reuters.com/world/middle-east/iraqi-kurdistan-has-energy-capacity-help-europe-says-iraqi-kurdish-pm-2022-03-28/>.

“Statistical Review of World Energy 2021,” BP, last visited September 29, 2022, <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>.

Notes: The BP Statistical Review of World Energy defines Europe as: European members of the Organisation for Economic Co-operation and Development (which includes Turkey), plus Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Gibraltar, Latvia, Lithuania, Malta, Montenegro, North Macedonia, Romania, and Serbia. In this report Europe, is used as above, excluding Turkey. Gas consumption in Europe comes from domestically produced gas, imported via pipeline gas and/or liquefied natural gas (LNG), and from storage withdrawals or injections. The figures used in this report are exports (pipeline and LNG) and percentages of these figures.

2 The phrase in brackets is borrowed from: Nikolas Stefanou, “Kurdistan Region of Iraq O&G: A Frontier of Opportunity,” Renaissance Capital, February 18, 2022, which is a brokerage research initiation report on the exploration and production (E&P) companies operating in the KRI oil and gas sector. The reports are available to clients of Renaissance Capital.

## History Does Not Repeat Itself. But It Rhymes.<sup>3</sup>

Initial expectations for developing the KRI's gas assets were high but realistic, based on promising early developments from the region's first gas field—with the first production of gas from the Khor Mor field coming on stream within sixteen months of the award of both the Khor Mor and Chemchemical fields to Pearl Petroleum in early 2017.<sup>4</sup> However, by mid-2009, these expectations were overtaken by hype, with projections that gas exports from the Khor Mor and Chemchemical gas fields would reach up to thirty billion cubic meters per annum (bcma), or about 2,900 million standard cubic feet per day (mmscfd), by 2014–2015.<sup>5</sup> After satisfying domestic KRI demand for gas, those exports—estimated at the time to be 1.5

bcma (1,450 mmscfd)—would be transported through the planned Nabucco pipeline to Turkey and Europe, to lessen their combined dependence on Russian gas—of which they used 162 bcm in 2008.<sup>6</sup> Among the catalysts for the Kurdistan Regional Government's (KRG) gas-export expectations through Nabucco were the vulnerabilities arising from the frequent disruptions of Russian gas supplies to Europe—as a consequence of the multiyear gas disputes between Russia and Ukraine—which intensified following the Russian invasion of Georgia in 2008.<sup>7</sup> However, after a promising start, gas production at Khor Mor peaked in 2012 at about 330 mmscfd (3.4 bcma) because of arbitration resulting from a conflict between the field's operator,

3 “History Does Not Repeat Itself. But It Rhymes,” Quote Investigator, last visited September 29, 2022, <https://quoteinvestigator.com/2014/01/12/history-rhymes/>.

4 Further information on Khor Mor, including its background, is available at: Ahmed Tabaqchali, “Statehood in the Kurdistan Region of Iraq through an Economic Lens,” Institute of Regional and International Studies (IRIS), March 2018, 7 (footnote 11), [https://ais.edu.krd/iris/sites/default/files/Statehood%20in%20KRI%20through%20an%20Economic%20Lens\\_%20FINAL\\_March2018.pdf](https://ais.edu.krd/iris/sites/default/files/Statehood%20in%20KRI%20through%20an%20Economic%20Lens_%20FINAL_March2018.pdf); Patrick Osgood, “Q&A: Crescent Petroleum CEO Majid Jafar,” *Iraq Oil Report*, November 6, 2012, <https://www.iraqoilreport.com/news/qa-crescent-petroleum-ceo-majid-jafar-9216/>; “Dana Gas and Crescent Petroleum Gas Project in Kurdistan Region of Iraq: Socio Economic Benefits Report,” Dana Gas and Crescent Petroleum, December 12, 2014, [https://www.crescentpetroleum.com/wp-content/uploads/downloads/Kurdistan\\_Gas\\_Project\\_Report\\_Executive\\_summary.pdf](https://www.crescentpetroleum.com/wp-content/uploads/downloads/Kurdistan_Gas_Project_Report_Executive_summary.pdf).

5 Simon Webb, “SNAP Analysis: Group Lines up Iraq Kurdistan Gas for Europe,” Reuters, May 17, 2009, <https://www.reuters.com/article/us-iraq-kurds-nabucco-snapanalysis-idUSTRE54G0OI20090517>. The sequence of events that developed into the hype surrounding the gas exports is as follows.

- In early 2007, Dana Gas acquired exclusive rights to appraise, develop, produce, market, and sell hydrocarbons from the KRI's Khor Mor and Chemchemical fields in a heads of agreement (HOA) (section IV) with the KRG. Later in the year, Dana, with the approval of the KRG, assigned a 50-percent interest in the HoA to Crescent Petroleum. <https://jusmundi.com/en/document/decision/en-dana-gas-crescent-petroleum-and-pearl-petroleum-v-the-kurdistan-regional-government-of-iraq-partial-final-award-tuesday-30th-june-2015>.
- In 2009, the companies formed the Pearl Petroleum consortium, with each holding a 50-percent equity stake. Crescent Petroleum and Dana Gas operate the fields as operator on behalf of Pearl. “Operations KRI,” Dana Gas, last visited September 29, 2022, <https://www.danagas.com/operations/kri/kri-2/>.
- In May 2009, Austria's OMV and Hungary's MOL Group each acquired a 10-percent equity stake in Pearl Petroleum from Dana Gas and Crescent Petroleum, whose stakes dropped to 40 percent each.
- OMV and MOL were two of the founders of the Nabucco consortium, which aimed to lessen Europe's dependence on Russian gas. This added a strategic significance to their investment in Pearl Petroleum.
- Both OMV and MOL expected the consortium to invest up to \$8 billion to increase production of 0.9 bcma (87 mmscfd) from Khor Mor to about 30 bcma (2,900 mmscfd) by 2014–2015. Interestingly, Nabucco's proposed capacity was 30 bcma.
- It was expected that half of the production, or 15 bcma (1,450 mmscfd), would be exported.
- Germany's RWE became a shareholder of the Nabucco consortium in 2008. In 2009, RWE acquired a 10% equity stake in Pearl Petroleum from Dana Gas and Crescent Petroleum, whose stakes dropped to 35% each. “Kurdistan Gas Project: A Ten-Year Look Back and Look Ahead,” PricewaterhouseCoopers, 2019, <https://www.crescentpetroleum.com/wp-content/uploads/2019/01/KRI-Impact-Assessment-Report.pdf>.

6 The KRG's Ministry of Natural Resources (MNR) estimated that domestic demand would be about 16 bcma by 2015, based on expectations of increased electricity demand from the conversion of diesel power generation to gas power generation, and for continued industrial demand for gas. However, this demand did not materialize, primarily due to the KRI's severe economic crisis precipitated by the loss of its share of the federal budget in 2014 because of the KRG's independent oil exports, the Islamic State of Iraq and al-Sham (ISIS) invasion and the fall of Mosul in June 2014, and a subsequent fall in oil prices. By 2017, the KRI's domestic demand had declined to about 8 bcma, and the conversion from diesel power generation to gas itself was delayed. Robin Mills, “A Rocky Road: Kurdish, Oil & Independence,” Iraq Energy Institute, February 19, 2018, 44, [https://www.qamarenergy.com/sites/default/files/A%20Rocky%20Road\\_%20Kurdish%20Oil%20and%20Independence.pdf](https://www.qamarenergy.com/sites/default/files/A%20Rocky%20Road_%20Kurdish%20Oil%20and%20Independence.pdf); Figure 5, p18.

Data on dependence on Russian based gas are from Tatiana Mitrova and Tim Boersma, “The Impact of US LNG on Russian Export Policy,” Columbia University School of International and Public Affairs, December 2018, [https://www.researchgate.net/publication/329950542\\_The\\_impact\\_of\\_US\\_LNG\\_on\\_Russian\\_export\\_policy](https://www.researchgate.net/publication/329950542_The_impact_of_US_LNG_on_Russian_export_policy). The data are ultimately based on data from Gazprom. However, the full definition of what constitutes Europe might differ from that used in BP's “Statistical Review of World Energy.”

7 Daniel Freifeld, “The Great Pipeline Opera,” *Foreign Policy*, August 22, 2009, <https://foreignpolicy.com/2009/08/22/the-great-pipeline-opera/>; Simon Pirani, Jonathan Stern, and Katja Yafimava, “The Russo-Ukrainian gas dispute of January 2009: A Comprehensive Assessment,” Oxford Institute for Energy Studies, February, 2009, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2010/11/NG27-TheRussoUkrainianGasDisputeofJanuary2009AComprehensiveAssessment-JonathanSternSimonPiraniKatjaYafimava-2009.pdf>.

Note: The Nabucco Pipeline project, first planned in 2002, aimed to lessen Europe's and Turkey's dependence on Russian gas exports. The aim was for Nabucco to be supplied by gas from Middle Eastern (primarily Iraq and Iran) and Caspian (primarily Azerbaijan) gas fields across Turkey, and into Europe through Bulgaria. The pipeline's planned capacity of 30 bcma would not have replaced their imports of Russian gas, which were 134 bcma in 2002, but would have helped diversify Europe's and Turkey's sources of gas.

Pearl Petroleum, and the KRG over the terms of the agreement to develop Khor Mor and Chemchemical, in which Pearl Petroleum initially sought damages of more than \$2 billion to cover overdue payments by late 2013.<sup>8</sup> The conflict and arbitration put a hold on further developments at Khor Mor, while Chemchemical was not developed. The KRG and Pearl Petroleum reached a settlement by the summer of 2017, as part of the KRG's resolution of its obligations to international oil companies (IOCs) operating in the KRI before the KRG's independence referendum in September 2017.<sup>9</sup>

The hype over gas exports was sustained by the 2013 finalization of a framework agreement for an energy deal involving the KRG and Turkey.<sup>10</sup> The agreement envisioned gas exports, primarily from the KRI's Miran and Bina Bawi fields, starting with 4 bcma in 2017, rising to 10 bcma by 2018–2020, and eventually to 20 bcma.<sup>11</sup> Soon after, Turkey's state-owned company BOTAS began the construction process for a gas pipeline on the Turkish side with a capacity of 16–20 bcma, which would connect at the border with a pipeline to be constructed by the KRG on its side of the border.<sup>12</sup> However, the fields were never developed because of a combination of a lack of financing for the significant development costs—mostly due to the lack of follow through by the Turkish side on a fully

termed sales contract that could have underpinned financing—the technical challenges of processing sour gas, and the build-up of overdue payments to the fields' operator, Genel Energy, a situation made worse by the 2014 collapse of oil prices.<sup>13</sup>

A crucial factor contributing to the failure to develop Miran, Bina Bawi, and Chemchemical, and to complete the full development of Khor Mor, was the KRI's lack of sufficient infrastructure—i.e., its lack of gas-processing plants and pipeline infrastructure.<sup>14</sup> A solution to the lack of pipeline infrastructure came in the form of a deal the KRG signed with Russia's Rosneft in September 2017 to expand the region's gas-pipeline infrastructure for \$1 billion.<sup>15</sup> The plans were for the construction in 2019 of a 30-bcma-capacity pipeline that would initially satisfy the KRI's domestic needs, after which exports to Turkey and Europe were planned to start in 2020. The line's capacity could have supplied 6 percent of European and Turkish gas imports of 472 bcm, of which Russian gas accounted for 35 percent, or 166 bcm, in 2016.<sup>16</sup> At the time, Rosneft was expected to be involved in the development of the Miran and Bina Bawi fields either through providing financing and/or partnering with Genel Energy (the operator of the fields), which would form the anchor fields for gas exports through the pipelines.<sup>17</sup> More

8 Highlights of the settlement of the arbitration case, as well as related subsequent cases between Pearl Petroleum and the KRG, are at: Tabaqchali, "Statehood in the Kurdistan Region of Iraq through an Economic Lens," 13 (footnote 29).

Full details of the arbitration, the initial terms of agreement for developing Khor Mor and Chemchemical are at: "Dana Gas and Others v. Kurdistan Region of Iraq. (1) Pearl Petroleum Company Limited; (2) Dana Gas PJSC; (3) Crescent Petroleum Company International Limited v. The Kurdistan Regional Government of Iraq, LCIA Case No. 132527," <https://jsumundi.com/en/document/decision/en-dana-gas-crescent-petroleum-and-pearl-petroleum-v-the-kurdistan-regional-government-of-iraq-partial-final-award-tuesday-30th-june-2015>.

Note: The story below provides further granularity to the dispute, which might be relevant to the termination of Genel Energy's license to develop Miran and Bina Bawi. Several industry officials in Kurdistan, who suggested that Khor Mor and Chemchemical were marketed to other IOCs and potential buyers, including BG Group, Chevron, and the Turkish Energy Company. Moreover, Khor Mor and Chemchemical gained strategic interests as a source of gas for the ongoing discussions between the KRG and Turkey that ultimately led to the framework agreement between the two. Patrick Osgood, "Dana Gas Takes Kurdistan to Court," *Iraq Oil Report*, October 22, 2013, <https://www.iraqoilreport.com/news/dana-gas-takes-kurdistan-court-11432/>.

9 For background to the KRG's obligations to IOCs (mostly from overdue payments of about \$1.8 billion to DNO ASA, Genel Energy, and Gulf Keystone), and the details of the resolution of these obligations before the September 2017 referendum, see: 11–13: Tabaqchali, "Statehood in the Kurdistan Region of Iraq through an Economic Lens," 11–13. "KRG Gets Creative in Bid to Boost Investor Confidence," MEES, September 1, 2017, <https://www.mees.com/2017/9/1/oil-gas/kr-gets-creative-in-bid-to-boost-investor-confidence/94b100a0-8f00-11e7-ab38-f774ebab244d>.

10 Emre Peker, "Kurds Forge a Risky Oil Deal with Turkey," *Wall Street Journal*, December 2, 2013, <https://www.wsj.com/articles/SB10001424052702304854804579234293171045128>; Humeysra Pamuk and Orhan Coskun, "Exclusive: Turkey, Iraqi Kurdistan Clinch Major Energy Pipeline Deals," Reuters, December 6, 2013, <https://www.reuters.com/article/us-turkey-iraq-kurdistan/exclusive-turkey-iraqi-kurdistan-clinch-major-energy-pipeline-deals-idUSBRE9A50HR20131106>.

However, *Iraq Oil Report* reported that the agreement is not a bilateral agreement between the KRG and Turkey, but a commercial agreement with the likely counterpart to the KRG being the state pipeline company BOTAS or its newly acquired subsidiary, Turkish Petroleum International Joint Stock Company (TPIC). For details into the agreement and counter parties see: Ben van Heuvelen and staff, "Turkey, Kurdistan Advance Energy Ties," *Iraq Oil Report*, March 29, 2013, <https://www.iraqoilreport.com/news/turkey-kurdistan-advance-energy-ties-10512>.

11 Pareto Securities initiation of research coverage of Genel Energy October 28, 2014 <https://paretosec.com>; Mills, "A Rocky Road: Kurdish, Oil & Independence," 43; "KRG Plans 10 bcm in Natural Gas Exports to Turkey in Two Years," *Hurriyet Daily News*, November 20, 2015, <https://www.hurriyetdailynews.com/kr-g-plans-10-bcm-in-natural-gas-exports-to-turkey-in-two-years-91471>.

12 For details of the plans for gas infrastructure, and other related issues, see: Ben van Heuvelen, "New Gas Pipeline Reinforces Turkey-KRG Ties," *Iraq Oil Report*, October 6, 2013, <https://www.iraqoilreport.com/news/hold-5-11375/>.

13 See footnote 9 on the KRG's obligations to IOCs including Genel Energy.

14 Natural gas from the wellhead in a gas field needs processing to remove water and impurities before it can be transported by pipeline to end markets.

15 Dmitry Zhdannikov, "Russia's Rosneft Clinches Gas Pipeline Deal with Iraq's Kurdistan," Reuters, October 18, 2017, <https://www.reuters.com/article-us-kurdistan-rosneft-idUSKCN1BT0MQ>.

16 "Statistical Review of World Energy 2016," BP, 2016, <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>.

17 Rosneft signed an agreement with KRG in May 2018, to study the gas pipeline construction and operation in order for Rosneft to evaluate its participation in the integrated gas business value chain of the region  
Dmitry Zhdannikov, "Rosneft Boosts Clout in Iraqi Kurdistan with Gas Pipeline Deal," *Reuters*, May 25, 2018, <https://www.reuters.com/article/Rosneft-kurdistan-idUSL5N1SW28W>.

gas was expected to come from increased production at Khor Mor and the development of Chemchemical, following the KRG's settlement with Pearl Petroleum a few weeks earlier. Rosneft was also expected to play a major part in the emergence of the KRI as a significant source of gas exports for Turkey and Europe that would lessen their dependence on Russian gas.<sup>18</sup> However, Rosneft's purchasing 30 percent of Egypt's giant gas field Zohr for more than \$1 billion within weeks of signing the KRI pipeline agreement suggested that its motive could have been to establish Russian influence or control over the supply of alternative sources to its own gas exports to Europe and Turkey—and, in the processes, preserve the importance of Russian exports for Europe and Turkey.<sup>19</sup>

Thereafter, the prospects for the KRI to become a gas exporter dimmed and the hype deflated, with no further

development of Miran and Bina Bawi, the KRI's export-pipeline infrastructure, or Rosneft's role in the development of the KRI's gas sector.

The resurrection of the search for alternatives to Russian gas following the February 2022 invasion of Ukraine revived interest in the KRI's gas-export potential, prompted by earlier signs of change in the KRI's gas sector. The first was in December 2021, when the KRG's Ministry of Natural Resources (MNR) officially terminated Genel Energy's license to develop Miran and Bina Bawi after informing it of its intention earlier in the summer; the second was news that the MNR had signed a contract to expand the capacity and reach of the KRI's limited pipeline infrastructure.<sup>20</sup> While the two developments were coincidental, they gave rise to speculation that they were related to plans for gas exports to Europe and Turkey, and that Rosneft was somehow involved.<sup>21</sup>

18 Ben Lando and Ben van Heuvelen, "Kurdistan Gets Russian Vote of Confidence," *Iraq Oil Report*, September 19, 2017, <https://www.iraqoilreport.com/news/kurdistan-gets-russian-vote-confidence-25460/>.

19 The developments for Zohr gas field were to satisfy the domestic Egyptian market. However, the fact that BP started gas production in Egypt's West Nile Delta earlier in 2017 suggested that a surplus of gas might develop in the future, raising the prospect of Egyptian gas exports. Nadia Rodova, "Rosneft Closes \$1.1 Bil Deal to Buy 30% Stake in Egypt's Zohr Natural Gas Field from Eni," *S&P Global Commodity Insights*, October 9, 2017, <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/100917-rosneft-closes-11-bil-deal-to-buy-30-stake-in-egypts-zohr-natural-gas-field-from-eni>; "West Nile Delta Gas Project," NS Energy, last visited September 29, 2022, <https://www.nsenergybusiness.com/projects/west-nile-delta-gas-project/>.

Ahmed Tabaqchali, "Rosneft in the Kurdish Region: Moscow's Balancing Act," *Iraq in Context*, November 7, 2017, <https://www.iraq-businessnews.com/2017/11/07/rosneft-in-the-kurdish-region-moscows-balancing-act/>.

20 "Termination of Miran and Bina Bawi PSCs," KRI Ministry of Natural Resources, press release, December 12, 2021, <https://gov.krd/mnr-en/activities/news-and-press-releases/2021/december/termination-of-miran-and-bina-bawi-pscs/>. The termination of the license occurred in December 2021; however, it was expected much earlier. For details on the termination, and related issues, see: Kate Dourian and staff, "KRG Serves Genel with Notice to Terminate Two Gas Contracts," *Iraq Oil Report*, August 20, 2021, <https://www.iraqoilreport.com/news/krg-serves-genel-with-notice-to-terminate-two-gas-contracts-43992/>; Ben van Heuvelen, "Looming Arbitration Highlights Kurdistan's Gas Strategy Woes," *Iraq Oil Report*, December 15, 2021, <https://www.iraqoilreport.com/news/looming-arbitration-highlights-kurdistans-gas-strategy-woes-44286/>.

The news of the expansion and extension of the pipeline network was reported by *Iraq Oil Report* in February 2022. The story indicated the contract was signed in December 2021, and that work had already begun. Ben Van Heuvelen, et al., "KRG Extends Gas Pipeline Network, Raising Potential for Exports," *Iraq Oil Report*, February 3, 2022, <https://www.iraqoilreport.com/news/krg-extends-gas-pipeline-network-raising-potential-for-exports-44418/>.

21 The pipeline's planned capacity expansion (see map in chart 1, and comments), and proximity of the extension to the Turkish border (35 kilometers away) suggested that it would easily link with the pipeline at the Turkish side, and have enough capacity to support both domestic needs and exports. Thus, its ultimate utility was for gas exports. There was no mention of Rosneft's role in the story about the pipeline network (footnote 20), yet industry sources indicated that this follows the 2017 deal, which, with the termination of Genel Energy's license to develop Miran and Bina Bawi, could suggest that Rosneft might be involved in both the fields' development and the pipeline infrastructure—either directly, or indirectly through providing the finance for the project. However, IOR (footnote 20) notes that according to multiple industry officials and KRG officials that KAR Group (the operator of the Khurmala Dome, and joint operator with Rosneft of the Kurdistan Pipeline Company (KPC), which transports the oil through the KRI to the Iraq-Turkey border), is the contractor for the pipeline. Moreover, the likely expiry in the summer of 2022 of the 2017 Rosneft-KRG deal (below) might have played a factor in the timing of both events in December 2021. Research update based on a call with Dana Gas' chief executive officer (CEO) confirming the *Iraq Oil Report* on the pipeline (footnote 20) that work on the pipeline has commenced, and that it follows the agreement that Rosneft signed with the KRI in 2017. Nikolas Stefanou, "Kurdistan's Gas Pipeline: No Longer a Pipedream?" Renaissance Capital, February 9, 2022. This speculation finds similarities between the unexpected termination of Genel Energy's license and reports that the dispute with Pearl Petroleum in 2013 was linked to the desire to replace them as an operator of Khor Mor and Chemchemical (see footnote 8).

Qamar Energy notes: "The terms in the framework agreement for the natural gas pipeline between Rosneft and the MNR are unclear, but it is understood that the agreement expires in summer 2022." See: "A Report into the Natural Gas Sector in the Iraq Kurdistan Region," Qamar Energy, September 18, 2021, <https://www.qamarenergy.com/sites/default/files/Qamar%20Energy%20-%20The%20Natural%20Gas%20Sector%20in%20the%20Iraq%20Kurdistan%20Region%20-%20September%202021.pdf>.



## The KRI's Gas Reserves

**O**n its website, the KRG's Ministry of Natural Resources (MNR) says, "The Kurdistan Region could hold as much as 200 trillion cubic feet (5.67 trillion cubic meters) of natural gas reserves, around 3% of the world's total reserves. This positions Kurdistan for a prominent role in regional and global gas markets."<sup>22</sup> This potential, however, is mostly undiscovered gas resources that have been neither explored nor evaluated.<sup>23</sup> In contrast, the greater certainty is in what the industry terms "proved reserves."<sup>24</sup> For the KRI, these currently total about 25 trillion cubic feet (tcf), representing 20 percent of Iraq's proved gas reserves of 124.6 tcf at the end of 2021, which represent 1.9 percent of the world's proved reserves—which means the KRI's proved reserves are less than 0.4 percent of the world's proved reserves.<sup>25</sup>

A promising feature of the KRI's gas reserves is the fact that most of them are in all-gas fields. This so-called "free gas" or "non-associated gas" is distinct from natural gas produced as a by-product of wells that produce a mix of oil and gas.<sup>26</sup> The crucial difference is that production of associated gas is complicated by the logistics and economics of oil production. Development of non-associated gas fields, however, can be managed with a more straightforward process, determined by its own logistics and economics.

In addition to its proved gas reserves, the KRG holds additional reserves whose quantities are less certain. These are sometimes called probable or contingent reserves. As of the end of 2020, they amount to 34.6 tcf in the fields in table 1, below.

The development of these gas reserves—both associated and non-associated, into marketable gas for domestic use or for exports—is heavily influenced by the KRI's geography, as well as specific factors such as the fields' geology, and the quality and chemistry of the gas that the fields contain.

The KRI's largely mountainous geography adds to the difficulty and cost of developing its reserves, and to building the pipeline infrastructure needed to transport the produced gas to end markets, which are somewhat mitigated by the region's proximity to Turkey and Turkey's gas infrastructure and pipelines to Europe. Geologically, most of the KRI's fields are "fractured carbonates," which have proven much more challenging to understand and develop than initially expected.<sup>27</sup> While, chemically, most of the gas from KRI fields is "sour gas," i.e., gas that has a high percentage of poisonous and corrosive hydrogen sulphide. Special processing and metallurgy are required to deal with high

22 "Gas," Ministry of Natural Resources, last visited September 29, 2022, <https://gov.krd/mnr-en/publications/gas/>.

23 Large volumes of natural gas are classified as undiscovered—or unproved—technically recoverable resources (TRR). Undiscovered TRR are expected to exist because the geologic settings are favorable, despite the uncertainty of their specific locations. Undiscovered TRR are also assumed to be producible over time using existing recovery technology." "Natural Gas Explained," US Energy Information Agency, last visited September 29, 2022, <https://www.eia.gov/energyexplained/natural-gas/how-much-gas-is-left.php>.

24 Some key definition of hydrocarbon reserves follow. "Oil (and/or Gas) Reserve Definitions," BP, last visited September 29, 2022, <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2021-oil-reserve-definitions.pdf>.

- Proved reserves: Although there is no single, universally accepted technical definition of proved reserves, the most widely agreed upon is "those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions." A probability cutoff of 90 percent is often used to define proved reserves, meaning that the proved reserves of a field are defined as that volume with a 90 percent chance of being produced over the lifetime of the field.
- Probable reserves: Probable reserves have been variously designated as "indicated" or 2P reserves, the latter referring to reserves that are estimated to have a better than 50-percent chance of being technically and economically producible.
- Contingent resources: Contingent resources are those quantities of petroleum that are estimated, on a given date, to be potentially recoverable from known accumulations, but that are not currently considered commercially recoverable.

Note: the phrase "from a given date forward," could change as the field is developed, and is producing; the phrases "technical" and "commercial/ly" means that these reserve estimates would increase or decrease depending on the emergence of new technologies and prevailing natural-gas prices.

25 "KRG Bans Gas Flaring: Minister," *Rudaw*, August 21, 2021, <https://www.rudaw.net/english/interview/210820211>; Mills, "A Rocky Road," 29; "Statistical Review of World Energy 2021."

26 "What is Natural Gas?" EK Interactive, last visited September 29, 2022, <https://ektinteractive.com/what-is-natural-gas/>.

27 There are two main rock types/formations that can act as hydrocarbon reservoirs: clastic (sandstones) and carbonate (limestone and dolomite) rocks. A reservoir is defined as being "fractured" only if a network of fracturing is distributed throughout the reservoir, with a significant effect on hydrocarbon flow and storage. Both clastic and carbonate reservoirs can possess a fractured system, but the carbonate reservoirs are more significantly influenced by their presence. In fractured carbonates, gas in the fractures flows out easily, whereas the gas in the pores of the matrix rock comes out more slowly, with a higher percentage remaining locked in the rock than occurs in more homogenous, non-fractured carbonate rock formations. Crucially, exploiting the fractures leads to high initial yields, yet overly aggressive levels of production would drain the oil in the fractures, and result in higher water flooding, which would make the oil inaccessible and lead to lower recovery of oil in place. The disappointments in the Taq Taq field are a case in point. These explanations are based on Stefanou, "Kurdistan Region of Iraq O&G" and comments by Thomas S. Warrick, nonresident senior fellow, Scowcroft Middle East Security Initiative, Atlantic Council.

**Table 1: The KRI’s Gas Reserves\***

Field	Gas Reserve Type			Gas Reserve Status		
	Associated TCF	Non-associated TCF	Combined TCF	Developed TCF	To Be Developed TCF	Combined TCF
Khurmala Dome	3.60		3.60	3.60		3.60
Kurdamir	2.30		2.30		2.30	2.30
Pulkhana	1.80		1.80		1.80	1.80
Shaikan	0.03		0.03	0.03		
Bina Bawi		4.90	4.90		4.90	4.90
Chemchemical		6.60	6.60		6.60	6.60
Khor Mor		9.40	9.40	9.40		9.40
Miran		3.50	3.50		3.50	3.50
Pirmam		0.88	0.88		0.88	0.88
Topkhana		1.60	1.60		1.60	1.60
<b>Sum</b>	<b>7.73</b>	<b>26.88</b>	<b>34.61</b>	<b>13.03</b>	<b>21.58</b>	<b>34.61</b>

\* These data include associated gas reserves from the KRI’s smaller oil-producing fields. Data based on: “A Report into the Natural Gas Sector in the Iraq Kurdistan Region,” 13, table 1. Data on Pulkhana based: Mills, “A Rocky Road,” 30.

concentrations of sulphur. This significantly increases the costs of field development, production, processing, and transportation.<sup>28</sup>

Thus far, only two of the KRI’s field-development plans for producing marketable gas have been commercially viable; these were developed and are producing gas that is marketed and consumed domestically in the KRI, mostly for power generation. The first is non-associated

gas from Khor Mor, whose geology is superior to almost all the other fields in the region, and where the gas is relatively “sweet,” i.e., very low in hydrogen sulphide. The second is associated gas from Khurmala Dome, which, while sour, is a byproduct of oil production at the KRI’s single largest oilfield, which produces one hundred and fifty thousand barrels per day in 2021, and, thus, produces sufficient gas to justify the economics of capturing gas.<sup>29</sup>

Field	Hydrogen Sulfid (ppm) content
Khurmala Dome	72,000
Kurdamir	6,000
Pulkhana	
Shaikan	
Bina Bawi	12,000-20,000
Chemchemical	
Khor Mor	100
Miran	12,000-20,000
Pirmam	180,000
Topkhana	

28 Sour gas contains high levels of hydrogen sulphide (H2S), which renders the gas poisonous and corrosive. It must be chemically treated and removed if present in levels greater than 4–10 parts per million (ppm). The extent of hydrogen sulphide determines the level of costs of gas treatment, and the extent of the need for separate facilities to deal with the sulphur produced as a byproduct of gas treatment. Thus, it ultimately affects the economics of field developments. The levels of hydrogen sulphide of the KRI gas can be seen from the table here, reproduced from “A Report into the Natural Gas Sector in the Iraq Kurdistan Region,” 52–56. “Kurdistan Region of Iraq O&G”.

Note: The division between associated and non-associated fields is not neat. Some fields are mixed gas and oil, some are oil dominated, and some are gas dominated. The non-associated gas in the table refers to fields that are primarily gas, while associated refers both to those that are predominantly oil and those that are mixed.

29 For further information on the Khurmala Dome and Khor Mor, including their background, see: Tabaqchali, “Statehood in the Kurdistan Region of Iraq through an Economic Lens,” footnotes 9 and 11; Kate Dourian, “Kurdistan’s Energy Sector 2021: Year in Review,” *Iraq Oil Report*, January 4, 2022, <https://www.iraqoilreport.com/news/kurdistans-energy-sector-2021-year-in-review-44322/>. Stefanou notes: “Khor Mor’s reservoirs are fractured carbonates, typical of the KRI, but the main reservoirs are Jeribe, Euphrates, and Azkand of Tertiary age (as opposed to the more common Triassic-Jurassic-Cretaceous in most KRI fields), similar to the Kirkuk field, and exhibit significantly better matrix porosity/permeability than older reservoirs in the KRI, offering excellent overall dual porosity/permeability properties.” Stefanou, “Kurdistan Region of Iraq O&G.”

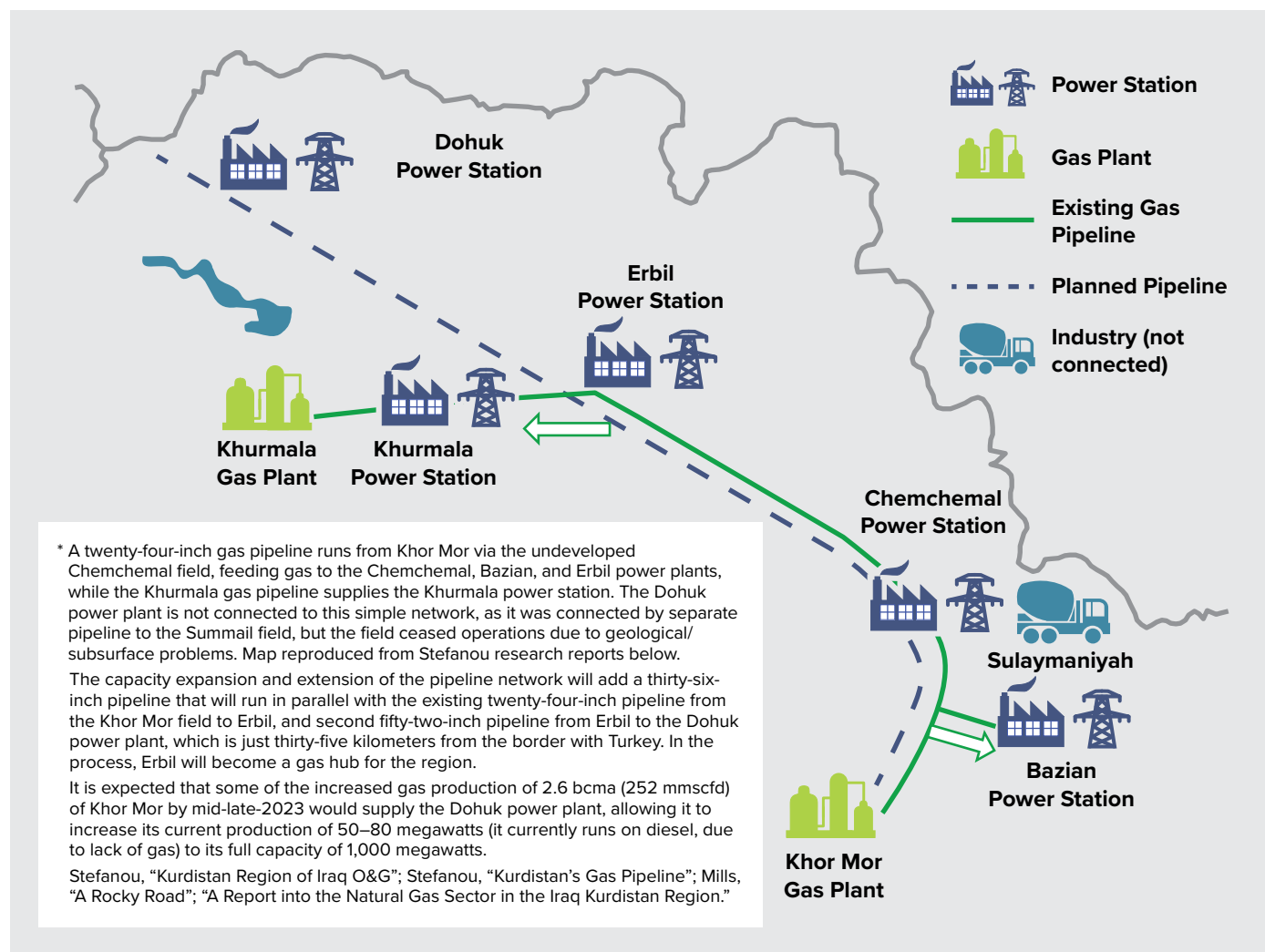
The upshot is the geological profiles of Khor Mor and the Khurmala Dome (which is part of the Kirkuk supergiant field) are superior to those of all the fields in the KRI. Both have much oil- and gas-extraction potential, and/or have been producing consistently for more than a decade with no deterioration in the reservoirs. Ultimately, this results in very attractive development economics, which explains the fields’ successful track records.

## Current Gas Production and Infrastructure

The KRI's current gas production is about 525 mmscfd (5.4 bcma), which is consumed domestically in the KRI, primarily for power generation.<sup>30</sup> This production is made up of 100 mmscfd (1 bcma) of associated gas, through capturing 70 percent of flared gas from oil production at Khurmala Dome, and about 425

mmscfd (4.4 bcma) of non-associated gas from Khor Mor.<sup>31</sup> Increased near-term production will come primarily from Khor Mor, with an increase from 250 mmscfd (2.6 bcma) to 675 mmscfd (7.0 bcma) by mid-late-2023.<sup>32</sup> Additional volumes of gas will likely come from Khurmala Dome, which would be relatively small, as the field's operator, the KAR

Chart 1: KRI's Gas-Pipeline Networks, Power Stations, and Gas-Processing Units.\*



30 All figures are rounded, and so might not add completely.

31 Dana Gas, 35-percent owner of Pearl Petroleum, is a public company and, as such, publishes gas-production figures from Khor Mor. But figures vary on the amount of gas captured and marketed from the Khurmala Dome. Qamar Energy reports that it is producing 87 mmscfd (0.9 bcma), while Stefanou reports a figure of bcma 97–155 mmscfd (1–1.6 bcma). "A Report into the Natural Gas Sector in the Iraq Kurdistan Region"; Stefanou, "Kurdistan Region of Iraq O&G."

32 The expansion is estimated to cost \$630 million, and will be partially financed by the US government's International Development Finance Corporation (DFC). Kate Dourian and Ben van Heuvelen, "Khor Mor Expansion Gets \$250 Million Boost from U.S.," *Iraq Oil Report*, September 8, 2021, <https://www.iraqoilreport.com/news/khor-mor-expansion-gets-250-million-boost-from-u-s-44060/>. However, expansion plans were temporarily suspended in late June, following three rocket or mortar attacks on the field. As such, the mid-2023 timeline would probably extend into late 2023. Mohammed Hussein, et al., "Khor Mor Expansion Suspended after Rocket Attacks," *Iraq Oil Report*, June 28, 2022, <https://www.iraqoilreport.com/news/khor-mor-expansion-suspended-after-rocket-attacks-44943/>.



Khor Mor Gas Plant Infrastructure. *Source:* Crescent Petroleum.

group, increases oil production and captures a higher percentage of flared gas. By mid-late-2023, the KRI's total production of marketable gas will be about 785 mmscfd (8.1 bcma), which will be absorbed domestically, mostly for power generation under a gas-purchase agreement with the KRG.

The majority of the associated gas produced as a by-product from the region's producing oil fields, other than Khurmala Dome, is flared. Only two fields, Tawke and Peshkabir, capture the flared gas—a combined total of less than 9.7 mmscfd (0.1 bcma), which is reinjected into the fields to maintain their pressure.<sup>33</sup> In mid-2021, the MNR mandated that all flared gas should be captured and

reinjected into the fields or sold commercially within eight-months, estimating that the region flared more than 145 mmscfd (1.5 bcma) over the last few years.<sup>34</sup>

The region's gas-pipeline infrastructure is basic, and limited to linking the gas fields to nearby power stations—Chemchemical, Bazian, Erbil, and Khurmala. A planned pipeline expansion would increase the current pipeline network's capacity and extend it to the Dohuk power plant (see map in chart 1). Equally limited are the small number and capacity of gas-processing units, with each of the producing fields containing a gas-processing facility dedicated for the gas produced from the field.<sup>35</sup>

33 Gas produced at Tawke and Peshkabir fields is captured and reinjected into the reservoir to maintain pressure. Most IOCs that are producing oil in the KRI have plans for dealing with the gas that is currently flared. Plans vary between gas reinjection, desulphurisation (given that most of the gas produced has a high percentage of hydrogen sulphide), sale and onsite consumption displacing diesel-powered generators for the field's operations. However, the issue faced by operators in deciding on a particular plan are the costs for gathering, processing, and desulphurising the gas versus the returns from selling the gas. The issues of gas reinjection are equally complex depending on the geology of the field and whether the field has a "gas cap" at the top of the oil-bearing reservoir rock.

All of these solutions for the associated gas have a bearing on the economics of producing the oil, and thus on increasing oil-production plans.

Renaissance Capital notes, based on data provided by GulfKeystone, that the cost estimates for gas-program management if the planned oil production for the Shikhan field (operated by GulfKeystone) increases by a further 75,000 bpd are \$275–375 million. This cost would reduce the total return from selling just the increased oil. Shaikhan oil production for the first half of 2022 averaged about 45,000 bpd. Gas produced at Sarqala is earmarked for a power station to be built nearby.

Lizzie Porter and Rawz Tahir, "Kurdistan Gives Oil Companies 18-Month Deadline to End Gas Flaring," *Iraq Oil Report*, July 29, 2021, <https://www.iraqoilreport.com/news/kurdistan-gives-oil-companies-18-month-deadline-to-end-gas-flaring-43931/>;

Nikolas Stefanou, "Regional Updates—Hopes up for Kurdistan's Gas?" Renaissance Capital, July 13, 2021; David Round, "Gulf Keystone Petroleum Ltd: Operations Update; Production Not Supported by New Wells," Stifel, June 24, 2022, <https://stifelinstitutional.com/capabilities/investment-banking/industry-coverage/energy-natural-resources/>.

34 Porter and Tahir, "Kurdistan Gives Oil Companies 18-Month Deadline to End Gas Flaring"; "KRG Bans Gas Flaring: Minister."

35 Khor Mor has a gas-processing facility in the field, while Khurmala has a gas-gathering pipe network, and a gas-processing facility at the field.

## The Pathways to Gas Exports

The capacity expansion and extension of the pipeline network in the KRI, the likely linkage with the Turkish pipeline, and Turkey's status as a gas-transit route to Europe would certainly enable the export of 16–20 bcma of KRI gas to Turkey and Europe. However, this potential is contingent on the KRI increasing gas production significantly beyond the current 5.4 bcma to satisfy current unmet and future local KRI demand, in order to reach the target.

The KRI gas fields have the potential for a significant increase in current gas production for the region, to generate meaningful gas exports by 2030, and to achieve significant peak exports by 2040. However, this potential production increase is highly dependent on a number of key requirements that, thus far, have not gone beyond the aspirational stage.<sup>36</sup> The most important requirement is securing financing, which would need to be anchored by a sales agreement for the purchase of the produced gas (for both domestic and foreign markets) at prices that would be economically feasible for both the producers and consumers of the gas. Such prices would be largely dependent on the end markets and the associated transportation costs—tariff charges made by the pipeline operators—for the exported gas.<sup>37</sup>

Overhanging this prospect is that the investment plans of IOCs in the region have changed dramatically over the past few years. IOCs have achieved a better understanding of the KRI's geology following a number of subsurface disappointments, such as overestimation of both the amount of resources contained within the fields and the percentage of oil and gas that can be recovered from them.<sup>38</sup> In combination with the financing challenges specific to the IOCs operating in the KRI and managing their counter-party exposure with the KRG, the IOCs' investment and development plans have become much more conservative in recent years.<sup>39</sup> Effectively, this means that securing gas-sales agreements in advance is essential before IOCs will embark on any development plans. Moreover, any such developments would be phased in over a number of years to spread out the investment costs and risks, manage the KRG counter-party exposure, and adjust field-development plans either upward or downward according to the field performance after production starts.

All of these factors affect the economics of the infrastructure investments required to expand the KRI's gas fields. Thus, future production timelines, shown in table 2, are highly dependent on these factors.

36 "It is important to note at the outset of this study that getting the conditions exactly right will be exceedingly difficult and achieving this level of production growth is very challenging." "A Report into the Natural Gas Sector in the Iraq Kurdistan Region."

37 For a comprehensive review of each of these challenges, the complexities of execution, and recommended solutions, see the base case presented in Ibid.

38 The challenges of understanding the KRI's geology, in particular its fractured carbonate reservoirs, were evident in the early days of KRI's oil and gas development. On several occasions, reserves downgrades were made from previously overly optimistic estimates. Some major downgrades were as follows.

- In 2014, an audit of the Shaikhan field, initially billed as the largest super giant oilfields discovered in the last fifty years, lowered estimates of gross oil in place (OIP) to 9.4 billion barrels of oil equivalents (boe) from 13.7 billion boe, and the recovery potential to 12 percent from 16 percent—in other words, an effective cut of reserves to 1.1 bn boe from 2.2 bn boe.
- In 2015, reserves estimates at the Barda Rash field were reduced to 250 million boe from 1.2 billion boe.
- In 2016, reserves at the Tawke field were cut to 242 million boe from 264 million boe.
- In 2016, reserves at the Akri-Bijeel, initially estimated at 43 million boe, were reassessed after disappointing tests and the field was relinquished.
- In 2017 reserves at the Taq Taq field were lowered to 59 mn barrels of oil equivalents (boe), following a prior downgrade in 2016 to 172 mn boe from an initial estimate of 499 mbope.
- Finally, the Summail gas field ceased operation after a promising start.

Sources: Nick Fletcher, "Gulf Keystone Slides after Audit of Its Iraq Reserves," *Guardian*, March 13, 2014, <https://www.theguardian.com/business/marketforceslive/2014/mar/13/gulf-keystone-petroleum-reserves-estimates>; Michael Kavanagh, "Afren Plunges amid Kurdistan Write-Down," *Financial Times*, January 12, 2015, <https://www.ft.com/content/b2b55bb0-9a79-11e4-8426-00144feabdc0>; "Mol Relinquishes Iraqi Block," *Argus*, January 11, 2016; "Taq Taq Throws a Spotlight on KRG's Future," *Argus Media*, March 29, 2017, <https://www.argusmedia.com/en/news/1432338-taq-taq-throws-a-spotlight-on-krgs-future>; Robin Mills, "Genel Energy Another Victim of Kurdish Geology," *National*, April 16, 2017, <https://www.thenationalnews.com/business/genel-energy-another-victim-of-kurdish-geology-1.21278>.

Note: A common problem with fractured carbonate reservoirs worldwide is that, in many cases, initial estimates are volumetric and tend to be based on assumptions of high recovery factors; however, subsequent lower reserve estimates are based on a recognition that actual recovery factors are lower than initial estimates. Moreover, improved recovery techniques can often recover most of the oil that the volumetric calculations indicate (i.e., meet initial high estimates), yet the costs tend to be higher, and their viability is dependent on the prevailing oil-price environment.

39 Stephano notes that most of the IOCs operating the KRI (with the exception of Pearl Petroleum and its shareholders) have restricted access to finances, with limited access to bank lending, and so resort to the expensive Nordic bond market in order to raise debt at interest rates of 8–12 percent at a time when global interest rates were much lower. This expensive financing, in turn, affects the economics of developing the gas fields, and thus the IOCs development plans. Stefanou, "Kurdistan Region of Iraq O&G."

For the issue of receivables due to the IOCs pre-2017, see: Tabaqchali, "Statehood in the Kurdistan Region of Iraq through an Economic Lens," 11–13.

For the recurring issue of receivables, see: Jamie Ingram, "As Momentum Returns to KRG Oil Sector, Repayment Change Highlight Challenges," MEES, May 14, 2021, <https://www.mees.com/2021/5/14/economics-finance/as-momentum-returns-to-krg-oil-sector-repayment-change-highlight-challenges/b5c48d70-b4b1-11eb-89df-cfa3ef513654>. Kate Dourian, Ben Lando, and staff, "Oil Companies Say KRG Payment Slow-Down Puts New Investment at Risk," *Iraq Oil Report*, May 22, 2021.

**Table 2: Projected Near-Term Production and Theoretical Future Production\***

Field	2022*		2023		2025		2030		2040	
	MMSCFD	BCM	MMSCFD	BCM	MMSCFD	BCM	MMSCFD	BCM	MMSCFD	BCM
Khurmala Dome	100	1.0	110	1.1	115	1.2	115	1.2	70	0.7
Kurdamir							115	1.2	230	2.4
Pulkhana							45	0.5	180	1.9
Shaikan							65	0.7	125	1.3
Bina Bawi							250	2.6	600	6.2
Chemchemical					100	1.0	350	3.6	600	6.2
Khor Mor	425	4.4	675	7.0	925	9.6	915	9.5	915	9.5
Miran							90	0.9	575	5.9
Pirmam							25	0.3	88	0.9
Topkhana							40	0.4	160	1.7
<b>Total</b>	<b>525</b>	<b>5.4</b>	<b>785</b>	<b>8.1</b>	<b>1,140</b>	<b>11.8</b>	<b>2,010</b>	<b>20.8</b>	<b>3,543</b>	<b>36.6</b>
<b>Domestic Demand</b>	<b>1,103</b>	<b>11.4</b>	<b>1,103</b>	<b>11.4</b>	<b>1,248</b>	<b>12.9</b>	<b>1,485</b>	<b>15.4</b>	<b>2,043</b>	<b>21.1</b>
<b>Available for Exports</b>							<b>525</b>	<b>5.4</b>	<b>1,500</b>	<b>15.5</b>

\* Associated gas fields are separated from non-associated gas fields. This assumes 2022 figures are mostly in line with those as of the end of 2021. Figures and timeline are based on: “A Report into the Natural Gas Sector in the Iraq Kurdistan Region,” 59–60. Note that Qamar Energy sees production of 22.6 bcm in 2030, and 42.4 bcm in 2040.

The most likely production increase by 2025 would come from a further capacity expansion of Khor Mor, and additional associated-gas production from the Khurmala Dome in line with higher oil production and a higher percentage of the flared gas being captured for sale. Specifically, Khor Mor’s operator, Pearl Petroleum, is evaluating a second production increase of 250 mmscfd (2.6 bcma) by 2024–2025, assuming that financing is secured and anchored by a gas purchase agreement. In combination with incremental gains from Khurmala Dome, this would increase the KRI’s gas production to 1,140 mmscfd (11.8 bcma), which would likely still be absorbed by domestic demand that is expected to reach 1,248 mmscfd (12.9 bcma).

The field most likely to add significantly to gas production is Chemchemical, which is near Khor Mor and is also managed by Pearl Petroleum. While Chemchemical’s geological characteristics are less promising than those of Khor Mor, Chemchemical’s development would be aided by its proximity to the same gas infrastructure that supports Khor Mor, and by Pearl Petroleum’s experience operating in the

region. However, Chemchemical will require a number of years to reach its full production potential, most likely starting at 100 mmscfd (1 bcma) by 2025–2030, then increasing in 250-mmscfd (2.6 bcma) increments to its ultimate potential production of 600 mmscfd (6.2 bcma) by 2040. Development costs of Chemchemical would likely be around \$1.4 billion.<sup>40</sup>

Initial development of the other non-developed gas fields and capturing of flared gas from current and future producing oil fields would likely increase total KRG gas production to 2,010 mmscfd (20.8) by 2030.<sup>41</sup> That would more than satisfy increased domestic demand in the KRI, estimated at 1,485 mmscfd (15.4 bcma), and allow for exports of 525 mmscfd (5.4 bcma)—although exports could start in smaller, yet increasing, amounts a few years earlier.

The KRI’s gas production, both associated and non-associated, could reach a plateau of 3,543 mmscfd (36.6 bcma) by 2040, of which 2,043 mmscfd (21.1 bcma) will be absorbed by local demand in the KRI. Within the mix,

40 These estimates were based on a scenario that assumes Chemchemical’s development would mirror that of Khor Mor. Nikolas Stefanou, “Dana Gas: The Long Game—Upgrade to BUY”, Renaissance Capital, February 28, 2022.

41 This assumes non-operated fields secure IOCs as operators or existing operators develop the associated oil fields. Moreover, increasing production of associated gas would be highly dependent on the costs of capturing and treating the sour gas produced. As such, these additional costs are assumed not to affect plans for increasing oil output. The dynamics of developing Miran and Bina Bawi are discussed fully in the next section.



Amedi in Dohuk Governorate, Kurdistan Region of Iraq. Source: Levi Clancy/[https://commons.wikimedia.org/wiki/File:Amedi\\_in\\_Dohuk\\_Governorate,\\_Kurdistan\\_Region\\_of\\_Iraq\\_02.jpg](https://commons.wikimedia.org/wiki/File:Amedi_in_Dohuk_Governorate,_Kurdistan_Region_of_Iraq_02.jpg).

two field clusters would dominate gas production, and are key to the commercial viability of gas exports: Khor Mor and Chemchemal, both managed by Pearl Petroleum, with a combined gas output potential of 1,515 mmscfd (15.7 bcma), or 43 percent of total peak potential production; and Miran and Bina Bawi, without an operator since December 2021 after the termination of Genel Energy's license, with a combined gas output potential of 1,170

mmscfd (12.1 bcma), or 33 percent of total peak potential production.

With potential gas production of 3,543 mmscfd (36.6 bcma) by 2040, of which 1,500 mmscfd (15.5 bcma) would be available for export, the KRI could become a major regional gas player, and a meaningful supplier of gas to Europe and Turkey.

## Hurdles to Overcome



A man works at Khor Mor gas plant in Iraqi Kurdistan region. *Source:* Crescent Petroleum.

**T**he changed world order following the invasion of Ukraine, and the medium-term outlook for sustained high gas prices as a result, has fundamentally altered the dynamics and the economics that held back the full development of the KRI's gas reserves. The addition of strategic and security dimensions to these dynamics and economics could certainly accelerate the KRI's gas-reserve development and reduce the risks associated with project finance. As such—and unlike in the case of the prior hype—the current hope for significantly expanded production is grounded in both experience and realism. Even so, hurdles, some significant and some less so, need to be overcome.

The three most significant hurdles are: the impact of the Federal Supreme Court (FSC) ruling on the unconstitu-

tionality of the Kurdistan Region of Iraq's Oil and Gas Law (KOGL), which may prove to be the most consequential; the dynamics of the development of Miran and Bina Bawi; and Rosneft's possible role in the planned expansion and extension of the pipeline network in the KRI, and in the development of Miran and Bina Bawi.<sup>42</sup>

### The Constitutionality of KRG Decisions on Oil and Gas Licensing

The legal and legislative framework governing the production of oil and gas in the KRI was upended in mid-February 2022 by Iraq's FSC's ruling that the KOGL is unconstitutional, and thus void.<sup>43</sup> Crucially, the ruling—irrespective of the debate on its timing, and on the politicization and constitutional status of the FSC—removes the ambiguity in

42 For a review of the other hurdles, see: Kate Dourian, "Internal Squabbles, Legal Challenges, and Muddled Policy Impede Kurdish Gas Exports," Arab Gulf States Institute, May 18, 2022, <https://agsiw.org/internal-squabbles-legal-challenges-and-muddled-policy-impede-kurdish-gas-exports/>; Mohammed Hussein, Rawaz Tahir, and Ben van Heuvelen, "Gas Pipeline Stalled by Intra-Kurdish Political Rifts," *Iraq Oil Report*, May 11, 2022, <https://www.iraqoilreport.com/news/gas-pipeline-stalled-by-intra-kurdish-political-rifts-44826/>; Amina Ismail and Maha El Dahan, "Analysis: Kurdish Tensions Stymie Iraqi Region's Gas Export Ambitions," Reuters, June 13, 2022, <https://www.reuters.com/business/energy/kurdish-tensions-stymie-iraqi-regions-gas-export-ambitions-2022-06-13/>.

Developments in Turkey's relationship with the KRG could present another hurdle.

- For a review of the complex relationship between Turkey and the KRG, and how that affects the relationship with Iraq, see: John M. Robert, "Turkey and the KRI: Strained Energy Relations," *Transatlantic Policy Quarterly*, November 27, 2018, <http://turkishpolicy.com/article/937/turkey-and-the-kurdistan-region-of-iraq-strained-energy-relations>.
- The FSC ruling will likely have a bearing on the expected conclusion of Iraq's eight-year-old arbitration case against Turkey and BOTAS. One possible implication of the ruling—that the KRG might not be the holder of the legal title to the oil it sells—could bolster Iraq's case that Turkey and BOTAS have breached their obligations under the Iraq-Turkey Pipeline (ITP) Agreement in enabling the export of the KRG oil. Thus, a ruling in Iraq's favor against Turkey would complicate either above point, or could create new hurdles. For a review of arbitration: Lizzie Porter, et al., "Iraq-Turkey Arbitration Ruling Nears, with Kurdistan's Oil Independence in the Balance," *Iraq Oil Report*, July 11, 2022, <https://www.iraqoilreport.com/news/iraq-turkey-arbitration-ruling-nears-with-kurdistans-oil-independence-in-the-balance-44981/>.
  - It should be noted that the Iraq-Turkey arbitration case concerns the export of oil over the Iraq-Turkey (oil) pipeline agreement and, as such, has no direct bearing on gas (as Iraq does not have a treaty with Turkey concerning the exports of gas). However, just as for the oil the KRG sells, the possible implication that the KRG might not be the holder of the legal title to the gas that it plans to sell and export, means Turkey and BOTAS would face another arbitration with Iraq concerning the export of such gas.
- Finally, a provision in the KRG's energy deal with BOTAS transfers the liability of any legal sanctions arising from the oil trade to the KRG, and not to BOTAS, which suggests that any compensation claimed by the GoI against Turkey and BOTAS would be transferred to the KRG. Fehim Tastekin, "Erdogan Not Giving up on Gas from Iraqi Kurdistan," *Al-Monitor*, February 22, 2022, <https://www.al-monitor.com/originals/2022/02/erdogan-not-giving-gas-iraqi-kurdistan>.

43 "Iraqi Supreme Court Casts Doubt over Legitimacy of Kurdistan's Oil and Gas Sector," Norton Rose Fulbright, March 2022, <https://www.nortonrosefulbright.com/en/knowledge/publications/0af5e6a5/iraqi-supreme-court-casts-doubt-over-legitimacy-of-kurdistans-oil-and-gas-sector>. "Iraqi Supreme Court Strikes Down KRG Oil Sector Independence," *Iraq Oil Report*, February 15, 2022, <https://www.iraqoilreport.com/news/iraqi-supreme-court-strikes-down-krg-oil-sector-independence-44500/>.



the country's 2005 constitution regarding the relative roles of the federal government and the federation's constituent governments (i.e., the KRG or producing governorates) over the development of oil and gas resources.<sup>44</sup>

Domestically, the ruling is unlikely to affect the current operations of IOCs, including international oil and gas service providers that operate in the KRI under contracts signed with the KRG prior to the FSC ruling. Essentially, this is due

to the independence that the KRG enjoys in managing the KRI, the FSC's limited remit in the region, and the fact that most of these IOCs are focused solely on the KRI, with no operations in the rest of Iraq.<sup>45</sup> However, the ruling will negatively affect the future production profile of these IOCs, as a number of oil service providers, whose services the IOCs need to maintain and grow production, have already complied with the ruling by not entering into future oil service contracts with the KRG.<sup>46</sup>

44 The ambiguity in the constitution over the development of the country's oil and gas resources is rooted in the different visions of the nature of federalism that is enshrined in the constitution. Ahmed Tabaqchali, Hamzeh al-Shadeedi, and Sarwar Abdullah, "Breaking the Impasse: The Baghdad-Erbil Budget Divide," Institute of Regional and International Studies, May 2021, 4–5, <https://auis.edu.krd/iris/sites/default/files/20210516-IER2-Final.pdf>.

The timing of the FSC ruling raised issues of political interference in the judiciary, and in particular the FSC, as the ruling came in the middle of a tortuous government formation process; and over two years after the FSC's prior bench said it was suspending the case indefinitely until both sides re-affirm their desire to pursue the case. The KRG argued that the decision is unconstitutional and infringes on the constitutional powers of the KRG in administering the KRI; and has since questioned the constitutionality of the court arguing that the FSC is unconstitutional in that it is not the same entity mandated by the constitution, and as such does not have the authority to interpret the constitution. This argument was further made by the Judicial Council of the Kurdistan Region of Iraq, which asserted that KOGL does not violate the Iraqi Constitution and therefore should be recognized as standing laws.

<https://www.iraqoilreport.com/news/iraqi-supreme-court-strikes-down-krq-oil-sector-independence-44500/>

<https://www.iraqoilreport.com/news/uncertainty-deepens-after-landmark-ruling-against-kurdistan-oil-sector-44651/>

Statement of the Judicial Council of the Kurdistan Region of Iraq No. 1511, 30 May 2022. <https://gov.krd/dmi-en/activities/news-and-press-releases/2022/june/statement-from-the-judicial-council-of-the-kurdistan-region-of-iraq/>

It should be noted that the current FSC was founded by law no. (30) of 2005, before the constitution came to existence. The 2005 constitution mandated creating a Federal Supreme Court (FSC), to replace the one created earlier, by law to be legislated by parliament. However, this never happened, and the original FSC continued to operate under law (30) of 2005, with its powers grandfathered in.

A view on the constitutionality of the FSC is provided by an article by the President of Supreme Judicial Council, Dr. Faiq Zidan, on 2021 04, that goes over the history of FSC, and argues that parliament's legislation of the amendment to law no. (30) of 2005—law 25 for 2021—has addressed the issues of its constitutionality and gave it the powers of the FSC that was mandated by the constitution.

<https://www.iraqfsc.iq/news.4771/>. In English translation

<https://www.iraqfsc.iq/news.4663/> Original Arabic version

45 The FSC ruling gives the federal Ministry of Oil (MoO) the right to alter or abrogate all oil and gas contracts concluded between the KRG and IOCs operating in the KRI. In June, the MoO, acting on this right, initiated legal action against seven IOCs operating in the KRI; the court declared that four of the seven contracts with KRG were void, and is reviewing the other three. The MoO has then initiated legal action against another two IOCs, while the KRG has appealed the ruling against the four IOCs.

There is a legal view that Iraq could have contractual liabilities if it decided to breach the KRG's oil and gas contracts signed before the FSC's ruling coming into force in mid-February 2022, and, thus, could face claims of significant liabilities by IOCs should they decide to file claims against the GoI in international jurisdictions. "Recent Iraqi Supreme Court Decision Likely to Trigger Investment Arbitration Claims," Gibson Dunn, June 17, 2022, [https://www.gibsondunn.com/recent-iraqi-supreme-court-decision-likely-to-trigger-investment-arbitration-claims/#\\_ftnref3](https://www.gibsondunn.com/recent-iraqi-supreme-court-decision-likely-to-trigger-investment-arbitration-claims/#_ftnref3).

Ben van Heuvelen, et al., "Baghdad Launches Legal Action Against Kurdistan's Oil Companies," *Iraq Oil Report*, June 2, 2022, <https://www.iraqoilreport.com/news/baghdad-launches-legal-action-against-kurdistan-oil-companies-44874/>; Lizzie Porter, et al., "Baghdad Court Declares Four KRG Oil Contracts Void," *Iraq Oil Report*, July 4, 2022, <https://www.iraqoilreport.com/news/baghdad-court-declares-four-krq-oil-contracts-void-44967/>; "Oil Ministry Puts Gazprom, Dana Gas in Legal Crosshairs," *Iraq Oil Report*, August 9, 2022, <https://www.iraqoilreport.com/news/oil-ministry-puts-gazprom-dana-gas-in-legal-crosshairs-45054/>; "Kurdistan Appeals Baghdad Ruling against IOCs," *Iraq Oil Report*, August 23, 2022, <https://www.iraqoilreport.com/news/kurdistan-appeals-baghdad-ruling-against-iocs-45097/>.

The perceived legal foundation under which IOCs signed contracts with the KRG, before the FSC ruling came to effect, was based on: the KRG is a constituent subdivision of Iraq according to the Iraqi constitution; the KRI's parliament in 2007 legislated the Oil and Gas law of the Kurdistan Region of Iraq (KOGL), under which the KRG signed contracts with the IOCs; the KRG, in 2008, sought and received an expert legal opinion from a professor of international law, that concluded that KOGL was consistent with the Iraqi constitution; the KRG's contracts with IOCs stipulated that the contracts, including all disputes, are solely governed by English law. Moreover, this perceived legal foundation further in 2021 benefited from: a precedent set in England in 2021, in a case involving disputes over two oil and gas contracts signed by the KRG, the High Court of Justice in England, ruled that in terms of oil and gas contracts, the acts by the KRG "were done in exercise of the sovereign authority of the state of Iraq."

However, negating this foundation: the GoI has, from the outset, as early as 2005 declared, and continued to declare, that all such contracts were illegal, and all IOCs that signed such contracts were aware of this view; the GoI informed companies that they would be blacklisted from dealing with the GoI if they were to sign any contract with the KRG without its approval. And as such: the GoI could argue that the FSC has affirmed its views, and as such the KRG is liable for any damages that IOCs might seek as it acts to implement the FSC's ruling. These points might be relevant if the MoO decides to initiate legal proceedings against the IOCs, and oil-service providers operating in the KRI, in international jurisdictions. This is based on discussions with Zaid Al-Ali, a specialist in international commercial arbitration and comparative constitutional law.

Complicating matters further is the implicit acceptance of the KRG's oil production in Iraqi budget laws. Indirect acceptance in pre-2021 budgets laws that the KRG was required to hand over the production 250,000 bpd to the State Oil Marketing Organization (SOMO) as part of its obligations in return for its share of the federal budget, and direct acceptance in the 2021 budget law in which the KRG is required to hand over the revenues from the sales/exports of 250,000 bpd, and pay production and transportation costs (i.e. IOCs and pipeline operators) from the proceeds of sales/exports above 250,000 bpd as part of its obligations in return for its share of the federal budget. For budget laws before 2021, see: Ahmed Tabaqchali, "The Debate over of the KRG's Share of the Federal Budget," Al Bayan Centre, June 22, 2019, <https://www.bayancenter.org/en/2019/06/1940/>. For the 2021 budget law, see: Tabaqchali, et al., "Breaking the Impasse."

46 In June, three US oil services companies, in separate communications with the federal Ministry of Oil, declared that they would not enter into any contracts for projects managed by the KRG, but did not address any prior (i.e., currently active) contracts that were signed. Lizzie Porter and Kate Dourian, "Halliburton Pledges to Obey Blacklist Policy against KRG Oil Sector," June 29, 2022, <https://www.iraqoilreport.com/news/halliburton-pledges-to-obey-blacklist-policy-against-krq-oil-sector-44954/>. In September, other oil service providers followed suit. Lizzie Porter, "Weatherford pledges to obey Baghdad's blacklist and exit Kurdistan", *Iraq Oil Report*, September 19, 2022. <https://www.iraqoilreport.com/news/weatherford-pledges-to-obey-baghdads-blacklist-and-exit-kurdistan-45146/>

By declaring the KOGI unconstitutional, the ruling will have repercussions for all IOCs, including international oil and gas service providers contemplating signing new oil and gas development contracts with the KRG, and would act as a strong deterrent for any future contract awards.<sup>47</sup> Finally, the ruling will likely have legal repercussions in international jurisdictions for the buyers and transporters of any exported gas.<sup>48</sup> This could lead to buyers demanding lower prices for the gas paid to the KRG, and higher transportation costs charged to compensate for the legal risk of dealing with the KRG going forward.<sup>49</sup>

Consequently, the FSC ruling raises the political risk of any gas-development plans in the KRI, and thereby reduces the likely availability of financing options for projects in the KRI. This will alter, perhaps considerably, the economics of gas-field development in the KRI. The first likely decision to be affected will be the preliminary final expansion plans of Khor Mor for 250 mmscfd (2.6 bcma) of increased gas production by 2025, followed by 600 mmscfd (6.2 bcma) of gas production from Chemchemal, and the 658 mmscfd (6.8 bcma) of future gas production at Kurdamir, Pirmam, Pulkhana, and Topkhana. But the FSC decision is unlikely to affect the associated gas produced from the current

oil-producing fields—Shaikhah's 125 mmscfd (1.3 bcma) or Khurmala's 115 mmscfd (1.2 bcma).<sup>50</sup> Finally—and importantly, given the termination of Genel Energy's license in December 2021—the development of Miran and Bina Bawi would need an IOC to sign a new contract with the KRG, which, in turn, will affect the KRG's plans to add 1,170 mmscfd (12.1 bcma) of potential gas production.<sup>51</sup> Ultimately, these uncertainties will affect more than 75 percent of the KRI's potential gas production, and will change the whole economics of gas-development and pipeline infrastructure in the KRI.

### Genel Energy's Pending Arbitration Claim

Ever since Miran and Bina Bawi were discovered in 2008, they have had the potential to transform the economics of gas exports.<sup>52</sup> However, Genel Energy, which had the license to develop the fields, failed over the years to overcome the challenges associated with their development.<sup>53</sup> The first challenge was to find financing for the fields' development—estimated at the time at \$5.4 billion.<sup>54</sup> The second challenge was finding additional financing for treating the sulphur that would be produced as a by-product of the fields' sour gas.<sup>55</sup> Any future plans for the fields'

47 Unlike the case of contracts signed before the FSC's ruling, the legal uncertainty or ambiguity about the constitutionality of KOGI is mostly removed from the case of contracts to be signed after the ruling. Moreover, the FSC's ruling will likely override any international expert legal opinion on the Iraqi constitution, given the Iraqi parliament's legislation in 2021 of the amendment to law no. (30) of 2005—the legislation that amended the powers of the FSC (footnote 44). Thus, any IOC, including international oil and gas service providers, entering into an oil and gas contract with the KRG should be on notice of the FSC ruling.

48 The legal risks and liabilities to buyers and transporters of the gas come from a possible implication of the FSC ruling, which is that the KRG might not be the holder of the legal title to the gas that it might sell, then the KRG cannot sell the gas to the buyers, who in turn have no ownership to the gas that they buy. "Iraqi Supreme Court Casts Doubt over Legitimacy of Kurdistan's Oil and Gas Sector." In late August 2022, the MoO, acting through Iraq's State Oil Marketing Organization (SOMO), informed oil traders and other crude buyers that Iraq is planning to take "firm legal action...against all parties involved, in order to block loadings of those unlawful cargoes originating from Iraq including but not limited to those from Kurdistan Region." Ben van Heuvelen and Ben Lando, "Baghdad Issues New Legal Threats to Block Kurdistan Exports," *Iraq Oil Report*, August 25, 2022, <https://www.iraqoilreport.com/news/Baghdad-issues-new-legal-threats-to-block-kurdistan-exports-45102/>.

Finally, all of the potential gas-export routes would go through Turkey. As such, Iraq's arbitration case against Turkey over the Iraq-Turkey Pipeline (ITP) agreement could have significant impact on the whole possibility of exports. While the ITP does not involve gas, the expected conclusion of the lawsuit in Iraq's favor might impact Turkey's decision concerning allowing gas exports through its territory. Lizzie Porter, et al., "Iraq-Turkey Arbitration Ruling Nears, with Kurdistan's Oil Independence in the Balance."

49 Prior to the FSC ruling, the prices that the KRG received for exported crude were impacted by the legal ambiguity in the constitution over the development of the oil and gas, and the resultant conflict between the KRG and Gol. This is expressed in the differentials between Brent crude (Europe Brent Spot Price FOB as provided the EIA) and the prices that the KRG received, in which the differentials were between \$10.04–12.80 in 2017–2021. While crude quality differentials between KRI oil and Brent crude account for part of this differential, a portion is due to the risk associated with buying the KRG's oil. Data from Deloitte reports on the KRG's oil exports for 2017, 2018, 2019, 2020, and 2021. There are tentative signs, from SOMO, EIA, and the Deloitte report for first half of 2022 that the FSC ruling had an effect on oil prices received by the KRG by increasing their price differential to Brent in March-June 2022, however, the analysis is complicated by oil market dislocations following the invasion of Ukraine, and more data from Deloitte reports for 2022 would be needed to get a clear picture. Ahmed Tabachchali, Twitter, October 20, 2022. <https://twitter.com/AMTabaqchali/status/1583777492460253186?s=20&t=MmGkKuv8lC7Z75EYnb9jvQ>.

50 These are determined by the interplay between the logistics of oil production (including any plans to increase production) and the MNR's mandate that flaring of gas must end.

51 The production profile of these fields would still be affected if the KRG and Genel Energy reach a settlement in the pending arbitration case, as this development would still need financing.

52 The combined future gas-production profile of Khor Mor and Chemchemal is meaningfully larger than that of Miran and Bina Bawi, and is sufficient on its own right to pin exports, yet the addition of Miran and Bina Bawi would add critical mass to the whole export profile—and thus, ultimately, to the whole economics of building the gas-export network.

53 Genel Energy's management was optimistic on the commercialization of the two fields and their potential production. Energy Year, "TOGY 2015 Atlantic Economic and Energy Summit," YouTube video, June 7, 2016, <https://www.youtube.com/watch?v=wEjiZ934vk4>.

54 These were made up of \$1 billion in upfront investment in the fields, \$1.9 billion in investments over the lifetime of the fields, and \$2.5 billion for the construction of gas-processing facilities at each of fields. Francisco Velasco, "Genel: Attractive Risk-Reward: Buy," Exotix Partners, August 24, 2016, <https://tellimer.com>. Exotix Partners has been rebranded as Tellimer Insights. "KRG Bans Gas Flaring: Minister."

55 See footnote 28 for a full discussion of the issues with sour gas and concentration at hydrogen sulphide, and "KRG Bans Gas Flaring: Minister," *Rudaw*, August 21, 2021, <https://www.rudaw.net/english/interview/21082021>.

development will need to contend with the complications arising from Genel Energy's upcoming compensation claim against the MNR, estimated at more than \$1.4 billion, for the termination of Genel's license.<sup>56</sup>

### What Role, if Any, for Rosneft?

On the back of its 2017 agreement with the KRG, Rosneft's possible role in the KRI's pipeline network, and in the development of Miran and Bina Bawi, represents a difficult hurdle to address given that neither the KRG nor Rosneft has provided the details of the agreement—as well as the complications associated with international sanctions against Russia, and the opaque nature of Rosneft's relationship with the Russian Federation.

Rosneft's transformation from its 1993 founding as a state-owned entity to one of the cornerstones of the Russian state's reasserting control of the strategically important sectors of the economy, such as energy, coincided with the emergence of the current Russian leadership in 2000. Rosneft has used its international energy resources as an extension of Russia's foreign policy, extending and supporting Russia's role in the global economy. However, this international role for Rosneft—in line with those of other national oil companies (NOCs)—is also company driven to increase and diversify its oil and gas assets beyond Russia.<sup>57</sup>

Rosneft's role in the KRI's oil and gas sector, with investments amounting to about \$5 billion—starting with the initial provisioning of \$1.5 billion in loans to the KRG in the form of forward oil sales in early 2017, and ending with the late 2017 deal to develop the KRI's gas pipeline infrastructure for \$1 billion—arguably exists for commercial reasons to expand the company's assets in an attractive

region in the world.<sup>58</sup> However, a more likely explanation is that Rosneft was acting to exert influence or control over the supply of alternative sources to Russian gas for Europe and Turkey. Its role as an extension of Russian foreign policy would be both relevant and powerful, given that, in the current European context, the quest for alternative sources of gas imports goes beyond the existing need to diversify supply sources, to include both security and strategic dimensions that would have long-term negative consequences for Russian gas exports to Europe. As such, if Rosneft is involved in the expansion and extension of the KRI's pipeline network, then it can play a critical part in preventing the export of such gas—most likely by using the control of the pipelines, similarly to Gazprom's control of Nord Stream 1, to exert pressure to support Russia's foreign policy in its conflict with Europe over the invasion of Ukraine.<sup>59</sup>

Irrespective of how this possible role plays out, Rosneft—and, by extension, Russia—would benefit commercially from its possible involvement, as the 2017 agreement with the KRG stipulated that Rosneft would fund and build the KRI gas-pipeline network for an estimated \$1 billion, and would recoup its investment from fees for operating the pipeline and long-term tariff payments.<sup>60</sup> While oil-pipeline tariffs are not comparable to gas-pipeline tariffs. Nevertheless, the extent of this commercial opportunity can be inferred from Rosneft's October 2017 investment, estimated at \$1.8 billion, in the capacity expansion of the KRI oil pipeline.<sup>61</sup> Data from Deloitte reports on the KRG's oil exports for 2019–2021 showed that pipeline tariffs paid to the Kurdistan Pipeline Company (KPC), which is 60 percent owned by Rosneft, for oil transported within the KRI were \$640 million, \$650 million, and \$870 million for 2019, 2020, and 2021 respectively, and an estimated \$320 million for 2022.<sup>62</sup>

56 Ben van Heuvelen, "Looming Arbitration Highlights Kurdistan's Gas Strategy Woes." Genel Energy's investments in the fields over the years are estimated at \$1.4 billion, which would be a part of its compensation. David Round, "Termination of Gas PSCs; Arbitration to Commence," Stifel, December 10, 2022, <https://stifelinstitutional.com/capabilities/investment-banking/industry-coverage/energy-natural-resources/>.

57 James Henderson, "Rosneft—On the Road to Global NOC Status?" Oxford Institute for Energy Studies, January 2012, <https://www.oxfordenergy.org/publications/rosneft-on-the-road-to-global-noc-status-2/>; Edward Chow and Andrew Stanley, "Russia's National Oil Champion Goes Global," Center for Strategic and International Studies, February 22, 2018, <https://www.csis.org/analysis/russias-national-oil-champion-goes-global>; Aldo Ferrari and Eleonora Tafuro Ambrosetti (Eds.), "Russia's Foreign Policy: The Internal-International Links," Institute for International Political Science, May 2021, [https://www.esteri.it/mae/resource/doc/2021/07/ispi\\_russia\\_foreign\\_policy.pdf](https://www.esteri.it/mae/resource/doc/2021/07/ispi_russia_foreign_policy.pdf).

58 Tabaqchali, "Rosneft in the Kurdish Region." The attractiveness of the commercial aspect was highlighted by statements by Rosneft's vice president in late 2017: on the terms offered by the KRG to Rosneft: "The terms that have been offered to us are remarkably value-accretive to Rosneft shareholders."; on the attractiveness of the KRI's assets: "Kurdistan has, in our view, a fairly exciting economic proposition in place. It has very high-quality geological reserve and there are fairly low costs associated with the production." Henry Foy, "Rosneft Commits to Investments in Kurdistan and Venezuela," *Financial Times*, December 20, 2017, <https://www.ft.com/content/c42aa230-e489-11e7-97e2-916d4fbac0da>.

59 "Nord Stream 1: How Russia Is Cutting Gas Supplies to Europe," BBC, September 6, 2022, <https://www.bbc.com/news/world-europe-60131520>.

60 "KRG and Rosneft Deal on Construction of Natural Gas Pipeline, Exports," Ministry of Natural Resources, September 18, 2017, <http://archive.gov.krd/mnr/mnr.krg.org/index.php/en/press-releases/596-kr-and-rosneft-deal-on-construction-of-natural-gas-pipeline,-exports-expected-in-2020.html>; Zhdannikov, "Russia's Rosneft Clinches Gas Pipeline Deal with Iraq's Kurdistan"; Lando and van Heuvelen, "Kurdistan Gets Russian Vote of Confidence."

61 Dmitry Zhdannikov and Vladimir Soldatkin, "Russia's Rosneft to Take Control of Iraqi Kurdish Pipeline amid Crisis," Reuters, October 20, 2017, <https://www.reuters.com/article/us-mideast-crisis-iraq-kurds-rosneft/russias-rosneft-to-take-control-of-iraqi-kurdish-pipeline-amid-crisis-idUSKBN1CP16L>.

62 The Kurdistan Pipeline Company (KPC) is a joint venture owned 60 percent by Rosneft, arising from its \$1.8-billion investment in expanding the pipeline, and 40 percent by the KAR Group (an Iraqi company, based in the KRI, and major player in the region's oil and gas sector). The figures are taken from the Deloitte report on Oil and Gas review in the Iraqi Kurdistan Region for 2019, 2020, and 2021. The estimates for 2022 are based on the Deloitte report for H1/2022. Note: KPC revenue figures cited are rounded to full numbers.



Sulaymaniyah, Kurdistan Region, Iraq. Source: Ahmed Yusuf/<https://www.pexels.com/@ahmedyusuf/>.

Such a commercial opportunity, and its role as an extension of Russia's foreign policy, would be significantly enhanced if Rosneft was involved in the development and commercialization of Miran and Bina Bawi as well.

Ultimately, the commercial opportunity from the extension and expansion of the KRI's pipeline network and the

development of Miran and Bina Bawi would be complicated by how the current sanctions imposed on Russia, and its companies, would affect the flow of revenues to Rosneft—an obstacle that could justify Rosneft withholding gas exports until payments are made, in the same manner as Gazprom has done with payments for gas exports to Europe.<sup>63</sup>

63 Nastassia Astrasheuskaya, et al., "European Gas Prices Soar after Gazprom Halts Supplies to Poland and Bulgaria," *Financial Times*, April 27, 2022, <https://www.ft.com/content/a2eea1a1-f72a-43c4-aa93-4e5477b5ead4>.

## Challenges and Opportunities

*“...It is important to note at the outset of this study that getting the conditions exactly right will be exceedingly difficult and achieving this level of production growth is very challenging.”—Qamar Energy in a report commissioned by the US Department of Energy’s (DOE) Office of International Affairs.<sup>64</sup>*

Securing Europe’s energy security in the wake of the invasion of Ukraine would entail establishing major long-term sources of gas imports, which would significantly reduce its sizable Russian gas imports and, in time, accelerate the development of non-hydrocarbon energy sources. The KRI’s gas-export potential of 15.5 bcma by 2040 is too far into the future to be a factor in the immediate term, given the extensive challenges involved in reaching it and the long-term shift to non-hydrocarbon energy sources—while the promising start of 5.4 bcma in exports by 2030 is small compared to Europe’s 2021 imports of Russian gas (161 bcm, out of total imports of 431 bcm). While marginal initially, 5.4 bcma in exports by 2030—in combination with alternative sources of gas—will play a meaningful role in securing Europe’s long-term energy security.<sup>65</sup> As such, it creates a powerful impetus for Iraq’s international stakeholders to work with the government of Iraq (Gol) and the KRG to overcome the hurdles standing in the way of the KRI’s gas-export potential discussed earlier. However, any solution that does not address the core issue at the heart of the conflict over the development of Iraq’s oil and gas resources will come with compromises that would

eventually unravel and deepen this conflict. Over the years, the deals between the Gol and KRG regarding the KRI’s share of the federal budget avoided addressing these issues.<sup>66</sup> As such, the deals were unworkable, not mutually advantageous, non-enforceable, and, thus, unsustainable, which ultimately entrenched the conflict.

This core issue affecting the future development of the KRI’s potential gas reserves is not merely different interpretations of Articles 111 and 112 of the Iraqi constitution, which relate to the country’s oil and gas development, but a fundamental disagreement about the nature of the federal structure enshrined in the constitution.<sup>67</sup> Essentially, this disagreement is about the balance of power between the constituents of the federation and the federal center. The KRG envisions a loose system in which power and decisions lie with the regions, while the Gol and non-Kurdish parties envision a strong federation in which power and decisions lie with the center. It is this fundamental disagreement that derailed legislation regarding the federal oil and gas law in 2007, and that led to two separate paths for development of oil and gas resources pursued by the Gol and the KRG—and eventually, to the conflict, between the two over this issue.<sup>68</sup>

The confluence of the Ukraine invasion that has prompted Europe to find alternatives to Russian gas and the FSC’s ruling on the unconstitutionality of the KRI’s oil and gas law present an opportunity to resolve the core issue at the conflict over the development of Iraq’s oil and gas resources, and the crucial outstanding issues that stand in

64 “A Report into the Natural Gas Sector in the Iraq Kurdistan Region.”

65 Alternative sources for Russian gas are discussed in detail in: Mike Fulwood, et al., “The EU Plan to Reduce Russian Gas Imports by Two-Thirds by the End of 2022: Practical Realities and Implications,” Oxford Institute for Energy Studies, March 2022, <https://www.oxfordenergy.org/publications/the-eu-plan-to-reduce-russian-gas-imports-by-two-thirds-by-the-end-of-2022-practical-realities-and-implications/>.

66 The author discussed the deals between the Gol and the KRG over the region’s share of the federal budget in detail at: Tabaqchali, “The Debate over of the KRG’s Share of the Federal Budget”; Tabaqchali, et al., “Breaking the Impasse.”

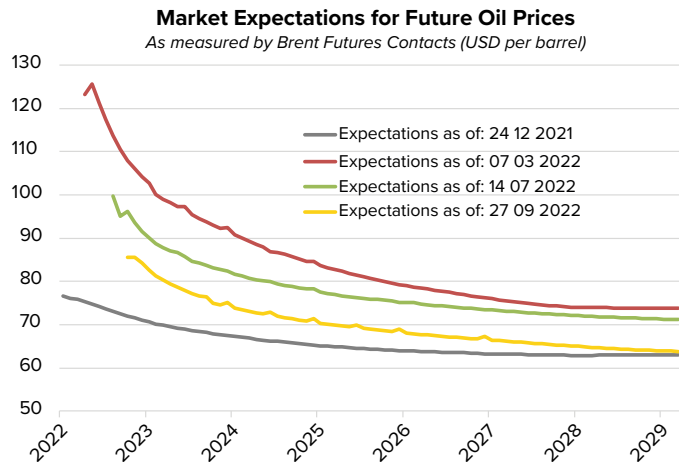
67 The two articles related to the development of oil and gas in the 2005 constitution are as follows.

- Article 111. Public ownership of oil and gas:
  - Oil and gas are owned by all the people of Iraq in all the regions and provinces.
- Article 112. Management of oil and gas
  - 112-1. The federal government, with the producing provinces and regional governments, shall undertake the management of oil and gas extracted from current fields, provided that it distributes its revenues in a fair manner in proportion to the population distribution in all parts of the country, specifying an allotment for a specified period for the damaged regions which were unjustly deprived of them by the former regime, and the regions that were damaged afterwards in a way that ensures balanced development in different areas of the country, and this shall be regulated by a law.
  - 112-2. The federal government, with the producing regional and governorate governments, shall together formulate the necessary strategic policies to develop the oil and gas wealth in a way that achieves the highest benefit to the Iraqi people using the most advanced techniques of the market principles and encouraging investment.

These articles, should be taken into consideration with: Article 110, which defines the areas that are the exclusive powers of the federal government; Article 114, which defines the areas in which power is shared by the federal government and regional authorities; Article 115, which defines the areas that are the exclusive powers of regional authorities, and gives preference to regional authorities in areas defined in Article 114; and Article 121, which gives regional authorities the right to amend national legislation in the regions in the areas not defined in Article 110. Raad Alkadiri, “Federalism and Iraq’s Constitutional Stalemate,” Chatham House, November 2020, <https://www.chathamhouse.org/sites/default/files/2020-11/2020-11-27-iraq-federalism-alkadiri.pdf.pdf>. Tabaqchali et al., “Breaking the Impasse.”

68 The different paths are explored under “The Constitution and the Development of Oil and Gas Resources” in: Tabaqchali, et al., “Breaking the Impasse.”

**Chart 2: Market Expectations for Future Oil Prices**



\* “Brent Oil Futures,” Investing.com, last visited September 29, 2022, <https://www.investing.com/commodities/brent-oil-contracts>; “Brent Crude Oil Continuous Contract,” Wall Street Journal, last visited September 29, 2022, <https://www.wsj.com/market-data/quotes/futures/UK/BRENT%20CRUDE/contracts>.

Note: Market expectations will continue to shift, reflecting developments in world economic growth, oil supply, and demand, as seen from the red, green, and yellow lines that reflect different expectations over the year in responses to developments such as the initial invasion, negative news on world economic growth, or continued hopes for high demand for oil relative to supply. Yet expectations, post-the Ukraine invasion have shifted considerably higher, as can be seen in comparing the red, green, and yellow lines to the grey line reflecting expectations that prevailed at end of 2021.

the way of the country’s development. The most important of these are to find a workable and sustainable formula for the KRI’s share of the federal budget, and how to address Iraq’s need for more gas sources to help it end its power shortages. The path to such a resolution requires acceptance and understanding (so far lacking) by Iraq’s political class, international partners, and stakeholders, of the conundrums that have prevented the resolution of these issues.

The first conundrum is that the KOGL laid the groundwork for the KRI’s emergence as a major oil exporter, yet the conflict with the Gol over the development of oil and gas resources forced upon the KRG a circuitous route, fraught with legal and constitutional uncertainties and risks, for establishing its independent oil exports, which had repercussions for realizing the full potential of these oil-export

revenues. As a consequence, oil-export revenues even in combination with the KRG’s non-oil revenues, have not eliminated the need for continuous support from the federal budget to cover the KRG’s expenditures in managing the KRI. The current high oil-price environment and the medium-term expectations for sustained high oil prices—albeit lower than current prices (chart 2)—enable greater financial independence, but not enough to eliminate the need for federal support. Moreover, market expectations are for decreasing oil prices every year from current levels (chart 2), which suggests that oil-export revenues would also decrease annually, and that the gap between expenditures and revenues would grow wider each year, necessitating greater support from the federal budget.<sup>69</sup> Similar dynamics would likely have similar consequences for gas-export sales.

The second conundrum is that the gap between the KRG’s expenditures and revenues can only be covered by the KRI’s share of the federal budget, which depends on the KRG supplying a significant portion of its oil exports, or their revenues, to the federal government. This, in turn, means that the KRG’s budget shortfall gets larger by the same amount, instead of closing.<sup>70</sup>

The third conundrum is that Iraq’s power shortages will persist into the foreseeable future. Thus, it needs gas imports—in particular, Iranian imports—irrespective of the current efforts to replace Iranian gas or to import electricity from the Gulf Cooperation Council (GCC).<sup>71</sup> This is primarily because demand growth will meaningfully exceed supply growth for the foreseeable future.<sup>72</sup>

A long-term, permanent resolution to all of these conundrums is a federal oil and gas law with a shared vision for the country’s federal structure that works equally for the KRG and the Gol. Such a law should preserve the independence of the KRI’s oil and gas sector, but add a layer of enforceable federal oversight over prices and export routes, which would lead to much higher realized oil and gas export revenues for the KRG, as well as the KRG contributing proportionally to the fulfilment of Iraq’s obligations to the Organization of the Petroleum Exporting Countries (OPEC). This version of oil federalism (i.e., with greater power placed with the regions) should come in parallel with financial federalism (i.e., full realization of independent oil-export revenues by the KRG) to be matched by a meaningfully smaller share of the

69 An upcoming piece by the author will review oil-export revenues, expenditures and other issues. Further details in: Tabaqchali, “The Debate over of the KRG’s Share of the Federal Budget”; Tabaqchali, et al., “Breaking the Impasse.” The path that the KRG followed is discussed in: Tabaqchali, “Statehood in the Kurdistan Region of Iraq through an Economic Lens,” 4–16.

70 See sources in footnote 69.

71 Robert Tollast, “A Power Grid for the Middle East: What Is the GCCIA and Can It Benefit Iraq?” *National*, July 16, 2022, <https://www.thenationalnews.com/mena/iraq/2022/07/16/a-power-grid-for-the-middle-east-what-is-the-gccia-and-can-it-benefit-iraq/>.

72 Ahmed Tabaqchali, “Iraq’s Power Conundrum: How to Secure Reliable Electricity While Achieving Energy Independence,” LSE Middle East Centre, March 24, 2020, <https://blogs.lse.ac.uk/mec/2020/03/24/iraqs-power-conundrum-how-to-secure-reliable-electricity-while-achieving-energy-independence/>.



Expanding Khor Mor gas plant infrastructure. *Source:* Crescent Petroleum.

federal budget.<sup>73</sup> This means that the large gap between the KRG's revenues and expenditures would grow, but could be closed by increased gas production in the KRI, with exports primarily to the rest of Iraq at prices that would make up the difference. Such an end market for the KRI's gas exports would mean that the development of the KRI's gas reserves would be aided by federal underwriting, which would significantly reduce—but not eliminate—the challenges of developing most, but not all, of these resources.

Underpinning this solution is the creation of mutual dependencies: the KRG relying on the Gol for its share of the budget, the Gol relying on the KRG for gas exports to meet the Gol's need for power generation. Such an arrangement might pave the way to building trust between the two sides. However, a solution will not be easy, as Iraq's recent history is littered with agreements and understandings that sacrificed clarity and sustainability for short-term political compromises.

<sup>73</sup> Such a fiscal federalism should include a resolution of a major outstanding conflict over the custom tariffs collected by the KRG, and the KRG's use of a much lower tariff structure than the federal structure. The last public report on the custom tariffs collected by the KRG was made by the World Bank, which is reported within a figure of 2.5 trillion Iraqi dinars in 2013 under "other revenues," which would have included custom tariffs plus fees. The change in the KRG's economic fortunes since the boom years (with the loss of the region's share of the federal budget, economic contractions from two oil price collapses, COVID-19, etc.), as well as the lack of data from the KRG, make it hard to estimate the figure, but it's reasonable to assume that it would amount in 2022 to at least the same figure of 2013, especially considering that all of Turkey's land exports, and a high percentage of Iranian land exports, pass through the KRI to the rest of Iraq. Federal budget laws require effectively 50 percent of these tariffs to be sent to the federal budget, but this has not been done, which adds to the conflict over the KRG's share of the federal budget. Moreover, the lack of federal control, and the lower custom tariffs collected by the KRG, make it very difficult for the federal government to plan, and execute, a strategy for raising non-oil revenues that includes custom tariffs. "Kurdistan Region of Iraq: Economic and Social Impact Assessment of the Syrian Conflict and the ISIS Crisis," World Bank, February 2015, <https://openknowledge.worldbank.org/handle/10986/21597>.

## About the Author

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## Abbreviations/acronyms

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Barrels	bbi	Kurdistan Region of Iraq’s Oil and Gas Law	KOGL
Barrels per day	bpd	Ministry of Natural Resources	MNR
Billion cubic metres	bcm	Ministry of Oil	MoO
Billion cubic metres per annum	bcma	Million standard cubic feet per day	mmscfd
Federal Supreme Court	FSC	Trillion Cubic Feet	tcf
Government of Iraq	Gol	State Oil Marketing Organization	SOMO
Kurdistan Regional Government	KRG		



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