

Reporting on Carbon Intensities, 2020 and 2021

Where Energy Transition plans exist - and for many oil & gas companies they are flimsy or non-existent - there is much talk of distant Nirvanas, faraway promises that are difficult even for energy professionals to assess, risk, and value.

My notion is that it is more sensible to judge such plans by close and critical review of two things; what did a company do last year and what does it plan for the next 3 years; and how is C-Suite remuneration tied to the outcomes, to performance, focussing very specifically on GHG Emissions ie CO₂ and then flaring of gas, venting and 'fugitive' emission (all of these latter 3 involving methane)?

The Oil & Gas Climate Initiative* has published clear recommendations on the reporting of relevant data and this is very welcome.

However, as soon as you look beneath the 'bonnet', into Annual and Sustainability Reports, it's clear that reporting is, let's say, heterogeneous though some would call it chaotic, with different measures, different units. And even my use there of the word 'measure' is contentious because very little is actually measured; so-called "engineering estimates" abound instead.

Our first review of companies' reporting of carbon data for 2020 began by perusing Annual & Sustainability Reports published in the period March – May 2021. Beginning at the individual company level was ultimately quite frustrating because of, at best, the differences in exactly what was reported and, at worst in some cases, the complete absence of credible detail.

An alternative approach is to start with the top-down reporting recommendations of the Oil & Gas Climate Initiative (OGCI) which – in the matter of carbon – focus on CO₂e Intensity and Methane Intensity. We will undertake a review of these two metrics – plus Flaring reporting – for a group of 22 companies, including the 10 IOC members of the OGCI (BP, ENI, Equinor, Repsol, Shell, Total; Exxon, Chevron, Occidental; Petrobras) and 12 E&Ps (Apache, Kosmos, ConocoPhillips, Marathon; AkerBP, Enquest, Harbour, Serica; SunCor Energy, Canadian Natural Resources, Cenovus Energy, Imperial Oil).

The Upstream Carbon Intensity Indicator

This indicator is meant to apply to the upstream, operated, oil and gas sector.

It is calculated as a ratio between scope 1 (direct) + scope 2 (from electricity and other power imports) greenhouse gas emissions (CO₂+CH₄) (expressed in kg CO₂e) and oil and gas production figures (expressed in boe) for the same upstream sector. Thus:

$$\text{Intensity} = [\text{CO}_2 \text{ Emissions} + 25 \times \text{CH}_4 \text{ Emissions}^{(1)}] / \text{Oil \& Gas Production}^{(2)}$$

⁽¹⁾: in kgCO₂e

⁽²⁾: at point of sale, in boe.

This cartoon neatly summarises the applicability (and, thus, restrictions):

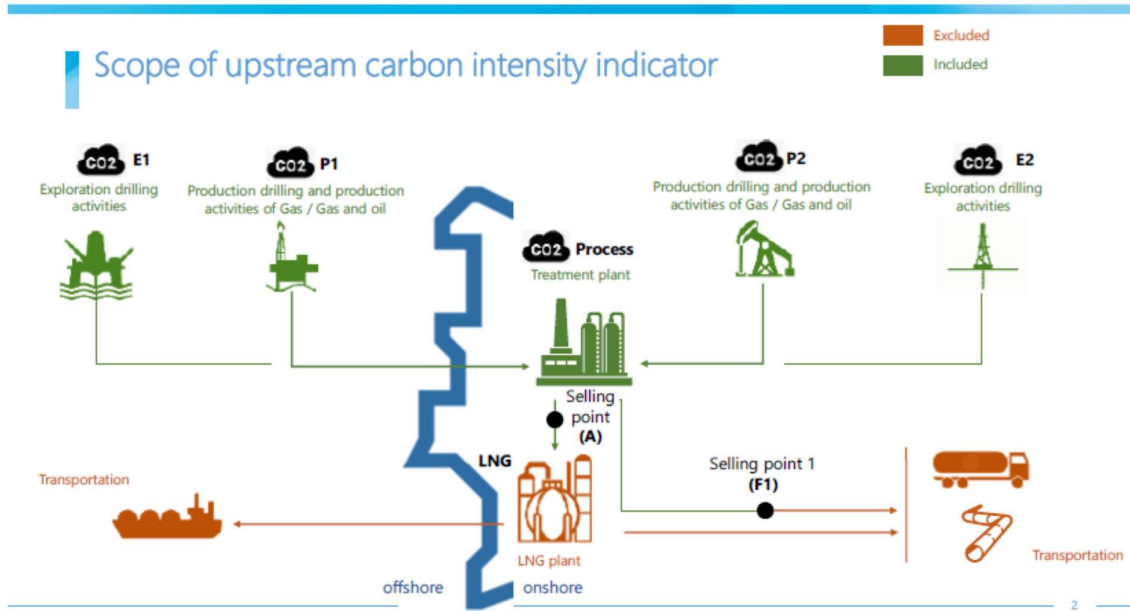


Figure 3: Boundaries of the carbon intensity target (illustration)

2. The Methane Intensity Indicator

This indicator is meant to apply to the upstream, operated, oil & gas sector.

The intensity is calculated as a percentage figure, which represents the volume of methane emissions for the upstream gas and oil sector as a percentage of the volume of the total gas marketed for the same upstream sector. Thus:

$$\text{Intensity} = \text{CH}_4 \text{ Emissions} / \text{Marketed Gas}^{(1)}$$

(1): Methane (Sm³)/Gas(Sm³) [x100 to give the %]

This cartoon neatly summarises the applicability (and, thus, restrictions):

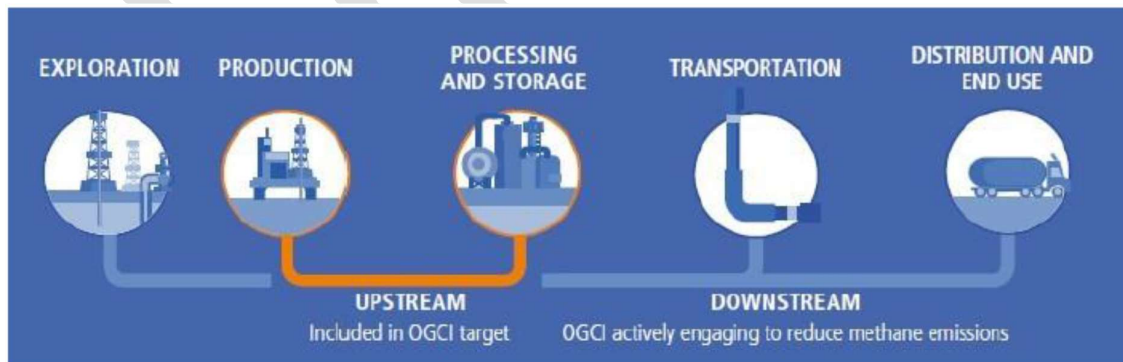


Figure 5: Boundaries of the methane intensity target (illustration)

Methane emissions from fugitives, venting and incomplete combustion, for example in flares and turbines, are all included.

Following this approach, emissions linked to *force majeure* events or sabotage are also included. The (non-comprehensive) list below details typical sources of emissions that are included in the scope of methane emissions reported:

Non-combustion related emissions

- Hydrocarbon storage tanks
- Compressor seals
- Pneumatic controls and pumps
- Liquids unloading and storage
- Fugitive leaks
- Loss of primary containment
- Gas dehydration
- Venting (e.g. casing head, gas separation)
- Well completion

Combustion-related emissions

- Flaring (ie unburnt methane)
- Stationary combustion sources, e.g. turbines

3. Flaring

To be clear, methane that exits the flare tip unburnt is counted as a methane emission (see 2. above), the CO₂ produced when methane is successfully burnt is counted as a carbon dioxide emission (see 1. Above) – at least that’s what OGCI say/recommend!

Reporting a **Flaring Intensity** is not suggested by OGCI but it seems as sensible to do it here as for Methane. Thus:

$$\text{Intensity} = \text{Flared Methane} / \text{Marketed Gas}^{(1)}$$

⁽¹⁾: Methane (Sm³)/Gas(Sm³) [x100 to give the %]

4. Data

The idea was to keep things simple – surely all of these companies, but especially the OGCI members, would publish enough data to fill out items A.- E. in this table, allowing calculation of the 3 Intensities (and comparison with what the companies themselves reported, if they did)?

COMPANY:	2020	2021
A. CH ₄ (Sm ³)		
B. GHG (million tonnes CO ₂ e)		
C. Flaring (Sm ³)		
D. Oil & Gas Production (boe)		
E. Marketed Gas (Sm ³)		
Carbon Intensity (B./D.)		
Methane Intensity (A./E.) as a %		

Flaring Intensity (C./E.) as a %		
<i>COMMENTS:</i>		

The observation is, yes, sort of. But consider for example reporting of methane emissions: for the 10 OGCI members the units reported in were: mmTCO₂e, kTonnesCH₄, mmTonnesCH₄, mmSm³. This modest heterogeneity was found in all of the reported items, not least in Marketed Gas.

And perhaps more surprising, the oil &/or gas production numbers were reported inconsistently.

Much effort was needed to work through this heterogeneous reporting and the inconsistencies. And one result was that in some cases, the reported Intensities could not be reproduced from the reported data!

These inconsistencies make credible absolute comparisons difficult though relative benchmarking is possible.

5. The 10 OGCI members

The table below summarises the anonymised data for the 10 Majors who are OGCI members, together with the OGCI’s stated targets for 2020. All reporting is for 2020 except for company A that reported for 2019.

Company	OGCI ¹⁾	A	B	C	D	E	F	G	H	I	J
Carbon Intensity ²⁾	19.5	34.7	26.8	33.0	15.8	24.1	20.0	8.0	63.0	21.0	18.0
Methane Intensity ³⁾	0.20	0.38	0.17	1.47	0.14	0.12	0.02	0.13	0.02	0.17	0.19
Flaring Intensity ³⁾	N/A	5.00	2.22	5.04	6.46	1.43	1.54	2.47	2.09	2.76	3.18

1): OGCI targets for 2020

2): Reported kgCO₂e/boe

3): Computed %

Taking these numbers at face value, most companies are failing to hit the OGCI **Carbon Intensity** target with a couple of clear outliers(A, C and H); in contrast most are below the **Methane Intensity** target with one clear outlier (A).

On **Flaring Intensity**, there are 3 clear outliers (A, C and D).

6. Next Steps

As these 10 Majors begin reporting 2021 flaring & emissions data – hopefully with a greater degree of consistency and recognition of OGCI’s recommendations with respect to Intensities – the above table will be updated to compare 2020 and 2021. This will demonstrate individual companies’ performance improvement and the alignment with any new OGCI targets.

In parallel, the analysis for 2020 and 2021 will be undertaken for 12 E&Ps - Apache, Kosmos, ConocoPhillips, Marathon; AkerBP, Enquest, Harbour, Serica; SunCor Energy, Canadian Natural Resources, Cenovus Energy, Imperial Oil.

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