



**EXECUTIVE COMMITTEE
ROYAL DUTCH SHELL PLC**

Title	Note for Discussion
Subject	A Shell methane emissions intensity target
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Sponsoring EC members	Maarten Wetselaar and Harry Brekelmans
Objective	Decision
There is increasing external focus on methane reduction targets from globally influential stakeholders. This Note for Discussion requests EC decision on: - whether or not to set a methane emissions intensity target/ambition (Section 2); - how Shell should position methane emissions from the full gas supply chain (Section 3); and - if in favour of setting a target/ambition, when and how to disclose it (Section 4).	
	
Maarten Wetselaar, ECMW August 22, 2018	Harry Brekelmans, ECHB August 22, 2018

NOTE FOR DISCUSSION

A SHELL METHANE EMISSIONS INTENSITY TARGET

1. Background

There is increasing external focus on methane reduction targets from globally influential stakeholders. On 24 September 2018, the Oil and Gas Climate Initiative (OGCI) will announce a target to reduce by 2025 the collective average methane intensity of the 10-member company aggregated upstream gas and oil operations to below 0.25% with the ambition to achieve 0.2%. BP and ExxonMobil have also recently announced methane emissions targets (Appendix 1). Following these announcements, Shell is likely to face increased pressure to demonstrate tangible actions it is taking to reduce methane emissions.

In November 2016, EC agreed that Shell would adopt a more proactive approach to managing methane emissions and address threats to the environmental credibility of natural gas.

In May 2017, EC supported a global methane external engagement plan, “stepping-up” Shell’s approach to promoting, protecting and defending the reputation of gas. This resulted in the Methane Guiding Principles signed in November 2017. Subsequently this coalition has broadened to now include all majors but also a growing number of pipeline and infrastructure companies, as well as NOCs such as QP and Gazprom. It has also deepened by producing detailed work on recommended operating practices and drafting recommended policy frameworks. The next step will be taken in January 2019 when the coalition meets to permanently establish itself under the auspices of UNE (United Nations Environment) and approve the work plan for 2019. While Shell’s leading role on this initiative is recognised and appreciated by all companies, NGOs and multilaterals involved, it is now timely to consider whether Shell should, in parallel, step up its own external profile on methane.

Decisions are therefore requested from EC on:

- iv. whether or not to set a methane emissions intensity target/ambition (Section 2);
- v. how Shell should position methane emissions from the full gas supply chain (Section 3); and
- vi. if in favour of setting a target/ambition, when and how to disclose it (Section 4).

2. Methane intensity target/ambition for Shell Operated Ventures

Two key considerations related to whether or not Shell sets a target/ambition are the emissions covered by the target/ambition, and the status of Shell’s data.

Methodology for calculating methane emissions

The target/ambition will only cover methane emissions within Shell’s operational control. It can either cover emissions from gas production from IG and Upstream or emissions from gas and oil production.

BP has announced a target covering gas only, while OGCI’s announcement will include gas and oil. There was considerable debate within the OGCI on the proposed methodology. Given the OGCI membership, and at the insistence of the NOCs, oil emissions were included so that a larger reduction in absolute methane emissions is achievable by 2025 (mainly by reducing flaring at oil wells)

Table 1 overleaf sets out the two options and the positives and challenges associated with each alternative. It also shows Shell’s estimated current methane emissions intensity for each option. There is little difference between these two baseline intensities because the methane emissions from oil-only assets account for around 7% of the total absolute amount of Shell Operated Ventures methane emissions.

The estimate of methane emissions intensity per asset in Upstream and IG using both methodologies is outlined in Appendix 2.

Table 1

Option 1: Gas Value Chain only $\left(\frac{\text{CH}_4 \text{ emissions of gas and associated gas assets}}{\text{operated marketed gas production}} \right)_{\text{volume}}$		Option 2: Gas and Oil Value Chain $\left(\frac{\text{CH}_4 \text{ emissions of gas, associated gas and oil assets}}{\text{operated marketed gas production}} \right)_{\text{volume}}$	
Shell current methane emissions intensity: estimated 0.08%		Shell current methane emissions intensity: estimated 0.09%	
Positives	Challenges	Positives	Challenges
Aligns with methodology used by BP in their recent announcement on methane emissions intensity target	Doesn't align with OGCI or EDF preferred approach.	Aligns with methodology proposed for OGCI target, to be announced in September 2018.	Emissions from oil assets as well as gas assets are considered, therefore weakening argument for environmental credibility of gas.
Conservative in assigning all emissions to marketed gas, therefore supports environmental credibility of gas, and advocacy of gas versus coal.		Aligns with EDF's approach for methane intensity targets to focus on emissions from oil and gas supply chains.	Does not align with gas product stewardship / value chain approach
Provides clarity when discussing methodology with third party partners, as the same processes of each supply chain are included when determining intensity.			
Supports focus on product stewardship of gas and the need to reduce methane emissions throughout the full value chain.			

Status of Shell's data

Shell's estimated weighted average SOV methane emissions intensity is ~0.1%, with a wide range between 0.004-0.84% across assets.

While this baseline is lower than the proposed target or ambition, there is significant data uncertainty calculating our methane emissions. The majority of SOVs calculate methane emissions using standard emission factors (the lowest accuracy of reporting).

Such uncertainty is an industry-wide issue. Estimates rely predominantly on emissions factors: established emission rates per throughput or piece of equipment, rather than actual emission rates from direct measurement.

The Sustainable Gas Institute (SGI), Imperial College London, has reviewed Shell's SOV and supply chain intensity methodology and supports Shell's approach. However, SGI emphasised the uncertainty inherent in the use of emissions factors.

It is expected that data quality will improve over the next few years. Experience shows that emission intensity usually declines with improvements in measurement (and especially when switching from estimates using factors to actual measurement). The Integrated Gas and Upstream businesses (representing more than 90% of Shell's methane emissions) are rolling out Methane Improvement Programmes that focus on improved data quality and reporting, implementation of Leak Detection and Repair (LDAR) Programmes and ensuring methane abatement opportunities are suitably considered in the Greenhouse Gas & Energy Management Plan process. The goal is to complete the Methane Improvement Programmes by the end of 2019. Focus on completing LDAR across both Integrated Gas and Upstream will improve data certainty and potentially lead to Shell announcing a lower target in 2020.

Recommendations:

Noting the positives in Table 1, as well as the recognised data uncertainty, the recommendations are:

- Apply Option 1 methodology covering gas production in Integrated Gas and Upstream, to support advocacy for the environmental credibility of gas.
- Announce a “target/ambition to maintain Shell's methane emissions intensity below 0.2% by 2025”. This number is aligned with industry peers e.g. BP's recent and OGCI's proposed announcements. Once more accurate measurement increases our comfort with the 0.1% data point we have the option to sharpen the public target.
- Do not include a separate methane intensity target for oil-only assets. (The methane emissions from oil-only assets account for around 7% of the total absolute amount of SOV methane emissions).

A decision is requested on whether the EC supports the recommendations.

3. Methane emission intensity for full gas supply chains

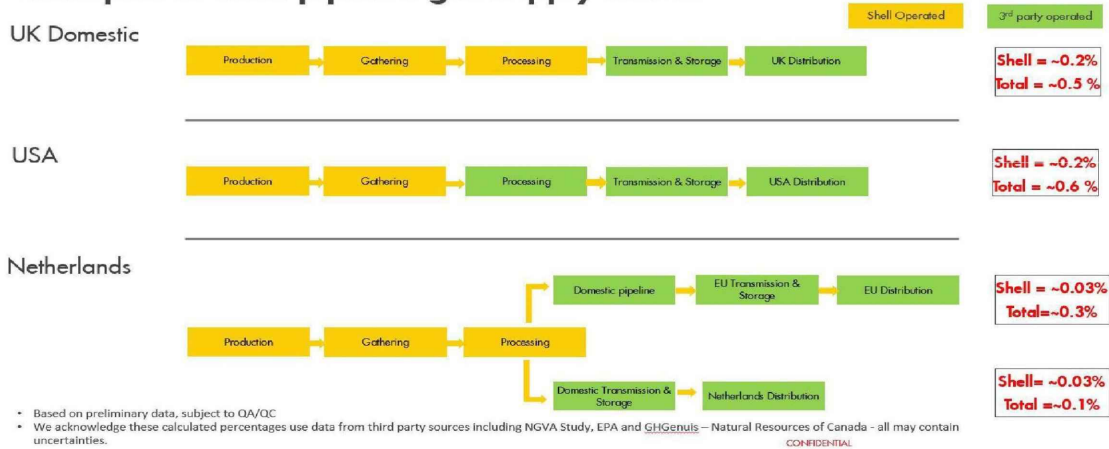
The methane emissions intensity for total (Shell operated and 3rd party operated) gas supply chains from well to customer for 80% of gas produced by Shell is <1%, which aligns with 97.5th percentile uncertainty analysis results. The IEA estimates the global gas supply chain methane leakage rate is 1.7%.

The IEA estimates emissions intensities across all other countries by scaling up US emissions intensities. For downstream emissions intensities, country-specific IEA scaling factors are based upon the extent of oil and gas pipeline networks and the strength of regulation. The estimates for Shell's calculations are not based on scaling factors. They are based on country-specific downstream emissions data sources including national and UNFCCC inventories as well as external reports. For those countries where this data is not available, the estimate is derived using IPCC emission factors and country-specific activities data e.g. the length of oil and gas pipelines (but not related to the US).

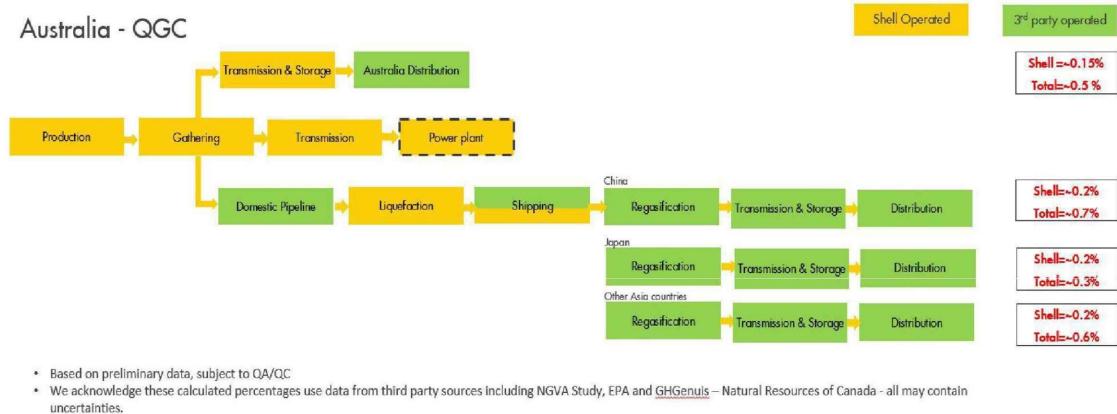
Examples of Shell pipeline gas supply chains and LNG gas supply chains are provided in Figure 1. They outline the process that gas molecules undertake from production to point of delivery to the customer and identify those parts of the supply chain operated by Shell (shown in yellow) and over which Shell has control of emissions, and those operated by third parties (shown in green), over which Shell can only attempt to influence emissions. The estimated methane emissions intensity for Shell's proportion of, and the total for, each example supply chain is included. Note that 80% of gas supply chains covered is the current status and work is ongoing to raise this to 100%.

Figure 1

Examples of Shell pipeline gas supply chains



Examples of Shell LNG gas supply chains



Options for announcement

It is intended to share these examples externally. The data uncertainty issues described in Section 2 are amplified when quantifying the full supply chain, despite our best efforts to estimate third party facilities methane leaks (e.g. pipeline systems in “other Asian countries” in Australia-QGC example above). Therefore, two options are proposed:

- Option 1: Shell includes specific percentages related to methane emissions intensity across pipeline and LNG example supply chains.
- Option 2: Shell includes a range for methane emissions intensity for the example supply chains and calls for greater transparency and improved data certainty across the full supply chain.

Recommendation:

Option 2 is the recommendation.

A decision is requested on whether the EC supports this recommendation.

4. Announcing a methane emissions target

Opportunities

Announcing a target/ambition provides clear demonstration of:

- Shell's purpose and strategy in action – providing more and cleaner energy.
- Shell's leadership on methane emissions reduction throughout the full natural gas value chain.

Risks

- a) A methane emissions intensity target could raise short-term expectations for a CO₂ emissions intensity target and closer scrutiny on how Shell will achieve and measure its Net Carbon Footprint ambition.

Context: *Follow This* submitted resolutions for the last two AGMs on setting targets. In addition, there has been a joint institutional investors' AGM letter in 2018 calling for targets. Momentum might be building to file a wider shareholder proposal to request Shell to set specific targets in relation to NCF.

Mitigation:

- Highlight that managing methane emissions is within Shell's operational control. Setting a target for our Net Carbon Footprint would require precisely predicting the actions of governments and society as a whole over the decades ahead. This cannot be done with reasonable certainty.
- Highlight Shell's Net Carbon Footprint ambition includes Scope 3, as well as Scope 1 and 2 emissions.
- Communicate that GHG emissions are included as component of internal scorecard which informs Executive Committee's remuneration.

- b) Announcing a 0.2% target that is higher than Shell's 0.1% current estimated intensity risks undermining credibility, could lead to accusations of misleading stakeholders.

Context: Aligned with BP, we will not announce a baseline methane emissions intensity. OGCi will announce a consolidated baseline across 10 companies which we can refer to as an industry baseline.

Mitigation:

- Ensure clear messaging on data uncertainty associated with current methane emissions intensity.
- Communicate actions to improve data certainty including investing in technology e.g. Quanta3 sensing system in Rocky Mountain House which has the potential to continuously monitor methane emissions in Shell's shales sites, and through OGCi Climate Investments' methane venturing activities.
- Communicate actions to achieve the target including real-world vignettes of work Shell is doing to improve our methane emissions performance.

Recommendation:

Considering the opportunities and risks highlighted in Section 4, the recommendation is to announce a target – rather than an ambition – at the Gastech conference in Barcelona on 17th September 2018.

A decision is requested on whether the EC supports this recommendation.

5. Communications plan

The following communication elements are proposed for EC consideration and advice.

- Engage with key stakeholders (e.g. EDF) ahead of an announcement: include information on difference between our value chain and other assessments, stating our intent in ensuring alignment with partners and other stakeholders in the gas value chain.
- ECMW announcement at Gastech (17th-20th September 2018 in Barcelona).
- Media: issue a global media release.
- Social media: ECMW publishes a piece on LinkedIn, which highlights the target/ambition. This is shared on other social media channels, including Shell's Twitter natural gas handle.
- Methane Guiding Principles: Inform all signatories as well as associated organisations, including the World Bank and UN Environment, highlighting Shell's continued industry leadership.
- All content released externally – including specific messaging relating to data uncertainty – will be reviewed and signed off by Shell Legal.
- Prepare Q&A, which anticipates key questions raised by media, investors and stakeholders:
 - Relationship to Shell's overarching strategy and NCF;
 - Increased pressure on Shell to publish a target on its CO2 performance;
 - Baseline and data-certainty;
 - Actions taken to detect, measure, report and reduce, including examples;
 - Clarity on when and in what public reports Shell will publish performance updates; and
 - Clear definition of what we mean by "methane intensity".
- Publish an article on Shell's intranet explaining the target/ambition to employees and how it aligns with the company's purpose and strategy.
- Distribute a joint note from ECMW, ECAB and ECHB to their respective extended leadership teams, outlining what is needed to achieve full transparency of Shell's methane footprint, as well as the full implementation of plans to mitigate emissions so that the company does not just reach the target, but goes beyond it.

APPENDIX 1: External focus on methane reduction targets

April 2018: The Environmental Defense Fund (EDF) released a white paper on methane target setting, advocating preference for companies to set an absolute target of 75% reduction in methane emissions by 2025. If an intensity target is used, EDF argues that 0.2% or less is achievable.

April 2018: BP's 'Advancing the Energy Transition' report announced it is targeting a methane intensity of 0.2% and holding it below 0.3% (covers operated ventures only and 'marketed' gas).

May 2018: ExxonMobil announced greenhouse gas reduction measures to improve performance by 2020, including a 15% decrease in methane emissions and a 25% reduction in flaring.

24 September 2018: The Oil and Gas Climate Initiative (OGCI) will announce a target to reduce by 2025 the collective average methane intensity of the 10-member company aggregated upstream gas and oil operations to below 0.25% with the ambition to achieve 0.2%. The OGCI baseline in 2017 is 0.32% (covers operated ventures only and 'marketed' gas).

Appendix 2: Methane intensity of SOV assets

Assets where there is a difference between the two methodologies are highlighted in bold. The differences are due to the inclusion of emissions from oil-only fields in the assets.

UP	Option 1 (BP method)	Option 2 (OGCI method)
UPU-PERMIAN (US)	0.84%	0.84%
UPD-SNEPCO (NIGERIA)	0.37%	0.37%
UPO-Tunisia	0.34%	0.34%
UPU-APPALACHIA (US)	0.29%	0.29%
UPO-UK	0.22%	0.23%
UPU-O&GD (ARGENTINA)	0.22%	0.22%
UPU-SCAN (CANADA)	0.11%	0.11%
UPO-SMEP (MALAYSIA)	0.11%	0.12%
UPD-SBEP (BRASIL)	0.09%	0.22%
UPO-SPDC (NIGERIA)	0.06%	0.10%
UPD-GOM (US)	0.05%	0.05%
UPO-NAM (NETHERLANDS)	0.03%	0.03%
UPO-SPEX (PHILIPPINES)	0.02%	0.02%
UPO-NORSKE (NORWAY)	0.004%	0.004%
IG	Option 1 (BP method)	Option 2 (OGCI method)
IGV- BOLIVIA	0.27%	0.27%
IGV-GASNOR (NORWAY)	0.20%	0.20%
IGA-QGC (AUSTRALIA)	0.16%	0.16%
IGV-INDIA	0.06%	0.06%
IGV-SMDS (MALAYSIA)	0.03%	0.03%
IGQ-QSGTL (QATAR)	0.02%	0.02%
IGV-TRINIDAD AND TOBAGO	0.01%	0.01%

