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Energising IRAQ

INTRODUCTION

Powering Iraq's future

Iraq is charting a new path for its indigenous resources and its youth, hoping to electrify the future with a mix of reforms and modernisation to fuel growth

OPEC's second-largest oil producer has suffered many false dawns. Hopes of energy security and economic prosperity have ended in disappointment for some international investors and a local population that lacks access to a secure, stable supply of power. But, with a greater commitment to learning from past mistakes and a focus on tapping the country's vast gas reserves, a sleeping electricity giant may finally be waking up.

The Middle East producer's mature oil industry continues to make progress. Crescent Petroleum CEO Majid Jafar puts it like this: "Iraq has gone from producing a couple of million barrels a day of oil to 5m b/d currently, and it should be double that—and more—potentially," noting there are still huge fields that are undeveloped and huge prospects that are unexplored.

There are now credible, albeit long term, ambitions for Iraq to become an energy hub and key regional player, with the start of two major projects: the Grand Faw Port and the Development Road. Grand Faw includes extensive container cargo, dry bulk cargo and oil terminals, along with a dry dock and naval base, while the Development Road would link the port to Turkey via road and rail and would incorporate a corridor for oil and gas pipelines. At the heart of Grand Faw is a major 300,000b/d refinery project that aims to boost production of domestic petroleum products and eventually a petrochemical plant in the second phase.

Even gas, often in oil's long shadow, is moving into the limelight with a clear aim of ridding Iraq of its dependency on imports from its neighbours and providing the energy for its electricity generation. Indeed, it's the top priority if Iraq is going to be a major growing economy, reduce onerous costs, meet the demands of its future prosperity and lay the foundations for its wider regional ambitions. The government has set itself the target of achieving gas self-sufficiency and entering the world gas market as an exporter by 2030.

Over the past couple of years, gas processing plants have come online, such as the Basrah Gas Company rehabilitation of existing NGL plants, adding up to 1bcf/d as well as 200mcf/d incremental capacity. There is a lot more to come as well.

Even the missed opportunity of capturing growing associated gas production—until recently simply flared as oil production grew—is being addressed. The government has set ambitious plans to develop both associated and free gas across Iraq's vast resources, and many projects are already underway to process flared gas.

Other plans are also afoot. Just look at the example of the Shell-led Basrah Gas Company joint venture that owns and operates midstream infrastructure to process and transport associated gas from the Rumaila, West Qurna 1 and Zubair oilfields as well as small volumes from the Tuba and Luhais oilfields in southern Iraq. It has one of the world's largest flare reduction projects.

The Sudani government has been on a roll in striking new deals to process flared gas, such as investment in processing 300mcf/d of gas at the Bin Umar oilfield. Meanwhile, TotalEnergies' $27b Gas Growth Integrated Project is another example of how investment is helping recover flared gas for power generation.

Let's not overlook the schemes to develop the country's substantial non-associated gas fields, including Akkas, Mansuriyah, Siba and Khashim Ahmer-Injana. Crescent Petroleum is part of the Pearl Consortium that is producing from the 500mcf/d Khor Mor field in the Kurdistan Region of Iraq, the country's largest non-associated gas project, which has been operational for more than 15 years.

Like never before, the narrative is clear in that both free and associated gas need developing, not one or the other. If the energy trilemma is the question, then gas is the answer: it can supply cheap, affordable and accessible energy, create energy independence and help meet Iraq's sustainability goals.

There are still plenty of challenges to overcome. International investors from the West have had a complicated relationship status in recent years, unsure whether to stick or twist given that political stability has ebbed and flowed, and business contracts and regulatory frameworks have not always proved to be favourable.

Chinese and regional investors have seized on that hesitation in recent oil licensing rounds, betting they can deliver a better outcome. Crescent Petroleum has also set an example here. The contracts it secured in the country's fifth bid round, including two blocks in Diyala governorate and one in Basrah governorate, promise to eventually produce up to 620mcf/d of gas, to be used to supply the local electricity grid and ensure that Iraq's ambition to capture and make use of its nascent resources is realised.

Across the country, much depends on how the investment environment evolves. There is good reason for initial optimism, and the door is open for IOCs to seize the initiative given efforts to institute reforms to tackle corruption and look again at the way contracts work and remove obstacles to doing business.

The government is prepared to think global and meet international investors halfway on their needs to maximise profits if there is a willingness to think local and help Iraq's need to provide reliable electricity.

Genuine international partnerships will start to accelerate, with a focus on improved transparency and providing incentives to bring in capital. Investors should see Iraq with fresh eyes rather than glance fleetingly and conclude wrongly that it is the same old story. It's time to think again. **PE**

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Enabling Iraq's energy independence

Transforming Iraq's natural gas sector is the key to the country's energy self-sufficiency, allowing it to chart a course towards becoming a supply hub for the wider region

Iraq faces a stark energy conundrum. The country holds the world's fifth-largest proved crude oil reserves—at 145b bl, equivalent to 8% of the global total—and is twelfth in terms of global gas reserves—at 131tcf. Renewables are another potential strength, with plans to install 12GW of solar capacity by 2030.

Despite this abundance, Iraq remains dependent on imports from its neighbours to supply its power generation plants, forcing it to rack up billions of dollars in debt for intermittent deliveries of gas and electricity.

Iraq imports some 40–50mcm/d of gas from Iran. In March 2024, Iraq's Electricity Ministry and the state-owned National Iranian Gas Co. signed a five-year agreement for the supply of up to 50mcm/d of Iranian gas.

The situation has encouraged policymakers to think anew about ways to tap the prodigious gas resources located on the Iraqi side of the border.

Even with the imports, Iraq cannot guarantee 24-hour electricity supplies across the country, particularly during the peak summer demand periods. Iraq's electricity demand in the summer exceeds 35GW, at least 10GW more than can be provided. The result is frequent blackouts and the overuse of pricey private diesel generators.

"Iraq's peak electricity demand has reached 35GW and is growing as population increases and lifestyles change in the country," said Abdulla al-Qadi, Iraq country chairman at Crescent Petroleum.

According to the IEA, by 2030 peak demand is expected to reach nearly 60GW. Assuming 70% of power will be generated from gas, this peak power demand will translate to gas demand of 6–8bcf, based on IEA figures.

About 66% of the power in Iraq is produced by natural gas, followed by 21% generated by burning fuel oil and diesel, noted Qadi. A small portion (6%) is produced by hydroelectricity, with the rest (8%) imported from Iran (up to 1,300MW/yr).

"Natural gas will replace other sources as well as the share of imported electricity in the short-to-medium term. But Iraq will need twice the amount of gas in the coming years to be able to supply demand for electricity, and our projects will help fill a portion of that need," said Qadi.

Picking up the pace

Improving the electricity generation picture is priority number one. "There has been a chronic electricity supply gap in Iraq," said Jessica Obeid, an energy specialist at consultancy Azure Strategy. "Although Iraq has installed additional power generation capacity, the demand has been growing, along with the losses."

Achieving this requires not only power supply and a modernised grid, but also tackling vested interests and non-technical losses, and then a tariff restructure, said Obeid.

The challenge of developing Iraq's prodigious domestic gas resources has thrown the issue of energy independence into sharp relief. For the government of Prime Minister Mohammed Shia al-Sudani, the need is to improve electricity services that could support economic development, improve government services and build better security.

In human terms, Iraqis continue to bear a heavy price for this situation.

"In a country where temperatures are 50°C in the summer, electricity provision is fundamental to social stability and security," said Majid Jafar, CEO of Crescent Petroleum, which has been developing gas for domestic use in Iraq since 2007.

Domestic development

Against this backdrop, Iraq has begun to chart a route to developing its indigenous resources, prioritising electricity generation from domestic sources.

In February 2023, during the signing ceremony of the fifth licensing round for Iraqi oil and gas fields, Prime Minister Sudani said his country would achieve gas self-sufficiency and enter the world gas market as an exporter by 2030.

30mt/yr

CO_2 emitted by gas flaring in Iraq

Standing still is not an option, given that the country's electricity demand is poised to double by 2030, according to the IEA. The IEA states that, if the current structure of electricity supply persists, domestic generation, imports and neighbourhood generation would need to double—for a total supply more than 250TWh.

Reform of pricing and subsidies is a priority. "In many governorates, there are only 4–8 hours a day of electricity in the summer months, so they end up paying much higher prices for diesel generators—which is also bad for the environment," said Jafar. "There needs to be more rational pricing for electricity, that also manages demand better, so that the outcomes can be better for the consumer."

While Iraq has managed to maintain impressive oil production in recent years, averaging 4.2m b/d in 2024, it is natural gas that is the centre of attention.

As oil production has soared, so has the amount of associated gas. However, the ability to capture and process this gas has not kept pace. That inability to utilise this potentially formidable resource has accentuated Iraq's gas deficit.

The supply-demand picture bears this out. Iraq consumed 18.7bcm of gas in 2023 but produced only 9.9bcm; although that is a 6.9% increase compared to 2022, according to Energy Institute figures, closing that gap will be difficult without a concerted drive to boost gas output.

This message has been absorbed at the highest levels. According to a statement issued by Sudani in Washington earlier this year, Iraq has the potential to "harness immense natural gas resources, invest in new energy infrastructure and renewables, and achieve energy self-sufficiency by 2030".

IRAQ'S SOLAR POWER PROJECTS PIPELINE

Project	Capacity (MW)	Province	Developer(s)	Status
2021 Bid Round				
Karbala	300	Karbala	Scatec*, Orascom, Al-Bilal	**Approved**
Iskandariya	225	Babylon	Scatec*, Orascom, Al-Bilal	**Approved**
Sawa-1	30	Muthanna	EJRE	Pending/Suspended
Sawa-2	50	Muthanna	EJRE	Pending/Suspended
Khidir	50	Muthanna	Phanes Group	Pending/Suspended
Al-Ramla	50	Qadisiya	Phanes Group	Pending/Suspended
Jissan	50	Wasit	Phanes Group	Pending/Suspended
Direct Awards				
Basrah	1,000	Basra	TotalEnergies	**Approved**
Najaf	1,000	Najaf	Acwa Power**	Under Negotiation
Muthanna***	750	Muthanna	PowerChina	**Approved**
Dhi Qar	450	Dhi Qar	Masdar^	Under Negotiation
Ramadi (Site 1)	250	Anbar	Masdar	Under Negotiation
Ramadi (Site 2)	100	Anbar	Masdar	Under Negotiation
Mosul	100	Nineveh	Masdar	Under Negotiation
Amarah	100	Maysan	Masdar	Under Negotiation
TOTAL	**4,505**			
of which approved	2,275			
of which under negotiation	2,000			
of which pending/suspended	230			

*Exited Iraq in April 2023.
**Investment linked to Iraqi-Saudi interconnection project proceeding, Acwa Power has been offered a stake at TotalEnergies' 1GW Basrah project.
***Original capacity at 2GW, new capacity to be delivered in two stages, financed by Iraq's Ministry of Electricity.
^Signed Heads of Agreement for 2GW in 2021, legal negotiations ongoing.

Sources: Iraq's Council of Ministers, Ministry of Electricity, Ministry of Oil, TotalEnergies, Masdar, Scatec, Middle East Economic Survey (MEES).

Ending flaring

The pressing need is to bring on both associated and free gas resources in short order, as well as to quash the wasteful flaring. The flaring of associated gas has grown from 12bcm in 2012 to around 17bcm now, putting Iraq second only behind Russia, emitting 30mt of CO_2 annually in the process.

Out of some 3.55bcf/d of produced gas in federal Iraq, 2.1bcf/d is captured and 1.4bcf/d is currently flared. If the government meets its oil production target of 6m b/d, the country is projected to flare an estimated 2.2bcf/d.

Efforts are underway to address this problem. The Shell-led Basrah Gas Company joint venture owns and operates midstream infrastructure to process and transport associated gas from the Rumaila, West Qurna 1 and Zubair oilfields as well as small volumes from the Tuba and Luhais oilfields in southern Iraq. It has one of the world's largest flare reduction projects, aiming to cut more than 9.5mt of CO_2e/boe/yr from entering the atmosphere by reducing upstream gas flaring (compared with 2020 levels).

All this offers material economic and environmental benefits. "Any cubic metre that is captured is a cubic metre of less pollution, and a few dollars more into government coffers, so it makes clear sense," said Abbas Kadhim, who leads the Iraq Initiative at the Washington-based thinktank the Atlantic Council. "There is an Arab expression that says, 'what you cannot capture as a whole, don't abandon altogether'. In other words, capturing even a small amount of flared gas is better than burning it all."

> "Any cubic metre that is captured is a cubic metre of less pollution, and a few dollars more into government coffers"
>
> **Kadhim, Atlantic Council**

Capturing flared gas is vital for Iraq's energy independence plans. Despite progress in natural gas production from both non-associated gas and capturing associated gas, Iraq remains the second-largest gas flaring country in the world. "It would be a major achievement if Iraq's plans to increase gas production materialise by the projected timeframe, by 2030," said Obeid.

The Sudani government has been striking new deals to process flared gas in recent months. In April 2024, the prime minister signed an agreement to incentivise investment in processing 300mcf/d of gas at the Bin Umar oilfield. Halfaya Gas Company signed an agreement with Iraq's South Gas Company to invest in processing the gas, with US companies including KBR, Baker Hughes and GE signing an MOU on the project. The agreements also call for 400km of pipelines to transport the gas, a marine export terminal, a gas processing plant and other facilities.

TotalEnergies' $27b Gas Growth Integrated Project (GGIP) is another example of how investment is helping recover flared gas power generation.

The GGIP will recover flared gas from three oilfields to supply to power generation plants. The project also involves a seawater treatment plant to provide water injection for pressure maintenance and to increase oil production as an alternative to the use of fresh water. Additionally, a 1GW solar photovoltaic plant will be developed by Saudi Arabia's Acwa Power.

Free gas

As ambitious as plans to capture associated gas are the schemes to develop the country's substantial non-associated gas fields, which include Akkas, Mansuriyah, Siba and Khashim Ahmer-Injana.

Crescent Petroleum is part of the Pearl Consortium that is producing from the 500mcf/d Khor Mor field in the Kurdistan Region of Iraq, the country's largest non-associated gas project, which has been operational for more than 15 years (see sidebar).

"Iraq today needs 4bcf/d of gas," said Jafar. "But it also needs to develop non-associated fields, whether in the Kurdistan region, Diyala, Anbar or Basrah."

Given that bringing on these free gas schemes would meet only current demand—Iraq's gas demand is set to double by the end of the decade, necessitating 8bcf/d—considerably more supply will be needed.

"That is why it is not a matter of either/or," said Jafar. "It needs all of the above."

The upside is that Iraq has the potential to meet its own needs in the long term, and to export gas to neighbours such as Kuwait and Turkey. Even LNG exports are an option. "Iraq has not even begun to really explore gas developments in a major way," said Jafar.

Gas will be fundamental to Iraq's ambitions towards energy independence, since it is considered a transition fuel, as the COP28 summit in Dubai in late 2023 designated it. That reflects gas's ability to replace dirtier fuels such as coal. The key is to reduce emissions and then bring in renewable energy sources. The latter's intermittency issues nonetheless require a stable baseload, which gas is best placed to provide.

Renewable energies will still have an important role to play in helping deliver on Iraq's energy independence mission. Bringing the share of renewables up to 30% of electricity supply by 2030 would help reduce emissions without raising costs. This could help free up 9bcm of gas for other use by 2030.

Stemming technical and commercial losses in the electricity system is another important step towards shoring up supply and curbing import dependency.

The next years will be crucial for Iraq's journey to energy independence and the roadmap to delivering on those ambitions is promising. Looking beyond the power sector, the Iraqi government knows it needs local industries to have reliable and cheaply sourced energy supply. The message is clear: gas is key to unlocking the hidden value across the economy that until recently has remained dormant. **PE**

Crescent looks to new frontiers

With Crescent Petroleum preparing to produce nearly 700mcf/d from four fields in Iraq's Diyala and Basrah regions of federal Iraq under a 20-year contract, the company is looking to repeat the successful model deployed in the Kurdistan Region of Iraq.

The Khor Mor and Chemchemal projects in the north of the country illustrate how regional companies stand to benefit from developing resources. Crescent accounts for at least 75% of the Kurdistan region's electricity demand, with 500mcf/d of gas production from local sources.

Crescent and its affiliate, Dana Gas, struck an agreement with the Kurdistan Regional Government (KRG) in 2007 to develop the gas resources in Iraq's north, securing a deal to appraise, develop, produce, market and sell hydrocarbons. The Khor Mor processing plant produces NGLs and LPG, which are sold to the KRG and local traders. Gas deliveries to the Erbil power plant started in October 2008 via a 180km pipeline. This gas is substituting for expensive diesel, delivering both cost savings and environmental benefits to Iraqis.

The Crescent Petroleum contracts in Diyala and Basrah are expected to eventually produce up to 620mcf/d of gas. The contracts cover gas production from two oil and gas blocks in northern Diyala province, while a third in the southern region of Basrah will be explored and developed to add further volumes.

"The fields we are developing in federal Iraq were discovered decades ago but are only now being developed," unlocking the immense value stored within its borders," said Crescent Petroleum's Iraq country chairman, Abdulla al-Qadi. "The gas we produce will be for local consumption, not export. It will supply electrical power plants but can also supply many other industries ranging from cement to ceramics to petrochemicals that will reignite the country's industry and economy."

The Diyala and Basrah projects are the fruit of its early efforts in the north of the country. The expansion plans take in all regions of Iraq.

"We have grown from nothing to 500mcf/d and hope to be at 750mcf/d by the end of next year," said Crescent CEO Majid Jafar. "And that is just the Kurdistan region. We can grow further, such as in Diyala, where we have shown that gas can displace liquid fuels and save billions for the host government. And we are avoiding 5mt/yr of CO_2 emissions in the process, equivalent to all the emissions avoided globally by Tesla cars." **PE**

Turning potential into reality

Majid Jafar, CEO, Crescent Petroleum

Iraq is the largest untapped major resource of hydrocarbons in the world, despite having been a founding member of OPEC. That is in large part due to the sustained period of turmoil it has been through; there was the war with Iran throughout the '80s, followed by the Kuwait invasion and the imposition of international sanctions throughout the '90s, followed by the US invasion and regime change in 2003. Iraq has suffered decades of war, sanctions and isolation from the international oil and gas industry, in terms of capital, technology and management.

Despite those challenges, the country has achieved much in recent years. It has gone from producing a couple of million barrels a day of oil to nearly 5m b/d currently, and it should double that—and more—potentially, if all goes to plan. There are still huge fields that are undeveloped, huge prospects that are unexplored.

Iraq is now officially the second-largest oil reserve holder in the Mideast next to Saudi Arabia, with 140b bl. And that very much underestimates the true potential.

Even under the most ambitious energy transition scenarios, oil and gas is going to play a prominent role for decades to come. So much of what the energy transition relies upon is made of oil, whether it's the electric cars, the wind turbines, or the solar panels. Natural gas is also fundamental, as was recognised at the COP28 climate summit last year. It's an important transition fuel, because gas replacing dirtier fuels like coal or liquid fuels in the case of the Middle East is how you quickly reduce emissions and then enable the addition of renewables. Because renewables are intermittent, you need to stabilise the baseload before you can add solar and wind.

Even as we look at an eventual transition away from fossil fuels, the fossil fuels we have in the Middle East and Iraq, in particular hydrocarbons, are going to be among the last in the market to go, because they are the lowest cost, and among the cleanest.

Iraq has some catching up to do, compared to the UAE and Saudi and others in the region.

Finally, we're making important strides in adding renewable energy, in particular solar. Both Acwa Power and Masdar, the leading Saudi and UAE companies respectively in the solar space, are now active on the ground in Iraq.

More reforms are needed to consolidate this progress. For example, we need to reform how electricity is priced, how fees are collected and the charges, all the way into the upstream with the contract model.

Iraq's first oil and gas bid rounds were based on a technical service contract model, under which the investor got the investment back, plus a fixed fee per barrel. However, that failed to align investors with the host government. That model gave the investor no incentive to reduce costs. And when oil prices went up, there was no incentive to put their best people and capital on the project, because they only got a fixed fee per barrel.

The positive is that those flaws are now widely recognised in Iraq. There was a revision of the contract model for the fifth bid round, that we bid on successfully, to turn it into more of a revenue sharing model, rather than a service fee. Now, you can bid on a percentage of revenues. And that has achieved better alignment. The outcome of the latest bid round is further proof of that progress. **PE**

Raising the stakes

Iraq's fifth and sixth oil and gas bid rounds have attracted a range of new players with gas as well as oil ambitions—and there's a seismic shift in the contracting process

After a fallow period that saw an effective moratorium on Iraq's oil and gas upstream licensing process, May 2024 saw awards covering the two most recent bid rounds, Licensing Round 5+ (LR5+) and Licensing Round 6 (LR6). These have introduced a clutch of new entrants to Iraq's energy sector, with just one of the 29 blocks on offer going to a Western major.

The two rounds followed an 11-block fifth licensing round, launched in April 2018, which saw contract awards in February 2023. Crescent Petroleum was awarded contracts to develop three blocks: the Gilabat-Qumar and Khashim Ahmer-Injana blocks, both in Diyala governorate, and the Khidher al-Mai field, in Basrah province.

Altogether, Crescent has committed to developing the Khashim Ahmer-Injana block to initially supply 120mcf/d of feedstock gas to Mansuriyah power plant, reaching up to 520mcf/d feeding into both Mansuriyah's power plants and other nearby power stations. The Basrah province block will also contribute to the local natural gas feedstock mix in due time.

"The fifth and sixth bidding round awarded fields containing large amounts of associated and non-associated natural gas, especially in Diyala region," said Abdulla al-Qadi, Crescent Petroleum's Iraq country chairman. "These projects aim to secure Iraq's energy independence and ultimately improve electricity services and related aspects. The result will be considerable savings for the national budget that could be invested in other sectors of the economy."

Since June 2017, Iraq has been importing natural gas from Iran—currently at a volume of around 1bcf/d—said Qadi. The price of Iranian gas is estimated at $9/m Btu based on the government's public pronouncements, amounting to more than $3.2b/yr. Iraq is also burning crude oil for power generation at a rate of 194,000b/d in 2018, according to available government figures.

"Gas supplied from the Khashim Ahmer-Injana block will significantly reduce these costs while providing more reliable supply," said Qadi.

It also represents Crescent's first formal entry into federal Iraqi territory; up until now, its operations had been focused on the Kurdistan Region of Iraq. With Kurdistan's KAR Group also securing the Daimah licence in Maysan province, Baghdad has signalled it is prepared to adopt a more open attitude to bringing in experienced developers to its upstream, putting aside past grievances related to Kurdistan's pursuit of an independent oil and gas strategy.

The sixth bid round, launched in 2023, revealed new thinking in Baghdad, being explicitly designed to help Iraq meets its domestic gas needs, with a priority placed on power generation and supplying feed gas to the country's industrial, petrochemical and fertiliser sectors. The 11 blocks on offer were mainly located in the country's western governorate of Anbar—which holds substantial non-associated gas reserves—and the northern governorate of Nineveh. Expected gas production from the round was 800mcf/d.

Government officials expect the various projects in the licensing round will hike oil production capacity to 6m b/d by 2030 from around 5m b/d now. Iraq anticipates deriving more than 3.46bcf/d of gas from the licensing rounds.

Not all areas attracted bids. Those that didn't were the Anbar, Okashat, Anah and al Anz blocks in Anbar province; the Pulkhana field in Salahuddin province; Tel Al Hajar block in Nineveh province; Block 11 in Muthana province; and Qalaat Salih block in Maysan province. On the other hand, with the 22 oil company bids attracted for the 29 blocks on offer, including majors Shell and BP, it is evident there is still ample heavyweight interest in Iraq's upstream.

> "The recent bid rounds were all about smaller fields—by Iraqi standards—compared to the supergiant fields awarded earlier"
>
> **Jafar, Crescent**

Improving contracts

What is equally significant is that Iraq has overseen a major shift in its contracting process. Contract terms have been re-evaluated over the years. "After 2003, we saw majors rushing into Iraq to plant a flag in the ground. The fee-based service contracts attracted the majors because they were hoping that, over the passage of time, they would get access to larger resources," said Qadi. "That model did not work for them, and it did not work for the government either, as the fee-based system meant there was no incentive to complete the projects on time and at cost."

According to analysis from consultancy Wood Mackenzie, Iraqi upstream licences had features of both service contracts and production-sharing contracts, creating a form of hybrid service contract that comprised a royalty, cost fee, remuneration fee and income tax. Of these, only the remuneration fee was a biddable parameter and was a percentage of net revenue share.

The first hybrid service contract was awarded in April 2018. Since then, Iraq has revised fiscal terms for oil and gas projects. The new terms address several structural shortcomings with the technical service contract. For example, the per barrel remuneration fee has been replaced with a biddable profit share. However, terms remain tough, with a typical government share of more than 95%.

Most acreage now being offered is under long-term profit sharing-based exploration, development and production contracts or development and production contracts. The current contract utilised the experiences and lessons learned from the previous technical service contract and aims to improve on those contracts, said Qadi.

Another major divergence from previous contracts is that the remuneration fee has been replaced by the net revenue share. This means the contractor will get a share of the net revenue with the government. "Sharing the net revenue with the government will guarantee government share while generating attractive returns for the contractor," said Qadi.

Other modifications include new clauses giving priority to Iraqi service providers and subcontractors, and only qualifying foreign subcontractors that specifically employ Iraqis. There are also new amendments to ensure a certain percentage of local content in the operations and within a specified timeframe, thereby increasing development and employment of the Iraqi workforce. Crescent, fresh from its success in the fifth bid round, is now set to bring its Kurdistan region experience to bear in Diyala, not far from its Kurdish production area.

"The recent bid rounds were all about smaller fields—by Iraqi standards—compared to the supergiant fields awarded earlier," said Majid Jafar, CEO of Crescent Petroleum. "In my view it would be good to take this new contract model and apply it to the older bid rounds. It is not straightforward, and there would have to be negotiation, but investors would welcome it. And it would achieve more investment, at less cost and with higher growth for Iraq's production." Perspective is needed when judging licensing rounds. In Jafar's view, what has been achieved in a relatively short space of time, through six bid rounds, is still substantial.

Despite criticism of terms, the country's oil and gas sector has succeeded in adding more than 2m b/d to domestic crude production, pushing it above 4m b/d. Without Iraq's OPEC quota constraints, it would be capable of more still.

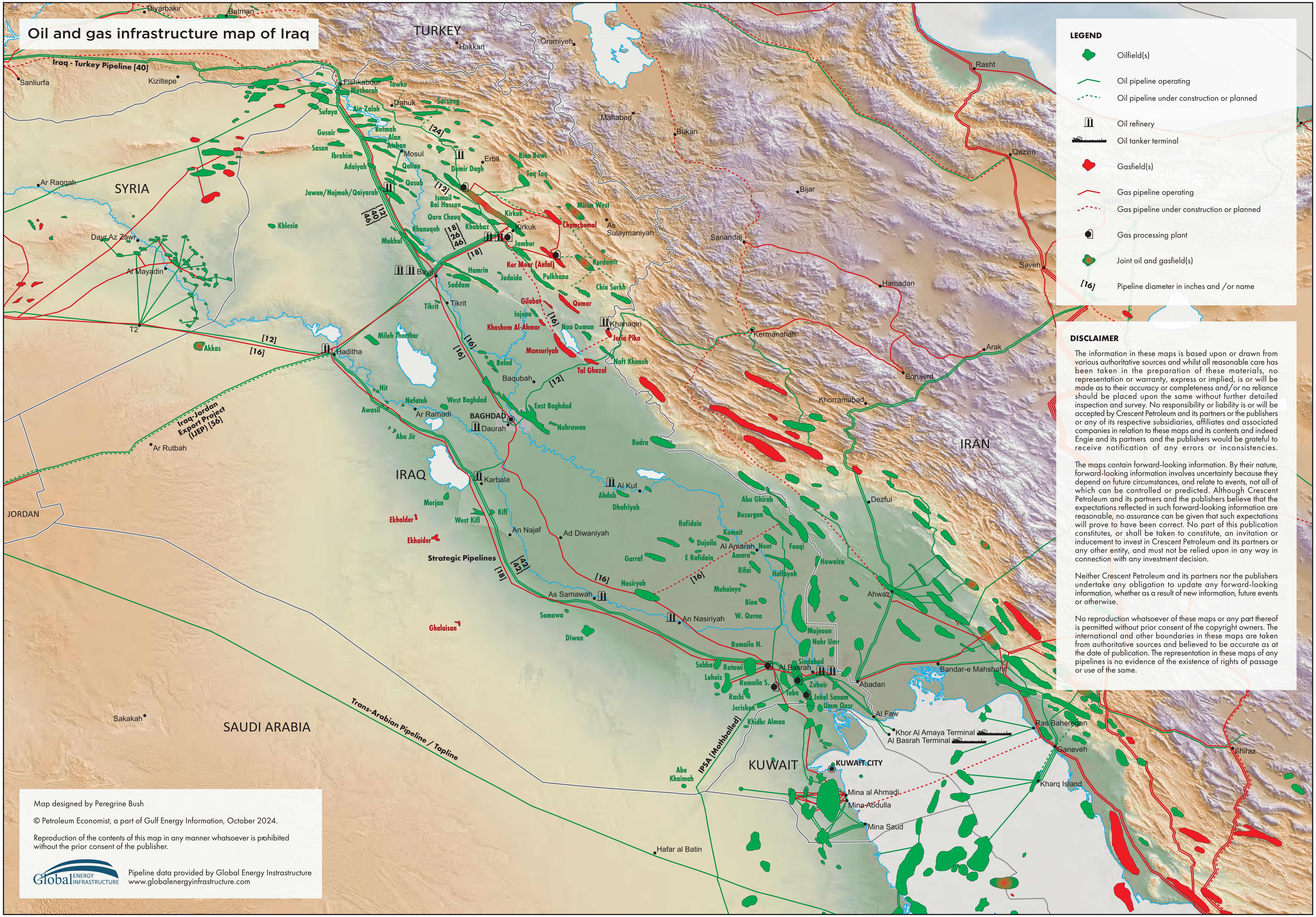
"We have gone from majors to NOCs to Chinese companies to private sector independents such as ourselves. And only now are we starting to bring forward the true potential in Iraq," said Jafar. **PE**

Bidding companies in Iraq's 5th, 5th+ and 6th licensing rounds

1	Shell (UK-Netherlands)
2	Sonangol P&P Iraq (Angola)
3	QatarEnergy (Qatar)
4	Crescent Petroleum (UAE)
5	Dragon Oil (UAE)
6	ADNOC (UAE)
7	ENI (Italy)
8	TotalEnergies (France)
9	Pertamina (Indonesia)
10	Petronas (Malaysia)
11	TPAO (Turkey)
12	KAR Iraq (Kurdistan Region of Iraq)
13	ZhenHua Oil (China)
14	Sinopec (China)
15	CNPC International (China)
16	Geo-Jade Petroleum (China)
17	Anton Oilfield Services (China)
18	CNOOC (China)
19	ZPEC (China)
20	Energy Group (China)
21	Gazprom (Russia)
22	Lukoil (Russia)
23	BP (UK)
24	Ukrzemresurs (Ukraine)

Source: Target/Petroleum Economist

Oil and gas infrastructure map of Iraq



LEGEND

Oilfield(s)

Oil pipeline operating

Oil pipeline under construction or planned

Oil refinery

Oil tanker terminal

Gasfield(s)

Gas pipeline operating

Gas pipeline under construction or planned

Gas processing plant

Joint oil and gasfield(s)

[16] Pipeline diameter in inches and /or name

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Enticing new partners to invest in energy security

There are opportunities for attractive returns and greater project success amid a real push by the Iraqi government for reform, as long as there is a shared understanding between the needs of investors and the host government

International investors have begun revisiting the blueprints for developing energy projects in Iraq. For starters, the government is tackling the numerous impediments to doing business, including solving substantial governance challenges and taking steps to resolve investment impediments for the private sector. Second, fears over resource nationalism, political strife and insecurity have begun fading with the current administration and its commitment to getting major projects off the ground. And finally, financing for energy projects is heading in the right direction.

Crescent Petroleum may well be a trailblazer in the country, but it also offers an example of how to do business in Iraq, exemplified since it began operations there in 2007. The message is clear: develop a local mindset. Foreign investors taking a fresh look at Iraq will see there is a clear opportunity to meet in the middle as the government embraces a more international outlook.

Policymakers are focusing on a series of key reforms to the business environment. "Political stability is a key enabler of investment, and several reform measures need to be in place to enhance the business investment climate," said Jessica Obeid, an energy specialist at consultancy Azure Strategy. "Chief among these measures are transparency, providing incentives, ensuring timely payments, streamlining licences and ensuring recovery of costs. Implementing anti-corruption measures to promote a transparent investment environment is the way forward, while addressing the structural issues of the sector and the business climate."

While Iraq has brought in foreign companies for service-oriented projects within the power and hydrocarbons sector, according to thinktank the Atlantic Council, the engagement of foreign entities often translates into the outsourcing of specific services to global corporations such as GE and Siemens, as well as Chinese firms.

Traditional resource nationalism has proved another obstacle. "The current attempt to capture flared gas could have been started as far back as 2007–08, but the officials who were in charge were more ideological than practical, which meant they did not give oil companies what they needed to invest. They did not like the idea of multinational corporations coming into Iraq and influencing the government," said the Atlantic Council's Abbas Kadhim.

Given such entrenched attitudes, new entrants have had to adopt a more hands-on approach.

Crescent Petroleum's operations in Iraq began in 2007, when the country was on a civil war footing.

According to Crescent CEO Majid Jafar, having a local mindset (reflecting the company's Iraqi origins) with a can-do attitude meant the company was able to drill wells and install seismic processing facilities and a pipeline within the space of 15 months, working in conjunction with the Kurdistan Regional Government.

"Matching investor expectation with that of the government is key to success. Iraq should focus on maximising the value of oil efficiently, rather than interpreting contracts as a zero-sum game with investors," said Jafar.

Sometimes, there is misalignment of expectations between the government and the foreign investors. "When it comes to natural gas, the priority is power generation in Iraq. But the large international majors, their priority is putting the gas in a ship and sending it to the international market," said Jafar.

> "Iraq should focus on maximising the value of oil efficiently, rather than interpreting contracts as a zero-sum game with investors"
>
> **Jafar, Crescent**

The sense now is that the attitude in Baghdad is changing. The Sudani government is focused on delivery of major projects, with substantial budget resources allocated. It has made it clear it wants new partners to come in and invest in energy infrastructure to enable Iraq's energy security and support Iraq's role in the evolving regional energy complex.

Reform focus

The government has also instituted broader reforms to the executive branch, including evaluation processes to measure government performance and tackle corruption. With more budget available for capital projects, said Jafar, the economic impact is palpable. "There is now a lot of liquidity in the Iraqi system, and the stock market is up by 100%. You can see the impact in the cranes across Baghdad's skyline and in the new housing developments."

While bureaucracy, corruption and lack of electricity continue to challenge doing business, the general direction is positive and the desire of the government to attract investment and solve industry problems is very visible, said Jafar.

Private investment is impacting across sectors. For example, in 2023, the International Finance Corporation (IFC), the World Bank's private sector-focused development institution, signed an agreement on a public-private partnership (PPP) to rehabilitate, expand and maintain Baghdad International Airport—creating the country's first genuine PPP project.

One of the biggest challenges facing investors is the lack of capacity of the local banking sector. Local lenders, which comprise around 70 private and six state-owned banks, are not well placed to support energy sector financing.

"Until now it has been mainly Western and Chinese energy companies who have committed to investing in Iraq," said Neeraj Agrawal, Crescent's CFO. "And Western companies finance their investment through their own balance sheet, as do the Chinese, with the latter seeing some assistance being provided by their government."

One area where Iraq has made strides is in attracting finance from development finance institutions (DFI) and export credit agencies (ECAs) principally for the power sector. Much of the financing for power projects in Iraq has come from the IFC and other similar bodies.

For example, UK Export Finance, an ECA, provided a $117m package to support the early-stage construction of two gas-fired, 750MW power plants in Dhi Qar and Samawha in the south of Iraq.

In late 2023, Iraq's Ministry of Finance closed a $242.7m US EXIM-backed buyer credit to finance the upgrade and rehabilitation of various existing power plants in Iraq. The financing was the 12th ECA-covered deal sealed by Iraq since 2018.

That appetite for financing power projects is not evident in the upstream oil and gas sector. "We have worked very closely with many DFIs, and we have seen no appetite for providing any financing. ECAs have been affected by it as well. Nobody touches upstream, the only exception being the IFC if gas is being currently flared, in which case they can actually provide financing to turn it into power generation," said Agrawal.

Crescent's securing of financing in 2021 for an expansion project at the Khor Mor gas plant in the north of Iraq provides a potential template for other energy companies to follow.

"We were able to mobilise close to $1b in financing for our expansion project, and we secured $250m financing from the US International Development Finance Corporation (DFC),"

The $250m financing with the DFC was signed in September 2021 and followed a series of financial innovations that showed solid projects can still secure funding in Iraq.

"We were also able to put in place a contract with an EPC contractor who agreed to take a certain percentage of the contract value during construction, but the majority of the contract value is from cash flow from the project," said Agrawal. "And we also mobilised a local bank in the UAE, with whom we have a corporate banking relationship, which provided a substantial sum of money. So, through these sources, we were able to mobilise funding."

Iraq's energy sector could prove a good fit for regional financial institutions such as The Arab Energy Fund (formerly Apicorp), the leading multilateral financial institution promoting investments in the MENA region's energy sector.

"We see them being a leader, and they could work with a large bank like Trade Bank of Iraq to create a financing base. But it is a gradual process," said Agrawal.

One area of reform would be to see a combination of knowledge and indirect risk instruments introduced. "Through a partnership between the governments and institutions like the World Bank, the IFC and the European Bank for Reconstruction and Development, we could create a version of the World Bank's Multilateral Investment Guarantee Agency, which would enable commercial capital to be unlocked," said Agrawal.

Another area where new financing could be secured is through the use of capital markets. Some oil and gas companies have issued bonds in the Kurdistan Region of Iraq, including Pearl Petroleum, Genel Energy and Norway's DNO.

"That has been a successful model in providing capital. The bond market was an important tool to unlock foreign capital for good solid projects run by good companies. And there is no reason why that cannot be created for federal Iraq as well," said Agrawal.

The view in Baghdad is that, with a bit of encouragement and support and a bit more stability, the pieces of the financing jigsaw will work together to help Iraq's energy sector reach its true potential. **PE**

Iraq's youthquake

With hundreds of thousands of young Iraqis entering the employment market every year, economic reforms are urgently needed to ensure the private sector can provide jobs for them

The street protests that gripped Iraq in 2018–19 plunged the country into a profound governance crisis, triggering a period of introspection as the authorities absorbed the impact of the marginalisation of the country's youth.

What started as disparate groups soon morphed into large crowds who targeted government and political party offices, making clear the need to create more jobs for the country's sizeable and growing youthful demographic.

Following the resignation of then-prime minister Adel Abdel-Mahdi, there came a new appreciation among the country's political class of the need to deliver better services and better employment opportunities for the hundreds of thousands of restive Iraqis entering the job market every year.

The challenge for Iraq has been to find long term policy prescriptions for tackling a crisis that will only continue to grow. Rather than the stock response to the 2019 demonstrations, which saw the creation of more public sector jobs, the call now is to enable a private sector-led diversified economy that could generate higher quality employment and opportunity for younger Iraqis.

Public sector wages now swallow more than half of the country's spending, with about 9m people toiling on the state's books, representing about 38% of total employment, according to the UN's International Labour Organisation (ILO).

Iraq has one of the region's fastest-growing populations, at a rate of 2.97% annually, compared to just over 1% in middle income countries.

"Iraq's population is estimated at 45m, with more than 60% under 21 years old. Job creation and employment opportunities are therefore a central consideration for all policymakers in the country," said Abdulla al-Qadi, Iraq country chairman at Crescent Petroleum.

The ILO notes that the Iraqi private sector has been constrained by decades of war, with small and medium-sized enterprises facing bureaucratic and financial barriers to expansion and formalisation. As a result, private companies are often located in the informal sector, which accounts for 54.8% of total employment.

36%

Rate of youth unemployment in Iraq

These employment dynamics, particularly in the private sector, have led to almost double the unemployment rate among the youth (36%) compared to the rest of the population (16.5%) in 2022.

There's a need to broaden the range and quality of vocational education and training to meet the needs of the labour market.

"If Iraq diversified its economy, it could create an environment where businesses can thrive and relieve the government of the burden of being the only employer people look to when they want a job," said Abbas Kadhim, head of the Iraq initiative at thinktank the Atlantic Council.

Every year, said Kadhim, up to 1m people enter the job market, and no government can absorb this number year in, year out. "What you do then is create other paths for employment, rather than in the unproductive public sector."

Companies active in the energy sector are starting to put job creation at the heart of their plans.

For its part, Crescent Petroleum has sought to empower communities through direct local employment and training opportunities for people within the communities in which it operates.

In the Kurdistan Region of Iraq (KRI), local nationals account for more than 85% of its employees. And in 2022, the number of local nationals in its full-time workforce increased by more than 26% compared with 2021.

"Over the past 15 years, our natural gas operations in the KRI have created thousands of direct and indirect jobs in the communities where we operate," said Qadi. "We have directly employed hundreds in northern Iraq and indirectly contributed to employment through our supply chain activities and the spending of our employees into the local economy. Our operational impact has been increasing significantly every year since 2008, and we have increased the number of jobs created from 340 to 2,200—increasing our employment contribution from our operational activities sixfold."

According to Qadi, the company directly impacts the communities in which it operates by providing direct employment opportunities and comprehensive training programmes for local residents.

"In 2023, we witnessed a notable 2% increase in the number of local nationals within our full-time workforce compared with the previous year. Within the KRI we maintained a high percentage of local employees, at 84%. In our new projects in federal Iraq, we aspire to reach up to 90% local employment in time, as well."

The focus is on thinking local. "We pride ourselves in getting close to 90% of our staff being Iraqi nationals and as local as possible," said Jafar. "And not just in labour positions, but management positions as well."

Training is pivotal to this effort. Crescent has established partnerships with several organisations, such as Education for Employment, which focuses on improving employability skills for young people. Through these partnerships it has offered a number of online courses that have been downloaded more than 500,000 times, with over 100,000 downloads from young Iraqis.

The company's training and development department leads comprehensive training programmes to develop its teams by boosting capacity and enhancing their skills.

"We also work to encourage personal and professional growth of our local employees by offering a wide range of training and development initiatives," said Qadi.

These programmes include personalised coaching sessions, hands-on training, workshops, e-learning courses, professional certification programmes, external training opportunities, leadership development and tailored programmes designed for high-potential local talent. "We have also brought onboard experienced expatriate technical trainers to act as expert training facilitators, leveraging their specialised knowledge to enhance the skills of our local workforce," said Qadi.

The aim is to replicate this in the new areas of Iraq in which Crescent will be working. "We intend to apply the lessons learned in Diyala, where we will employ hundreds of people in the coming years, to unlock the hidden value in these fields," said Qadi. Diyala has seen comparatively little development than other Iraqi regions. "We will train and develop all our staff much like we have done in every other one of our operations. We will also have a substantial Training and Development Fund and will invest in local communities in the Diyala area, much as we have in our other operations".

Other oil and gas companies have also put resources into job creation. China's ZhenHua Oil, which has an oilfield project in East Baghdad, has offered study scholarships and short-term training in China for young Iraqis. The company said it has created more than 5,000 local jobs and made positive contributions to local social development and the improvement of people's livelihoods.

In the long-term, the government will be under pressure to make good on its commitments to develop Iraq and support its private sector as the main font of job creation.

Analysts are optimistic about the direction of travel. "Prime Minister Sudani has kept his head down, focusing on building infrastructure, and initiating a lot of investment projects," said Renad Mansour, project director at the Iraq Initiative at London-based thinktank Chatham House. "There is a lot of momentum resulting from his strong mandate and the government wants to ride its current high approval rating. The message is, we are serious about developing the country." **PE**

Regional visions

Although Iraq remains a major crude exporter, it is still some way from becoming a regional energy supply hub. Ambitious new cross-border schemes aim to rectify that situation

With major buyers of its oil in China, India and other Asian markets, Iraq is already deeply integrated into global energy markets, alongside its relations with neighbours such as Jordan and Turkey.

Iraq sells crude to Jordan at a rate of 450,000bl per month. Oil exports of 3.4m b/d would be higher still but for the cessation of pipeline exports via the northern pipeline to the Turkish port of Ceyhan since March 2023, when 470,000b/d of exports were halted after an international arbitration ruling that deemed them as not having federal government consent.

Regional energy relations are burgeoning. The UAE is ramping up purchases of Iraqi crude, with state firm ADNOC beginning its first cargo purchases in April of this year. Iraqi policymakers are focusing on plans to substantially augment these regional relationships through development of its still untapped natural gas reserves. Prime Minister Mohamed Shia al-Sudani's government is painting on a larger canvas, charting ambitious plans that envisage Iraq's energy sector as a vital cog in a much broader regional setting.

40mt

Volume of cargo expected by 2050 via the planned Development Road

Iraq has initiated two major projects to cement its role as a vital link between Asia and Europe and to bolster its geopolitical importance: the Grand Faw Port and the Development Road. The port's masterplan includes extensive container cargo, dry bulk cargo and oil terminals, along with a dry dock and naval base. The proposed 1,200km Development Road would link al-Faw port to Turkey via road and rail and would incorporate a corridor for oil and gas pipelines.

Politics is a key shaping factor in this project activity. The Grand Faw Port and the Development Road projects are part of a government vision to do something different.

"The Sudani government is making a point about the need to think about Iraq first," said Renad Mansour, head of the Iraq Initiative at thinktank Chatham House. "The Development Road is part of the prime minister's pitch to the Iraqi people to say, we can offer you something different through these mega projects."

Now is an opportune moment for Iraq to create interdependencies with neighbours such as Kuwait and Turkey. Even though the latter remains locked in a conflict with PKK forces in the north of Iraq, major international projects can create the means for Iraq to be valuable to Turkey.

The rationale for the Development Road is to transform the country's economy by accelerating development, accentuating connectivity to the global market and establishing new modes of revenue and employment creation.

The Development Road plan gained renewed moment in April 2024, when Iraq joined together with Turkey, Qatar and the UAE to establish the framework for implementing it. The project will start at al-Faw Port on the Gulf coast and finish at Faysh Khabur on the Iraq-Turkey border, before extending through the latter's extensive rail and highway networks. By 2028, the freight trains transport capacity will reach 3.5m containers and 22mt of bulk cargo a year, rising to 7.5m containers and 33mt of cargo by 2038, and to about 40mt of cargo by 2050.

Energy is the glue that binds these projects together. On the Grand Faw project, the centrepiece is a major refinery project that involves Iraq's state-owned Southern Refineries Company and China National Chemical Engineering Company. The al-Faw Investment Refinery Project is part of a government plan to hike refining capacity and boost domestic petroleum product output.

The new $8b refinery will have a capacity of 300,000b/d and will aim to supply domestic and international markets. The project is part of the Iraqi government's plan to boost production of domestic petroleum products. The second phase will see a petrochemical plant built with a 3mt/yr capacity.

Al-Faw Port could emerge as one of the region's largest ports. Notably, it is attracting the interest of Gulf states. The UAE is particularly keen, with AD Ports Group striking a preliminary joint venture agreement with the General Company for Ports of Iraq to develop the port and its associated economic zone.

Energy matters

Above all, Iraq's ambitious vision rests on its credibility as a supplier of energy. According to Abbas Kadhim, head of thinktank the Atlantic Council's Iraq Initiative, Iraq is one of the few countries in the region with room to increase its oil export capacity.

"No country in the region other than Iraq is able to add 5–6m b/d more than its current production," said Kadhim.

OPEC supply constraints suggest such increases in production are unlikely in the near-term. Nevertheless, the refining expansion underway could help Iraq to transform itself into a regional supply hub.

"Iraq is seriously doing a good job on the refining side, especially in the past couple of years," said Palash Jain, refining analyst at consultancy FGE. "And going forward, there are a couple of projects, such as the Basrah refinery upgrade that is expected to come onstream around 2025 or 2026, which will be important for increasing gasoline production."

> "No country in the region other than Iraq is able to add 5–6m b/d more than its current production"
>
> **Kadhim, Atlantic Council**

It is not just from the refining side that progress is being registered. "On the gas supply side, over the past couple of years we have gas processing plants that have come online, such as Basrah train one and the Halfaya gas plant. Furthermore, we anticipate that three additional projects will become operational within the next 9–12 months: the Dhi Qar Gas Plant, Basrah NGL Train 2 and the Khor More Gas Plant," said Jain.

The government has sanctioned budget for a pipeline between Basrah and Haditha that will support domestic consumption as well as exports. "All these developments show that Iraq's political stability is helping a lot, and that Iraq can become an energy hub in future if it ensures continuity of political and economic stability and resolves disputes between the Kurdistan Regional Government and the federal government," said Jain.

If Iraq is serious about cementing its credentials as a regional energy hub, it will have to think seriously about its future integration with regional markets.

"Iraqis face important questions. One is, do they want to be a place where people drop a few coins as they travel through, or do they actually want to be an integral part of this Development Road—in other words, develop an economy around it?" said Kadhim.

Alongside the logistical and funding challenges, other factors threaten to undermine Iraq's progress. The existence of rival competing projects to the Development Road is a challenge.

The Chinese-led Belt and Road Initiative and the India–Middle East–Europe Economic Corridor (IMEC), backed by the US, envisage connectivity and infrastructure development going hand in hand, and linking a number of countries and regions.

"Within the Gulf region, Kuwait has its own port that is situated close to al-Faw," said Kadhim. While IMEC has heavyweight backing, it would require a full normalisation of relations between Saudi Arabia and Israel to be implemented. That looks a distant prospect.

"The question is, can these development projects become operational before the political side of things can be realised? In this way, the Iraq route may make more sense."

Iraq is still a long way from realising these grandiose regional ambitions. But the deals being inked suggest the Development Road and Grand Faw Port projects are starting to gain serious momentum, giving Iraq hope of making itself a much more important regional player. **PE**

Centrepiece projects chart ambitious energy future

Iraq is thinking on a large canvas, as a series of major projects attempt to reshape its development — with natural gas at the core of many of these

MILESTONE: Al-Faw Grand Port

Key details:

- The $6b al-Faw Grand Port masterplan is one of Iraq's biggest projects, envisaging a first-phase five-berth container terminal with a capacity of 3.5m TEU/yr.
- The project is designed to become the Middle East's largest port, with a masterplan including container, dry bulk and oil terminals, a dry dock and a naval base.
- Al-Faw Grand Port has attracted much interest from the Gulf states, in part due to its location close to Kuwait at the neck of the Gulf. The UAE's AD Ports Group has signed a preliminary joint venture agreement with the General Company for Ports of Iraq to develop the port and its associated economic zone.

Why it's important: The port is due to play a key role in linking Asia and Europe and is intrinsically linked to the Development Road project (see below), which will see 1,200km of road and rail stretching from Basra to Turkey. The aim is to leverage Faw's strategic location linking commercial lines between the east and the west, unlocking opportunities for trade, investment and economic growth. Energy is central to Grand Faw's ambition; its centrepiece is a major refinery, part of an effort to boost domestic petroleum product output.

Challenges: As with many projects in Iraq, getting from drawing board to finished project on such a sizeable scheme could prove difficult. Al-Faw Grand Port has experienced many delays since its inception in 2010. While phase one should be completed by next year, there remains question marks over future progress, with later phases contingent on progress being registered on the Development Road.

Likely completion date: Phase one completion due 2025, fully operational by 2028.

MILESTONE: Development Road

Key details:

- The proposed 1,200km Development Road would link al-Faw port to Turkey via road and rail, incorporating a corridor for oil and gas pipelines.
- The project, which will cost about $17b, will finish at Faysh Khabur on the Iraq-Turkey border, before extending through the latter's extensive rail and highway networks.
- The scheme would see the freight trains transport capacity reach 3.5m containers and 22mt of bulk cargo a year, rising to 7.5m containers and 33mt of cargo by 2038, and to about 40mt of cargo by 2050. The initial capacity of the high-speed train is expected to be 13.8m passengers a year.

Why it's important: The project aims to help wean Iraq off its hydrocarbon reliance, generating new revenue streams from the transhipment of goods between East and West. The Development Road will also support the emergence of new cities and industrial hubs along the corridor. Progress has been registered this year, with an MOU signed in April 2024 between Iraq, Turkey, Qatar and the UAE.

Challenges: Building rail, road and energy pipelines from scratch will test Iraq's ability to secure financing in a country that has a track record of insurgency and sabotage of pipelines. It will also require stable interstate relations, notably with Turkey; this is not a given, as bilateral ties have experienced strains in recent years. Another key challenge is that it will face competition from rival schemes involving other states.

Likely completion date: 2050

MILESTONE: Al-Faw Refinery Project

Key details:

- This major new refinery will see Iraq's state-owned Southern Refineries Company and China National Chemical Engineering Company develop a 300,000b/d facility, aiming to supply both domestic and overseas markets.
- Costed at $8b, the project is part of the Iraqi government's plan to boost production of domestic petroleum products. It is also intended to develop the country's nascent petrochemicals capabilities, with a second phase set to establish a petrochemical plant with a 3mt/yr capacity.
- Al-Faw refinery will also include a 2,000MW power plant and the establishment of a training facility to upksill 5,000 workers.

Why is it important? The refinery scheme has secured heavyweight Chinese backing, a critical sign of confidence, and enjoys strong political impetus given Iraq's need to become self-sufficient in products. As the largest greenfield project among a host of upgrades to existing refineries across Iraq, its success could have a transformative impact on the country, and allow it to achieve greater value-added from its prodigious energy resources.

Challenges: Across the globe, large refining projects have struggled to come onstream in a timely fashion—Nigeria's Dangote refinery being a prime example. Iraq will face similar challenges in hitting project timelines.

Likely completion date: 2028

MILESTONE: Basrah Natural Gas Liquefaction (BNGL) plant

Key details:

- After the first train was inaugurated in May 2023, BNGL has emerged as a vital project for Iraq's energy sector.
- The plant comprises two gas processing units with a capacity of 200mcf/d each. When both trains come onstream the plant will add 400mcf/d. That will leave Basrah Gas Company's gas processing capacity at 1,400mcf/d.
- The BNGL plant has been designed in line with a capacity to capture additional gas in the future, and will include power generation, water management and sulphur treatment facilities.

Why is it important? The BNGL plant could play a key role in helping reduce gas flaring. It is designed to eliminate an additional 10mt of CO_2 from entering the atmosphere—a key ambition for the Iraq government. BNGL will be providing 320mcf/d of dry gas which will in turn generate 1,900MW of power to the national grid, along with 2,150t/d of LPG and 5,900b/d of condensate.

Challenges: Having achieved its key project milestones, BNGL is unlikely to face obstacles in future.

Likely completion date: The second train is due onstream by end-2024.

MILESTONE: Halfaya gas plant

Key details:

- The Halfaya gas plant, located in Maysan in southeastern Iraq, was commissioned in June 2024 after a fast-track execution by China Petroleum Engineering & Construction Corporation, a subsidiary of CNPC (whose subsidiary is one of the project owners, along with TotalEnergies) awarded the contract for the gas compression upgrade project in January 2023.
- Its scope focuses on improving the gas compression systems at Central Processing Facility (CPF) 1 and CPF 2.
- As more gas is produced at Halfaya oil field, this will require building new gas capturing facilities over time. The Halfaya gas plant will be able to process 300mcf/d of flared gas.

Why is it important? Halfaya has a key role to play in halting the flaring of associated gas. The upgrade project will supply gas and condensate to a gas processing plant in Halfaya, which will increase the volume of natural gas being processed—another key policy aim of Iraq's government.

Challenges: The project manager on the Halfaya gas plant is Petrofac, a UK registered oil and gas services company that has faced litigation claims in the UK over allegations of fraud.

Likely completion date: 2024

MILESTONE: Khor Mor gas plant expansion

Key details:

- The so-called KM 250 expansion project and will boost the Khor Mor field's production by 250mcf/d, taking the total output to 700mcf/d.
- The gas field operator, Pearl Petroleum Company. a joint venture of Dana Gas and the UAE-based Crescent Petroleum, Austria's OMV, Germany's RWEST and Hungary's Mol Group, has mobilised some $800m in financing for the project.
- The project dates back to 2007, when Dana Gas and Crescent signed an agreement with the Kurdistan regional government to appraise, develop, produce, market and sell hydrocarbons from Khor Mor and the nearby Chemchemal field.

Why is it important? As the first significant private sector-led natural gas development project in Iraq, it has set a template for other projects looking to feed gas to domestic industries and to power generation. The expansion being planned will ensure more end users in the Kurdistan region have access to gas supplies, supporting industry and improving electricity coverage.

Challenges: The gas field has been on the receiving end of missile attacks on at least a couple of occasions, underscoring the impact of the difficult security situation in Iraq's north.

Likely completion date: Completion estimated by the end of 2025.

MILESTONE: Dhi Qar gas recovery project

Key details:

- Oilfield services contractor Baker Hughes is developing a gas recovery project in the southern Iraqi province of Dhi Qar, which will capture 200mcf/d of gas from the Nasiriyah and al-Gharraf fields, for power generation purposes.
- State-owned South Gas is the partner in the project which is also designed to help reduce Iraq's dependence on gas imports from Iran, and stem gas flaring.
- The project will have the capacity to treat 130mcf/d of flared gas from the al-Gharraf field and 70mcf/d of flared gas from the Nasiriyah field.

Why is it important? Dhi Qar is another significant strategic Iraqi project that is designed to both increase domestic gas supply and reduce imports from Iran—effectively killing two birds with one stone. The impact in reducing flaring from the associated gas fields is another bonus.

Challenges: Like many Iraqi projects, the Dhi Qar gas recovery scheme has been subject to frequent delays already. The hope will be that it can make faster progress, having initially been due to start as far back as 2018.

Likely completion date: No official date has been given for completion.

MILESTONE: Gas Growth Integrated Project (GGIP)

Key details:

- Initially signed in September 2021, and finalised in July 2023, the TotalEnergies-led GGIP will involve four main contracts—a common seawater supply project; a project to gather associated gas from oil fields; development of the Ratawi field; and the establishing of a 1GW solar energy project to supply the Basrah region's grid.
- The consortium to implement this project will be composed of TotalEnergies (45%), QatarEnergy (25%) and Basrah Oil Company (30%).
- The seawater treatment plant will provide water injection for pressure maintenance and increase oil production.

Why is it important? With a price tag of $27b, the GGIP is one of the largest of Iraq's megaprojects—and a statement of confidence in Iraq's future from a major international energy company. It also brings together oil, gas and renewable energies into one integrated whole—a potential template that could help transform Iraq's wider energy prospects.

Challenges: The deal took a long time to gestate and had to overcome objections from Iraqi politicians over its terms. There remains the possibility that political objections could resurface. The large size of the project, and the fact that it encompasses so many different elements, could also present hurdles to a speedy conclusion.

Likely completion date: TotalEnergies aims to complete the first phase of a solar power project and the initial phase of an associated gas project in 2025

MILESTONE: Basrah refinery upgrade

Key details:

- An upgrade to the 80,000b/d, two-train Basrah refinery will involve a fluid catalytic cracking unit and associated facilities, as well as the installation of light gas oil hydrodesulphurisation technology.
- The new facilities will be located adjacent to the existing Basrah refinery, including a vacuum distillation unit and a diesel desulphurisation unit.
- Undertaken by Japan's JGC Group, the project is set to cost $3.75b. A $1.4b loan has been provided by the Japan International Cooperation Agency.

Why is it important? Located 12km east of Iraq's southern city, Basrah refinery is one of the biggest crude oil refineries in Iraq. One of the key aspects of the upgrade it that it will help Iraq's oil products meet international environmental standards.

Likely completion date: Construction work is due to finish by the summer of 2025.