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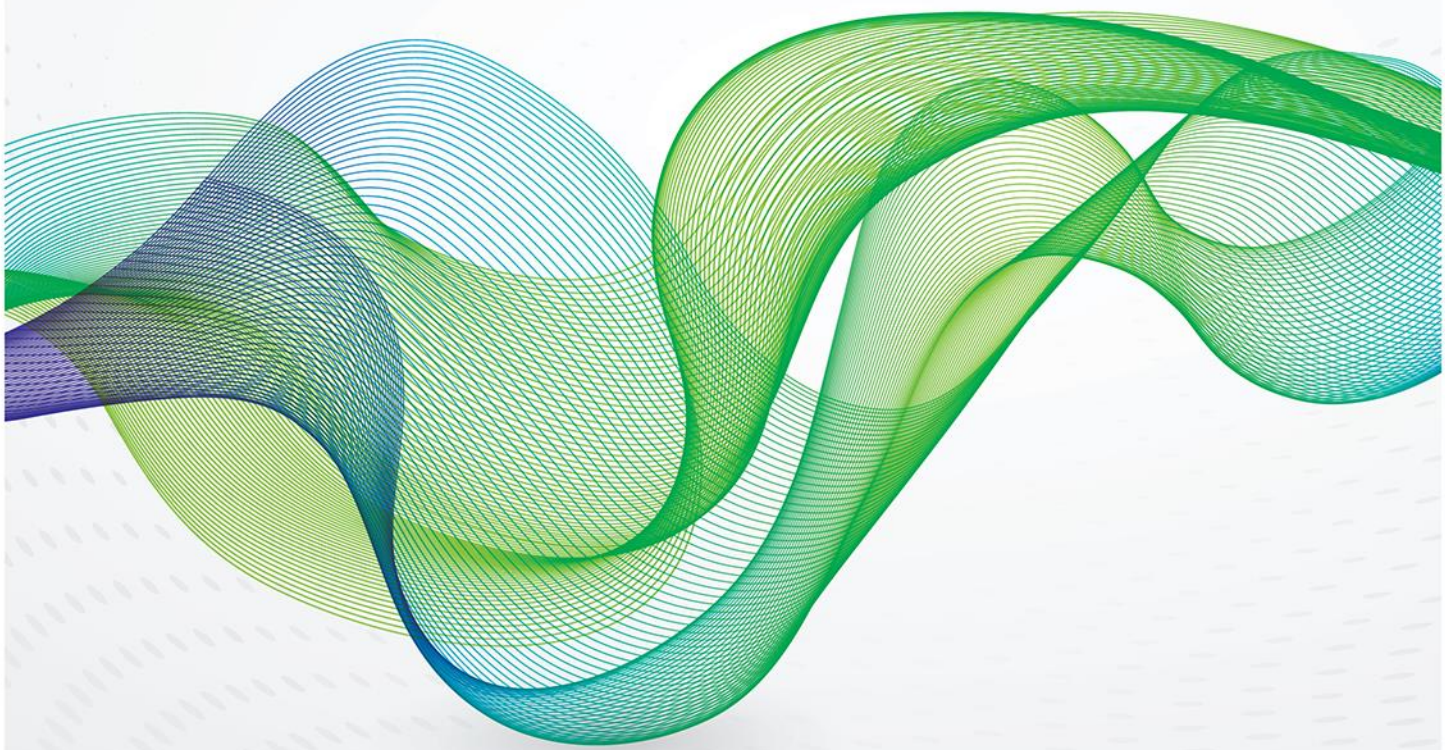
Can Iraqi oil production surprise again on the upside?



OXFORD ENERGY COMMENT

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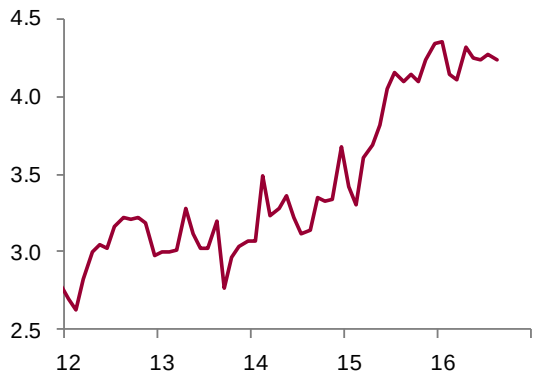
I. Introduction

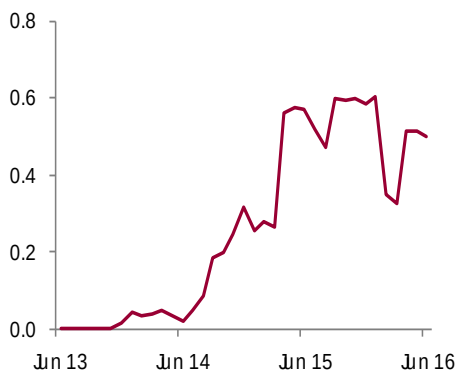
Iraqi oil production outperformed expectations in 2015, after multiple years of disappointing growth. Iraqi production, including output from the semi-autonomous Kurdish region, rose by 0.62 mb/d to above 3.9 mb/d in 2015, the fastest growth since 2004 when Iraq's oil sector was recovering after the US invasion (see Figure 1). The growth was even more impressive at points during 2015 – up by almost 1 mb/d year-on-year (y/y) across July and August 2015. Production controlled by the Kurdistan Regional Government (KRG) also grew strongly in 2015, as independent exports via the Kurdish-controlled pipeline to Turkey ramped up, compensating for the permanent closure of the older Kirkuk–Ceyhan pipeline (see Figure 2). Across the second half of 2015, Iraqi production was higher y/y by an average 0.85 mb/d; that pace of growth has broadly continued into 2016, with January–June y/y growth averaging almost 0.6 mb/d. This performance was all the more surprising given that upstream spending was lower by around one-third – to $13–14 billion in 2015[1] – and that other political and security issues have been plaguing Iraq.

Figure 1: Iraq oil production, mb/d



Source: Energy Aspects

Figure 2: Exports from northern Iraq, mb/d



Source: KRG Ministry of Natural Resources

Given that Iraq was one of the main contributors to oil output growth in 2015, the dynamics within the Iraqi oil sector are key to understanding the global oil market rebalancing process. In this comment, we argue that even though the impressive run of growth has continued into 2016, the prospects are far less positive as we head into 2017, as decline rates will assert themselves amid lower levels of investment and upstream activity. In the medium term, political instability, severe fiscal pressures, and serious delays in key infrastructure projects will constrain Iraq's output growth; the government's revised but still ambitious plan to reach the 6 mb/d output target by 2020 is thus unlikely to be met.[2]

II. Explaining the 2015 oil output increase

Over the last eight years, Iraq has been investing heavily in its upstream sector, but the increase in upstream capacity was not fully translated into higher output. The key factor constraining and delaying Iraqi production growth has been the state of the country's oil infrastructure. The fact that Iraq's infrastructure is aging and in a poor state is hardly surprising after decades of conflict (much of which took place in and around oil fields in the Basra region) and sanctions that prevented access to equipment and expertise for maintenance and improvements. Post-Saddam Iraq has faced huge challenges in extracting and transporting oil to markets – from well drilling and water injection to pipelines and export facilities.

[1] IEA (2016), Oil Market Report, April, Paris: IEA.
[2] Financial Times, 'Iraq struggles to match January's record oil production', 24 May 2016.

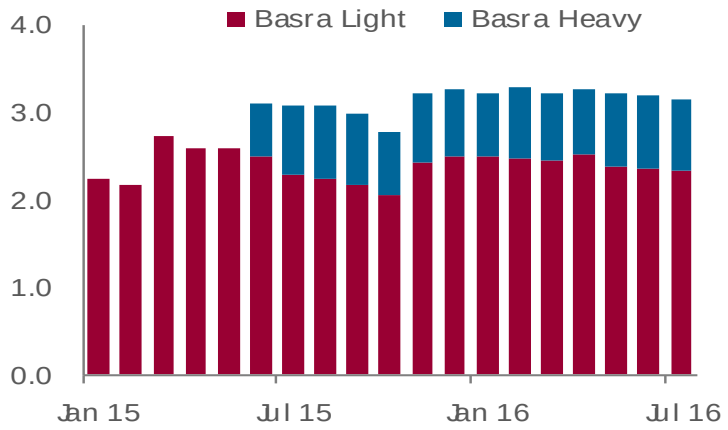
In 2015, some of these infrastructure bottlenecks started to ease. The installation of new single point mooring buoys (SPMs) at the southern Basra terminals in 2014 played an important role in the increase in output in 2015. It laid the foundations for one of the key sources of growth: the launch of the Basra Heavy grade in June 2015 and the associated debottlenecking that allowed various fields to ramp up.[3] Production controlled by the Kurdistan Regional Government (KRG) also grew strongly last year, as independent exports via the Kurdish-controlled pipeline to Turkey ramped up.

The Launch of Basra Heavy

Prior to the launch of the Basra Heavy grade, Iraq was facing increasing quality issues with the Basra Light grade. New and existing fields were increasingly tapping into the heavier Mishrif reservoir,[4] lowering the API of exports, which triggered a discount mechanism within the Basra Light price formula. In response, Baghdad limited output from some fields (such as Lukoil's 0.4 mb/d West Qurna 2) to below capacity to mitigate the quality issues.[5] The 23.5 API Basra Heavy grade provided a solution to these issues, removing the constraints on ramping up production of heavier crude streams and improving the quality of the Basra Light stream, which is now in line with its intended 29.7 API.

Ahead of the introduction of Basra Heavy, there was general belief that several factors would limit the increase in production volumes. These included: aging onshore pumps that were keeping loadings from the SPMs well below the nameplate capacity, the fact that refiners were unfamiliar with the new grade, and also that it was only available in large 2 mb parcels that many would find hard to handle. On all counts Iraq outperformed expectations. Infrastructure debottlenecking allowed all three active SPMs to load both grades, supplied via different pipelines and pumps, significantly boosting capacity (see Figure 3).

Figure 3: Southern exports by crude grade, mb/d



Source: Bloomberg

Baghdad has been able to place a large volume of Basra Heavy in the market, in part because it allocated a large proportion to international oil companies (IOCs) to pay off arrears on technical service contracts (TSCs) related to fields in southern Iraq.[6] This was initially unpopular with the IOCs, which were left with the challenge of finding a home for the cargoes, sometimes selling them on the

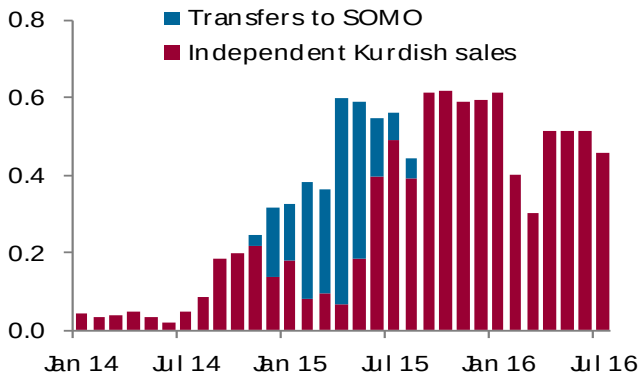
[3] Platts, 'Basrah Heavy crude heads to USGC, pressuring Latin American grades', 23 September 2015.
[4] Three main reservoirs provide the majority of oil for the giant fields in the south of Iraq. Each of the reservoirs has quite different crude oil characteristics. The Zubair reservoir contains light sour crude (API 34–36, sulphur 0.9–4.5%); the Mishrif reservoir is heavier sour crude (API 24–28, sulphur 4%); and the Yamama reservoir is the lightest and is sweet crude (API 37–44, sulphur 0.5%). Several fields draw from more than one of these reservoirs, and as field expansions take place the amounts of crude drawn from each formation will increase at different rates.
[5] The National, 'Blending problems slow Lukoil plan to boost Iraq production', 21 April 2015.
[6] FT, 'Iraq's new crude grade frustrates oil companies in region', 9 July 2015.

spot market at hefty discounts to the official Selling Price (OSP). The IOCs therefore pressed Baghdad to cut the official prices to better reflect market appetites for the grade. These adjustments were eventually made and the spread to Basra Light widened by around $1 per barrel; this helped, as did the fact that the new grade gradually became more accepted amongst refineries in Asia and other markets. At the end of the day, IOCs would rather receive payment in this form than have the arrears build up further, especially given the parlous state of Iraqi finances. All in all, the launch of Basra Heavy was integral to the substantial uplift in southern Iraqi production, which rose y/y by over 0.4 mb/d in 2015 according to official figures.

Kurdish exports increased

Further production gains came in 2015 due to Kurdish exports. Oil first flowed on a new pipeline (controlled by the Kurdistan Regional Government, or KRG) to Turkey in December 2013, but limited capacity and a dispute with Baghdad kept flows below 0.1 mb/d until September 2014. The rapid advance of the self-titled Islamic State (IS) militants was the indirect catalyst for an upswing in volumes as the KRG took control of several fields around Kirkuk, and an export deal was struck with the federal government under its new prime minister, Haider al-Abadi. Export flows leapt to 0.56 mb/d by April 2015 and even though the export deal broke down over the following months, the need for Kurdish support in the fight against IS meant that Baghdad took little action to try and halt exports (see Figure 4). Over 2015, Kurdish pipeline exports averaged 0.49 mb/d, almost 0.4 mb/d higher than the previous year (Figure 4). Part of this increase came from a ramp-up in fields operated by international companies under KRG licences, such as Taq Taq and Tawke. However, the majority of the increase actually resulted from connecting the formerly federally operated fields into the Kurdish pipeline network, as their production had been largely shut-in since frequent attacks closed down the old Kirkuk–Ceyhan pipeline in February 2014.[7] So the northern export gains had more to do with easing previous disruptions than bringing online entirely new output – in contrast to KRG's initial expectations of a rapid ramp-up in output following the completion of the pipeline.[8] Indeed, Kurdish exports had been meant to reach 1 mb/d by end-2015 without any contribution from the federal fields, according to KRG forecasts in 2014.

Figure 4: Allocation of Kurdish exports, mb/d



Note: includes transfers to the federal State Organization for Marketing of Oil (SOMO).
Source: Iraqi Ministry of Oil, KRG Ministry of Natural Resources.

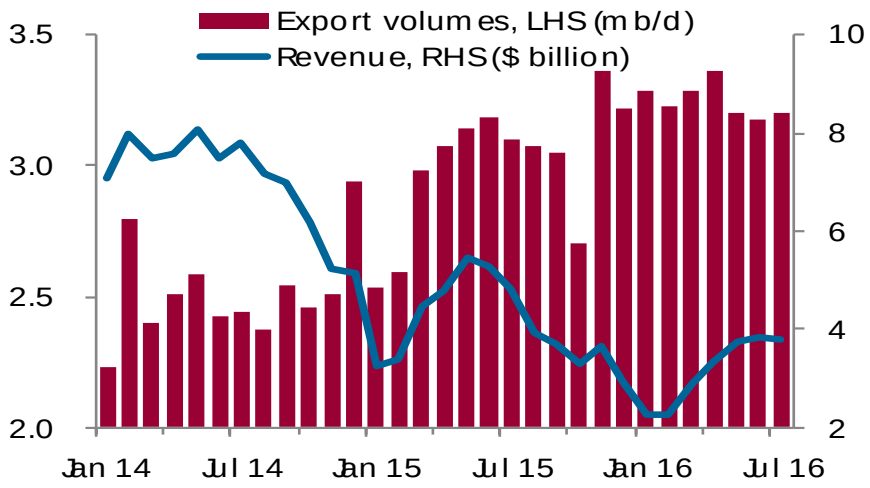
III. Higher output did not relieve the fiscal pressures

The surge in Iraqi export volumes did not, however, prevent revenues from collapsing as oil prices fell (see Figure 5). Both the federal government and the KRG had been facing their own financial crises prior to the fall in global oil prices, and these have become even more crippling over the last 18

[7] Robin Mills (2016), 'Under the Mountains: Kurdish Oil and Regional Politics', OIES WPM63, OIES: Oxford.
[8] MEES, 'KRG Production Set To Fall In 2016', Volume: 59 Issue: 12, 25 March 2016.

months. Due to the adverse impact on upstream spending, this has direct consequences for the prospects of further production growth.[9]

Figure 5: Federal oil exports and revenues, mb/d / $ bn



Source: Iraqi Ministry of Oil

Monthly federal revenues from southern exports in the first half of 2016 were 60 per cent lower than over the same period in 2014, at $18.3 billion, despite export volumes being almost 0.9 mb/d higher. The already overstretched Iraqi budget has been forced deeper into deficit, with the 2016 shortfall almost certainly higher than even the $21.3 billion forecast in the budget (see Table 1). This has forced the federal government to take various emergency measures. Among these were instructions requiring IOCs to reduce their budgets for key fields in the south; this led upstream investment to fall from around $21 billion in 2014 to $13–14 billion in 2015.[10] While this clearly has consequences for future southern production growth, the issue for Baghdad is that in addition to the relatively low per barrel fee it pays to IOCs under TSCs, it must also repay their investments.

This creates a situation where, because of short-term financial pressures, Baghdad blocks the investment required to increase, or likely even maintain, output in the future.[11] Indeed, the oil ministry has been pushing for further spending cuts in 2016, reportedly taking the total to just $9 billion.[12] In May, the IMF agreed to give Iraq a $5.4 billion emergency loan, but only if Baghdad committed to clearing arrears owed to IOCs and service companies.[13] While this is good news for those companies, it does not mean the government will agree larger upstream budgets any time soon. The IMF plans also require cuts to subsidies and tax increases, which risk adding to public discontent.

[9] IMF (2016), Iraq: Selected Issues, August, Washington: IMF.
[10] IEA (2016), Oil Market Report, April, Paris: IEA.
[11] IMF (2016), Iraq: Selected Issues, August, Washington: IMF.
[12] Reuters, 'Iraq oil projects face delays as companies resist spending cuts', 13 May 2016.
[13] IMF, 'Iraq Gets $5.34 Billion IMF Loan to Support Economic Stability', 14 July 2016. https://www.imf.org/en/News/Articles/2016/07/12/14/31/NA071416-Iraq-Gets-IMF-Loan-to-Support-Economic-Stability.

Table 1: Iraqi budget figures, $ bn

Category	2014	2015	2016
Expenditure	149.3	105.2	93.2
Revenue	119.0	80.7	71.9
Oil	*110.9*	*67.5*	*61.4*
Non-oil	*8.1*	*13.2*	*10.5*
Oil dependence (%)	93%	84%	85%
Assumed oil price ($/bbl)	90	56	45
Projected deficit	**(30.2)**	**(24.5)**	**(21.3)**

Source: MEES, Energy Aspects

The KRG faces a worse situation, even though independent exports were meant to provide it with financial security. The KRG has been struggling financially since monthly transfers from the federal budget were halted in February 2014 by former federal Prime Minister Maliki.[14] A bloated public sector, together with corruption, led to a wage bill of over $750 million per month in early 2015, although pay cuts and other measures have cut this to below $500 million more recently.[15] The KRG has also experienced an influx of refugees fleeing IS from Syria and other parts of Iraq, which has added to the financial strain. Actual monthly revenues still come in well below the level needed to cover public salaries, let alone the full budget, causing KRG debts to continue to rack up – reaching over $25 billion according to some estimates.[16] The KRG owes money to local and foreign firms, including oil companies. It has also received substantial loans from neighbouring Turkey and has entered into various pre-payment contracts with trading houses, committing future volumes in return for payments that are keeping it afloat during the current financial crisis.[17]

An analysis of official KRG figures released for the first five months of 2016 illustrates these issues (see Table 2). Kurdish exports totalled 70 mb, which we calculate to be worth around $2.2 billion given the prevailing discount of around $8 per barrel to Brent prices. The KRG received nearly $2.3 billion, but $630 million of that was in the form of prepayments or loans from an unnamed foreign government, most likely Turkey. Therefore the KRG actually received around $540 million less than the implied value of the crude, partly because some of it went to repaying past loans and partly due to the fact that trading houses probably receive rather more favourable terms in exchange for prepayments. This means that the KRG is seeing less of the benefit of the recent recovery in crude prices than its creditors, which is likely to remain the case for a lengthy period of time.

[14] Al Monitor, 'Maliki Puts Kurds on Spot Over Oil Payments', 11 March 2013; The Economist, 'Kurdistan: Dream on Hold', 9 July 2016.
[15] Reuters, 'How Kurdistan bypassed Baghdad and sold oil on global markets', 17 November 2015; Iraq Oil Report, 'KRG keeps producers waiting for pay', 26 September 2016.
[16] Iraq Oil Report, 'KRG oil payments sputter on low revenue', 26 May 2016.
[17] Financial Times, 'Traders aid Kurds with oil payments', 25 February 2016; Reuters, 'Glencore taps into Iraqi Kurdistan with $300 million oil deal', 11 March 2016.

Table 2: KRG export revenues

	Payments received				…of which		Volume lifted (mb)			Implied value*
	On acc.	Prepay.	Loans	Total	To IOCs	To KRG	New sales	Past debt	Total	
Jan-16	470	180	-	**650**	75	**575**	18.7	-	**18.7**	**458**
Feb-16	204	100	-	**304**	71	**233**	10.4	1.5	**11.9**	**305**
Mar-16	207	200	150	**557**	36	**521**	9.2	-	**9.2**	**295**
Apr-16	376	-	-	**376**	59	**317**	13.2	1.0	**14.3**	**502**
May-16	391	-	-	**391**	75	**316**	12.1	3.8	**15.9**	**631**
Total	**1,648**	**480**	**150**	**2,278**	**316**	**1,962**	**64**	**6**	**70**	**2,190**

Note: *Calculated as $8 per barrel below monthly average Brent price

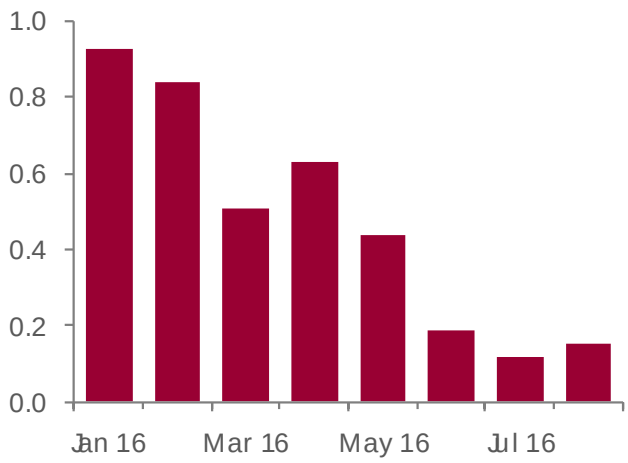
Source: KRG Ministry of Natural Resources, Energy Aspects

A key group of creditors are the IOCs (such as Genel and DNO) that have developed Kurdish fields over a number of years. Arrears rose to over $2 billion as they waited for the KRG to establish a payment mechanism, straining the finances of these companies and leading them to cut spending to minimal levels. In September 2015, the KRG began making monthly transfers. However, these mainly just cover current expenditure, and thus the arrears remain high. While DNO has resumed investment, on the basis that regular payments are being made, other producers are holding back for now. Delays to the payments in May and again in August and September have created additional concerns, as they suggest the KRG is struggling to find sufficient cash to maintain the payments.

IV. The outlook for Iraqi oil

Despite the financial problems facing both the federal government and the KRG, y/y Iraqi production still grew in the first half of 2016; in the year-to-June, output was higher y/y by an average of 0.59 mb/d. This was largely because of base effects as the southern ramp-up only really started in June 2015 with the launch of Basra Heavy (Iraqi production has been consistently above 4 mb/d since June 2015). The comparisons became less favourable from June 2016 onwards and the y/y increase declined to just 0.14 mb/d on average over July and August this year (see Figure 6).

Figure 6: Iraqi production, y/y change, January–August 2016, mb/d



Source: Energy Aspects

Furthermore, it seems that incremental growth in output has already stalled, after hitting a high of

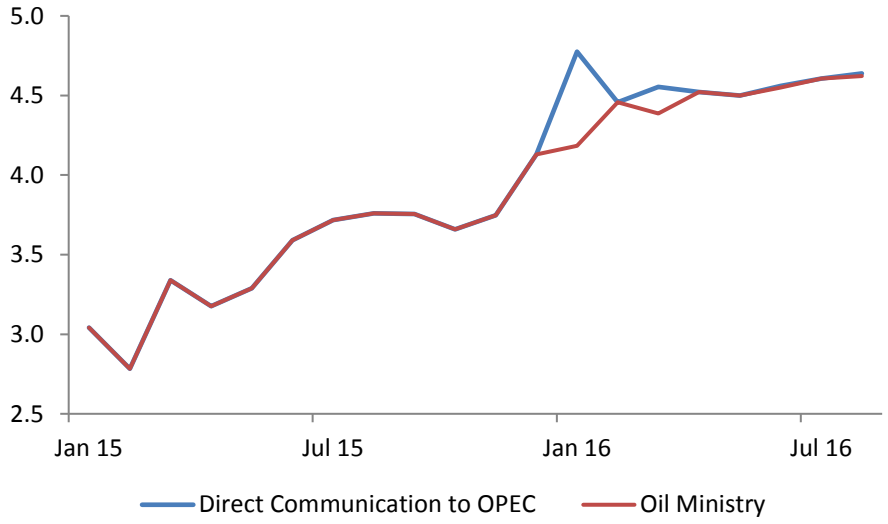
4.35 mb/d in January 2016. The picture has been complicated by various temporary factors:

- the Kurdish export pipeline shut between mid-February and mid-March after a bombing;
- Baghdad shut-in 0.15 mb/d of federally controlled fields that were supplying the Kurdish pipeline network between March and August;[18]
- power supply issues affected pumping stations in southern Iraq during May, cutting output by around 70 thousand b/d.

Production in Northern Iraq has also suffered from militant attacks – in particular the attack on the 70 thousand b/d Bai Hassan South production facility by the self-titled Islamic State group (IS) at the end of July. This damaged the Bai Hassan South facility and caused a short-lived shutdown of the whole Bai Hassan field.

It is worth noting that it has become harder to accurately assess Iraqi production recently because the federal oil ministry appears to have inflated published monthly figures, quietly adding a further 0.7 mb/d for Kurdish production to the totals even though some of the volumes had already been captured and Kurdish output is currently below these levels. This process began in parallel with discussions between OPEC and non-OPEC producers about a potential production freeze deal, and can explain in part the divergence in some months between figures directly communicated to OPEC and those reported by the oil ministry (see Figure 7).[19] The wide range in southern loading programmes – from a high of 3.62 mb/d in February to just 2.99 mb/d in July – and significant divergence in actual loading figures, are indications that Iraqi officials themselves are struggling to predict how much crude will be available ahead of time.

Figure 7: Difference in Iraqi Production Numbers, mb/d

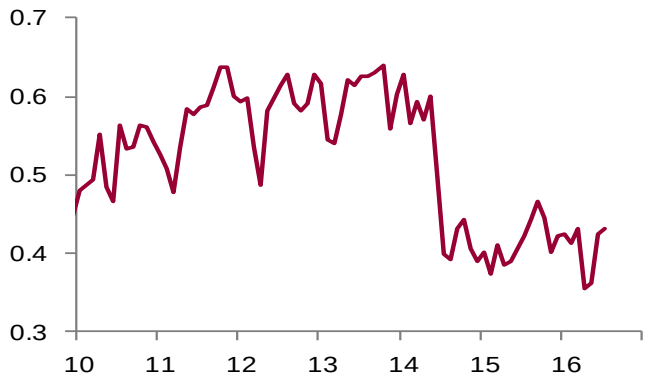


Source: Iraqi Ministry of Oil, OPEC Secretariat

Further confusion has been sown by signs that refinery runs are being cut, particularly by the KRG, in order to offset disruptions at oil fields and maintain crude exports. Runs at federal refineries have also been low recently – at just 0.38 mb/d in Q2 16, the lowest level in at least eight years (see Figure 8) – probably for similar reasons.

[18] Reuters, 'Iraq halts pumping of Kirkuk oil into Turkey pipeline: sources', 14 March 2016.
[19] Bloomberg, 'Iraq Tells OPEC at What Oil Output Level It's Ready to Freeze', 8 September 2016.

Figure 8: Federal refinery demand, mb/d



Source: Iraqi Ministry of Oil

Southern oil output

The key question is what direction Iraqi production will take from here. Starting with federal production in southern Iraq, there is little prospect of growth in the short to medium term despite the massive reserve base, given the lack of investment.[20] The government has already asked IOCs operating in the southern fields to cut their development plans to reduce its investment obligations, and production peaks have been revised for most contracts in recent years (see Table 3). Even the longer-term outlook will remain decidedly negative until Baghdad can secure significant investment by IOCs in both fields and large infrastructure projects.

Table 3: Revised plateau production rates mb/d

Field	Plateau rate, (Contracted)	Plateau rate, (Amended)	Reduction
Rumaila	2.85	2.10	0.75
Zubair	1.20	0.85	0.35
West Qurna-1	2.83	1.60	1.23
West Qurna-2	1.80	1.20	0.60
Majnoon	1.80	1.00	0.80
Halfaya	0.54	0.40	0.14
Gharraf	0.23	NA	NA

Source: MEES, Bloomberg, Reuters

The first warning sign is the Iraqi oil rig count; this has fallen sharply and is down by over 50 per cent since mid-2014 (see Figure 9). While production costs at fields in southern Iraq are low, they are still subject to decline rates which can actually be very high at brownfield sites. For instance Rumaila, Iraq's largest field (currently producing around 1.35 mb/d), experiences an underlying decline rate of about 17 per cent per year according to the operator BP.[21] A constant programme of drilling is required simply to offset declines at Rumaila and other large fields in southern Iraq, before any capacity expansion is achieved. But as noted above, Baghdad has been forcing IOCs to lower their investment budgets in order to reduce the repayments that it has to make to them.

[20] IMF (2016), Iraq: Selected Issues, August, Washington: IMF.
[21] BP, 'Rumaila to increase production by 50 percent by the end of the decade', Press Release, 17 December 2014.

Figure 9: Iraqi oil rig count

Source: Baker Hughes

Indeed, a comparison of field-level production figures from early 2016[22] with the 2016 average production targets reportedly set by Baghdad points towards declines of 0.12 mb/d rather than growth (see Table 4), with West Qurna 1 and 2 expected to fall by 60 thousand b/d and 50 thousand b/d respectively. Although the figures include growth from Rumaila, the allowed budget of $2.48 billion is only sufficient to keep production broadly flat at best, and not to raise output. While Rumaila's budget is being kept broadly flat y/y, operators of other fields have been asked to substantially cut spending. The lack of regular field-level production data restricts this analysis and it is possible that some fields will outperform their targets despite the restricted investment budgets. But equally, production at most fields was above the target level in early 2016, and so the average target points to declines over the course of the year. These numbers certainly suggest that production from the largest fields as a group is set to experience some decline by year-end, even in the absence of further problems with power supplies, or other disruptions.

Table 4: Southern field production and targets, mb/d

Field	Early 2016	2016 target
Rumaila	1.37	1.40
West Qurna 1	0.44	0.38
West Qurna 2	0.45	0.40
Zubair	0.36	0.35
Majnoon	0.22	0.20
Gharraf	0.11	0.10
Total	**2.95**	**2.83**

Source: Company reports, Reuters

Still, there are a few projects that could deliver some growth in 2016. At Gazprom's Badra field a new processing train and several new wells have been brought online, raising production from around 30 thousand b/d across 2015 to 64 thousand b/d currently, with the potential for further growth later in the year.[23] Iraqi officials have also stated that the 20 thousand b/d Subba field, which is being developed by a local company, will start up in 2016, although few details are available. Finally, at the start of the year, Iraq hoped to achieve a boost of around 0.11 mb/d to production from a group of smaller fields

[22] Iraq does not publish regular field-level production data, so these figures are gathered from a variety of sources and reflect different points in the year. While this hinders analysis, they still provide a useful indication of general trends.
[23] TASS, 'Gazprom Neft boosts oil production on Iraqi Badra field to 67,000 bpd', 22 July 2016.

operated by local companies through the deployment of enhanced oil recovery (EOR) techniques. This process formed part of the much larger Integrated South Project (ISP) and included a long-delayed seawater treatment plant. Baghdad has held discussions with both Exxon and CNPC, but so far there has been no indication that either firm is ready to fund the multi-billion dollar ISP and so we assume that the plans for EOR are on hold for now.[24]

Iraq has shown some signs of allowing the IOCs to plan larger investment budgets for 2017, in the hope of stimulating higher production.[25] Baghdad will remain wary of having to hand over too large a share of its desperately needed oil revenues, but it will also want to avoid letting natural declines eat further into production. In fact, the new Iraqi oil minister, Al-Luaibi, wrote to the IOCs in August to encourage them to submit spending plans that include sufficient investment to raise production, not just enough to keep output flat. This may encourage more drilling and activity in late 2016 and 2017, although IOCs look set to remain cautious, as the minister's letter also made it clear that repayments were not guaranteed if the oil ministry was not allocated enough funds in the Iraqi budget.[26]

Iraqi officials have also signalled a willingness to consider shifting from flat per-barrel fees to payments that are linked to the market price of crude.[27] However, this type of payment has usually been floated as a means of reducing payments to IOCs when oil prices fall; such a change is unlikely to encourage more investment given that the fixed fees under the current TSCs are already considered tough by international contract standards. But clearing arrears, together with some increased flexibility in contract structures, could be enough to encourage more investment by IOCs.[28]

Beyond the next few small projects, the progress of the ISP will be the key determinant of the long-term path of oil production in southern Iraq as the Central Seawater Supply Facility (CSSF), which is supposed to provide up to 12.5 mb/d of treated water for injection, is required to sustain reservoir pressure and raise output across the main southern oil fields.[29] When the project was initiated in 2009, the first 5 mb/d phase was meant to come online by 2013. That timeline was soon delayed, largely because Baghdad removed Exxon from the project in 2011 after the company had secured upstream licences from the KRG.[30] Even last year, Iraqi officials were admitting that Phase 1 was unlikely to be completed before 2020, and little progress has been made so far this year. While consolidating the CSSF and associated pipeline and infrastructure projects into the ISP might on paper reduce the kind of bottleneck issues that have plagued previous Iraqi infrastructure build-outs, it has made it even more costly at a time when IOCs are slashing Capex. Tenders are being issued for small elements of the ISP, but the water treatment plant itself is stalled.

If Baghdad remains determined to push ahead with a single large project, this will actually reduce the prospects for long-term growth. Several IOCs have been exploring options for smaller water treatment plants to serve their individual fields,[31] but these are extremely unlikely to be approved while Baghdad clings on to the CSSF. Admittedly, abandoning it would put the final nail in the coffin for the lofty (and

[24] MEES, Iraq Seeks Chinese Funding For Crucial Water Injection Project, Volume: 58 Issue: 22, 29 May 2015.
[25] Reuters, 'Iraq asks foreign companies to raise oil output, exports', 23 August 2016.
[26] MEES, 'Iraq: Major Challenges Remain For New Oil Minister Despite Kirkuk Breakthrough', Volume: 59 Issue: 35, 2 September 2016.
[27] IMF (2016), Iraq: Selected Issues, August, Washington: IMF; Al Monitor, 'Iraq prepares to amend its existing oil contracts', 9 March 2016.
[28] One project that may prove to be a bellwether is the 0.2 mb/d expansion of CNPC's Halfaya field, which currently produces 0.2 mb/d. In January 2016, Baghdad publicly stated that the project could go ahead, but only if CNPC agreed to defer the repayment of development costs until additional oil is being produced – movement on that project could signal Baghdad is no longer solely focused on minimizing repayments to IOCs, but such a shift is not expected before next year and then there will be a delay until the impact is seen in production.
[29] Increasing amounts of water injection will be required to raise field production to the target levels without doing permanent damage to reservoirs. This is particularly the case with the Mishrif reservoir as it does not have a natural aquifer and plays a large role in future production. There are already issues with the demands being placed on Iraq's main water sources – the Tigris and Euphrates rivers – making them increasingly unviable. Instead the CSSF was conceived to eventually supply around 12 mb/d of water for water injection. Approximately 1.5 barrels of water is required for each 1 barrel of oil recovered where water injection is used.
[30] MEES, 'Iraq Seeks Chinese Funding For Crucial Water Injection Project', Volume: 58 Issue: 22, 29 May 2015.
[31] Iraq Business News, 'IOCs seek Independent Water Facilities', 5 November 2014.

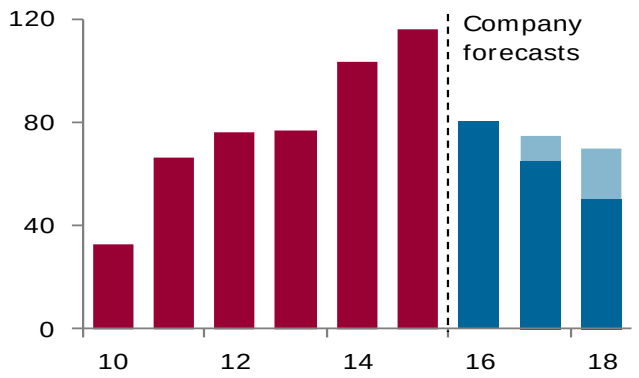
improbable) ambitions to raise production to 9 mb/d or even 12.5 mb/d, and smaller projects might not all go ahead, but this may prove to be a more effective strategy for securing future growth.

Northern output

Turning to the Kurdish region, the situation is again worse than that facing the federal government and the future prospects less certain. The international companies working on Kurdish fields are much smaller, with these assets making up a much larger share of their portfolios, making them less resilient to the lack of payments.

A notable feature of the Kurdish fields operated by international companies is how quickly output fell when Capex was reduced. The Taq Taq field (operated by a consortium led by Genel) produced 0.12 mb/d across 2015, but according to a recent presentation from the company its production will average just 80 thousand b/d this year, and will fall further to 50–70 thousand b/d by 2018 depending on whether discretionary investment resumes (see Figure 10).[32] DNO's Tawke field averaged 0.14 mb/d in 2015, and exceeded 0.15 mb/d in Q2 15 after the pipeline export route opened up. But this had fallen to 0.12 mb/d in April 2016 and was even lower in Q1 16, at just 92 thousand b/d, partly due to the lengthy disruption to the export pipeline.

Figure 10: Taq Taq output and Genel forecast, thousand b/d



Source: Genel Energy

Regular monthly payments from the KRG to oil companies have encouraged some activity to restart at both fields. In the case of Taq Taq, this is only enough to stabilize production levels, while DNO has spoken more positively about raising output. However, the recent delays in payments create some doubts over whether investment will continue. Adding to the challenges, reserve estimates for both fields were downgraded in Q1 16 – down by almost half, in the case of Taq Taq, to 356 mb.[33] Gulf Keystone had better news in October 2015, when it more than doubled reserves at its Shaikan field, but output of the heavy, low quality crude remains below 40 thousand b/d despite plans to reach 0.1 mb/d. The KRG expects TAQA to bring online the 30 thousand b/d Atrush field later in 2016, but discussions over the financing of a pipeline spur may well delay that until 2017.[34] It also hopes that local operator KAR Group can raise output from the Kirkuk field, but this may again be optimistic.[35]

These declines, together with Baghdad's decision to block flows from various fields onto the Kurdish pipeline network, have reduced KRG-controlled production (this includes the former federal fields that were gained in 2014) by over 0.2 mb/d from its peak last year to just above 0.6 mb/d. In an effort to maintain export volumes, which are already heavily committed under the term deals discussed above, the KRG has had to slash supplies to local refineries, and local sales. These steps may soon lead to fuel shortages, which could spark further unrest. However, the month of August brought some positive

[32] Genel Energy, 'June 2016 Investor Presentation', 9 June 2016.
[33] Bloomberg, 'Genel Cuts Taq Taq Reserves Estimate by Almost 50%, Takes Charge', 29 February 2016.
[34] The National, 'Production at Atrush oilfield in Kurdish region to be delayed', 11 August 2016.
[35] MEES, 'KRG Production Set To Fall In 2016', Volume: 59 Issue: 12, 25 March 2016.

news. The federal government allowed several fields it controls to resume pumping into the Kurdish pipeline network. Together these fields can produce around 0.15 mb/d, but early indications are that output has resumed at lower volumes. Operations have also restarted at the Bai Hassan South facility. These two developments have returned as much as 0.2 mb/d of production in Northern Iraq; this allows Kurdish exports to rise by a slightly lower amount as the KRG will want to direct a small amount to the local market that has been starved of crude for much of the year. But the restart of flows from the federally controlled fields is governed by a temporary agreement between Erbil and Baghdad that is unlikely to be translated into a lasting settlement, given the long history of political differences.

In short, while the Kurdistan region still contains sizeable reserves, it now appears far less attractive to international oil companies, even though regular monthly payments are currently being received. Meanwhile, the deeply indebted position of the KRG, including prepayments under the export deal, leaves little scope for either tackling the numerous crises or attracting foreign investment to the upstream. Also, the chance of a comprehensive deal emerging between the KRG and the central government is still remote, as financial problems on both sides are likely to prevent the necessary compromises; this means the next flare-up in political tensions between Baghdad and Erbil may lead to flows being shut off again.[36]

V. Conclusions

Since the start of 2016, incremental Iraqi production growth has stalled as continued strength in southern output was offset by declines and pipeline disruptions in the Kurdish region. As we head into 2017, the decline baton is expected to pass to the large fields in the south, as a result of lower investment over both 2015 and 2016 offsetting any growth from additions of smaller fields. A higher oil price environment will encourage Baghdad to agree more generous investment budgets with IOCs in an effort to halt further declines, but new capacity additions will remain thin on the ground. That may come as a major surprise, relative to market expectations that have taken the trend witnessed in 2015 and the first half of 2016 as a guide for future growth. Further into the future, the situation does not look much better. In the south, the glacial progress of the seawater treatment facility represents a barrier to significant growth at any of the large fields, while the star of the Kurdistan region shines much less brightly now than it did a few years ago due to recent reserve downgrades. In short, while Iraq may manage some modest growth in the next few years, the accelerator will not be pressed down again, as it was in 2015, for some years to come.

[36] MEES, 'Iraq: Major Challenges Remain For New Oil Minister Despite Kirkuk Breakthrough', Volume: 59 Issue: 35, 2 September 2016.