Emission Omission

October 2020

A Shareholder Engagement Guide to Uncovering Climate Risks from Non-Operated Assets in the Oil and Gas Industry

EDF ENVIRONMENTAL DEFENSE FUND

ROCKEFELLER ASSET MANAGEMENT

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Foreword

Sayma Robbie
Senior Vice President, NOJV excellence
bp

In February, bp announced our new purpose: to reimagine energy for people and our planet. We also shared our ambition to be a net zero company by 2050 or sooner, and to help the world get to net zero. And we introduced 10 aims to help us fulfil our ambition. One of those aims, aim 4, is focussed on reducing methane intensity in our operations.

Methane intensity is the amount of methane emissions from our operated upstream oil and gas assets as a percentage of the total gas that goes to market from those operations. In September, we announced a methane intensity target of 0.20% by 2025, using a measurement approach.

Non-operated joint ventures make up a significant portion of our production. We will work to influence these partners to set their own methane intensity targets of 0.20%. However, our work does not stop there. We are engaging with partners on methane mitigation technology and best practices on a bilateral basis and in collaboration with others.

Reducing methane emissions in non-operated joint venture assets is an important issue for our industry. There's an opportunity to share learnings and best practices about emission detection and mitigation with our partners. While bp and EDF may not agree on everything in this report, we've found common ground on the importance of addressing this issue, and we welcome engagement from other stakeholders. We believe that dialog can generate new ideas, identify solutions and help companies address methane emissions across the natural gas value chain.

Joint ventures are complex entities that can involve numerous participants. They rarely look the same. They can include collaborations between international oil companies, national oil companies, and host governments, among others. While this structure can present challenges to parties seeking to set specific methane intensity targets, it also presents opportunities to support and learn from joint venture partners, many of which are on their own decarbonization journeys. Recognizing this, bp is collaborating with other like-minded companies, such as those in the Methane Guiding Principles group, to put workable options into action. In addition, we are working with non-industry stakeholders such as EDF to get their perspective and input.

Investors are important partners as the world transitions toward net zero and bp welcomes their perspective. Investors draw on many sources of information and this report provides additional perspectives and can assist them and other stakeholders in engaging constructively with energy companies on non-operated asset methane management. We hope it will support a broader dialogue that helps bring about action to reduce global methane emissions.

Sayma Robbie
Senior Vice President, NOJV excellence
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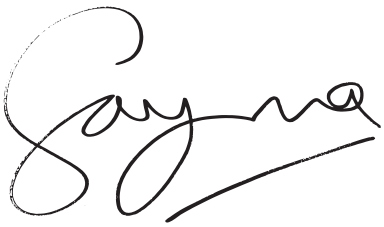

Preface

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An Investor Perspective on Enterprise Climate Risk Management

In January 2020, climate-related hazards topped the World Economic Forum's most significant long-term threats in their 2020 Global Risks Report.[1] According to the Fourth National Climate Assessment, issued by 13 U.S. Federal agencies, "Without substantial and sustained global mitigation and regional adaptation efforts, climate change is expected to cause growing losses to American infrastructure and property and impede the rate of economic growth over this century".[2] As academics, think tanks, governments and investors affirm the economic implications of climate change, the pressure on regulators to act will likely intensify.[3]

According to the International Energy Agency (IEA), 15% of global energy-related greenhouse gas emissions come from the production and delivery of oil and gas, which increases the probability of regulation for the sector.[4] Concurrently, the IEA views oil and gas majors as critical in the transition to a low-carbon economy. This sentiment is echoed by several international oil companies (IOCs), which have committed to net-zero emissions while simultaneously allocating resources to grow natural gas as a percentage of their overall production relative to oil.

This prospect should raise the following questions for investors: How are these companies positioned to deliver competitive products that can be labeled as "lower-emissions"? Which producers will be able to verify the entirety of their value chain greenhouse gas emissions to meet emerging regulation and product quality standards?

At Rockefeller Asset Management, we believe that climate transition risks, such as those raised above, can be material to company profitability and asset values.[5] As a result, climate risk analysis is fundamental to our investment research process, when material, and therefore a critical tool in seeking to meet our clients' investment objectives.[6] For this reason we have collaborated with the experts at Environmental Defense Fund (EDF) to both deepen our understanding of the risk-return ramifications of oil and gas value chains and enhance constructive shareholder dialogues on emissions abatement.

In the last decade we have seen the shareholder call for climate risk analysis drive improved disclosure and emissions target setting across segments of the oil and gas industry.[7] And yet, despite company commitments to reduce, and government proclamations to regulate, global emissions from this industry continue to rise.[8]

There is an unaddressed structural challenge in emissions control that is contributing to this growth: **While an estimated 70% to 90% of upstream assets from public oil and gas company majors are produced from joint ventures,most targets set by those same companies only cover those ventures where the company is the operator.[9]**

This has created a labyrinth of business relationships which has resulted in an incomplete accounting of emissions. Excluding these emissions in target-setting creates an "accountability gap," whereby other operators – such as National Oil Companies (NOC), are potentially exempt from stakeholder expectations to manage, mitigate or disclose operated emissions. The lack of disclosure calls into question the extent to which enterprise climate risk management extends to production partners, and obscures risks that could be material to a company's profitability.

We believe that galvanizing shareholder engagement for non-operated assets and joint ventures will be the next frontier in managing climate risk from the petroleum industry. Should investors encourage strong emissions control throughout the production footprint, they could drive tangible reductions in greenhouse gas (GHG) emissions for their portfolio companies. This could result in those companies offering products and services that have a competitive advantage in the low-carbon economy.

In this paper we explore the management of methane emissions from the oil and gas industry as a test case for Enterprise Climate Risk Management in non-operated assets. We offer this current analysis of IOC joint venture exposure, technical guidance on joint venture arrangements and engagement questions with a clear goal: to support constructive dialogues which may both mitigate investment risks and drive reductions in climate warming, thereby linking shareholder engagement to shareholder value.

1 "The Global Risks Report 2020." World Economic Forum, 15 Jan. 2020.
2 "Fourth National Climate Assessment." U.S. Global Change Research Program, 2018.
3 "The Inevitable Policy Response: Preparing investors for an abrupt transition." UN PRI, 9 Jan. 2020.
4 When accounting for direct (scope 1), indirect emissions (scope 2) and emissions from the use of products (scope 3), the oil and gas industry accounts for 42% of global greenhouse gas emissions. Beck, Chantal et al. "The future is now: How oil and gas companies can decarbonize." McKinsey & Company, 7 Jan. 2020.
5 Assets that are no longer able to deliver required and expected returns will likely need to be impaired. Asset write-downs can weaken a company's balance sheet and financial positioning.
6 Our research approach examines physical risks such as the effects of extreme weather on infrastructure, supply chains and customers and transitional risk stemming from public policy, technology, and consumer demand disruption for products and services when material.
7 Horster, Maximilian and Papadopoulos, Kosmas. "Climate Change and Proxy Voting in the U.S. and Europe." Harvard Law School Forum on Corporate Governance, 7 Jan. 2019.
8 "Methane Tracker 2020." IEA, March 2020
9 Mogstad, Martin. "The Web of Partnerships between bp, Chevron, Eni, ExxonMobil, Shell, and Total." Water Street Partners, 29 Nov. 2016

Glossary

Non-operated assets (NOA)

An asset at which another oil and gas company assumes the role of asset operator, overseeing all decision-making and standards

Operated asset

An asset where a company's employees and directly managed contractors are on the ground using the company's standards for processes, tools and systems

Joint venture (JV)

A business entity created by two or more parties, generally characterized by shared ownership, shared returns and risks, and shared governance

Joint venture operating companies (JV OPCO)

A company that is established by the formation of an oil and gas joint venture to lead the operations of an asset

International Oil Company (IOC)

A publicly traded oil and gas company with international operations

National Oil Company (NOC)

An oil and gas company that is majority-owned by the government

Equity reporting

The reporting of information (financial, environmental, etc.) across assets where a company is a shareholder

Operational reporting

The reporting of information (financial, environmental, etc.) across assets where a company is the operator

Methane Guiding Principles (MGP)

A set of five principles signed by members of the oil and gas industry that commits signatories to reduce methane emissions across the natural gas value chain

Oil and Gas Climate Initiative (OGCI)

A voluntary, CEO-led initiative with 12 member companies, which aims to lead the industry response to climate change

Oil and Gas Methane Partnership (OGMP)

A voluntary industry effort to create a gold standard for reporting on methane emissions

Health, Safety, Security and Environment (HSSE)

A company's process for ensuring health, safety, security and environmental protection for its employees and stakeholders

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About Environmental Defense Fund

Environmental Defense Fund (EDF) is one of the world's largest environmental nonprofit organizations, with more than 2 million members and a global staff of over 700 scientists, economists, policy experts and other professionals. EDF finds practical and lasting solutions to the most serious environmental problems. Working with businesses, scientists and academics, EDF takes a leading role in minimizing the environmental and health risks associated with the development of oil and natural gas globally.

About Rockefeller Asset Management

With over 30 years of experience in global investing, Rockefeller Asset Management (RAM), a division of Rockefeller Capital Management, pairs a distinctive worldview and long-term investment horizon with thorough fundamental research combining traditional and non-traditional analysis. RAM offers strategies that seek to outperform benchmarks over multiple market cycles, driven by a disciplined investment process in a highly collaborative team culture. As of June 30, 2020, RAM had $9.7 billion in assets under management.

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PART 1

Hidden risks in the oil and gas value chain

As part of due diligence, oil and gas investors should consider how methane management decisions by production partners can threaten consumer and commercial demand for natural gas. The combustion of natural gas for electricity has a lower climate impact than that of coal, but upstream oil and gas production process emissions of methane – a potent greenhouse gas 84 times more powerful than CO_2 in its first 20 years in the atmosphere – can cancel out any climate benefit if not managed appropriately. Recent findings from the Permian Basin, a major oil and gas field between West Texas and New Mexico, show that at current emission rates, the 20-year climate impact of burning natural gas produced in the Permian for electricity is nearly tripled.[10]

While natural gas has been marketed by the petroleum industry as a necessary and important bridge fuel in the transition to a low-carbon economy, production of natural gas generates a significant amount of GHG emissions along its supply chain. If these emissions are not curtailed, continued investments in natural gas production and infrastructure could face escalating regulatory risk as the European Union, China and other markets consider strengthening climate change policies.[11] Additional regulatory costs associated with natural gas could decrease its competitive advantage, in some instances, as costs for renewable energy infrastructure continue to fall, potentially decreasing returns or even leading to the stranding of assets.[12] As public trust in the petroleum industry and consumer acceptance declines, calls for policy action and competition from cleaner energy sources may intensify. [13, 14, 15]

The Accountability Gap

The portfolios of the world's largest publicly traded oil and gas companies – IOCs – are comprised of two types of assets: operated and non-operated. Operated assets are those in which a company's employees and directly managed contractors use the company's standards for processes, tools and systems. Non-operated assets, in contrast, are assets in which another oil and gas company assumes the role of asset operator, overseeing all decision-making and standards, including environmental, health and safety protocols. Due to this divergence in the chain-of-command, IOC reporting on emissions and targets is often incomplete, only accounting for emissions and ESG data from their operated assets, and largely omitting data from their non-operated assets. The IOC non-operating partner, however, typically continues to generate and report revenue from the asset equivalent to its equity ownership in the asset.

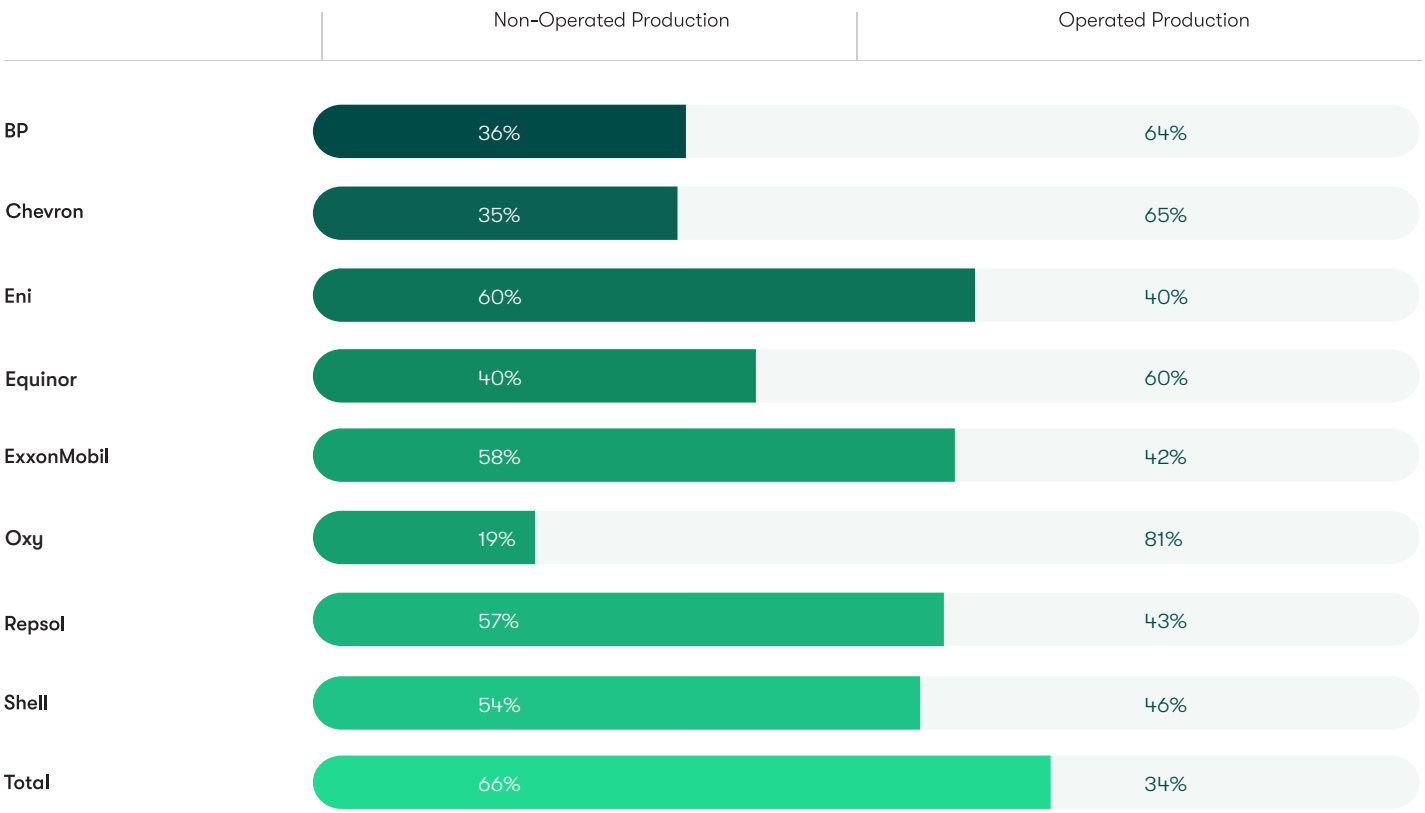
Given that an estimated 70%-90% of global upstream IOC assets are held in joint venture partnerships, investors should consider the dynamics of these structures in their research and analysis.[16] Every joint venture will have operating and non-operating partners, each with varying equity stakes in the asset and with different standards and practices for emissions management. Typical IOC joint venture partners include other IOCs, NOCs and joint venture operating companies – entities created specifically to lead operations of an asset. As a result, an IOC with leading practices could be in minority partnerships with operators who have substandard approaches. If IOCs only take responsibility for their operated emissions, they are omitting certain risks to the cost of supply from carbon pricing mechanisms such as regional efforts to enforce border-adjusted carbon taxes.

10 Zhang et al. "Quantifying methane emissions from the largest oil-producing basin in the United States from space." Science Advances, 22 Apr. 2020.
11 Kalesi, Poppy. "EU's climate credibility rests on tackling methane emissions from gas." Euractiv, 1 Jul. 2020.
12 Grant, Andrew and Coffin, Mike. "Breaking the Habit." Carbon Tracker, 13 Sep. 2019.
13 DePillis, Lydia. "The oil and gas industry has a problem - and the industry knows it." Houston Chronicle, 12 May 2017.
14 "The Inevitable Policy Response: Policy Forecasts." UN Principles for Responsible Investment, 2019.
15 "Citing Climate and Portfolio Risks, Investors Call on Oil and Gas Producers to Oppose Federal Methane Rollbacks." ICCR, 29 Aug. 2019.
16 Mogstad, Martin. "The Web of Partnerships between bp, Chevron, Eni, ExxonMobil, Shell, and Total." Water Street Partners, 29 Nov. 2016

Figure 1

Operated versus Non-Operated Production, on an equity basis, across publicly traded OGCI members (2018)

While non-operated assets comprise on average 40% of supermajor production, only 1% of their workforce is tasked to manage them.[17] For the nine companies analyzed in this report, non-operated equity production volume ranges from 19%-66% (Figure 1). More than half, five of the nine, operated less than 50% of their production.



Note: Equity reporting is the reporting of information (financial, environmental, etc.) across assets where a company is a shareholder by equity stake in those assets.

17 Kwicinski, Joshua. "Raising the Bar on Non-Operated Joint Venture Influencing." Water Street Partners, 12 Dec. 2017.

Non-Operated Asset Benchmarking

Across the companies analyzed, the scale of non-operated assets is significant by multiple metrics. Non-operated assets were estimated to account for 19%-66% of company production, with five of the nine companies deriving more than 50% of their production from non-operated assets. This picture is similarly reflected in company revenue as non-operated assets were estimated to account for 19%-65% of company revenues in 2018.

These non-operated assets are frequently among the most valuable assets in company portfolios. According to the data from Rystad Energy, three of the nine companies – ENI, Total and Repsol – each had 68%-82% of their net-present value (NPV) derived from non-operated assets. Companies analyzed were also found to have committed significant portions of 2018 capital expenditure towards non-operated assets, likely indicating continued investment.

Table 1

Non-Operated Production Exposure (equity basis, 2018)

Company Name	Total production (million BOE) [18]	% total production non-operated	% revenue non-operated	% NPV non-operated assets	% capex non-operated, incl. exploration capex[19]
bp	1,234	36%	33%	34%	30%
Chevron	1,260	35%	38%	36%	49%
ENI	791	60%	57%	68%	63%
Equinor	759	40%	41%	36%	25%
ExxonMobil	1,623	58%	59%	47%	37%
Oxy	579	19%	19%	11%	4%
Repsol	335	57%	63%	82%	41%
Shell	1,496	54%	58%	47%	41%
Total	1,030	66%	65%	76%	64%

18 BOE: barrel of oil equivalent
19 Capex: capital expenditure

Bringing National Oil Companies into Climate Change Dialogues

Depending on the country in which production is taking place, the operating partner in an IOC joint venture could be a NOC – where an IOC has an equity investment in an asset operated by an NOC or by an operating company with joint NOC and IOC ownership. Many of the largest non-operated assets owned by the nine companies analyzed in this paper are in countries with an NOC, and some of the most significant non-operated production is from countries including Qatar, Kazakhstan and the United Arab Emirates. These NOCs are owned by and closely connected to their respective governments.

While shareholder pressure has been instrumental in impacting progress with publicly traded leaders in the oil and gas sector, the question of how to engage NOCs has been a persistent concern for many stakeholders committed to limiting global warming. NOCs operate nearly 51% of global gas and 58% of global oil production and are the stewards of approximately 60% of the world's gas and 65.7% of the world's global oil reserves.[20] However, few NOCs are subject to public equity shareholder engagement as they are largely owned and controlled by national governments. As a result, the management and disclosure of GHG emissions from these entities is largely unknown. Investors and other stakeholders should consider working with IOCs to expand their methane reduction commitments to non-operated assets. Shareholder engagement on this issue can flow through IOC value chains to NOCs, a segment of oil and gas production largely inaccessible to public equity investor influence (see Figure 2).

Figure 2 shows the top NOC partnerships for each of the nine analyzed IOCs. Top NOC partners for this table were determined by analyzing production from non-operated assets where the IOC has a ≥ 5% equity stake and where an NOC is the largest equity holder, or the second largest after the IOC. This includes assets where the NOC is the co-largest owner with other partners.

While this table does not show operational control by company, the analysis demonstrates the depth and breadth of IOC-NOC interrelationships at the asset level. The largest IOC-NOC partnership our analysis found was between Total and Abu Dhabi NOC (the state-owned oil company of the United Arab Emirates, also known as ADNOC) – where 34% of Total's production is from assets where ADNOC is the largest equity owner. Major partnerships were also identified between the IOCs and Sonatrach in Algeria, Petrobras in Brazil and Qatar Petroleum.

Co-ownership of an asset, or multiple assets, may afford IOCs an influencing pathway with their NOC partners. However, there are other types of relationships that may link an IOC and an NOC. Rosneft for example does not show up on this table as a partner for bp, but bp directly owns close to 20% of the company.[21]

> National Oil Companies operate nearly 51% of global gas and 58% of global oil production and are the stewards of approximately 60% of the world's gas and 65.7% of the world's global oil reserves [...] shareholder engagement on this issue can flow through International Oil Company value chains to National Oil Companies.

20 "The Oil and Gas Industry in Energy Transitions." International Energy Agency. January 2020.
21 "Partnership with Rosneft." bp.

Figure 2

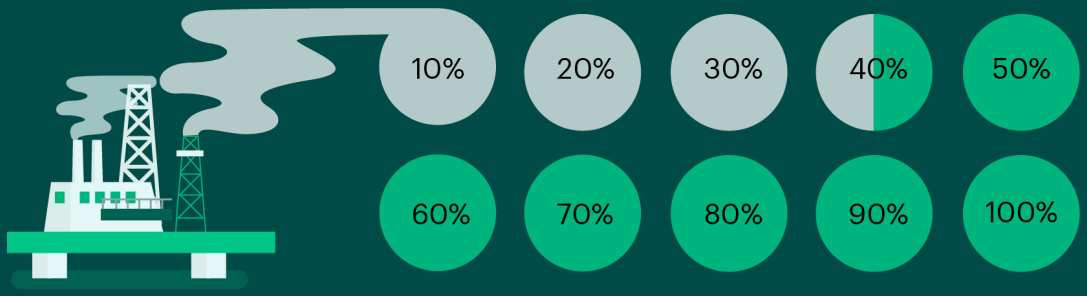
Top IOC-NOC Joint Venture Partnerships by shared asset production (Percentage of total production from IOCs' assets where NOC has a shared ownership stake)

	1		2		3	
bp	Abu Dhabi NOC **UAE**	31%	CNOOC **China**	3%	YPF	2%
Chevron	CNOOC **China**	4%	PDVSA	3%	PTTEP **Thailand**	1%
ENI	Abu Dhabi NOC **UAE**	14%	Sonangol **Angola**	6%	Sonatrach **Algeria**	5%
Equinor	Petoro **Norway**	8%	Petrobras **Brazil**	6%	Sonatrach **Algeria**	3%
ExxonMobil	Qatar Petroleum **Qatar**	13%	EBN **Netherlands**	1%	NNPC **Nigeria**	0.5%
Oxy	Sonatrach **Algeria**	20%	Abu Dhabi NOC **UAE**	15%	Ecopetrol **Columbia**	5%
Repsol	Petrobras **Brazil**	18%	Sonatrach **Algeria**	13%	NOC **Libya**	10%
Shell	Abu Dhabi NOC **UAE**	15%	Petrobras **Brazil**	14%	Omani Government **Brazil**	13%
Total	Abu Dhabi NOC **UAE**	34%	Qatar Petroleum **Qatar**	11%	PTTEP **Thailand**	5%

Partners include operators in the "NOC" and "INOC" categories in Rystad, but excludes Equinor as a top INOC / NOC partner.

Joint Venture Management is Key to Reducing Global Warming

Joint Ventures (JVs) represent
35% of global upstream production



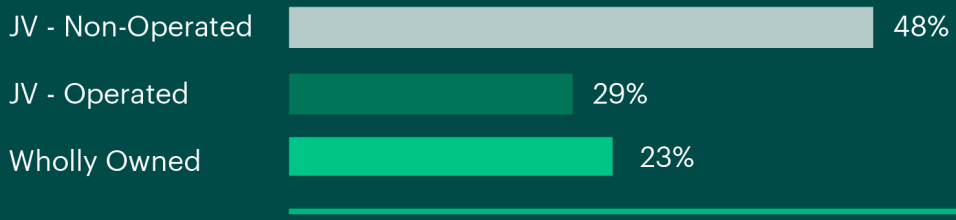
JVs account for

77%

of total production by supermajors

JVs account for **85% of production in key producing countries**

Non-operated JVs account for
48% of supermajor production



Source: UCube (Upstream Database) Rystad Energy and Water Street Partners Analysis

PART 2

Driving Industry Accountability on Non-Operated Assets

ESG reporting on non-operated assets is a complex issue that receives limited disclosure. Most IOCs report emissions from the entirety of their operated assets, regardless of their equity position in those assets. Only a smaller share of IOCs report emissions from non-operated assets by reporting their equity emissions (see Table 2). Equity emissions are typically reported as the share of emissions from each asset equivalent to a company's ownership stake.

Equity emissions reporting is an important disclosure that shows accountability for emissions from non-operated assets. **However, as companies own a percentage of economic output of an asset, not a piece of tangible infrastructure, a company can only reduce emissions from their equity stake in an asset if the entire asset is committed to reduce.** This places significant emphasis on collaboration with, and influencing of, operating partners (see The Ways and Whens to Influence Joint Ventures for further detail). Some operating partners may have similar best practices and approaches on ESG, but often they do not. Table 2 shows the percentage of each analyzed company's non-operated production which is not covered by two global voluntary industry methane initiatives: the Oil and Gas Climate Initiative (OGCI) and the Methane Guiding Principles (MGP).

As company methane and emissions targets largely do not extend to non-operated assets (Table 2), this may leave large portions of company production emissions unaccounted for in carbon footprint management.

Non-operated assets raise uncertainties regarding methane emissions management that warrant greater investor attention and engagement. To date, the majority of industry's methane reduction commitments have only been for companies' operated assets. This means in some cases up to 65% of a company's production is exempt from its reduction target. However, there are some encouraging signals that non-operated methane emissions abatement is gaining momentum.

Industry Commitments to Date

Recent years have seen progress in raising awareness about managing methane risk from non-operated assets, with some limited initial action. Some individual companies are starting to extend the coverage of their methane commitments to non-operated assets. Though the stringency of its target is relatively unambitious, in 2019 Chevron became the first oil and gas company to signal a commitment toward establishing a methane reduction target for both its operated assets as well as "assets it has a stake in but does not operate itself."[22]

Additionally, in February 2020, bp announced that it will "work to influence" its non-operated partners to set their own methane intensity targets of 0.20%, in line with the target for their operated assets. In support of this commitment, in 2020 bp and EDF are spearheading a workshop series through the Methane Guiding Principles to accelerate methane management at non-operated joint ventures; the initiative brings together IOC joint venture and methane experts to discuss opportunities to influence joint venture partners' methane management.

Furthermore, in 2020 the Oil and Gas Methane Partnership (OGMP) – an initiative launched at the UN Climate summit in 2014 and hosted by the UN Environment Programme – has been reinvented to specify the quality level of reported emissions and extended to include all member companies' operated and non-operated assets. The 10 founding partner companies, including both IOCs and NOCs account for 23% of global oil and gas production.[23] They will also report methane emissions from non-operated assets under the framework, increasing the quality of the reporting to the highest level within five years.

22 Chevron's has committed to a 20-25% reduction in methane intensity from 2016–2023.

23 OGMP founding members include bp, Ecopetrol, Eni, Equinor, Neptune Energy International, Pemex, PTT, Repsol, Shell and Total; Our estimate of the percent of global oil and gas production, using 2018 Rystad data, covered by the OGMP is based on OGMP 2.0 suggested criteria for reporting emissions and is analyzed at the asset level, including (1) production from assets operated by OGMP members and (2) production from assets not operated by an OGMP member but where at least one member holds more than 5% equity.

Table 2

Non-Operated Asset Methane Disclosure and Target Coverage (as of September 2020)

Company Name	Individual methane targets	Commitments to work to address methane from non-operated assets (not necessarily a target)	Reports methane emissions from non-operated assets	% non-operated production NOT covered by either the OGCI or MGP global methane initiatives (2018)
bp	0.20% intensity by 2025, using direct measurement[24]	Yes [25]	Yes [26]	65%
Chevron	20-25% reduction in intensity from 2016–2023[27]	Yes[28]	Yes [29]	67%
ENI	-80% vs. 2014 by 2025[30]	No	No	83%
Equinor	Near zero emissions[31]	No	No	35%
ExxonMobil	-15% vs. 2016 by 2020 [32]	No	Yes [33]	36%
Oxy	Commitment to set a target this year[34]	No	No	98%
Repsol	-25% vs. 2017 by 2025[35]	No	No [36]	68%
Shell	0.2% intensity by 2025[37]	No [38]	No	57%
Total	Near zero emissions[39]	No	No	71%

Methane Targets The two leading forms for methane targets are absolute and intensity. Absolute targets set a limit for total emissions that is independent of production rates. Environmental Defense Fund recommends intensity targets are calculated as total methane emissions from oil and gas production over total natural gas production; "Taking Aim." Environmental Defense Fund, April 2018.
Industry Methane Initiatives This metric includes all company non-operated asset production not from joint venture partners covered under voluntary industry methane initiatives including the Oil and Gas Climate Initiative (OGCI) and the Methane Guiding Principles (MGP).

bp has committed to "work to influence [its] joint ventures to set their own methane intensity targets of 0.2%" without a setting a timeline. bp's GHG emissions are reported by operational control and by equity share, including all JV emissions, except for Rosneft.
Chevron states that "GHG emission intensity reduction metrics apply to all upstream Chevron oil and natural gas, whether Chevron has operational control or not." Chevron has committed to "lower upstream oil net GHG emission intensity by 5-10 percent and upstream natural gas net GHG emission intensity by 2-5 percent from 2016 to 2023." Chevron reports overall GHG emissions on an equity basis – excluding all non-operated assets in which Chevron has an equity interest of 16% or less – but not does not break out by GHG.
Eni has committed to "Net-zero carbon footprint by 2030 on direct emissions from Upstream operations value in equity" but it is unclear if this includes methane emissions.
ExxonMobil "reports GHG emissions on a net equity basis [reflecting the] percent ownership of an asset. [...] The net equity greenhouse gas metric includes direct and imported greenhouse gas emissions and excludes emissions from exports (including Hong Kong Power through mid-2014)."
Repsol's methane emissions are only disclosed as an emissions intensity figure, without specification as to whether they are for operated or non-operated assets.
Shell target does not include non-operated assets in its reporting, but Shell states a commitment to working with NOJV partners to on HSSE&SP risks.
Total has committed methane emissions at operated gas facilities close to zero, but does not include oil production. Total reports emissions by equity share, but does not break down by greenhouse gas.

24 "Methane measurement approach." bp, Sep. 2020
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29 "2019 corporate sustainability report." Chevron, May 2020
30 "Reducing greenhouse gas (GHG) emissions." Eni, 7 Feb. 2020
31 "Reducing GHG emissions." Equinor, 2020.
32 "2020 Energy and Carbon Summary." ExxonMobil, 28 Jan. 2020
33 Op. Cit
34 "Climate-Related Risks and Opportunities: Positioning for a Low-Carbon Economy." Occidental, May 2019
35 "2019 Integrated Management Report." Repsol, 20 Feb. 2020
36 Op. Cit
37 "Shell announces methane emissions intensity target for oil and gas assets." Royal Dutch Shell, 17 Sep. 2018.
38 "Sustainability Report 2019: Delivering Energy Responsibly." Royal Dutch Shell, Apr. 7, 2020
39 "Integrating Climate Into Our Strategy." Total, Nov. 1, 2019

PART 3

Risks to Shareholder Value From Non-Operated Asset Methane Emissions

In the power sector, natural gas investments are touted by industry as cost-effective, low-carbon replacements for coal generation, while large industrial companies see a place for natural gas in a net-zero future as a feedstock for hydrogen and other chemicals. By extension, public sector support for natural gas power generation capacity is underpinned by the public perception that it is a better choice for the climate than other fossil fuels. Whether industry's climate argument holds is largely dependent on methane emissions performance across the production value chain. Action to effectively measure and mitigate emissions is critical if industry is to support its climate case for the use of natural gas in the energy transition.

Risks to Shareholder Value

The IEA's Stated Policies Scenario estimates that gas will overtake coal as the main source of fossil fuel power generation capacity by 2025.[40] Concurrent with demand and capacity growth, a growing number of oil majors have communicated plans to increase the percentage of natural gas in their production volumes as a key piece of their climate strategy in coming years. Total has stated it is targeting a sales mix of 40% gas by 2030; Eni has communicated that 60% of its portfolio will be gas by 2030 and 85% by 2050; and Shell has stated that potentially growing the proportion of gas in its portfolio from 50% to 75% could be a way to meet its 2050 targets.[41, 42, 43]

As companies allocate resources toward natural gas production and infrastructure as a key driver of their future value, investors should consider potential reputational, consumer and regulatory headwinds the natural gas market faces. A growing number of downstream electric utilities and industrial consumers of natural gas are touting and committing to climate goals while maintaining – or even increasing – natural gas investments.[44] Yet without management of upstream emissions, producers of natural gas may not be able to comply with customer demand for lower-emissions products.[45, 46]

If regulators similarly continue to feel pressure to step up climate commitments, insufficient management of methane and other emissions from both operated and non-operated assets could risk stranding assets that are no longer economically viable to produce and sell as major markets increase climate regulation. If assets are no longer able to deliver required and expected returns, they will likely be impaired. Asset write-downs may weaken a company's balance sheet and financial positioning, driving a potential loss of value for some investors.[47]

The most immediate example is forthcoming regulation under consideration as part of the European Union's (EU) Green Deal gas market reforms. Comprising nearly 47% of the internationally traded market, the EU is the world's largest single market for natural gas, with 2018 gas imports reaching an all-time high of 78% of the addressable market. [48]

EU policymakers are considering a strategy including legislation that would severely limit methane emissions from the entire lifecycle of natural gas imported into the EU.[49] This specific rule would consider emissions from the production of natural gas. Given that most

40 IEA. "Installed power generation capacity by source in the Stated Policies Scenario." IEA, 29 Jan. 2020.
41 Direct correspondence with Total.
42 ENI. "The New ENI: Creating Value Through the Energy Transition." ENI, Feb. 2020. page 7.
43 Shell. "Shell Energy Transition Report." Shell, April 2018. page 55.
44 Ptacek, Sophia and Carter, Sheryl. "More Utilities Make Big Commitments to Climate Action." 5 Mar, 2019.
45 Watson, Dominic. "Federal methane rollbacks spark new opposition from 12 major utilities." Environmental Defense Fund, 9 Oct. 2019.
46 Ratner, Ben. "New companies oppose methane rollbacks but industry divide remains." Environmental Defense Fund, 6 Dec. 2019.
47 Grant, Andrew and Coffin, Mike. "Breaking the Habit." Carbon Tracker, 13 Sep. 2019.
48 bp Energy Economics, "bp Energy Outlook 2018." bp, Feb. 2018.
49 Renssen, Sonja van. "EU turns to methane emissions in fight against global warming." Euractiv, 12 Mar. 2019.

producers do not include non-operated assets in methane abatement plans, it is critical for shareholders to consider a company's compliance with potential EU standards, across their asset portfolio.

What the EU decides to do with methane could inspire other major gas importers, including notably China and Japan, to consider similar policies as they look to mitigate their climate impact. These could manifest as tariffs, fines or taxes, but this could also potentially lead to more serious consequences such as the stranding of assets and infrastructure or forced obsoletion from jurisdictions that decide to leapfrog gas in favor of renewables.

As renewable energy becomes cheaper at scale, and as younger, more environmentally-minded consumers, employees and voters emerge, it will become increasingly important for producers to take meaningful steps to ensure that adverse climate impacts are kept to a minimum across their assets.[50, 51]

Producers that can verify the entirety of their value chain may build greater investor confidence in their ability to compete in a decarbonizing future. Including non-operated assets in methane reduction targets is an important signal to investors that a company is acting to preserve past and future investments.

While we present this guidance in the context of methane emissions management, there is wider applicability to learning about a company's management of joint ventures that can relate to other risks to shareholder value such as production efficiency, occupational health and safety liabilities, spill and waste management, water use and disposal as well as a variety of human rights concerns. Ultimately, this discovery process can uncover important nuances concerning management quality and enterprise climate risk management linking shareholder engagement to creating shareholder value.

3 Key Questions for a Quarterly Analyst Call

While long-term investors are increasingly voicing their concerns regarding the physical and transition risks from climate change, company quarterly calls tend to be dominated by a focus on short-term analyst expectations. In addition to traditional corporate engagement channels, it is becoming increasingly important for analysts to raise issues such as the physical, transition and liability risks from climate change in mainstream public dialogues. Given recent commitments to expand natural gas exploration and production across oil majors, we offer the following questions to investors concerned about the future value of these assets:

1. What percentage of the company's production is from non-operated assets? What programs does the company have in place to address potential liabilities from these assets?

2. Given increasing discourse surrounding the reputational and potential regulatory risks of greenhouse gas emissions from natural gas production, how are you considering the risk of asset stranding from your non-operated assets?

3. What governance structure at board and management levels does the company currently have in place to manage risk from joint ventures and non-operated assets?

50 Kennedy, Ryan and Pinto, Pablo. "Insights into the Oil and Gas Workforce of the Future." University of Houston Hobby School of Public Affairs, June 2019.
51 Funk, Cary and Hefferon, Meg. "U.S. Public Views on Climate and Energy." Pew Research Center, 25 Nov. 2019.

PART 4

Shareholder Engagement Guidance

When it comes to shareholder engagement on climate risk, calling for the inclusion of non-operated emissions in GHG reduction targets is essential to reducing regulatory and reputational hurdles. The lack of disclosure calls into question the extent to which enterprise climate risk management extends to production partners, potentially obscuring risks that could damage company profitability – a major red flag for investors. Even the largest companies are not impervious to social pressure. Those that are able to build public and consumer trust by demonstrating their commitment to a net-zero future across their assets may be the ones to generate long-term value.

On-going advancements in emissions measurement and management technology make abatement a low-hanging fruit for significant climate system impact. Recent analysis from the IEA finds that one third of global methane emissions from upstream operations can be mitigated at no net cost.[52]

As we enter this new decade, it is time to evolve investor engagement beyond requests for incremental emissions disclosure. Now is the time to call companies to action, encouraging them to establish targets that cover 100% of their production volumes, across all assets, and that are based on credible emissions measurements. Investors should focus on questions that drive action, transparency and accountability in this largely unknown and unaccounted for segment within the global oil and gas system.

Following are investor engagement questions and technical guidance on oil and gas industry non-operated assets. We offer these recommendations as a starting point to catalyze constructive shareholder dialogue with companies. As investors look to improve oversight of this part of the oil and gas industry, these resources can help investors assess non-operated asset methane risk, benchmark company performance and ultimately accelerate action.

"Now is the time to call companies to action, encouraging them to establish targets that cover 100% of their production volumes, across all assets, and that are based on credible emission measurements."

52 IEA. "Methane Tracker 2020." IEA, March 2020.

Engagement Questions

Investors play a critical role in improving company disclosure and performance on environmental, social, governance and broader financial issues. Below are suggested questions to assist investors as they assess emissions performance and engage constructively to help ensure their portfolio companies are appropriately managing methane risk from non-operated assets.

Questions are aligned along the Task Force on Climate-Related Financial Disclosure's (TCFD) four recommendation categories for disclosure. For each section, questions move from most general, for companies with no disclosure, to more specific questions for companies with higher levels of disclosure.

Level 1

Level 2

Level 3

Governance

1. How does the company oversee the coordination and integration of non-operated assets within the company's corporate structure?
2. Describe the Board of Directors' role in the oversight of climate risk, and how climate risks from non-operated assets are factored into that responsibility.
3. Describe the responsibilities and roles of the functional team managing climate risks group-wide and for the non-operated asset portfolio. How are they integrated into joint venture teams?
4. How often do representatives at the group-level, specifically EHS staff visit non-operated joint venture teams?

Strategy

1. What efforts has the company made to influence non-operated asset joint venture partners on methane mitigation, and how successful/unsuccessful was the effort?
2. What programs and/or processes are in place for methane technology and best management practices sharing between non-operated asset joint venture partners?
3. For planned exploration and production projects up to 2030, what share is expected to come from non-operated assets?
4. What efforts has the company made to positively influence methane and climate policy in countries with major non-operated assets?

Risk Management

Level 1 Level 2 Level 3

1. What percentage of current and planned production volumes come from non-operated assets? What share of non-operated production is operated by a company with a methane reduction target or by members of a voluntary methane coalition (incl. OGMP, MGP and OGCI)?
2. What methods are used to verify the accuracy of non-operated asset methane emissions data received from partners? What levels of assurance are applied by internal or external functions?
3. How does the company integrate methane and other environmental health and safety risks from non-operated assets in its enterprise risk management processes?
4. How are methane and other EHS priorities integrated into current and future contract terms for its non-operated assets and joint ventures?

Metrics and Targets

1. What is the company's estimate of non-operated asset methane emissions and how are they reported?
2. In what format(s) and with what frequency do joint venture partners share methane emissions data, and/or other EHS data?
3. What efforts is the company undertaking to improve the quality and credibility of its methane emissions data, and how is that, or could that be extended to non-operated assets to ensure robust quantification?
4. Does the company's target extend to non-operated assets? If not, what is the plan and timeline to extend the target's coverage?

The Ways and Whens to Influence Joint Ventures

William de Hoop Scheffer, Managing Director, Water Street Partners, an Ankura Company

Engaging with joint venture partners offers clear opportunities to improve disclosure, transparency and best practices at non-operated assets – however, driving change with joint venture partners also presents certain challenges.

While non-operating partners are afforded a degree of influence by operators through their ownership stake in the asset, typical oil and gas agreements provide non-operators few formal rights. For a non-operating partner to effectively influence operators, they must undertake a structured, collaborative and sustained approach to achieving their goals through a "partner influencing campaign."

A deliberate and coordinated effort to drive operator improvements in select focus areas can improve venture performance, reduce GHG emissions and help the non-operating partner deliver value beyond the asset. A well-executed influencing campaign can also drive value for operating partners, providing technical expertise and solutions to meet environmental goals.

But first, to achieve these goals, companies and their shareholders must understand how to balance the **Ways** and **Whens** of operator influencing.

The Ways

Rights, protections and obligations non-operating partners typically can hold in existing joint ventures with regard to environmental policies and practices. Typical terminology that is prevalent across joint venture legal agreements, can include clauses along three categories:[53]

Reporting and Transparency

Environmental impact assessment clause
Obligates joint ventures to conduct a detailed environmental review either at the set-up or ramp-down of the activities

Waste management and recycling provision
Ensures joint ventures appropriately handle and recycle waste generated across the value chain

Reduction Measures

GHG emission and reporting clause
Obligate joint ventures to reduce GHG emissions (e.g., CO^2, CH^4) and to periodically track and report total GHG

Net carbon footprint provision
Ensure joint ventures reduce total carbon footprint of products they produce (i.e., reduce full life cycle emissions)

Prevention Clauses

Sustainable sourcing clause
Obligates joint ventures to instill sustainable sourcing practices across their supply chains

Decommissioning and remediation clause
Obligates joint ventures to perform certain environmental activities (e.g., conducting impact assessment, safely plugging wells) during and at the end of the joint venture

53 Water Street Partners analysis from the environmental provisions in 72 venture and related legal agreements in the petroleum and mining sectors.

The Whens

Influencing points throughout the life of a joint venture that can allow non-operating partners an opportunity to achieve greater influence with operating partners or solidify EHS goals in contract.

Inception of the joint venture

Non-operating partners are most successful when aligning on EHS goals at the start of an agreement. When negotiating and structuring new joint venture agreements, the non-operator has significant leverage to incorporate clauses that are at the forefront of environmental protection and that conform to company best practices. This can occur during the selection and submission of bids from potential operating partners, the joint venture formation or the Final Investment Decision (FID).

During the life of the joint venture

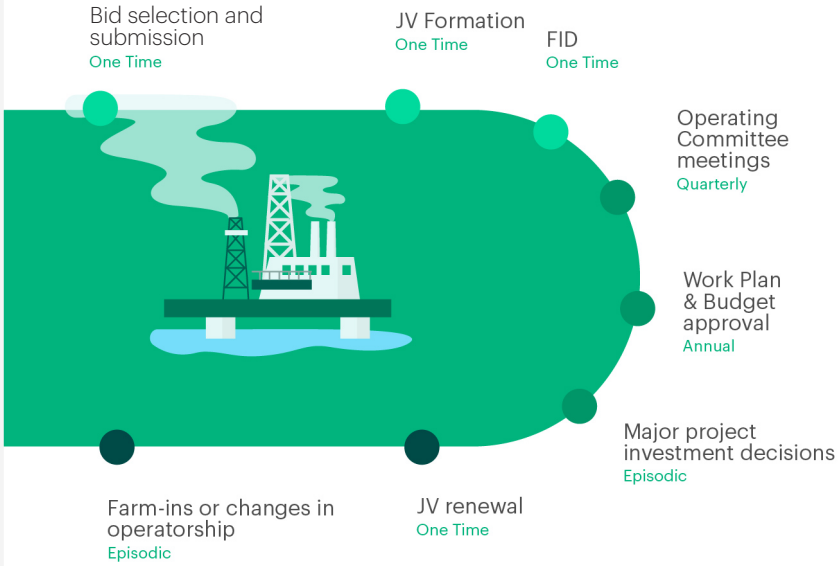
Once a joint venture agreement is in place, non-operating partners can still maximize influence by raising EHS goals during certain key convening points in the lifetime of a joint venture. These are often decision points where approval is required from a non-operator and can include Operating Committee meetings, the approval of a Work Plan & Budget (WP&B) or major project investment decisions.

End of the joint venture

Finally, the end of a joint venture also offers an opportunity for non-operating partners to negotiate provisions on EHS goals when considering re-extending an agreement, either through joint venture renewal, restructuring or changes in operatorship.

WHEN

Specific "influencing points" in the life of a JV to effect environmental decisions:



Once the **Ways** and **Whens** are clearly understood and defined, they can be translated into an integrated work plan. This work plan can be used to track and benchmark influencing objectives for non-operated assets and determine further tactics on how to influence the operator in high-priority areas. Shareholder engagements can focus on pointed questions around the development and implementation of such work plans.

Methodology

EDF analyzed the portfolios of the publicly traded members of the Oil and Gas Climate Initiative (OGCI) – a voluntary, CEO-led initiative.[54] These nine companies are bp, Chevron, Eni, Equinor, ExxonMobil, Occidental, Repsol, Shell and Total.

EDF conducted internal analysis to estimate the portfolios of these companies using data from Rystad Energy UCube Database. Rystad builds global estimates and projections of oil and gas production based on bottom-up estimates from individual fields. Our analysis uses 2018 revenue and production data, including crude oil, condensate, natural gas liquids and gas reported in barrels of oil equivalent.

Production estimates throughout this paper are stated on an equity basis, where company production is estimated from all operated and non-operated assets based on the company's equity share. For example, if a company owns 5% of an asset, they are credited with 5% of the production from that asset. Revenue data is also based on a company's equity share and is estimated by Rystad using production per year and historical and forecasted prices of hydrocarbons.

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54 Our analysis was limited to publicly traded companies because they are largely owned by non-governmental stakeholders, creating opportunity for external influence.

Emission Omission

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