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June 14, 2021

The Honorable Gary Gensler, Chair
Commissioner Hester M. Peirce
Commissioner Elad L. Roisman
Commissioner Allison H. Lee
Commissioner Caroline A. Crenshaw

U.S. Securities and Exchange Commission 100 F Street, NE
Washington, DC 20549

Re: Request for Comment on Climate Change Disclosures

Dear Chair Gensler and Commissioners,

We are writing to share research that responds to the request for comment on Climate Disclosure made on March 15, 2021[1]. The following comment outlines a proposal to amend the SEC's 2010 Modernization of Oil and Gas Reporting Rule (as it relates to Item 1202 of Regulation S-K)[2] to require oil and gas reserves disclosures that the effective CO_2 emissions that they represent in a scientifically valid and user-friendly manner. The comment seeks to answer the following questions put forth in the March 15, 2021 request:

1. What information related to climate risks can be quantified and measured? How are markets currently using quantified information? Are there specific metrics on which all registrants should report (such as, for example, scopes 1, 2, and 3 greenhouse gas emissions, and greenhouse gas reduction goals)? What quantified and measured information or metrics should be disclosed because it may be material to an investment or voting decision?

2. Do climate change related impacts affect the cost of capital, and if so, how and in what ways? How have registrants or investors analyzed risks and costs associated with climate change? What are registrants doing internally to evaluate or project climate scenarios, and what information from or about such internal evaluations should be disclosed to investors to inform investment and voting decisions? How does the absence or presence of robust carbon markets impact firms' analysis of the risks and costs associated with climate change?

4. What are the advantages and disadvantages of establishing different climate change reporting standards for different industries, such as the financial sector, oil and gas, transportation, etc.? How should any such industry-focused standards be developed and implemented?

5. What are the advantages and disadvantages of rules that incorporate or draw on existing frameworks, such as, for example, those developed by the Task Force on Climate-Related Financial Disclosures (TCFD), the Sustainability Accounting Standards Board (SASB), and the Climate Disclosure Standards Board (CDSB)? Are there any specific frameworks that the Commission should consider? If so, which frameworks and why?

[1] https://www.sec.gov/news/public-statement/lee-climate-change-disclosures
[2] https://www.sec.gov/rules/final/2008/33-8995.pdf

7. What is the best approach for requiring climate-related disclosures? For example, should any such disclosures be incorporated into existing rules such as Regulation S-K or Regulation S-X, or should a new regulation devoted entirely to climate risks, opportunities, and impacts be promulgated? Should any such disclosures be filed with or furnished to the Commission?

The following is an outline of our proposal:

Emissions Data Use in Assessing Climate Risk in Securities Analysis

Oil and gas greenhouse gas (GHG) emissions data is both quantifiable and readily accessible to investors. For example, more than 70 metrics and targets aligned with the Task Force on Climate-related Financial Disclosures (TCFD) can be accessed on a Bloomberg Terminal[3]. These metrics consist of governance and operations data, which includes Scope 1, Scope 2 and Scope 3 emissions totals by year. See Figure 1 below.

Figure 1
GHG Emissions Data Available on Bloomberg Terminal

Source: Bloomberg

Bloomberg Terminal users can also evaluate potential future capital expenditures at risk in the oil and gas industry using the 2D Scenario Analysis Tool, created by Carbon Tracker and powered by Rystad Energy's asset-level data[4]. The model can evaluate scenarios reported by companies themselves, or can be used to identify opportunities in companies already transitioning to low-carbon strategies (see Figure 2).

[3] https://data.bloomberglp.com/professional/sites/10/Climate-related-Analysis-Brochure.pdf
[4] Utilizing a 2 degree Celsius scenario.

Figure 2
Company Capital Expenditures Scenario Analysis

Source: Bloomberg

Market participants with access to the Bloomberg Terminal and Rystad may use these information tools to inform their allocations and proxy votes, but both are costly, with a Bloomberg and Rystad subscription priced at roughly $25,000 and $15,000 per year, respectively. While Bloomberg has been providing emissions data since 2017, many market participants are making investment decisions about oil and gas securities without this critical information. In addition, at a recent investor event, Bloomberg acknowledged that the quality, accuracy and uniformity of emissions-related disclosures could all use improvement in order to better serve investors and price risks accurately[5].

An additional tool utilized by market participants for assessing climate risk is software that analyzes the underlying constituents of an investor's portfolio to assess both the physical and transition risks associated with climate change. Some prominent providers of these tools are listed in Figure 3 below[6]:

[5] Emerging Markets Investors Alliance Webinar: "Pricing Climate Risks" June 3, 2021
[6] WK Associates counted over two dozen software packages currently on the market.

Figure 3
Company Capital Expenditures Scenario Analysis

Provider	Methodology	Type of Risk	Output
Carbon Delta	Climate Value-at-Risk	Physical & Transition	Company/Portfolio Level: Cost of reaching emission reduction targets Expected costs of physical risks
Carbone 4	Carbon Impact Analytics CIARA	Physical & Transition	Company/Portfolio Level: Carbon impact of underlying firms (Scope 1,2,3) Overall vulnerability and financial value at risk
FourTwenty Seven	Corporate Physical Climate Risk Scores	Physical	Company/Portfolio Level: Exposure to climate hazard, country risks impacting portfolio, company dependence on natural resources threatened by climate change
Trucost	Carbon Earnings at Risk	Transition	Company/Portfolio Level: Stress test a company's ability to absorb future future carbon prices and assess earnings at risk
ISS ESG	Carbon Risk Rating	Physical & Transition	Company/Portfolio Level: Evaluates company carbon efficiency and exposure to carbon risks related to its industry

Source: WK Associates

These software tools rely on accurate and complete data, reported by companies and 3rd party providers across all emissions scopes, to successfully price potential risks. In discussions with providers, accurate Scope 3 data from the oil and gas industry was observed to perform a valuable "check" on aggregate emissions totals, given the downstream effect of refined petroleum products on all transportation activity.

Scenario analysis, such as the services offered for Bloomberg Terminal users and select software providers, requires the use of Scope 3 Greenhouse Gas (GHG) emissions data. The GHG emissions Scope 1, 2 and 3 concept was introduced in 2001 by the World Resources Institute (WRI) and World Business Council for Sustainable Development as part of their Greenhouse Gas Protocol Corporate Accounting and Reporting Standard[7]. The objective of the emissions scopes was to create a method for companies to measure and report the emissions associated with their businesses based on proximity to core operations.

Scope 1 and Scope 2 GHG Emissions

Scope 1 emissions originate from operations that are directly owned and controlled by a company. Scope 2 apply to indirect operational emissions. In the oil and gas exploration and production (E&P) segment operational emissions include those from the use of company vehicles and equipment to

[7] https://ghgprotocol.org/corporate-standard

emissions caused by methane leakage and gas flaring. Scope 2 emissions are one step beyond a company's immediate control, such as carbon pollution related to the electricity and heat the company purchases from utilities. These emissions can be mitigated by sourcing inputs from a power grid with lower carbon intensity, or through on-site renewables.

Scope 1 and 2 emissions reduction efforts have been the focus of the oil and gas sector for more than a decade[8]. While admirable, Scope 1 and Scope 2 emissions only represent about 10 percent of an average E&P's carbon footprint[9]. Scope 1 and Scope 2 emissions also lack standardization, which makes comparability a challenge[10].

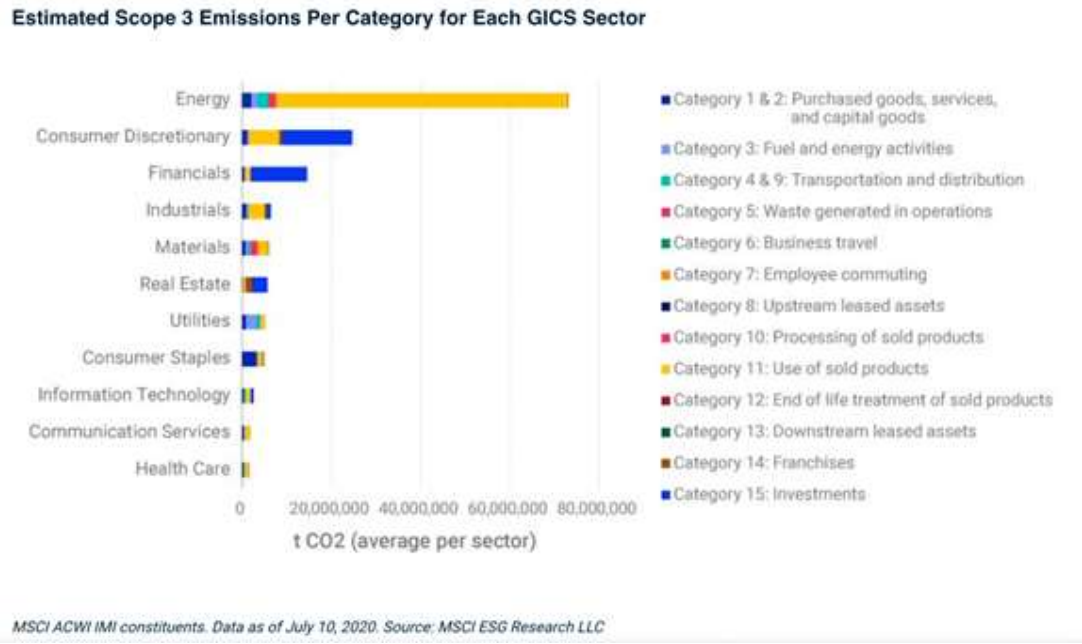
Scope 3 GHG Emissions

Scope 3 emissions are those generated from value chain activities that are not accounted for and reported in the company's Scope 1 and 2 corporate inventories[11]. Put differently, a company's Scope 3 carbon emissions include everything beyond its direct operations and electricity use, including supply-chain operations and end-product usage by customers[12]. In many sectors the emissions that originate from a company's corporate value chain are difficult to ascertain and quantify. However, in the energy sector, especially in oil, gas and coal production, Scope 3 emissions are comprised primarily of the expected GHG emissions attributable to a company's reserves. As such, they fall into Category 11 or the "use of sold products" classification of Scope 3 inventories, as indicated in the calculation guidance provided by the GHG Protocol[13].

Scope 3 emissions can represent the largest source of emissions for companies and present the most significant opportunities to influence GHG reductions. For instance, Scope 3 emissions account for roughly 70-90% of lifecycle emission from oil products and 60-85% of those from natural gas, according to the IEA (International Energy Agency)[14]. Further, a July 2020 study of the MSCI ACWI Investable Market Index, which includes roughly 99% of the global equity market, found that the Scope 3 emissions of the integrated oil and gas industry are more than six times the level of its Scope 1 and 2 emissions[15]. In addition, the Scope 3 emissions of the energy sector far outpace those of any other Global Industry Classification Standard (GICS) category, especially with respect to use of products sold (See figure 4).

[8] https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/equinor-s-move-to-halve-carbon-intensity-scope-3-emissions-both-praised-panned-56984504
[9] https://www.morningstar.com/articles/961748/understanding-the-emissions-challenge
[10] https://www.morningstar.com/articles/961748/understanding-the-emissions-challenge
[11] https://www.api.org/~/media/Files/EHS/climate-change/Scope-3-emissions-reporting-guidance-2016.pdf
[12] https://www.msci.com/www/blog-posts/scope-3-carbon-emissions-seeing/02092372761
[13] https://ghgprotocol.org/sites/default/files/standards_supporting/Chapter11.pdf
[14] https://www.iea.org/reports/world-energy-outlook-2018
[15] https://www.msci.com/www/blog-posts/scope-3-carbon-emissions-seeing/02092372761

Figure 4
Scope 3 Emissions (GICS)



Source: MSCI

The fossil fuel sector's Scope 3 emissions are also a key input for the financial service industry's "financed emissions" calculation. In a 2020 study, the Carbon Disclosure Project (CDP) found that almost all financial institutions' climate impact and risks are driven by the fossil fuel exploration and production activities they finance. The CDP study of 85 financial institutions with $27 trillion in assets under management found that their financed emissions were more than 700 times greater than their own operational emissions[16].

In recognition of the very significant GHG emissions reduction opportunity represented by Scope 3 emissions, energy companies have improved their disclosure and goal-setting against this metric. Figure 5 features information compiled by Reuters in January 2021 that summarizes the public reduction targets for Scope 1, 2, and 3 GHG emissions by nine major integrated oil and gas companies.

[16] https://6fefcbb86e61af1b2fc4-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/005/741/original/CDP-Financial-Services-Disclosure-Report-2020.pdf?1619537981

Figure 5
Oil Major GHG Reduction Commitment, as of January 2021

Company	Scope 1 Targets	Scope 2 Targets	Scope 3 Targets	Link to Executive Pay	Details
British Petroleum	Yes	Yes	Yes	Yes	Bring net GHG emissions from its equity barrels from well to petrol station to zero by 2050. Reduce GHG intensity of all products it sells by 50% by 2050
Chevron	Yes	No	No	Yes	Lower upstream oil net GHG emission intensity by 5-10%. Upstream natural gas net GHG emission intensity by 2-5% by 2023. Methane intensity target.
ConocoPhillips	Yes	Yes	No	No	Reduce GHG emissions intensity by up to 15% (CO2e per boe) by 2030 per boe vs 2017 levels.
Eni	Yes	Yes	Yes	Yes	Reduce absolute emissions by 80% and emissions intensity by 55% by 2050. Includes products purchased from third parties 2030 net zero carbon target in Scope 1 and 2 for upstream activities, overall group by 2040. Methane reduction target.
Equinor	Yes	Yes	Yes	Yes	Reduce net GHG emissions to zero by 2050, including Scope 3 emissions from customers' use of Equinor's equity production volumes. Reduce upstream CO2 per boe produced to below 8 kg by 2025. Achieve carbon neutral global operations by 2030. Reducing absolute greenhouse gas emissions from operated fields and onshore plants in Norway towards net zero by 2050 without offsets. To ensure no routine flaring and near zero methane emissions by 2030. Reduce net carbon intensity to zero by 2050.
Exxon	Yes	Yes	No	Yes	Reduce methane emissions intensity by 40% to 50% versus 2016 levels by 2025. Eliminate routine flaring and cut upstream scope 1 and scope 2 gas emissions by 30% by 2030. Report Scope 3 emissions. Performance share award pay tied to managing risks related to climate change.
Repsol	Yes	Yes	Yes	Yes	Reduce net carbon emissions to zero by 2050 (incl. Scope 3 from own barrels produced). Reduce carbon intensity vs 2016 by 10% by 2025 (per gigajoule), 20% by 2030, 40% by 2040 Reduce absolute emissions by 3 mln tonnes by 2025 (incl. Scope 3). Reduce methane emissions by 25% by 2025.
Shell	Yes	Yes	Yes	Yes	Ambition to be zero-emissions energy business by 2050 (Scope 1, 2, 3). Reduce net carbon footprint (an intensity-based measure of carbon emitted per energy unit) of all products sold by at least 3% vs 2016 by 2022 and by 65% by 2050 (Scope 3). Use of nature-based offsets and carbon capture technology.
Total	Yes	Yes	Yes	Yes	Worldwide Scope 3 emissions lower in 2030 vs. 2015. Overall Scope 1, 2, 3 emissions intensity reduction by at least 60% by 2050. Overall Scope 1, 2 emissions to net zero by 2050. European Scope 1, 2, 3 emissions down 30% by 2030 in absolute terms, 100% by 2050. Five mln tonnes/year of carbon sinks by 2030. Methane intensity targets.

Source: Reuters[17]

Scope 3 Emissions and Access to Capital

Access to capital is a significant reason for the urgency with which major energy companies have set GHG emissions reduction targets. In a February 2021 letter to its clients, Blackrock, the world's largest asset manager with $8 trillion in assets under management, outlined various ways that GHG emissions disclosures influence its investment decision-making and proxy voting[18]. These include creating a watch list of companies with significant climate-related risk. In the case these companies do not take strong steps toward aligning their business plans -- including their Scope 3 emissions disclosure and reduction -- with a 2ºC climate mitigation strategy the company will vote against

[17] https://www.reuters.com/article/climate-change-carbon-targets/update-2-big-oils-climate-targets-idUSL1N2JH32C
NOTE: 1) Scope 1 refers to emissions from a company's direct operations, such as a diesel generator on an offshore platform
2) Scope 2 are emissions from the power a company uses for its operations, such as gas-powered electricity purchased
3) Scope 3 includes emissions from products sold, such as gasoline sold at petrol stations or jet fuel sold to an airline
4) BOE stands for barrels of oil equivalent

[18] https://www.blackrock.com/corporate/investor-relations/blackrock-client-letter

management on climate-related proxy proposals and potentially exit holdings based on a determination that they would present a risk to clients' returns[19].

Another demonstration of the use of Scope 3 emission by investors is the work of the Transition Pathway Initiative (TPI). The Transition Pathway Initiative is an asset-owner led collaborative which assesses companies' preparedness for the transition to a low carbon economy[20].

In coordination with the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science (LSE), TPI publishes data based on a variety of disclosures including Scope 3 emissions[21]. These are intended to help investors assess the alignment of their portfolios with the goals of the Paris Agreement**.** A total of 104 investment organizations, with more than $26 trillion in assets under management, have committed to using TPI data to inform their investment research and aid in company engagement. TPI has published case studies on how the Dutch asset manager Robeco, UK-based Brunel Pension Partnership, private equity firm PineBridge Investments, Swedish insurance company Länsförsäkringar AB, the UK's Universities Superannuation Scheme (USS), and the Church of England Pensions Board all use TPI data, including Scope 3 emissions, in both investment decision-making and proxy voting[22].

It is worth noting that a November 2020 TPI report funded by Aberdeen Standard Investments, BNP Paribas Asset Management, Legal & General Investment Management, Robeco, and Neuberger Berman found that the energy sector remains slow in implementing new operational and strategic carbon management practices[23]. The 2020 assessment of the energy sector, comprising 163 companies in coal mining, electricity, and oil and gas production and distribution, used Scope 3 emissions data to create carbon performance metrics showing that only 5 of the 53 oil and gas companies reviewed had performance and policy indicators aligned with the Paris Pledges. And no oil and gas producer was aligned with 2°C warming targets outlined by the United Nations[24].

The SEC itself has indicated its understanding of the importance of Scope 3 disclosures in its very recent treatment of shareholder proposals. In March 2021, the SEC denied ConocoPhillips' and Occidental's requests to exclude Scope 3 disclosure shareholder proposals from their proxy materials[25].

How to Calculate Oil and Gas Scope 3 Emissions

Given its consequence in assessing climate risk in the energy sector, our research strongly points to the need for the broad availability of Scope 3 emissions data. While access to comprehensive Scope 3 emissions data is limited, an adjustment of the SEC's 2010 Modernization of Oil and Gas Reporting Rule[26] (specifically regarding Item 1202 of Regulation S-K), including the application of internationally respected scientific information to routinely reported reserves information, would allow a much broader group of market participants to access these material data and enhance the market's efficiency in pricing the risks of climate change overall.

Scope 3 emissions calculation and reporting for companies with fossil fuel reserves can take several forms. For example, the approach described by the World Resources Institute (WRI) in its paper *A Recommended Methodology for Estimating and Reporting the Potential Greenhouse Gas Emissions from Fossil Fuel Reserves*, is a comprehensive translation of fossil fuel reserves into expected CO_2 emissions as well as detailed accounting for Categories 1, 2, 3 and 5 emissions, as noted in Figure 4.

[19] https://www.blackrock.com/corporate/investor-relations/blackrock-client-letter
[20] https://www.transitionpathwayinitiative.org/overview
[21] https://www.transitionpathwayinitiative.org/publications/65.pdf
[22] https://www.transitionpathwayinitiative.org/publications/66.pdf?type=Publication
[23] https://www.transitionpathwayinitiative.org/publications/61.pdf?type=Publication
[24] https://www.transitionpathwayinitiative.org/publications/61.pdf?type=Publication
[25] https://www.ft.com/content/50b52600-dd43-427c-88a6-149cf790cb70
[26] https://www.sec.gov/rules/final/2008/33-8995.pdf

Methodology for Estimating the Potential Greenhouse Gas Emissions from Fossil Fuel Reserves

In 2016, WRI published a working paper titled *A Recommended Methodology for Estimating and Reporting the Potential Greenhouse Gas Emissions from Fossil Fuel Reserves*[27], as supplemental guidance to the GHG Protocol. This working paper outlines a recommended methodology corporate accounting and disclosure of potential CO_2 emissions from fossil fuel producers' reserves or Scope 3 emissions for companies with fossil fuel reserves.

As noted in the working paper, the first draft of this methodology was prepared based on desk research and consultations with exchange regulators and reserves auditing firms. A second draft was developed based on feedback from 15 select experts, as well as an open comment period during which 20 submissions were received. The experts were drawn from reserves auditing firms, the SEC, companies including Shell and Equinor, industry associations including IPIECA (International Petroleum Industry Environmental Conservation Association), voluntary reporting programs, nongovernmental organizations, and academia. As such, it is the most comprehensive and thoroughly reviewed methodology for calculating GHG emissions that we have come across.

The methodology begins with the recommended use of the Petroleum Resource Management System (PRMS) (for oil and gas) and the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) template (for coal), or consistent national codes, to quantify the size of fossil fuel reserves. It goes on to suggest inclusion of other emissions considerations, such as the amounts of fossil fuels used as fuel in internal operations, those lost through flaring, venting, and fugitive activities or employed in CO_2 EOR processes, and those lost through CH4 (methane) leakage.

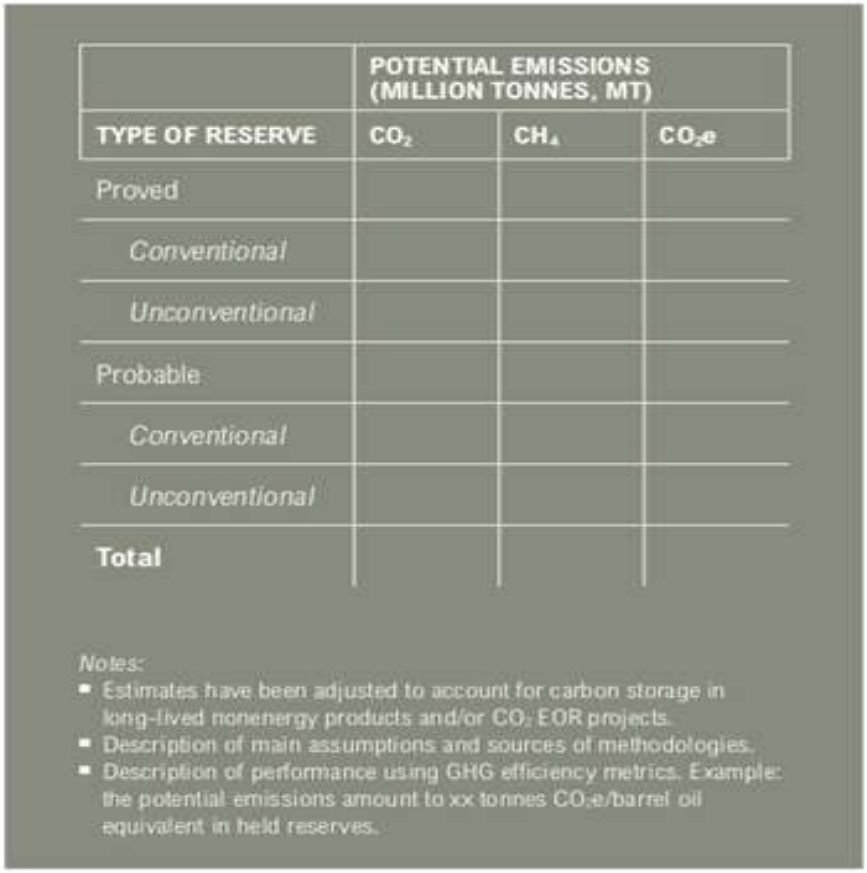
The WRI methodology also recommends disclosure of emissions in terms of the proven and probable reserves from which they originate and suggests that the Intergovernmental Panel on Climate Change (IPCC)[28] Tier 1 emissions factors be used to calculate potential GHGs emissions and CO_2 equivalents. The WRI guidance also suggests the resulting CO_2 emissions factors from proven and probably fossil fuels reserves be reported in similar fashion to Figure 6.

[27] https://ghgprotocol.org/sites/default/files/standards/WRI16_WorkingPaper_FF.pdf

[28] The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988. It was later endorsed by the United Nations General Assembly through Resolution 43/53. The IPCC was the winner of the 2007 Nobel Peace Prize and has been recognized by the world's leading authority by organizations such as the Royal Society, Britain's most prestigious scientific institute. Its main objective is to assess scientific, technical and socio-economic information relevant to the understanding of human induced climate change, potential impacts of climate change and options for mitigation and adaptation. Its research is done by a group of leading scientists from industry (including representatives from ExxonMobil and other companies), government and civil society. Summaries of this work are subject to line-by-line approval by all 120 participating governments. Typically this involves the governments of more than 120 countries.[The IPCC has completed four assessment reports, developed methodology guidelines for national greenhouse gas inventories, special reports and technical papers. The IPCC National Greenhouse Gas Inventories Programme was managed from 1991 by the IPCC WG I in close collaboration with the Organisation for Economic Co-operation and Development (OECD) and the International Energy Agency (IEA).

Data from the IPCC 2014 climate assetment report show that the major sources of emissions have been coal (34%), oil (25%), gas (10%), cement (2%) and land-use (29%)

Figure 6
WRI Suggested Format for Disclosure of Potential GHS Emissions and CO2 Equivalents



	POTENTIAL EMISSIONS (MILLION TONNES, MT)		
TYPE OF RESERVE	CO_2	CH_4	CO_2e
Proved			
Conventional			
Unconventional			
Probable			
Conventional			
Unconventional			
Total			

Notes:
- Estimates have been adjusted to account for carbon storage in long-lived nonenergy products and/or CO_2 EOR projects.
- Description of main assumptions and sources of methodologies.
- Description of performance using GHG efficiency metrics. Example: the potential emissions amount to xx tonnes CO_2e/barrel oil equivalent in held reserves.

Source: WRI

The WRI reporting methodology translates proven and probably fossil fuel reserves into expected CO_2 emissions, while adding additional CO_2 equivalents that arise from activities such as venting and other fugitive emissions. The translation of proven and probable reserves to expected CO_2 emissions is made possible through the application of the IPCC's effective CO_2 emission factors.

The Intergovernmental Panel on Climate Change (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations dedicated to providing the world with objective, scientific information relevant to understanding the scientific basis of the risk of human-induced climate change. In addition, the IPCC examines the physical, political, and economic impacts of climate change, and possible response options.

In its Guidelines for National Greenhouse Gas Inventories published in 2006[29], the IPCC included "Default CO_2 Emissions Factors for Combustion" (see Figure 7). The carbon content of different fossil fuels and the reserves from which they originate can vary considerably, both among and within primary fuel types on a per mass or per volume basis. However, the IPCC's measurement of effective CO_2 emissions of fuels upon combustion as reflected in the Default CO_2 Emissions Factors for Combustion avoids this complication.

[29] https://www.ipcc-nggip.iges.or.jp/public/2006gl/

Fossil fuel combustion processes are optimized to derive the maximum amount of energy per unit of fuel consumed, which delivers the maximum amount of CO_2. Efficient fuel combustion ensures oxidation of the maximum amount of carbon available in the fuel. CO_2 emission factors for fuel combustion are therefore relatively insensitive to the combustion process itself and are solely dependent on the carbon content of the fuel.

For these reasons, as well as the global credibility of the IPCC, the U.S. Environmental Protection Agency (U.S. EPA) uses the Default CO2 Emissions Factors for Combustion in its calculation of Emission Factors for Greenhouse Gas Inventories[30]. This calculation is used by the U.S. EPA Center for Corporate Climate Leadership, which has in turned been used by ExxonMobil[31] and other companies to calculate their Scope 3 GHG emissions[32].

In June 2016, the oil industry sustainability group IPIECA published "Estimating petroleum industry value chain (Scope 3) greenhouse gas emissions. Overview of methodologies[33]." The document draws on the WRI and the World Business Council for Sustainable Development (WBCSD) GHG Protocol Scope 3 Standard to outline approaches used by the oil and gas industry to determine company's Scope 3 emissions. Exxon drew on the IPIECA methodology to report its Scope 3 emissions noted earlier[34]. The document is also available on the website of the American Petroleum Institute (API)[35].

The IPCC effective CO_2 emission factors are also the reference coefficients for ISO Standard 14064[36] on the quantification and reporting of greenhouse gas emissions. Finally, these are also the metric used in the Carbon Disclosure Project (CDP) Scope 3 disclosure guidance for oil companies[37].

[30] https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf
[31] ExxonMobil has participated in the Intergovernmental Panel on Climate Change (IPCC) since its inception in 1988. https://corporate.exxonmobil.com/-/media/Global/Files/energy-and-carbon-summary/Energy-and-carbon-summary.pdf
[32] https://corporate.exxonmobil.com/-/media/Global/Files/energy-and-carbon-summary/Energy-and-Carbon-Summary.pdf Page 43
[33] https://www.ipieca.org/resources/good-practice/estimating-petroleum-industry-value-chain-scope-3-greenhouse-gas-emissions-overview-of-methodologies/
[34] https://corporate.exxonmobil.com/Sustainability/Energy-and-Carbon-Summary/Scope-3-emissions
[35] https://www.api.org/~/media/Files/EHS/climate-change/Scope-3-emissions-reporting-guidance-2016.pdf
[36] http://www.iso.org/iso/catalogue_detail?csnumber=38381
[37] https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/guidance_docs/pdfs/000/000/469/original/CDP-Scope-3-Category11-Guidance-Oil-Gas.pdf?1479754082

Figure 7
IPCC Default CO2 Emissions Factors for Combustion

TABLE 1.4
DEFAULT CO_2 EMISSION FACTORS FOR COMBUSTION [1]

Fuel type English description		Default carbon content (kg/GJ)	Default carbon oxidation factor	Effective CO_2 emission factor (kg/TJ) [2]		
				Default value [3]	95% confidence interval	
		A	B	C=A*B*44/12*1000	Lower	Upper
Crude Oil		20.0	1	73 300	71 100	75 500
Orimulsion		21.0	1	77 000	69 300	85 400
Natural Gas Liquids		17.5	1	64 200	58 300	70 400
Gasoline	Motor Gasoline	18.9	1	69 300	67 500	73 000
	Aviation Gasoline	19.1	1	70 000	67 500	73 000
	Jet Gasoline	19.1	1	70 000	67 500	73 000
Jet Kerosene		19.5	1	71 500	69 700	74 400
Other Kerosene		19.6	1	71 900	70 800	73 700
Shale Oil		20.0	1	73 300	67 800	79 200
Gas/Diesel Oil		20.2	1	74 100	72 600	74 800
Residual Fuel Oil		21.1	1	77 400	75 500	78 800
Liquefied Petroleum Gases		17.2	1	63 100	61 600	65 600
Ethane		16.8	1	61 600	56 500	68 600
Naphtha		20.0	1	73 300	69 300	76 300
Bitumen		22.0	1	80 700	73 000	89 900
Lubricants		20.0	1	73 300	71 900	75 200
Petroleum Coke		26.6	1	97 500	82 900	115 000
Refinery Feedstocks		20.0	1	73 300	68 900	76 600

Source: IPCC

Oil and Gas Reserves and Effective CO_2 Emissions Data

Fossil fuel reserves data is the other half of the effective CO_2 emissions calculation. Oil and gas reserves reporting guidance exists in Regulation S-K and Regulation S-X under the Securities Act of 1933 and the Securities Exchange Act of 1934, as well as Industry Guide 2. Accounting Standards Codification (ASC) 932[38] provides the specifics for the calculation of reserves required for disclosure.

Fossil Fuel Reserves Calculation

The general term 'reserves' typically refers to oil and gas and mineral resources that are commercially viable and are further broken down into the sub-categories of proved (P1), probable (P2) and possible (P3). Environmental and social considerations are specifically addressed in determining the commercial viability of a reserve under the Petroleum Resource Management System (PRMS) developed by the Society of Petroleum Engineers (2007).

Under the PRMS, new extraction projects can generally be categorized as reserves, provided that the projects will start within five years. Also, if reserves were deemed to be subject to a combustion constraint, they should be re-classified as contingent resources (that is, contingent on their ability to

[38] https://www.fasb.org/cs/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1175820075990&blobheader=application/pdf
https://www.sprioilgas.com/blog/sec-oil-and-gas-reserve-reporting-an-in-depth-explanation

be utilized). Contingent resources are those discovered, but not commercially viable, and otherwise reflect the same profile of probabilities that apply to "normal" reserves and prospects.

The Committee for Mineral Reserves International Reporting Standards (CRIRSCO) template has similarities to the PRMS system. The CRIRSCO template includes social and environmental aspects in its 'Modifying Factors', where consideration of mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors are all determinative if a measured or inferred resource can be classified as a reserve. First, all companies falling under a reporting code are required to consider environmental factors in their justification of whether or not reserves can be extracted. Second, the "competent person" is reminded that consideration of environmental factors should form part of their professional duty to the public.

Proved and probable mineral reserves (CRIRSCO template) have the same approximate level of associated confidence as proved and probable petroleum reserves. PRMS distinguishes between conventional and unconventional resources, while CRISCO does not. Broadly speaking, unconventional resources are not influenced by the normal hydraulic effects of a reservoir and require enhanced extraction techniques. Unconventional resources include extra-heavy oil, bitumen, tight gas, coal bed methane, shale gas, oil shale, and gas hydrates.

Many firms have reserve committees that oversee resource reporting. Any of the senior management sign-offs, such as those required under the U.S. Sarbanes-Oxley Act (2002), also require assurance that the evaluator has followed appropriate due diligence.

Under International Financial Reporting Standards (IFRS) there are no requirements for the reporting of reserves and resources for oil, gas or mining operations. Under US GAAP (Generally Accepted Accounting Principles) it is only oil and gas firms that must disclose proven reserves information, but not probable reserves (in contrast with Canada). However, many SEC-registered issuers disclosure probable reserves information. These gaps in disclosure deny many market participants the information necessary to make optimal investment decisions, but this shortcoming is beyond the scope of this document.

Use of Oil and Gas Reserves Data in Securities Analysis

The SEC requires oil and gas reserves disclosure because these data play a very significant role in the proper assessment of a security's risk exposure. Oil and gas reserves are the most important assets of any oil and gas company and reserves represent most of the value of an exploration and production company[39]. In fact, IHS Energy analysis has found that about 80 percent of the value of most publicly traded oil and gas companies is based on their proved reserves[40].

Among other things, securities analysts use reserves as the basis for calculating unit-of-production depreciation, depletion and amortization rates, impairment testing and decommissioning cost estimates. For example, a decrease in estimated proved reserves would increase depreciation and depletion and amortization expenses, while an increase in reserves would reduce each of these. In addition, the timing of reserves depletion may impact the provision for decommissioning cost estimates.

Trends in fossil fuel reserves data may also indicate downside risk for specific securities. For example, recent data published by researchers at Simon Fraser University show that the growth of these reserves has a negative effect on firm value[41]. These conclusions were reached by analyzing a sample of 679 North American oil and gas firms for the period 1999 to 2018. The study's evidence is consistent with markets penalizing future investment in undeveloped reserves growth due to climate policy risk.

[39] https://mercercapital.com/energyvaluationinsights/the-fair-market-value-of-oil-gas-reserves/
[40] https://ihsmarkit.com/research-analysis/do-investments-in-oil-and-gas-constitute-systemic-risk.html
[41] https://www.nber.org/system/files/working_papers/w26497/revisions/w26497.rev0.pdf

SEC's 2010 Modernization of Oil and Gas Reporting Rule

In 2010, the SEC published a rule called the Modernization of Oil and Gas Reporting[42], which was intended to provide investors with a more meaningful and comprehensive understanding of oil and gas reserves to aid valuation. The rule's amendments were designed to update the oil and gas disclosure requirements to align them with then current practices and changes in technology.

Among those changes was the requirement to disclose proven and probable reserves based on their final product, including those from "non-traditional" sources. In this case, non-traditional resources include bitumen, shale and coalbed methane. The SEC's guidance was that these disclosures could be made in tables such as Figure 8 with "Synthetic Oil" and "Synthetic Gas" used as a catchall for unconventional resources (such as oil sands, shale and coalbed methane).

The ability to book more proved undeveloped reserves under the Modernization of Oil and Gas Reporting rule, along with the opportunity to recognize large proved undeveloped reserves in unconventional resource plays, means that undeveloped reserves had greater impact on a company's financial results and resulting valuation. Consequently, the Modernization of Oil and Gas Reporting rule has had the effect of capitalizing additional high carbon reserves from "non-traditional" sources. This boosted the valuation of oil and gas companies that went on to provide more high carbon fuels to the market.

Providing reserves to CO_2 emissions data in Section 13 disclosures would help mitigate the unintended consequences of the 2010 rule. Disclosing oil and gas reserves in terms of the CO_2 emission they represent would allow market participants to accurately price and compare the climate risks of different issuers. In fact, the Commission indicated such differentiation had applications to investment analysis in its 2010 rule when it said, "We believe that with this separate disclosure, investors will be able to identify resources in projects that produce synthetic oil or gas that may be more sensitive to economic conditions from other resources[43]." Today a significant portion of that sensitivity is to the economic conditions created by the climate risk associated with high carbon resources.

[42] https://www.sec.gov/rules/final/2008/33-8995.pdf
[43] Ibid. Pages 23, 24.

Figure 8
Current SEC Oil and Gas Reserves Disclosure Guidance

Summary of Oil and Gas Reserves as of Fiscal-Year End
Based on Average Fiscal-Year Prices

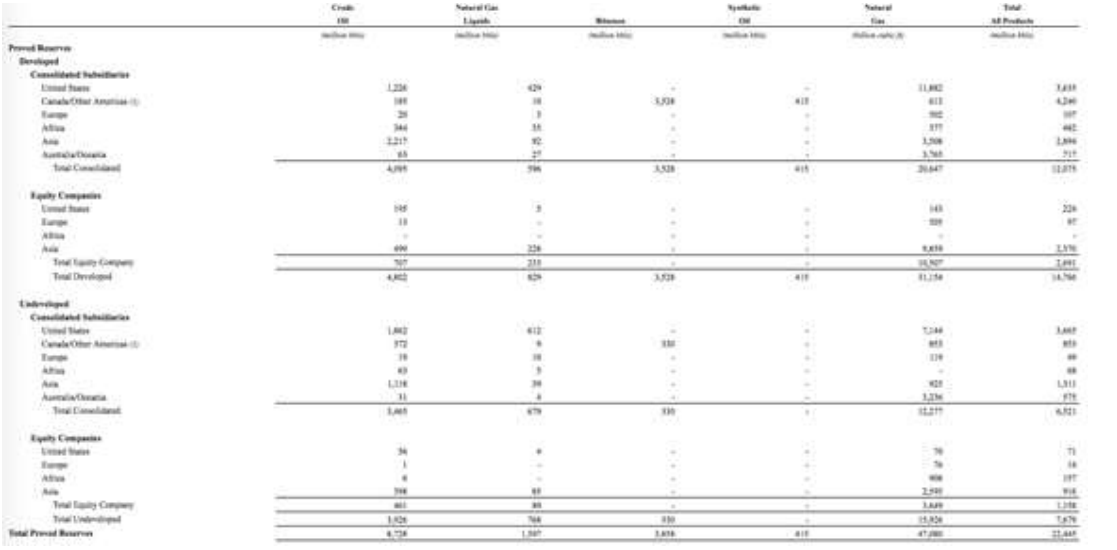
	Reserves				
	Oil	Natural Gas	Synthetic Oil	Synthetic Gas	Product A
Reserves category	(mbbls)	(mmcf)	(mbbls)	(mmcf)	(measure)
PROVED					
Developed					
Continent A					
Continent B					
Country A					
Country B					
Other Countries in Continent B					
Undeveloped					
Continent A					
Continent B					
Country A					
Country B					
Other Countries in Continent B					
TOTAL PROVED					
PROBABLE					
Developed					
Undeveloped					
POSSIBLE					
Developed					
Undeveloped					

Source: SEC

In its Form 10-K filing made for its fiscal year ending December 31, 2019, ExxonMobil satisfied the oil and gas reserves disclosure requirement with the table below (Figure 9)[44]. The data is confined to developed and undeveloped proven reserves. Reserves information is typically presented at a summary level by country or continent, as shown in ExxonMobil's table.

[44] https://www.sec.gov/ix?doc=/Archives/edgar/data/34088/000003408820000016/xom10k2019.htm Page 6

Figure 9
Exxon Reserves Disclosure Form



	Crude Oil (million bbls)	Natural Gas Liquids (million bbls)	Bitumen (million bbls)	Synthetic Oil (million bbls)	Natural Gas (million cubic ft)	Total All Products (million bbls)
Proved Reserves						
Developed						
Consolidated Subsidiaries						
United States	1,226	429	-	-	11,882	3,433
Canada/Other Americas (1)	195	18	3,528	415	613	4,240
Europe	20	3	-	-	502	107
Africa	364	35	-	-	377	462
Asia	2,217	92	-	-	3,508	2,894
Australia/Oceania	65	27	-	-	3,765	717
Total Consolidated	4,095	596	3,528	415	20,647	12,075
Equity Companies						
United States	195	5	-	-	143	224
Europe	13	-	-	-	509	97
Africa	-	-	-	-	-	-
Asia	499	228	-	-	9,858	2,370
Total Equity Company	707	233	-	-	10,507	2,691
Total Developed	4,802	829	3,528	415	31,154	14,766
Undeveloped						
Consolidated Subsidiaries						
United States	1,892	612	-	-	7,144	3,165
Canada/Other Americas (1)	372	6	330	-	853	853
Europe	19	10	-	-	119	49
Africa	93	5	-	-	-	98
Asia	1,318	39	-	-	923	1,311
Australia/Oceania	31	4	-	-	3,256	575
Total Consolidated	3,665	679	330	-	12,277	6,521
Equity Companies						
United States	56	4	-	-	70	73
Europe	1	-	-	-	76	14
Africa	4	-	-	-	908	157
Asia	398	85	-	-	2,595	918
Total Equity Company	461	89	-	-	3,649	1,158
Total Undeveloped	4,126	768	330	-	15,926	7,679
Total Proved Reserves	8,728	1,597	3,858	415	47,080	22,445

Source: SEC 10K filing

Proposed Changes to the 2010 Modernization of Oil and Gas Reporting Rule

Given the credibility of the IPCC effective CO_2 emissions factors and the importance of accurate reserves data in securities analysis, we suggest that they be utilized to create a quantifiable and measurable indication of the future CO_2 emissions represented by proven and probable reserves reported in annual disclosures included in 10-K statements.

GHG emissions reporting is essential to investors' understanding of material climate risk considerations. Scope 3 emissions data for oil and gas companies would both advance the objectives of the SEC's 2010 Interpretive Guidance Regarding Disclosure Related to Climate Change and update its oil and gas reserves disclosure guidance to reflect the changing economics and related risks of fossil fuels development and marketing.

In February 2021, a worldwide database of fossil fuel reserves called the Global Registry of Fossil Fuels was launched by the Carbon Tracker Initiative and Global Energy Monitor[45]. The organizations note that existing databases on fossil fuel reserves and production lack detail, are proprietary, or are solely for industry use. If the SEC were to mandate more accurate accounting of fossil fuel reserves and their associated effective CO_2 emissions, it also would be a significant contribution to efforts to understand the climate impact of future energy consumption globally.

Format of Proposed Effective CO2 Emission Disclosure

Figure 10 (below) reflects a merging of ExxonMobil's actual reserves disclosures in its 2020 10-K and the format for effective CO_2 emissions disclosures outlined above. The calculation of the effective CO_2 emissions of proven and probable oil and gas reserves involves the multiplication of the oil equivalent of each type of a company's reserves by the corresponding IPCC effective CO_2 emission factor.

- **Effective CO_2 Emissions from Oil and Gas Reserves Calculation**
  Million BBLS oil or equivalent * Effective CO_2 Emissions Factor = Expected CO_2 Emissions

[45] https://carbontracker.org/climate-risks-from-oil-gas-and-coal-production-must-be-added-up-to-avoid-locking-in-the-climate-emergency/

In Figure 10 and in ExxonMobil's FY2020 10-K, natural gas reserves are converted to an oil-equivalent basis at six billion cubic feet per one million barrels. As noted in the WRI methodology, separate calculations should be made for proven and probable reserves.

Figure 10
Proposed Effective CO2 Emissions Disclosure

Sample Effective CO2 Emissions Disclosure (Based on format used by ExxonMobil in its Form 10-K - https://www.sec.gov/ix?doc=/Archives/edgar/data/0000034088/000003408821000012/xom-20201231.htm)

Disclosure of Reserves
Summary of Oil and Gas Reserves at Year-End 2020

Calculation: Million BBLS oil or equivalent * Effective CO2 Emissions Factor = Expected CO2 Emissions

Natural gas is converted to an oil-equivalent basis at six billion cubic feet per one million barrels, as used in the Exxon 10-K.

	Crude Oil (Millions BBLs)		Natural Gas Liquids (Millions BBLS)		Bitumen (Millions BBLS)		Synthetic Oil (Millions BBLS)		Natural Gas (Millions BBLS - Oil Equivalent)		Oil-Equivilent Total for All Products	
		IPCC Effective Emissions Factor (kg/TJ)2		IPCC Effective Emissions Factor (kg/TJ)2		IPCC Effective Emissions Factor (kg/T		IPCC Effective Emissions Factor (kg/T		IPCC Effective Emissions Factor (kg/TJ)2		Effective CO2 Emissions (kg/TJ)2
		73,300 See IPCC CO2 Emissions Factors Ta		64,200 See IPCC CO2 Emissic		80,700 See IPCC CO2 Emissic		84,735 See IPCC CO2 Emission		56,100 See IPCC CO2 Emission		-
		Effective CO2 Emissions		Effective CO2 Emissions		Effective CO2 Emissions		Effective CO2 Emissions		Effective CO2 Emissions		
Proven Reserves												
Developed												
Consolidated												
United States	1,029	75,425,700	444	28,504,800					1,729	97,006,250	3,202	200,936,750
Canada	288	21,110,400	5	321,000	76	6,133,200	311	26,352,585	79	4,413,200	759	58,330,385
Europe	11	806,300	2	128,400					67	3,730,650	79	4,665,350
Africa	314	23,016,200	31	1,990,200					53	2,973,300	398	27,979,700
Asia	2,215	162,359,500	84	5,392,800					554	31,070,050	2,853	198,822,350
Australia/Ocea	44	3,225,200	23	1,476,600					557	31,266,400	624	35,968,200
Total Consolid	3,901	285,943,300	589	37,813,800	76	6,133,200	311	26,352,585	3,039	170,459,850	7,915	526,702,735
Equity Companies												
United States	107	7,843,100	4	256,800					14	776,050	125	8,875,950
Canada	8	586,400							49	2,739,550	57	3,325,950
Africa												
Asia	432	31,665,600	214	13,738,800					1,499	84,075,200	2,144	129,479,600
Total Equity C	547	40,095,100	218	13,995,600					1,561	87,590,800	2,326	141,681,500
Total Develope	4,448	326,038,400	807	51,809,400	76	6,133,200	311	26,352,585	4,600	258,050,650	10,241	283,363,000
Undeveloped												
Consolidated												
United States	930	68,169,000	412	26,450,400					511	28,648,400	1,853	123,267,800
Canada	209	15,319,700			5	403,500	133	11,269,755	15	832,150	362	27,825,105
Europe	11	806,300	5	321,000					7	392,700	23	1,520,000
Africa	42	3,078,600							0.3	18,700	42	3,097,300
Asia	935	68,535,500	40	2,568,000					164	9,219,100	1,139	80,322,600
Australia/Ocea	30	2,199,000	8	513,600					465	26,086,500	503	28,799,100
Total Consolid	2,157	158,108,100	465	29,853,000	5	403,500	133	11,269,755	1,162	65,197,550	3,922	264,831,905
Equity Companies												
United States	24	1,759,200							3	177,650	27	1,936,850
Europe	1	73,300							11	626,450	12	699,750
Africa	6	439,800							153	8,573,950	159	9,013,750
Asia	393	28,806,900	59	3,787,800					398	22,299,750	850	54,894,450
Total Equity C	424	31,079,200	59	3,787,800					565	31,677,800	1,048	66,544,800
Total Undevelc	2,581	62,158,400	524	33,640,800	5	403,500	133	11,269,755	1,727	96,875,350	4,970	204,347,805
Total Proven R	7,029	515,225,700	1,331	85,450,200	81	6,536,700	444	37,622,340	6,327	354,926,000	15,211	999,760,940

(1)Other Americas includes proved developed reserves of 119 million barrels of crude oil and 138 billion cubic feet of natural gas, as well as proved undeveloped reserves of 179 million barrels of crude oil and 77 billion cubic feet of natural gas.

Source: Exxon filing and WK Associates

Limiting Emissions Estimates to Sales Quantities of Oil and Gas Reserves

Exhaustive calculations of oil and gas Scope 3 emissions may require looking beyond the sales quantities reported in reserves estimates, as illustrated in the proposed methodology. However, the purpose of this calculation is to determine the potential economic impact of the effective CO_2 emissions represented by proven and probable fossil reserves. If the purpose were to calculate of the contribution of oil and gas industry emissions to the total amount of greenhouse gases present in the atmosphere, a more comprehensive approach would be necessary.

Distinctions Between Combusted and Manufactured Reserves

A portion of sales quantities of fossil fuel reserves are not combusted, but used in the manufacture of products, such as petrochemicals, asphalts, lubricants, waxes and pigments. However, under the PRMS, oil and gas quantities are defined in terms of sales quantities measured at the reference point, which is typically the point of sale to third parties, or where custody is transferred to the producing entity's downstream operations[46]. Our method also assumes this will be the point at which carbon pricing, through a tax or similar means, will be assessed. In this circumstance, the economic impact of combusted reserves and those used in manufacturing is equivalent and we believe there is no need to account for the storage of carbon in non-fuel products.

Adjustment of Reserve Types in 2010 Modernization of Oil and Gas Reporting Rule

The Modernization of Oil and Gas Reporting Rule of 2010 changed reserves reporting categories from the type of each reserve to its end product. This change blurs the line between upstream and downstream oil and gas operations that is often an important consideration for investors. It also complicates the attribution of reserves to the IPCC effective CO_2 emissions factors that would help investor understand the emission they may create.

To assist investors in understanding the economic considerations specific to each reserve type and to accommodate the accurate attribution of the effective CO_2 emissions, the reserve types would have to be changed to a manner consistent with the "Default CO_2 Emissions Factors for Combustion" of the IPCC's Guidelines for National Greenhouse Gas Inventories[47]. For example, the Modernization of Oil and Gas Reporting Rule allows for disclosure of reserves in a catch-all category called "Synthetic Oil", which does not correspond directly to an individual category in the IPCC's Guidelines for National Greenhouse Gas Inventories.

In some cases, PRMS guidelines may not allow for reserves categorization that is perfectly consistent with the IPCC categories. For instance, under PRMS, if natural gas is sold wet (i.e., without the removal of NGLs), then the NGLs are included in the reserve estimate for natural gas. In such cases, and consistent with the WRI methodology[48], reporting companies may simply use emission factors for the reported reserve type (natural gas in this case).

Consistency with SEC and Congressional Climate Risk Disclosure Priorities

Although the SEC need not have a legislative mandate to update the 2010 Modernization of Oil and Gas Reporting Rule with the disclosure of effective CO_2 emissions factors[49], the Climate Risk Disclosure Act includes a section that aligns very well with the methodology outlined in this comment letter. In July 2019, Senator Elizabeth Warren[50] and Congressman Sean Casten[51] introduced The

[46] https://files.wri.org/d8/s3fs-public/A_Recommended_Methodology_for_Estimating_and_Reporting_the_Potential_Greenhouse_Gas_Emissions_from_Fossil_Fuel_Reserves.pdf

[47] https://www.ipcc-nggip.iges.or.jp/public/2006gl/

[48] https://files.wri.org/d8/s3fs-public/A_Recommended_Methodology_for_Estimating_and_Reporting_the_Potential_Greenhouse_Gas_Emissions_from_Fossil_Fuel_Reserves.pdf Page 9.

[49] https://www.americanprogress.org/issues/economy/reports/2021/06/10/500352/sec-broad-authority-require-climate-esg-disclosures/

[50] https://www.congress.gov/bill/116th-congress/senate-bill/2075

[51] https://www.congress.gov/bill/116th-congress/house-bill/3623

Climate Risk Disclosure Act, because:

"Investors lack access to basic information about the potential impact of the climate crisis on American companies[52]."

The Climate Risk Disclosure Act references a mandate for disclosures under Section 13 of the Securities Exchange Act of 1934 that include "the potential amount of direct and indirect greenhouse gas emissions that are embedded in proved and probable hydrocarbon reserves, with each such calculation presented as a total, as well as in subdivided categories, by the type of reserve"[53]. A complete excerpt from the Act is in the Figure below:

Figure 11
The Climate Risk Disclosure Act

(2) require that a covered issuer, with respect to a disclosure required under subsection (s) of section 13 of the Securities Exchange Act of 1934 (15 U.S.C. 78m), as added by section 5

(a) Climate Risk Disclosure Rules. Not later than 2 years after the date of enactment of this Act, the Commission, in consultation with the appropriate climate principals, shall issue rules with respect to the information that a covered issuer is required to disclose pursuant to subsection (s) of section 13 of the Securities Exchange Act of 1934 (15 U.S.C. 78m), as added by section 5

(C) if the covered issuer engages in the commercial development of fossil fuels, include in the disclosure—

(III) the potential amount of direct and indirect greenhouse gas emissions that are embedded in proved and probable hydrocarbon reserves, with each such calculation presented as a total and in subdivided categories by the type of reserve

Source: CRS

The IPCC-based effective CO_2 emissions factors from oil and gas reserves would address the mandate outlined in this proposed legislation.

In February 2010, the SEC issued "Interpretive Guidance Regarding Disclosure Related to Climate Change"[54]. In that guidance the Commission identified four existing items in Regulation S-K that may require disclosure related to climate change: description of business, legal proceedings, risk factors, and management's discussion and analysis of financial condition and results of operations, or MD&A. All of these are backward-looking and non-quantifiable considerations.

During its review of Regulation S-K completed in February 2020, the SEC passed on the opportunity to update this guidance[55]. At that time, SEC Commissioner Allison Lee expressed disappointment with this decision and pointed out "investors are overwhelmingly telling us, through comment letters and petitions for rulemaking, that they need consistent, reliable, and comparable disclosures of the risks and opportunities related to sustainability measures, particularly climate risk[56]."

Inclusion of CO_2 emissions factors for oil and gas reserves in SEC disclosure requirements would enable the Commission to substantially enhance its climate risk disclosure guidance, as represented by its 2010 "Interpretive Guidance Regarding Disclosure Related to Climate Change".

[52] https://www.warren.senate.gov/imo/media/doc/The%20Climate%20Risk%20Disclosure%20Act%20of%202019%20-%20One%20Pager.pdf
[53] https://www.congress.gov/bill/116th-congress/senate-bill/2075/text
[54] https://www.sec.gov/rules/interp/2010/33-9106.pdf
[55] https://www.natlawreview.com/article/sec-indicates-it-will-not-modify-climate-change-disclosure-criteria
[56] https://www.sec.gov/news/public-statement/lee-mda-2020-01-30

Comparison Effective CO2 Emissions Disclosure Proposal to Voluntary Standards

The following is an overview of the guidance of five leading climate risk disclosure standards regarding effective CO_2 emissions and related risks represented by the fossil fuel reserves of oil, gas and mining companies.

The standards reviewed include the Global Reporting Initiative (GRI) Sector Standards for Oil, Gas and Coal; the Greenhouse Gas Protocol; the Sustainability Accounting Standards Board (SASB) Oil and Gas Exploration and Production[57] and Coal Company[58] standards; the Task Force on Climate-Related Financial Disclosures (TCFD) guidance for the Energy Sector; and the Climate Disclosure Standards Board (CDSB) Framework.

Key Points

1. The standards with specific guidance for the disclosure of CO_2 emissions represented by fossil fuel reserves (GRI, GHG Protocol and SASB) validate the assumptions of the effective CO2 emissions of oil and gas reserves proposal outlined in this comment.

2. None of the standards or their guidance contradict this proposal in methodology or application.

3. The GHG Protocol and the GRI include reference to a 2016 World Resources Institute (WRI) working paper titled *A Recommended Methodology for Estimating and Reporting the Potential Greenhouse Gas Emissions from Fossil Fuel Reserves*. This working paper, which was referenced earlier in this comment letter, presents a methodology that is consistent with our proposal, but which includes more extensive GHG emissions inputs.

4. The TCFD Energy Sector guidance included no specific reference to disclosing effective CO_2 emissions in oil and gas reserves, but it did include disclosure of Scope 3 emissions, which could be understood to include the emissions addressed by this proposal. The CDSB Framework included no guidance directly relevant to this proposal, but it is a reporting framework that references other reporting standards such as the TCFD.

Global Reporting Initiative (GRI)

The Global Reporting Initiative (GRI) is an international independent standards organization that provides reporting guidance for companies and public entities on issues such as climate change, human rights and corruption. GRI was formed by Ceres and Tellus Institute with the support of the United Nations Environment Program (UNEP) in 1997. In 2019, GRI started an effort to develop disclosure standards by sector and began the project with the oil, gas and coal industries. The sector guidance development process has included a comment period on an exposure draft that closed on October 6, 2020[59]. (The Sector Standard: Oil and Gas is expected to be released in mid-2021 and the Sector Standard: Coal is expected to be released by the end of 2021.)

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[57] https://www.sasb.org/wp-content/uploads/2018/11/Oil_Gas_Exploration_Production_Standard_2018.pdf
[58] https://www.sasb.org/wp-content/uploads/2018/11/Coal_Operations_Standard_2018.pdf
[59] In October 2020, PWYP US submitted comments on the GRI Oil and Mining Sector Reporting exposure draft that included the following feedback regarding risk disclosure related to fossil fuel reserves.

Climate resilience and transition

In the last bullet point of the third section under "What to report" (Line 513) GRI should specify that this disclosure should include both proven and probable reserves sorted by reserves type.

The use of proven and probable fossil fuels reserves sorted by reserves type as the basis to assess carbon risk is a forward looking metric, which has advantages over historic metrics such as CO2 emissions.

The reserve type should be indicated in a manner consistent with the "Default CO2 Emissions Factors for Combustion" of the IPCC's Guidelines for National Greenhouse Gas Inventories (https://www.ipcc-nggip.iges.or.jp/public/2006gl/). Aligning the disclosure of proven and probable reserves with the IPCC's categories will aid in the quantification of the effective CO2

The GRI Oil and Mining Sector Reporting exposure draft includes general references to the risks posed by the development of existing fossil fuel reserves. It also features more specific consideration in its Climate Resilience and transition section. Specifically, it recommends disclosure of the following.

"Investments in exploration of new oil and gas reserves and development of new fields (percentage of total CAPEX) Estimated reserves by resource type and emission potential of these reserves[60]*."*

GRI suggests referring to WRI's working paper *A Recommended Methodology for Estimating and Reporting the Potential Greenhouse Gas Emissions from Fossil Fuel Reserves* to calculate emission potential of fossil fuel reserves. The paper is summarized in the GHG Protocol section of this document.

Greenhouse Gas Protocol (GHG Protocol)

The Greenhouse Gas Protocol (GHG Protocol) is a partnership between WRI and the World Business Council for Sustainable Development (WBCSD) Corporate Standard. It first published reporting standards in 2001 and has evolved these to help companies and public entities account for emissions throughout their value chains.

The GHG Protocol divides emissions into three scopes. Scope 1 is direct GHG emissions, Scope 2 covers indirect GHG emissions from consumption of purchased electricity, heat or steam; and Scope 3 is indirect emissions from value chain activities. Each emission scope is further broken down into upstream and downstream activities. The effective CO_2 emissions from fossil fuel reserves could be considered Scope 3 emissions from a downstream activity, as the emissions from combusted reserves would fall under "Use of Sold Products".

Sustainability Accounting Standards Board (SASB)

The Sustainability Accounting Standards Board (SASB) is a non-profit organization, founded in 2011 to develop sustainability accounting standards. Just as the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) have established International Financial Reporting Standards and Generally Accepted Accounting Principles (GAAP), respectively, SASB's mission "is to establish industry-specific disclosure standards across ESG topics that facilitate communication between companies and investors about financially material information."

SASB has Oil and Gas Exploration and Production[61] and Coal Company[62] standards that include guidance relevant to fossil fuels reserves disclosure.

The SASB oil and gas reserves calculation recommendation is that the reporting entity should follow guidance published by the U.S. Securities and Exchange Commission (SEC) in its Oil and Gas Reporting Modernization (Regulation S-X Section §210.4-10) for the classifying of reserves as proved and probable. For coal reserves, SASB's definition is consistent with the SEC Industry Guide 7, Description of Property by Issuers Engaged or to Be Engaged in Significant Mining Operations[63], which states the following:

1. Reserves, as that part of a mineral deposit which could be economically and legally extracted or produced at the time of the reserve determination

emissions represented by the reserves of a fossil fuel company, which should be an important consideration in determining their exposure of regulatory and demand risks related to climate change.

[60]

[61] https://www.sasb.org/wp-content/uploads/2018/11/Oil_Gas_Exploration_Production_Standard_2018.pdf
[62] https://www.sasb.org/wp-content/uploads/2018/11/Coal_Operations_Standard_2018.pdf
[63] https://www.sec.gov/about/forms/industryguides.pdf

2. Proved reserves, as reserves for which (a) quantity is computed from dimensions revealed in outcrops, trenches, workings, or drill holes; grade and/or quality are computed from the results of detailed sampling, and (b) the sites for inspection, sampling, and measurement are spaced so closely and the geographic character is so well defined that size, shape, depth, and mineral content of reserves are well established.
3. Probable reserves are reserves for which quantity and grade and/or quality are computed from information similar to that used for proven (measured) reserves, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for proven (measured) reserves, is high enough to assume continuity between points of observation.

Guidance for Reporting Estimate CO_2 Emissions from Reserves

The SASB Oil, Gas and Coal standards have guidance for reporting the estimated CO_2 emissions represented by proven and probable reserves. The SASB standard suggests reporting estimated carbon dioxide emissions embedded in proved hydrocarbon reserves in Metric tons (t) CO_2-e. The standard suggests calculating the estimated potential carbon dioxide emissions from proved hydrocarbon reserves using the following formula, derived from a study titled *Greenhouse-gas emission targets for limiting global warming to 2 °C*[64] published in the journal *Nature* in April 2009 by Malte Meinshausen et al, outlined in the Figure below.

Figure 12
Emission Targets

$E = R \times V \times C$, where:

2.1.1 E are the potential emissions in kilograms of carbon dioxide (kg CO_2);

2.1.2 R are the proved reserves in gigagrams (Gg);

2.1.3 V is the net calorific value in terajoules per gigagram (TJ/Gg); and

2.1.4 C is the effective carbon dioxide emission factor in kilograms CO_2 per terajoule (kg/TJ).

Source: Malte Meinshausen

The SASB standard also suggests the following:

"In the absence of data specific to the entity's hydrocarbon reserves, carbon content shall be calculated using default data for each major hydrocarbon resource published by the Intergovernmental Panel on Climate Change (IPCC) in its 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The entity shall use default carbon content values per unit of energy that is listed in IPCC Table 1.3 Default Values of Carbon Content, Volume 2: Energy, Chapter 1. The entity shall use calorific values per weight of hydrocarbon contained in IPCC Table 1.2 Default Net Calorific Values (NCVs) and Lower and Upper Limit of the 95% Confidence Intervals, Volume 2: Energy, Chapter 1. For other assumptions required to estimate the carbon content of hydrocarbon reserves, the entity shall rely on guidance from the IPCC, Greenhouse Gas Protocol, U.S. Energy Information Agency (EIA), or the International Energy Agency (IEA)."

The SASB standards for Oil, Gas and Coal go on to suggest reporting of the sensitivity of hydrocarbon reserve levels to future price projection scenarios that account for a price on carbon emissions. The

[64] https://www.nature.com/articles/nature08017

standard suggests disclosing sensitivity analyses of a report's reserves using the International Energy Agency (IEA) in its World Energy Outlook (WEO) scenarios in a manner similar to the following Figure

Figure 14
Sensitivity of Reserves to Prices

Table 3. Sensitivity of Reserves to Prices by Principal Product Type and Price Scenario

PRICE CASE	PROVED RESERVES			PROBABLE RESERVES		
(Scenario)	Oil (MMbbls)	Gas (MMscf)	Product:A (measure)	Oil (MMbbls)	Gas (MMscf)	Product:A (measure)
Current Policies Scenario (base)						
New Policies Scenario						
Sustainable Development Scenario						

Source: Malte Meinshausen

Both reporting standards also use the proximity of reserves to areas of significant sustainability importance as a suggested reporting metric. For example, a suggested metric for Biodiversity Impacts is "percentage of proved and probable reserves in or near sites with protected conservation status or endangered species habitat". The Oil, Gas and Coal standards suggest reporting the percentage of proven and probable reserves "in or near areas of conflict" and "in or near indigenous land". Finally, both standards also recommend reporting of the percentage of proven and probable reserves in countries that have the 20 lowest rankings in Transparency International's Corruption Perception Index.

Task Force on Climate-related Financial Disclosures (TCFD)

The Task Force on Climate-Related Financial Disclosures (TCFD) is an organization that was established in December 2015 by the Financial Stability Board (FSB), an international body that monitors and makes recommendations about the global financial system. The TCFD, which is chaired by Michael Bloomberg, has published a set of voluntary climate-related financial risk disclosures for various business sectors. The TCFD's first guidance document was published in 2017[65]. It includes climate disclosure guidance for the Financial Services Sector and Energy Sector that have relevance to the effective CO2 emissions in fossil fuel reserves. The TCFD's guidance indicates that GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.

Energy Sector Guidance

The TCFD recommendations for Energy Sector reporters include the following regarding historical GHG emissions but include no reference to fossil fuel reserves[66].

- Estimated Scope 3 emissions, including methodologies and emission factors used
- Describe current carbon price or range of prices used
- Amount of gross global Scope 1 emissions from: (1) combustion, (2) flared hydrocarbons, (3) process emissions, (4) directly vented releases, and (5) fugitive emissions/leaks

[65] https://assets.bbhub.io/company/sites/60/2020/10/FINAL-TCFD-Annex-Amended-121517.pdf
[66] https://www.tcfdhub.org/Downloads/pdfs/E10%20-%20Energy%20-%20metrics.pdf

Financial Services Guidance

The TCFD Carbon Footprinting and Exposure Metrics for Financial Services companies also provide potentially useful insights for the calculations of potential GHG emissions as a proportion of investment assets. TCFD offers four suggested methods for carbon footprinting and exposure metrics, using issuer's Scope 1 and Scope 2 GHG emissions as the carbon quantity input[67]. None of these calculations or other TCFD data guidance includes fossil fuel reserves data, but it is possible they could be adjusted to do so.

Method 1 - Weighted Average Carbon Intensity

Portfolio's exposure to carbon-intensive companies, expressed in tons CO2e / $M revenue. Metric recommended by the Task Force.

$$\sum_{n}^{i}\left(\frac{\text{current value of investment}_i}{\text{current portfolio value}} * \frac{\text{issuer's Scope 1 and Scope 2 GHG emissions}_i}{\text{issuer's \$M revenue}_i}\right)$$

Method 2 - Total Carbon Emissions

The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO2e.

$$\sum_{n}^{i}\left(\frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i\right)$$

Method 3 - Carbon Footprint

Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tons CO2e / $M invested.

$$\frac{\sum_{n}^{i}\left(\frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i\right)}{\text{current portfolio value (\$M)}}$$

Method 4 - Carbon Intensity

Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tons CO2e / $M invested.

$$\frac{\sum_{n}^{i}\left(\frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i\right)}{\sum_{n}^{i}\left(\frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} * \text{issuer's \$M revenue}_i\right)}$$

[67] https://www.tcfdhub.org/Downloads/pdfs/E09%20-%20Carbon%20footprinting%20-%20metrics.pdf

Climate Disclosure Standards Board (CDSB)

The Climate Disclosure Standards Board (CDSB) is an international consortium of business and environmental NGOs including Ceres, GHG Protocol Initiative, the World Resources Institute (WRI) and SASB that was created during the 2007 World Economic Forum in Davos. The Carbon Disclosure Project (CDP) acts as CDSB's secretariat. The CDSB Framework does not include specific reporting guidance itself but organizes existing reporting standards including the Task Force on Climate-related Financial Disclosures (TCFD) and the International Financial Reporting Standards.

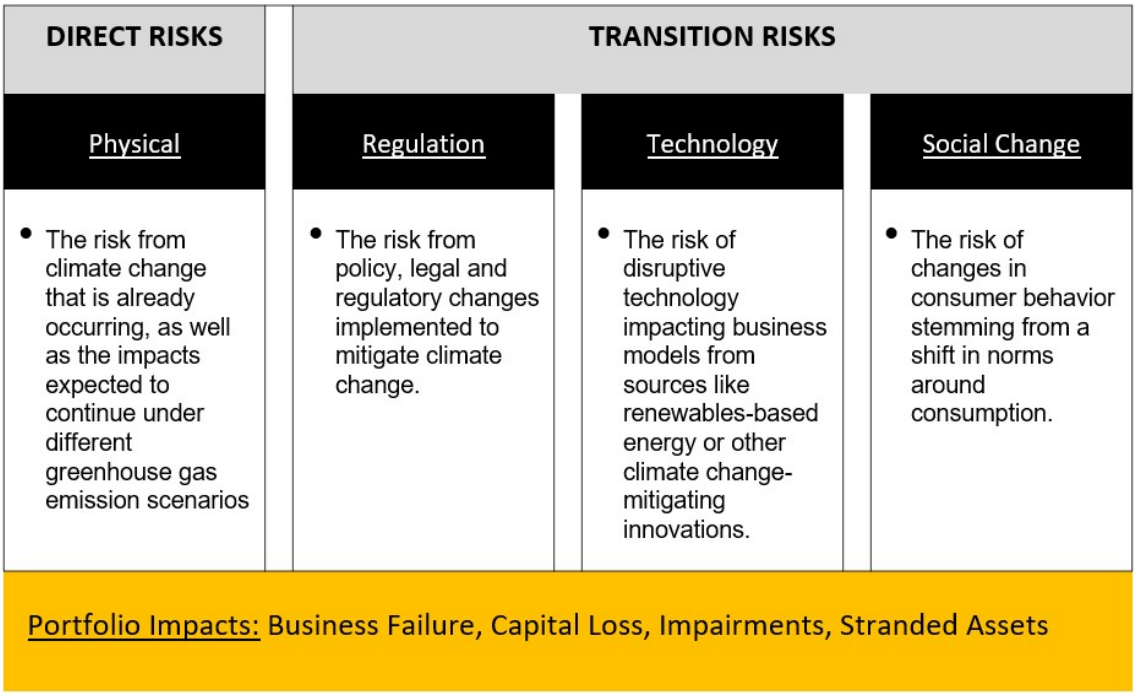
Climate Risk Disclosure

The CDSB Risks and Opportunities section identifies areas that would be broadly relevant to the disclosure of the effective CO_2 emissions of oil and gas reserves[68]. However, it lacks specific guidance about those disclosures. Instead, it references reporting principles and guidance from other organizations. For example, it points reporters to the guidance of Carbon Tracker regarding whether an organization's natural capital dependencies are subject to known limits, e.g., planetary boundaries. Carbon Tracker's CO_2 budget research could apply to this guidance.

Application of Effective CO2 Emissions Data to Securities Analysis

As discussed at the outset, investors are attempting to price climate risks in an environment of significant uncertainty. Figure 15 below highlights the broad categories of risks that portfolio investors face. All four of the risk channels outlined below can result in unexpected capital loss for the exposed firm.

Figure 15
Climate Risk Disclosure Act



Source: WK

Each channel transmits effects in a slightly different manner:

- **Physical Risks**: Physical impacts on property, plant and equipment (e.g. heatwave, drought, storm, flood, fire, sea level rise) can incur significant capital losses. Effects include, property

[68] https://www.cdsb.net/sites/default/files/cdsb_framework_2019_v2.2.pdf

damage, potential for lower productivity in regions with outdoor labor, greater energy expenditures, lower agriculture output due to declining crop yields, higher and more frequent costs associated with cleanup, remediation and insurance around extreme weather events

- **Regulatory Risk**: Regulatory impacts can include tax changes and new licensing regimes.

- **Social Risks**: Changing patterns of consumption and customer behavior impacts both investors and companies. Demand shifts force re-pricing of commodities, goods and services resulting in potential impairments and stranded assets.

- **Technology Risks**: Competition from disruptive technology has implications for CAPEX requirements and can drive margins lower. Investment horizons shorten and incumbent industries are forced to adapt.

Increasingly, analysts in fixed income are incorporating higher discount rates as a "blunt force" instrument to ensure a margin of safety when investing. In discussions with institutional investors, these discounts to the cost of capital range between 200-500 basis points. Firms facing the more extreme physical and transition risks are awarded higher discount rates. Therefore, in an analysis of upstream producers, industry standard oil and gas PV10 is sometimes closer to PV15, under select circumstances. A common heuristic employed when evaluating upstream investment opportunities is to compare the firm's enterprise value to PV10. If those reserves are discounted at a significantly higher rate, the resulting present value is lower, narrowing the field of opportunity under this metric.

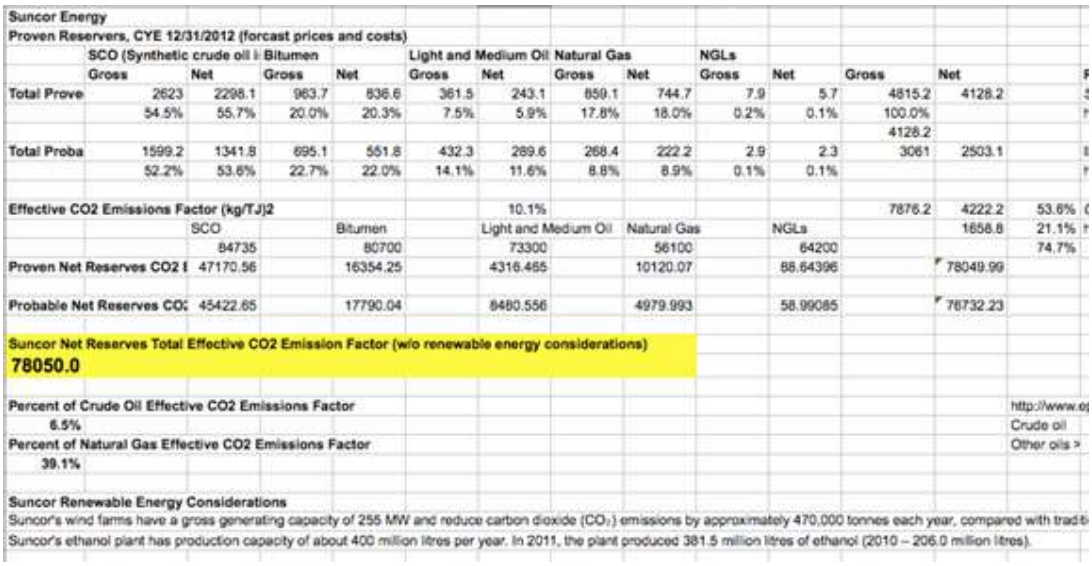
The CFA institute, a respected accreditation body for securities analysts, recommends that analysts and PMs model the impact of carbon pricing at $50-$100/tCO2 by 2030. While the impact on valuation is dependent on the industry, as well as the particular carbon pricing scheme and various emissions allowances, the direct effect will be higher production costs. And the indirect effects will come through higher energy inputs, which can pressure margins. Investors are also questioning integrated oil price assumptions in a potentially lower demand environment. This can lead to the modeling of potential impairments and stranded assets.

Against this backdrop a tool that can clarify the aggregate downstream emissions potential for the transportation segment (via the aggregation of emissions from reserves) would provide tremendous clarity on the scope of potential risks. The numbers, if ultimately available through improved disclosures, would be a valuable input for physical risk models, climate risk portfolio software tools, as well as analysis of individual upstream producers.

Applicaton of Data from Effective CO_2 Emissions Methodology

The result of the effective CO_2 emissions calculation described above is a number that can be compared to data from peer companies or to a benchmark. Benchmarks could include the effective CO_2 emissions of a company if its reserves were made up entirely of crude oil or natural gas. The follwing is an example of how the methodology could be applied to the FY2012 reserves disclosure of Suncor Energy, a firm in the spotlight at the time of the Modernization rule.

Figure 16
Suncor Energy Reserves Disclosure, FY2012



Suncor Energy
Proven Reservers, CYE 12/31/2012 (forcast prices and costs)

	SCO (Synthetic crude oil i		Bitumen		Light and Medium Oil		Natural Gas		NGLs				
	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net	
Total Prove	2623	2298.1	963.7	836.6	361.5	243.1	859.1	744.7	7.9	5.7	4815.2	4128.2	
	54.5%	55.7%	20.0%	20.3%	7.5%	5.9%	17.8%	18.0%	0.2%	0.1%	100.0%		
											4128.2		
Total Proba	1599.2	1341.8	695.1	551.8	432.3	289.6	268.4	222.2	2.9	2.3	3061	2503.1	
	52.2%	53.6%	22.7%	22.0%	14.1%	11.6%	8.8%	8.9%	0.1%	0.1%			

Effective CO2 Emissions Factor (kg/TJ)2			10.1%			7876.2	4222.2	53.6%
	SCO	Bitumen	Light and Medium Oil	Natural Gas	NGLs		1658.8	21.1%
	84735	80700	73300	56100	64200			74.7%
Proven Net Reserves CO2 E	47170.56	16354.25	4316.465	10120.07	88.64396		78049.99	
Probable Net Reserves CO2	45422.65	17790.04	8480.556	4979.993	58.99085		76732.23	

Suncor Net Reserves Total Effective CO2 Emission Factor (w/o renewable energy considerations)
78050.0

Percent of Crude Oil Effective CO2 Emissions Factor
6.5%
Percent of Natural Gas Effective CO2 Emissions Factor
39.1%

Suncor Renewable Energy Considerations
Suncor's wind farms have a gross generating capacity of 255 MW and reduce carbon dioxide (CO_2) emissions by approximately 470,000 tonnes each year, compared with tradi
Suncor's ethanol plant has production capacity of about 400 million litres per year. In 2011, the plant produced 381.5 million litres of ethanol (2010 – 206.0 million litres).

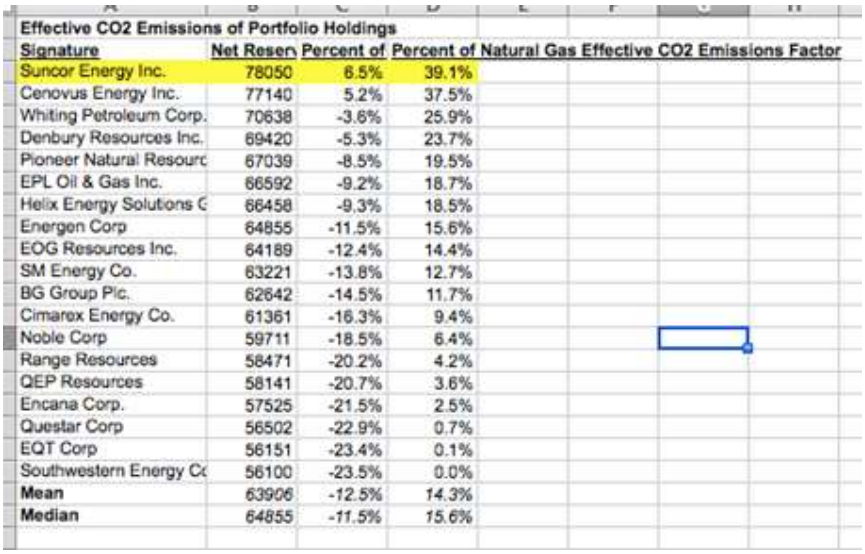
Source: WK Associates

As described above, each type of oil-equivalent proven and probable reserves total is multiplied by its corresponding IPCC effective CO_2 emissions factor, as indicated in Figure 7. In this case, these emissions factors were totalled and then calculated on a weighted basis by reserves type. The result is an effective CO_2 emissions fact of all of Suncor's reserves. Once a company's effective CO_2 emissions factor is calculated, it is benchmarked against the IPCC data to determine if it is higher or lower than a benchmark based on the effective CO_2 emissions factor of crude oil. High-carbon fuels are generally understood to be those with carbon content higher than crude oil. The precedent for using a crude oil as a benchmark for carbon content includes the Energy Independence and Security Act of 2007, which prohibits the U.S. federal government agencies from buying fuels with carbon content higher than crude oil.

Using this methodology, we can see that Suncor's FY2012 reserves CO_2 emissions factor is 78,050 (kg/TJ)2. When that number is compared to the emissions factors listed in Figure 7, we see it is a 6.5% higher factor than if all its reserves were crude oil and 39.1% higher than if all of Suncor's reserves were solely natural gas.

As Figure 17 demonstrates, effective CO_2 emission data could be applied to portfolio decision-making. In the example provided, the oil and gas exploration and production company holdings in a particular portfolio are compared based on their effective CO_2 emissions score. These data indicate that Suncor Energy and Cenovus Energy both have effective CO_2 emissions score above a crude oil benchmark. This information could help securities analysts screen portfolios for holdings that present material climate risks in this manner.

Figure 17
Comparison of Total Effective CO2 Factors



Effective CO2 Emissions of Portfolio Holdings			
Signature	Net Reser	Percent of	Percent of Natural Gas Effective CO2 Emissions Factor
Suncor Energy Inc.	78050	6.5%	39.1%
Cenovus Energy Inc.	77140	5.2%	37.5%
Whiting Petroleum Corp.	70638	-3.6%	25.9%
Denbury Resources Inc.	69420	-5.3%	23.7%
Pioneer Natural Resourc	67039	-8.5%	19.5%
EPL Oil & Gas Inc.	66592	-9.2%	18.7%
Helix Energy Solutions G	66458	-9.3%	18.5%
Energen Corp	64855	-11.5%	15.6%
EOG Resources Inc.	64189	-12.4%	14.4%
SM Energy Co.	63221	-13.8%	12.7%
BG Group Plc.	62642	-14.5%	11.7%
Cimarex Energy Co.	61361	-16.3%	9.4%
Noble Corp	59711	-18.5%	6.4%
Range Resources	58471	-20.2%	4.2%
QEP Resources	58141	-20.7%	3.6%
Encana Corp.	57525	-21.5%	2.5%
Questar Corp	56502	-22.9%	0.7%
EQT Corp	56151	-23.4%	0.1%
Southwestern Energy Co	56100	-23.5%	0.0%
Mean	*63906*	*-12.5%*	*14.3%*
Median	*64855*	*-11.5%*	*15.6%*

Source: WK Associates

Use of Effective CO2 Emission Data in Estimating Carbon Tax Impacts

Assuming the implementation of an economy-wide carbon tax based on fossil fuel production, effective CO_2 emissions factors would be an essential tool in understanding a security's exposure to such a tax on a forward-looking basis.

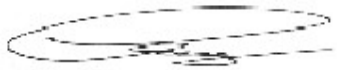
Use of Effective CO2 Emission Data in Reserves Decline Estimations

In a net asset value (NAV) approach to oil and gas securities valuation, the reserves of a company are drawn down to zero through the subtraction of year-over-year production. The resulting NAV can be compared to company estimates and the NAV calculations of other oil and gas producers. The effective CO_2 emissions of reserves could be included in the calculation of the decline of the reserves in a NAV, thereby reflecting reserves based diminished by the marketability of higher carbon reserves.

We are grateful that the Commission has undertaken this effort to understand the need for climate data and we look forward to seeing how input from this comment period is reflected in your next steps on these critical issues. Whatever action the Commission chooses to take, it is our recommendation that any climate data disclosure the SEC requires should be mandatory and not grounded in a principles-based approach. While the voluntary disclosure standards referenced in this comment have been beneficial, the consistency and standardization necessary to optimize the usefulness of climate data to investors is only possible through mandatory reporting. As indicated above, we also believe this reporting should be included in issuers' standard annual reports, such as Form 10-K or 20-F.

Thank you for the opportunity to share these insights based on our experience and consultation with colleagues in the securities field. We welcome the opportunity to engage further on any of these issues.

Sincerely,



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