Why we need clearer ESG metrics around gas flaring

A thought piece by capterio

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Executive summary

- **Flaring is a critical metric that many ESG-focussed groups (e.g. regulators, investors, ratings agencies, lenders, consumers and governments) are increasingly seeking to understand. Some of these groups are facing particular urgency to finalise their sustainability accountability frameworks before COP26.**

- **We reviewed the corporate reporting on gas flaring from 13 leading oil and gas companies. We found that the quality and comprehensiveness of recent reporting of gas flaring varies widely between companies – making comparisons extremely cumbersome at best, and near-impossible at worst.**

- **To make real progress on flaring reduction, we need a set of transparent, comprehensive and standardised reporting standards. Our research offers recommendations in 6 areas, and highlights the 3 most critical being the reporting of "non-operated assets", of "methane slip", and on "routine- vs non-routine flaring".**

- **New fit-for-purpose tools like *FlareIntel* can help provide dramatically improved transparency and help companies to reduce gas flaring, create value and accelerate the energy transition. We have limited time to act.**

Introduction

Two months ago, Capterio launched FlareIntel, which is a free and open-access digital tool. Our intent in developing this tool was to increase focus and accountability on this key emissions source and facilitate faster deployment of flare capture solutions (some of which we conduct with our Capterio *projects*). The tool adoption has been rapid, most likely because it not only allows users to dynamically explore flare volumes and operators at both a country and facility level for the first time, but also illustrates their emissions impact.

In the follow-up, several oil and gas companies, investors and regulators approached us with a key question: "*how do the figures in FlareIntel compare to those reported by individual companies*?". But, to answer this question, we first need to answer the supposedly simpler question: "*how do companies compare on their self-reported flaring data?*".

Perhaps unsurprisingly, even answering the simpler, second, question is challenging, mostly because there is no standard approach to reporting gas flaring. This needs to be solved. A senior sustainability executive at bp puts it: "*good ESG metrics should be simple, standardised and informative*". We agree.

After all, flaring is a key element of company ESG performance. As groups such as rating agencies, investors, fund managers, lenders, aggregators, consumers, citizens and governments are seeking to sharpen their understanding with better ESG metrics around flaring, it is right that they seek to better understand the data presented, and in time, to demand better data.

Given its importance, this paper focusses only on a consistent analysis of *self-reported* data. We leave our comparison of company-reported data with actuals, as measured in FlareIntel, to a sequel paper.

Inconsistent flaring metrics make performance comparisons challenging today

We analysed the sustainability and/or annual reports for 13 companies[1], each of whom are endorsers of the World Bank's Zero Routine Flaring programme. Unsurprisingly, there is a very wide range of reporting units, comprehensiveness and granularities, making direct comparison a non-trivial exercise. Exxon reports the highest flaring (at 320 million scf/day in 2020), and Equinor quotes the lowest (at 48 million scf/day).

But for the 8 reasons outlined in Figure 1, we should be careful with these data, especially any interpretation of comparative performance.

Theme	Observation	Impact
1: There is no standard unit used to report flaring figures	Companies report in volume or in tonnes of hydrocarbon or CO2, or CO2-equivalent, sometimes a combination. It is, however, not clear if these are "net" of methane slip, or "gross". Where both volume and tonnes of CO2 or CO2e are provided, sometimes reconciliation is problematic	Lack of consistency on units makes comparison a cumbersome (and potentially error-prone) calculation exercise, partly because of undisclosed assumptions
2: Non-operated coverage is mostly absent	The majority of companies report on an operated flaring (on 100% equity basis, although sometimes that is not clear). **Chevron** has some disclosure of non-operated flaring (where equity is >16%). **Qatar Petroleum** does not report for operated assets, rather combines it with non-operated assets, and provides no breakdown	Non-operated emissions are often at least as material and represents a potentially large underreporting exposure. Members of the OGMP 2.0 have committed to reporting flaring for non-operated assets by 2025
3: Only some companies report the CO2 emissions from flaring	Only **Chevron** quote flaring impact in CO2 terms, although some quote CO2e (see next point), and **Chevron** quotes both	Lack of reporting makes CO2 contribution from flaring unclear, despite this being a key metric
4: Methane slip (from	Only **Chevron, Total** and **PEMEX** directly report methane slip (at 98.5%, 98.5% and	Including emissions from methane is critical (as on a

[1] Shell, bp, Eni, Total, Equinor, Repsol, Exxon, Chevron, ConocoPhillips, Qatar Petroluem, PEMEX, Sonatrach and SOCAR.

incomplete combustion) is mostly omitted	84% respectively – but the first two are unrealistically low). Best practice is to disaggregate methane from CO2, which only **Chevron** does fully. It is, however, possible to derive the implied upper bound for combustion efficiency by comparing the reported CO2e number on emissions with the volume of hydrocarbons flared. The derived combustion efficiencies are: **Shell** (93.4%), **ConocoPhillips** (93.0%) and **ENI** (86.5%).	CO2-e basis, they are likely to be significantly higher than those from gas combustion). Companies however use different figures for CO2-mass-equivalence of methane (some use 25x, others 28x, whereas the emerging standard is 84x)
5: Few companies differentiate between routine vs non-routine flaring	Only 4 companies split the data (**Equinor**, **Eni**, **Total**, **Repsol**) and show wide variations in percentages. **Total** and **Equinor** imply that routine flaring is typically <20%, whilst **Repsol** and **Eni** are above 50% in 2020	Since this is such a wide-spread commitment, companies ought to improve reporting here. The most-used definition of routine vs non-routine flaring, from the World Bank, leaves significant room for interpretation (and local jurisdictions are creating their own variants), rendering direct comparisons, where present, challenging.
6: Geographical disclosure is mostly missing but would be helpful	**Chevron** gives a detailed country breakdown. **Shell** gives breaks out Nigeria (and has previously broken out Australia)	Disclosure at a country breakdown is of interest to those tracking super flarers, and for local country engagement
7: Companies report over different elements of their value chain	Inconsistency in coverage – some companies quoting only for upstream/E&P, others also include downstream flaring, and **ENI** changed its reporting segmentation in 2020, making comparison unclear. Only **PEMEX** does this fully	Best practice would be to break down the numbers by value chain.
8: Few companies quote flaring intensity	Flaring intensity is arguably a helpful measure of relative performance, only **Equinor**, **Chevron** and **ConocoPhillips** report this, but **Chevron's** figure is on an equity basis, including non-operated assets, therefore hard to reconcile with its own other flaring reporting	There is no clear standard for the units of, or the calculation of flaring intensity, e.g. per barrel or per boe or per tonne of hydrocarbon

Table 1: summary of the findings of a review of flaring reporting from 13 companies.

Most critically, the current reporting approaches have three major omissions:

1. With the exception of Qatar Petroleum and Chevron, **companies do not report their flaring from non-operated assets**. Given that several companies have hefty non-operated positions in (e.g.) West Qurna, Zubair or Rumaila in Iraq, these figures materially underestimate total flaring.

   In our view (whilst it is clearly more difficult to influence activities as a non-operated partner), any company that has a participating interest, even if non-operated, in an asset that flares has a shared opportunity – indeed,

accountability – to minimise flaring. We are not therefore convinced that the approach of "spinning out" underperforming assets into "bad banks", as has been suggested for at least 2 European majors, is the right way to deliver lower emissions reporting.

2. With the exception of Total, Chevron and PEMEX, **companies omit to report (or make it very hard to back-calculate) the methane associated with incomplete combustion of gas at flares**, yet this will soon be a requirement under EU methane legislation.

   Specifically, since all flares emit methane in uncombusted form (as so-called "methane slip"), we think it is critical to report (and therefore, to measure) methane, preferably separately. We have shown that even a flare operating at "best practice" combustion efficiency (of 98%, meaning with 2% "methane slip") has *total* CO2-equivalent emissions, when methane slip is included, that are 1.6x higher than those from just CO2 alone. See our article "*Flaring's billion tonne methane secret*", and note that we use a GWP for methane over a 20-year basis, that is 84x that, by mass, of CO2.

   We are concerned that Chevron and Total's CO2e emissions are dramatically under-reported due to unrealistically low rates of methane slip. Each company reports the equivalent to a methane slip rate of 1.5%, but whilst this is just possible for true world-class operations, we consider if unlikely given the geographical diversity of their portfolios.

   The combustion efficiencies back-calculated from a reconciliation of the flared volume and CO2e data, as provided by Shell, ConocoPhillips and ENI, appear to be significantly lower than this best practice (ranging from 87% to 93%). PEMEX helpfully cites an average combustion efficiency of 84%, meaning that the actual CO2-e emissions are 7x those from the CO2 from flaring – equivalent to adding 27% to the scope 3 emissions from combusting Mexican crude.

   Interestingly, as we have illustrated in our article "*celebrating successful flare capture projects*", our advanced subscription analytics tool *FlareIntel Pro* may be able help with "direct detection of methane slip" from the temperature profile of gas flares detected by satellite. Indeed, this is an ongoing research topic of *FlareIntel Pro*. We are also excited that the OGMP (the "Oil and Gas Methane Partnership") has a working group focussed on methane from flaring.

3. **Few companies report their "routine" flaring, yet the majority of leading companies have endorsed the World Bank's Zero Routine Flaring initiative** (representing more than 73% of the world's production). Delivering this commitment is key, but without clear reporting (against a clear definition of what is/isn't routine flaring), real progress is hard to measure and deliver.

Figure 1 below summarises our assessment of the quality of reporting data on gas flaring by company, although we have withheld the company names. Since the reporting is insufficient for us to assess the "accuracy" of the flaring figures, we exclude this from our assessment.

	Scoring									
Type	Scale		Methane			Breakdown			Commentary	Total
	Volume (or tonnes HC)	Tonnes CO2	Methane slip	Clear GWP	Tonnes CO2e	Country	Non-operated	Routine/ non routine	Commentary	Total score
IOC	1	1	1	1	1	0	0.5	0	1	6.5
IOC	1	0	0.5	1	1	0	0	1	1	5.5
NOC	1	0	1	1	1	0	0	0	1	5
NOC	1	0	0.5	1	1	0	0.5	0	1	5
IOC	1	0	0.5	1	0.5	1	0	0	1	5
IOC	1	0	0.5	1	1	0.5	0	0	1	5
IOC	1	0	1	1	0	0	0	1	1	5
IOC	1	0	0	1	0	0	0	1	1	4
IOC	1	0	0	0	0	0	0	1	1	3
IOC	1	0	0	0	0	0	0	0	1	2
IOC	1	0	0	0	0	0	0	0	1	2
NOC	0	0	0	0	0	0	0	0	0	0
NOC	0	0	0	0	0	0	0	0	0	0
NOC	0	0	0	0	0	0	0	0	0	0

Figure 1: summary of reported volumes by company (left side) and Capterio's "reporting quality index" which is an assessment of the comprehensiveness of the reporting. The maximum possible score on this scale is 9. We allocate a score of 0.5 if the element is partial, incomplete, or can only be derived from a back calculation.

Chevron and Eni score most highly (and they report on methane and give further granularity). Some other household names disclose the bare minimum, and several GGFR/ZRF members do not even appear to report flaring publicly.

Regarding the actual flare measurements reported, best-practice is to physically install a gas flaring meter. However, few operators meter all their flares, and most flares globally are not metered. Additionally meter readings can be inaccurate (especially if calculations ae not regularly updated with accurate pressure, temperature, physical conditions and compositional data – as field conditions and oil properties change over time). And since retro-fitting flare meters can be expensive (partly due to the meter cost, and partly as fitting may require production shutdowns), alternative methods are common. The common alternatives ("mass balance", or "GOR"-based assessments) are also potentially error prone unless the underlying assumptions are regularly updated, leaving the possibility of satellite-derived estimates (which in our experience are often highly accurate) a viable alternative.

We need a better standard for flaring metrics

The world is increasingly seeking transparency in reporting. Increasingly, investors, regulators, ratings agencies and consumers and others are seeking transparency in order to hold companies to account, to measure progress and to prioritise intervention and/or investment.

To achieve this, we need a set of clear and credible metrics around gas flaring. The current cacophony of metrics enables each company to claim that each is fairly disclosing flaring, whilst not offering any real clarity on comparative performance. One operator went further and explained how definitions were tweaked and reasons were found to exclude some assets to "optimise" the reported figures.

So, clearly, we need some clear standards – and clear global leadership to build alignment towards these standards. Whilst OGMP 2.0 members will be working towards improved reporting by 2025, we have some clear recommendations to offer.

In relative order of priority, we recommend to: (1) include emissions for **non-operated** assets, on a 100%-equity basis; (2) report flaring broken down into volume from combustion and from **"methane slip"** associated separately (with measurement – or better proxies), and to report in CO2 and CO2e volumes separately, with a clear GWP for methane (we recommend shifting to a 20-year view); (3) report "**routine**" **vs "non-routine"** flaring (with a clear set of definitions). Additional, we recommend to: (4) provide regional / **country breakdowns**, especially for exceptional countries; (5) use a **clear segmentation** between upstream, midstream and downstream, and finally: (6) report a standardised and **meaningful flaring intensity metric** (e.g. flaring per barrel of oil, probably not barrel-of-oil-*equivalent* basis).

A single aligned, comparable metric on flaring will help companies and the world to measure progress and drive change. Clear metrics will help us to meet "Zero Routine Flaring" by 2030 commitments and make progress towards meeting the Paris agreement goals.

Referring briefly to the first question posed above ("*how do the figures in FlareIntel compare to those reported by individual companies?*"), our premium product FlareIntel Pro can help to answer this question, plus can address many of the issues identified in Table 1. We have very good reason to believe that the satellite data, on which we do additional processing, provides credible and independent estimates of flaring, as illustrated in our paper "*celebrating successful flare capture projects*". Please contact us to find out more about FlareIntel Pro.

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