

**BP CONFIDENTIAL**

**“RISING RISK: Improving Methane Disclosure in the Oil and Gas Industry” - Summary**

The purpose of this note is to summarize the EDF report “RISING RISK: Improving Methane Disclosure in the Oil and Gas Industry”

***EDF Report Summary***

In this report, EDF claims that disclosure of methane emissions by oil and gas companies is not adequate and that the lack of disclosure ~~could constitute~~<sup>is</sup> a material risk for investors. Excerpts from the report, EDF press release, and EDF website that highlight ~~these claims~~<sup>is claim</sup>:

***“A first-of-its-kind report by Environmental Defense Fund shows that leading oil and gas companies are putting themselves and their investors at financial and reputational risk by failing to adequately disclose meaningful information on emissions of methane.”***

***“Voluntary reporting on methane emissions by the oil and gas industry is poor —~~less than a third of reviewed companies report emissions and zero companies disclose emissions reduction targets [...]~~ making it challenging for investors to effectively gauge materiality, assess performance and manage risk.”***

***“A new report by Environmental Defense Fund finds that none of the 65 market leaders reviewed in the production and midstream segments disclose targets to reduce methane emissions and less than a third report such emissions via accessible, investor-facing data sources.”***

The report attributes this risk to three factors

1. **Economic Risk**: Poor disclosure hinders investor understanding of the amount of saleable product being wasted.
2. **Regulatory Risk**: Current and future regulations to minimize emissions have potential financial and operational impacts.
3. **Reputational Risk**: Methane emissions threaten natural gas’ legitimacy in the transition to a cleaner energy economy, potentially jeopardizing “social license to operate,” and limiting demand

The report recommends four standardized metrics for companies to adopt in their reporting: emission rate, reduction targets, Leak Detection And Repair (LDAR) protocol and economic value of methane emissions. ~~These metrics are~~<sup>Each metric is discussed in a later section of this paper.</sup>

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1. ~~Emission Rate~~ — Emission rate refers to the percentage of total methane volume which is being lost as a function of production or throughput — a single methane intensity figure. By reporting emissions as a percentage, the resulting data becomes comparable between companies, regardless of size, and over time, as a given company's operations evolve. (Note this is % of methane produced not % of gas produced). Reporting of absolute methane emissions is also recommended.
  2. ~~Reduction Targets~~ — Goal setting is the most basic and effective management device for improving performance. Emission reduction goals and timelines provide actionable information about management commitment to reduce emissions.
  3. ~~LDAR Protocol~~ — Operators should report the frequency, methodology and scope of their leak detection and repair (LDAR) programs. LDAR is one of the most important ways for a company to reduce emissions, so understanding how a company approaches LDAR can help investors gauge how effectively a company is reducing emissions.
  4. ~~Economic Value of Methane Emissions~~ — Expressing methane emissions as a dollar value allows investors to easily understand the potential financial impact of wasted natural gas.
- The report also recommends that companies should utilize direct measurement of emissions, particularly for fugitive emissions (equipment leaks) rather than estimates of emissions.

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The report urges i

1. — Investors to put pressure on companies to improve disclosure and adopt the metrics recommended in the EDF report.
2. Existing disclosure platforms/organizations are urged ~~should to~~ identify how they can improve methane disclosure and encourage companies to use these platforms to disclose their methane emissions. CDP, SASB, GRI, and IPIECA are specifically mentioned.

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#### General Issues

~~This section addresses some of the general issues in the paper. The and the suggested metrics are considered individually.~~

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The EDF paper is based on onshore US data and knowledge only but suggests that these the proposed metrics and methodologies should be used globally. The paper states that there are affordable solutions to mitigating methane emissions, ~~but, as~~ discussed in the economic value metric below, the paper does not consider the cost of mitigating measures in regions where gas is not exported, there is no market/value for natural gas, operational cost structures are very different than in the onshore US, and the physical structure of the industry and methane emissions profile are very different (e.g. offshore production).

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Although less emphasized than in other EDF funded-sponsored works, the concept of “super emitters” is mentioned in this paper. These other studies have reported that a majority of methane emissions come from a relatively small subset of sites/equipment, have coined the term “super emitters” to describe these high emitting sites, and assert that the high emissions are due to avoidable malfunctions or activities and can be readily eliminated. Other works have characterized intermittent gas production site activities as “super emitters” that account for the majority of the emissions incorrectly suggesting that these are both continuous and available for elimination. In reality, what sites are high emitting tends to vary day-to-day and whether such short-term high emissions are due to avoidable causes or an inherent part of operation and design has not been determined. These emissions tend to be intermittent in nature and are sometimes an inherent part of equipment intended design.

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The paper also calls for increased quantitative measurement, especially around fugitive for equipment leaks (fugitive emissions). The type of measurement described is usually difficult, very costly and does not appear to have value for a “find & fix” LDAR program which does not depend on economic value test to determine whether a leak would be fixed or not. would not help inform any more than an effectively run leak detection and repair program.

#### **Proposed Metrics**

Each of the recommended metrics will be addressed metrics, addressed separately in this section, but generally, all these metrics suggest a level of disclosure beyond what is that currently included in BP's the Sustainability and Annual reports. This additional disclosure would have to be agreed at the leadership level.

The following discussion is intended to address:

- The form of the metric;
- The feasibility of producing the metric with available data and;
- The issues and implications of the metric

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#### **Emission Rate – Form of Metric**

Form of Metric: The EDF report calls for two separate emission rate metrics:

1. Methane emitted divided by produced methane for production operations or throughput methane for mid-stream (gathering, processing, pipelines) operations - expressed as a percentage.
2. Methane emitted divided by the gas volume equivalent (BOE's X 6,000 scf/BOE) of hydrocarbons produced for production operations or hydrocarbon throughput for midstream operations - expressed as a percentage.

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EDF asserts that Emission Rate — As described in the EDF paper, the standard emission rate is calculated by dividing methane emissions by methane production or throughput —

~~a single methane intensity figure. Companies should use average methane composition to determine methane production.~~

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~~Emission rate refers to the percentage of total methane volume which is being lost as a function of production or throughput — a single methane intensity figure. By reporting emissions as a percentage, the resulting data becomes comparable between companies, regardless of size, and over time, as a given company's operations evolve. (Note this is % of methane produced not % of gas produced) Reporting of absolute methane emissions is also recommended.~~

#### **Emission Rate - ~~Emission Rate~~ — Feasibility:**

~~BP currently reports its methane emissions internally per asset in the GHG reports. The environmental report also has total hydrocarbons per asset. However, it should be noted that these production figures are aggregate of oil and gas and that the gross gas volumes are not currently collected (they are provided on an equity share basis and there is no breakdown of gas). BP does not currently centrally collect all the data points necessary to produce the emission rate metrics. is metric. We currently collect methane emissions as metric tonnes and hydrocarbons exported as BOE's.~~

~~In order to produce an accurate metrics, as described in the EDF paper, additional information would need to be centrally collected on (methane emitted to methane produced) an asset by asset basis.~~

- ~~1. Annual gas production. Whether this would include gas produced but not exported (e.g. reinjected gas) is a decision to be made.~~
- ~~2. Methane volume percent in the natural gas produced. If methane content is relatively stable (likely) a periodic update could be collected rather than annual. evaluation would be required annually.~~

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~~Additionally, as mentioned previously, the information currently collected is on the basis of natural gas. The reports recommends the metric to be on the basis of methane produced which means that a representative natural gas composition would have to be developed for each reporting unit. Depending on reservoir variability, this could require composition data from each relevant basin to also be collected.~~

#### **Emission Rate – Implications**

~~In order to produce an accurate metric as described in the EDF paper (methane emitted to methane produced) an asset by asset evaluation would be required annually.~~

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~~Additionally, as mentioned previously, the information currently collected is on the basis of natural gas. The reports recommends the metric to be on the basis of methane produced which means that a representative natural gas composition would have to be developed for each reporting unit. Depending on reservoir variability, this could require~~

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~~composition data from each relevant basin to also be collected.~~ Depending on how the volume percent is metric is interpreted, i.e. whether or not 'methane production' includes gas handled but not marketed as is the case in our operations that involve reinjection, it might cause some assets to appear overly disadvantaged. If the focus is exported gas this metric would be meaningless for assets which do not export gas.

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~~If BP decided to develop and disclose its own these metrics for this, accommodation would be needed for assets which do not export gas. it would have to accommodate for regions without a gas market.~~

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#### Reduction Target – Form of Metric

5. In the description of the reduction target metric, EDF says companies can set targets based on either or both absolute emissions and emissions intensity. EDF asserts that goal setting is the most basic and effective management device for improving performance. EDF notes that emission reduction goals and timelines should provide transparent and actionable information about management's commitment to reduce emissions.

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#### Reduction Target – Feasibility

In the current Sustainability Report, emissions targets are addressed as follows:

"A company's GHG emissions can be influenced by a variety of factors that may result from shifts in business activity, production or assets. This makes it difficult to establish an appropriate GHG target that can be cascaded throughout the organization with the objective of achieving cost-effective emission reductions. For these reasons, BP – like some of our peers – does not set enterprise-wide GHG targets and instead requires performance management at a local level through our operating management system."

BP (and our peers) will be reporting progress in the external initiatives which we have joined. The Climate and Clean Air Coalition (CCAC) Oil and Gas Methane Partnership (CCAC-OGMP), which BP signed onto in October 2015 has methane as one of its focus areas.

#### Reduction Target – Implications

The EDF paper states that companies can choose to set their emission targets on either or both absolute emissions and emissions intensity. As stated, BP's position is that setting company-wide targets on either basis is inappropriate, as stated in the sustainability report quoted above.

Industry is addressing ways to evaluate and execute emissions reductions through organizations like the CCAC and believe that initiatives such as these are the most effective way to ultimately reduce emissions. BP (and our peers) will be reporting progress in the external initiatives which we have joined. Industry believes that

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initiatives such as these are ~~the most~~ effective way to ultimately reduce emissions. Many of the currently existing reporting frameworks are a result of collaborative industry and stakeholder engagement activities and the resulting metrics take into consideration this consensus on drivers such as information availability, regulatory and disclosure constraints. Accepting the reduction target described in the paper undermines collective industrial efforts.

**Commented [SGR5]:** I would drop this. It is simply an assertion and raises the immediate question of "why does it undermine collective effort?". If kept, we need to credibly explain why.

#### LDAR Protocol – Form of Metric

EDF asserts that LDAR is one of the most important ways for a company to reduce emissions, so understanding how a company approaches LDAR can help investors gauge how effectively a company is reducing emissions.

EDF calls for companies to ~~Operators should~~ report the frequency, methodology and scope of their LDAR programs. ~~For upstream companies operations,~~ the paper defines coverage as percentage of well sites covered by LDAR. For midstream companies, coverage is defined in two separate ways: (1) percent of pipeline miles covered by LDAR; and (2) percent of facilities surveyed as defined by the EPA. ~~If a company inspects assets with various frequency rates, then it should seek to provide a breakdown by frequency, and the percentage of assets covered under each frequency bucket. EDF recommends frequent inspection - quarterly or monthly.~~

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**Commented [SGR6]:** Is it just producing sites? For example I believe the gas pipelines from Azerbaijan to Europe also have cameras.

#### LDAR Protocol – Feasibility

Industry recognizes the importance of leak detection and BP has plans in place to expand the current LDAR efforts.

The majority of BP upstream operated assets have Optical Gas Imaging (OGI) camera technology and the plan is to expand to all producing sites eventually. These programs will evolve over time and at variable frequencies. Leak detection information will be available mostly at a regional level unless compliance with regulations requires more granular information. The metric above suggests that coverage must be determined on a percent well basis.

**Commented [AC7]:** I didn't notice this on the metric yesterday. What do folks think of this language?

Frequency is established on a site by site basis and depends on several prioritizing factors such as facility enclosure, leak history of the process area and proximity of high vibration equipment or thermal cycling that can exacerbate the conditions for leaks to develop, and regulatory drivers. Sites in the United States are approaching LDAR from a regulative perspective.

Although BP's current LDAR programs do not quantify measure the leak volumes and the intent is to repair leaks found on a prioritized basis. R, repair of leaks is prioritized based on a subjective assessment of the size, whether the leak is in an enclosed space or not,

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severity and other factors such as proximity to other process equipment and feasibility of repair during uptime. Leaks that are not severe and cannot be repaired when the equipment is online will may be prioritized for the next available turnaround. For this reason, it is irrelevant to quantify the volume of the leak since it will be repaired independent of it.

No information regarding LDAR programs is currently collected centrally. In order to accurately report as EDF proposes, the necessary information on frequency of inspection and methodology (likely OGI unless regulatory requirements differ) would need to be collected from each asset.

#### ***LDAR Protocol – Implications***

Because of the different drivers and leak detection survey frequencies in each asset/region, this metric could lead to erroneous conclusions about leaks among the different regions and companies even when using the “buckets” approach for different frequencies as frequencies can vary within even a an asset/region.

#### ***Economic Value of Emissions – Form of Metric***

The EDF paper says this metric should be developed by multiplying the average sale price of gas (expressed as \$/Mcf) by the total Mcf of gas production emitted for the year. Expressing methane emissions as a dollar value allows investors to easily understand the potential financial impact of wasted natural gas.

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#### ***Economic Value of Emissions – Feasibility***

Similar to the methane emission rate metric, quantifying the financial impact of methane emissions would require an appropriate price for each region to be applied to the emission estimates reported internally. Where there is a value for gas, this would require an asset by asset evaluation to determine the appropriate net back value to be applied. For regions without a gas market, this value would be zero. None of this information is currently collected centrally.

#### ***Economic Value of Emissions – Implications***

It appears from the wording of the paper that The EDF paper assumes a market and value for gas and apparently has not considered the fact that some regions outside the US do not have a market for gas or gas exported has no monetary value to the company. Although setting the price as zero for those regions is a defensible position, industry should be prepared for resistance to this practice. For midstream companies which gather, process, and transport gas for a fee, the EDF paper does not recognize that gas value is not relevant to the midstream company. Where there is no value for the gas, companies do not claim a value for it.

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Using an average price of gas (Henry Hub, for example) overlooks several important details such as export agreements with national companies, royalties, taxation structures, and commercial agreements that affect the local price of gas. Without the appropriate level of detail, this metric provides investors with little meaningful information.

The paper also ~~seems to overlooks~~ the fact that some sources may not be able to be mitigated to zero emissions. For example, fugitives can be minimized with effectively run LDAR programs, but not totally eliminated and, methane emissions from incomplete combustion of fuel gas and in flares can only be addressed by reducing fuel use (efficiency) or flaring.

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