New Flaring Data Accelerates Global Call To Action

A thought piece by capterio

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A thought piece by Capterio. 1600 words, reading time 6 minutes 30 seconds.

Executive summary

- The World Bank released this week it's latest Global Gas Flaring Tracker Report. The figures are concerning: gas flaring in 2019 has increased by 3% vs 2018, to 150 BCM per year, reaching levels last seen in 2009. That's $17 billion per year of potential lost sales and, 550-1200 million tonnes of CO2-equivalent (and potentially avoidable) emissions.

- When flaring is combined with the latest estimates from the IEA's methane tracker of venting and leaking (adding another 115 BCM), the potential lost sales of gas increase to $34 billion and the total CO2-equivalent emissions increase to 7.8 billion tonnes. The combined emissions from flaring, venting and leaking imply that the total emissions from the natural gas value chain are 2.1x greater than that generated through "end-use" combustion.

- COVID has sharpened the focus on the climate crisis and highlights the need to accelerate the "energy transition". We must reduce emissions from the natural gas system (including its associated oil value chain) if gas is to play a key role. Studies have shown that abatement of flaring, venting and leaking is not only possible with proven technology, but also is frequently commercially attractive. It's time to act.

Emissions from the global gas system are heading in the wrong direction

Capterio has compiled and analysed the latest data on natural gas. We combine the World Bank's Global Gas Flaring Reduction Partnership (released July 21, 2020) with production data from the bp Statistical Review of World Energy (released in June 2020) and data on venting and leaking from the IEA's Methane Tracker (released in March 2020).

By integrating these data, we derive a comprehensive view on the scale of the losses in the global gas system (noting that the gas system also includes the oil value chain is a key). We believe our approach is unique, and we have not seen the data aggregated and analysed in this manner elsewhere.

The numbers in Figure 1 are startling. Globally, we waste almost 300 BCM of gas (7% of what we consume), leading to a revenue potential loss of $34 billion (assuming $3 per mmbtu). While total gas production is up by 3%, so too is flaring (the deliberate combustion of natural gas), venting (the deliberate release of methane, from e.g. storage tanks) and leaking (the accidental release of methane).

But perhaps more concerning is that the emissions from the total natural gas system are 2.1x higher than those from the end-use combustion of gas alone, driven mostly from venting. These basic facts arguably challenge the conventional view that gas quite as "clean" as some imagine – significantly weakening its advantage over coal. As a senior executive at Shell said publicly, "*unless the industry solves the problem of methane, natural gas will not even be a transition fuel, let alone a destination fuel*".

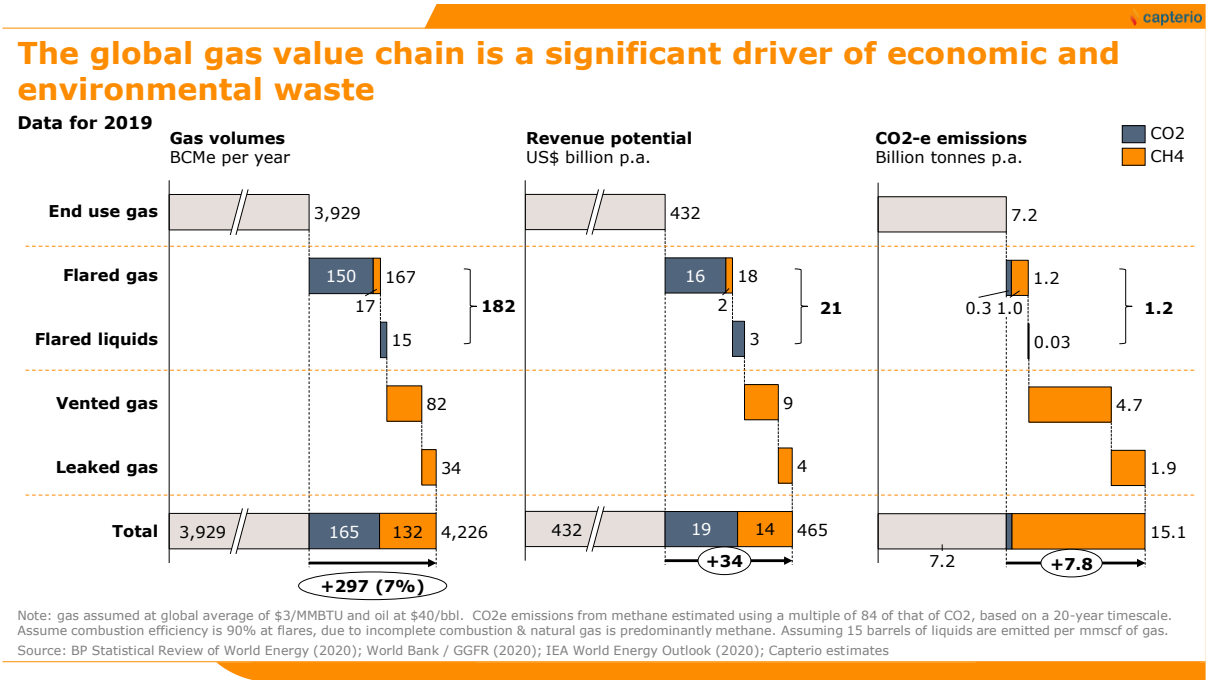

Figure 1: volumes, revenue potential and CO2-equivalent emissions from the global gas system (including the oil value chain), integrated data from bp, IEA and World Bank. Globally we consume 3929 BCM of gas, emitting 7.2 billion tonnes of CO2. When the 7% of gas losses are included (leading to revenue losses of some $34 billion), the total CO2-equivalent emissions rise by 7.8 billion tonnes. See below for a note on our methodology (but note that we calculate the CO2-equivalent emissions of methane over a 20-year period).

This situation can be fixed. But the good news is that the oil and gas industry is committed to reducing its emissions. Many companies and countries have joined the World Bank's Zero Routine Flaring by 2030 commitment. The issue of methane (venting and leaking) is also getting a lot of attention through, e.g. the Methane Guiding Principles, the OGCI, the Climate and Clean Air Coalition, Global Methane Solutions and more. An increasing number of companies are making Paris-compliant "net zero" commitments. Plus, the IEA and agile and specialist companies have demonstrated that solving the issue makes money: many methane and flare capture projects have negative marginal abatement costs.

Gas flaring has increased by 3% despite flat oil production

As the World Bank clearly noted, gas flaring in 2019 increased to 150 BCM (up by 3% vs 2018), driven by US, Venezuela and Russia. Figure 2 has the "league table" quoted on an absolute basis (left chart) and on a relative basis, using our "flaring intensity" (right chart). The global average" flaring intensity" is 152 scf of gas flared per barrel of oil produced (up from 147 in 2018), but countries such as Venezuela and Algeria have more than 2x the average figure.

The large "span of performance" of flaring intensity in Figure 2 is driven by three factors, namely: (i) the intrinsic gassiness of the resource, (ii) the approach the operator takes to use the produced gas, and: (iii) the "waste disposal" method (i.e. flaring vs venting, see related article). But as we argue in a recent article co-published with Chatham House, the fact that Saudi Arabia and Norway have flaring intensities 10-20 times lower than the global average, driven by good anti-flaring policies, demonstrates the art of the possible.

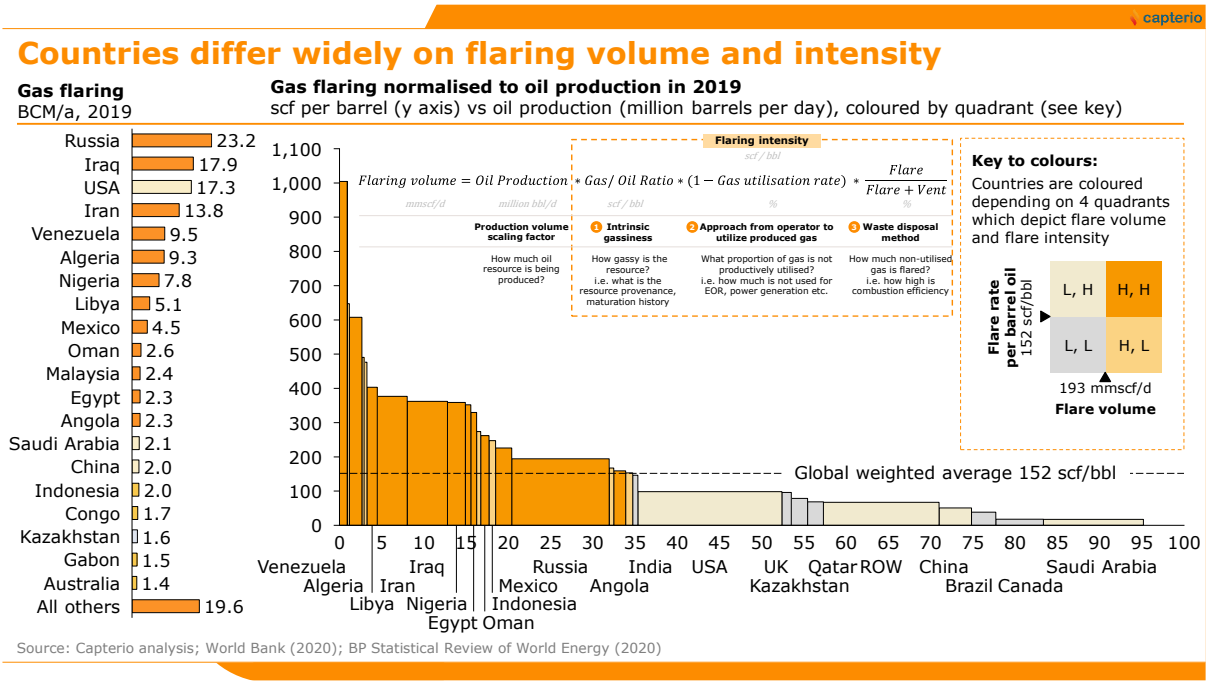

Figure 2: league table of gas flaring countries (left chart) and gas flaring intensity. The countries labelled in dark orange have both high flaring volumes and high flaring intensity.

A combination of poorer operations or commercial imperatives probably drives increased flaring

We also found it instructive to unpick headlines and understand the underlying driver of higher flaring, especially noting that its primary driver (oil production) has remained flat from 2018 to 2019. Our analysis and insights have been informed by Capterio's "Global Flaring Intelligence Tool" which provides detailed and real-time operator-by-operator and asset-by-asset visibility into every flare world-wide. Our analysis highlights that, contrary to popular belief, the majority of flaring is derived from flares that are routine, or mostly continuous in nature.

Diving deeper into the data published by the World Bank for flaring in 2019, we note that countries divide into two groups as outlined in Figure 3.

- 4 countries show a reduction by 0.3 BCM: Iran, Kazakhstan, Angola and Canada. Iran's reduced flaring is mostly driven by lower production (due to US sanctions following the collapse of the nuclear deal), whereas the three others appear to show structural improvements. Angola, for example, is now fully seeing the benefit of a world-first, led by bp, of an offshore associated gas to LNG project. Canada's significant reduction in flaring intensity is likely a result of proactive policy and strong regulation, but Kazakhstan's lower flaring may anomalous as we explore below.

- 9 countries show more than 0.3 BCM per year of increased flaring. The decomposition in Figure 3 highlights that *in all cases*, higher flaring is associated with higher flaring intensities (and is not simply due to increased production). Higher flaring is likely driven by a combination of either: (a) the commercial imperative to bring on oil production without a solution to associated gas overriding the environmental impact – as has happened to varying extents in the US Permian, Eagleford and Bakken, (b) poorer-run operations with lower uptime of critical gas equipment (e.g. gas compressors) that would otherwise capture and monetise or dispose of the associated gas (as is likely, e.g. in Venezuela), or: (c) in some exceptional cases (such as Australia), several large gas projects have had unusually high flaring during commissioning phases (such as Shell's Prelude floating LNG plant and Total's Ichthys development).

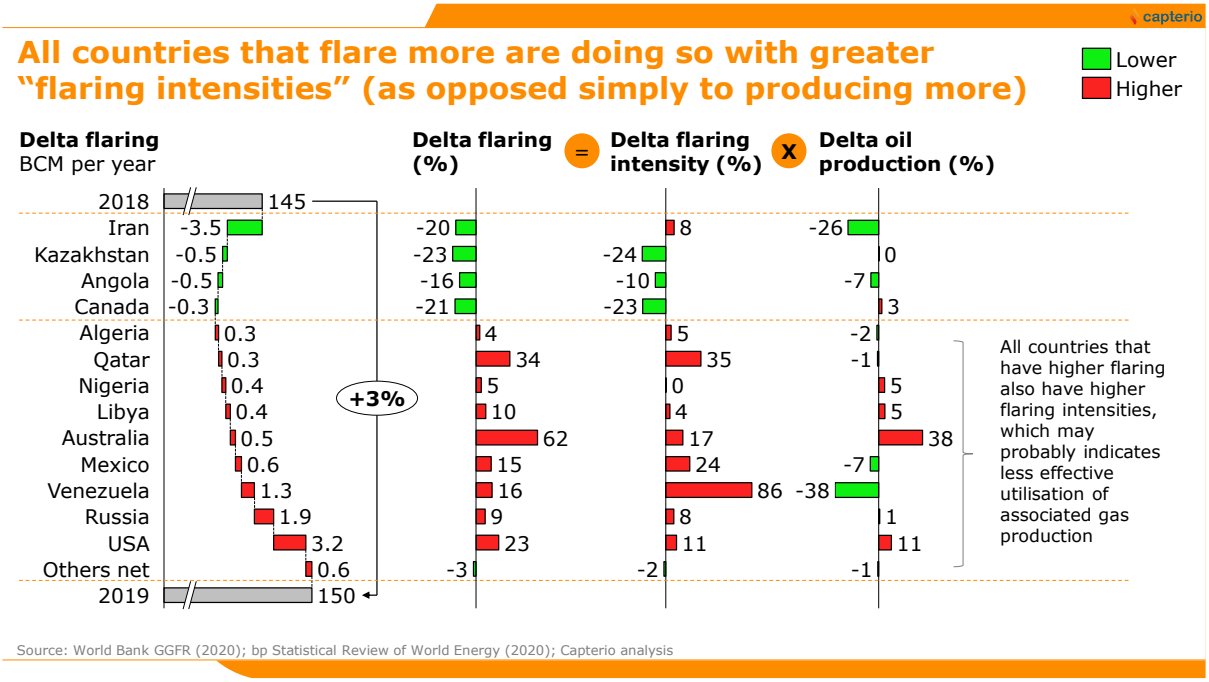

Figure 3: Analysis of the variance in flaring between 2019 and 2018 by country. We have decomposed the change in flaring in absolute and relative terms into a change in "flaring intensity" and oil production. Strikingly, all countries that show material increases in flaring have higher flaring intensities – meaning that operational "quality", not oil production rates, are driving increased flaring.

The World Bank identifies lower flaring in 2020 in several countries (and we agree). However, let's be clear, to a large part, lower flaring in 2020 is due to lower production as OPEC cuts reduce oil production in member countries, and as production is shut-in in high-cost onshore unconventionals in the USA. These gains may not be enduring, and there is even a risk that cuts to capital investments may lead to higher flaring intensities (see FT letter). Iraq is a case in point as government-driven budget cuts have stalled the three major flare-to-power projects (associated with Rumaila, West Qurna, Zubair, Halfaya and Ratawi fields), according to a report by Oxford Institute for Energy Studies.

Despite the commentary above, we cannot rule out a third potential driver, that changes in flaring result from changes substitution of venting with flaring. It is conceivably that, Russia, for example, has increased flaring as a result of a reduction in venting or that Kazakhstan's dramatic reduction in flaring is simply due to increased venting. Since flaring is much preferable to venting (given that CH4 is a more potent greenhouse gas than CO2), it is important that increased scrutiny doesn't lead to unintended counterproductive behaviours with poorer climate outcomes. Additional insight into this critical question will no doubt be revealed as methane-focussed satellites such as GHG Sat, TROPOMI and MethaneSat explore this topic.

Many gas flares can be captured, creating value, reducing emissions and improving reputations. It's time to act.

This analysis, which combines multiple datasets to define an integrated picture of the gas (plus associated oil) value chain highlights that the numbers are "heading in the wrong direction". The climate crisis requires us to act.

Gas flaring can represent an opportunity to create a "triple win" (for asset owners, for national oil companies and their governments, and for the planet) and help companies and countries to deliver their commitments to the Paris agreement and their "net zero" ambitions. We have demonstrated that even in today's world of lower commodity prices and reduced capital spent, flare gas projects – under the right commercial structure and with the right agile and specialist approach – are often intrinsically attractive.

The time to act is now.

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[A note on our methodology: we derive the CO2-equivalence of methane using a Global Warming Potential over a 20-year period, using data from the IPCC. We also assume that 3-10% of methane is "slipped" due to incomplete combustion in flares and that some natural gas liquids are also entrained in these flares. Best practice flares slip around 2-3%, but we suggest that 10% is a more representative global figure and that this area deserves more research].

The authors would like to thank members of the World Bank's GGFR programme, the IEA, Colorado School of Mines and several National and International Oil Companies for their help to shape the views in this article.

List of interesting articles:

- Flaring in MENA: The Multi-Billion Dollar Decarbonisation Lever, co-authored with Chatham House
- Agile And Specialist: The Right Approach To Flare Capture
- Post COVID: Flaring Helps Deliver The Energy Transition
- Risk-Free, Low Cost, Low Emission Barrels
- How Flaring Helps Deliver Paris
- Flaring's Billion Tonne Secret: Methane
- Why Europe Needs Low Carbon Gas

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Capterio: Capterio is an agile and specialist project developer focused on monetising waste gas in oil & gas energy systems. We build solutions to quickly capture waste gas and utilise it, taking it to pipelines, injecting it (for storage, enhanced recovery or disposal), converting it to power, liquids (e.g. CNG, LPG, GTL, LNG, etc) or other creative solutions.

We screen and source opportunities powered by our bespoke tools, e.g. Global Flaring Intelligence Tool (GFIT) which provides real-time insights into flaring for every asset, operator and non-operated partner worldwide. We select and procure technology, we negotiate commercial contracts, we provide project financing, and oversee construction and operations. We bring together assets together with technologies, know-how and financing to deliver on-the-ground, real-world, safe and reliable solutions.

We are actively seeking pioneering partners which seek to drive value and decarbonise. Since we build and finance on-the-ground solutions, our offer is uniquely attractive to operators and governments and delivers revenue, production and reserves (see article). See our website for more information on our proven track record and financing options.