Quantifying Sustainability: Unveiling the Link Between ESG and GHG Management in Oil & Gas

American Association of Drilling Engineers
Fluids Management Group

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Outline

- What is ESG?
- Drivers for ESG
- Elements of ESG
- Elements of the “E” in ESG
- Question/Answer Session

What is ESG?

ESG stands for: Environment, Social and Governance

- Many of these issues have already been tracked.
- ESG has become an umbrella term.
- Related to business “Sustainability”
- Sustainability definition: *“development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.”*

What is ESG?

- **Environmental**: Impact on the natural world (e.g., climate change, pollution, resources used).
- **Social**: Interactions with employees, communities, and stakeholders (e.g., human rights, diversity, labor practices).
- **Governance**: Decision-making structure (e.g., board composition, compensation, transparency) .

A Starting Point: Five Broad Dimensions of Sustainability

SASB's research begins with a universe of ESG issues, then applies the industry lens

Environment

- GHG Emissions
- Air Quality
- Energy Management
- Water & Wastewater Management
- Waste & Hazardous Materials Management
- Ecological Impacts

Leadership & Governance

- Business Ethics
- Competitive Behavior
- Management of the Legal & Regulatory Environment
- Critical Incident Risk Management
- Systemic Risk Management

Business Model & Innovation

- Product Design & Lifecycle Management
- Business Model Resilience
- Supply Chain Management
- Materials Sourcing & Efficiency
- Physical Impacts of Climate Change

Social Capital

- Human Rights & Community Relations
- Customer Privacy
- Data Security
- Access & Affordability
- Product Quality & Safety
- Customer Welfare
- Selling Practices & Product Labeling

Human Capital

- Labor Practices
- Employee Health & Safety
- Employee Engagement, Diversity & Inclusion

ESG Drivers

- World pressure to reduce GHG emissions
- Net Zero Goals
- SEC Proposed Climate Disclosure (GHG) rules for public companies
- Investors/financial markets seeking companies with high ESG scores
- Pressure from shareholders
- Vendors requiring ESG score for master service agreement (MSA)
- Environmental Justice efforts by U.S. federal and state agencies
- Woven into fabric of financial markets and regulatory agencies
- Calls for Carbon Tax or Cap and Trade System
- EU Carbon Border Adjustment Mechanism (CBAM)
- Carbon offset markets

Standards for ESG

- GRI (formerly Global Reporting Initiative) - standards for 40 sectors including O&G operations and equip suppliers and services to O&G.

  Link: GRI ESG Standards

- SASB = Sustainability Accounting Standards Board

  SASB Standards include subset of ESG issues most relevant to financial performance in each of 77 industries. Link: SASB Standards and Other ESG Frameworks

- TCFD – Task Force on Climate-related Financial Disclosures
  associated with Bloomberg LP

The TCFD is a standard the SEC used to proposed climate disclosure rules.

Link: TCFD

Industry Specific ESG Guidelines

- GHG Protocol global standardized frameworks to measure and manage GHG emissions from private and public sector, value chains and mitigation actions.
- IPIECA – global O&G association that advances environmental and social performance. Guidance for O&G operations and service companies. Link: IPIECA ESG Guidance Document
- GRESB – Global Real Estate and Infrastructure. Industry-led organization that provides ESG data to financial markets.

ESG Term - Materiality

- Materiality – whether certain information is relevant and important the company's ESG reporting. If material, include; if not, then exclude. Prepare a materiality matrix to make decisions on materiality.

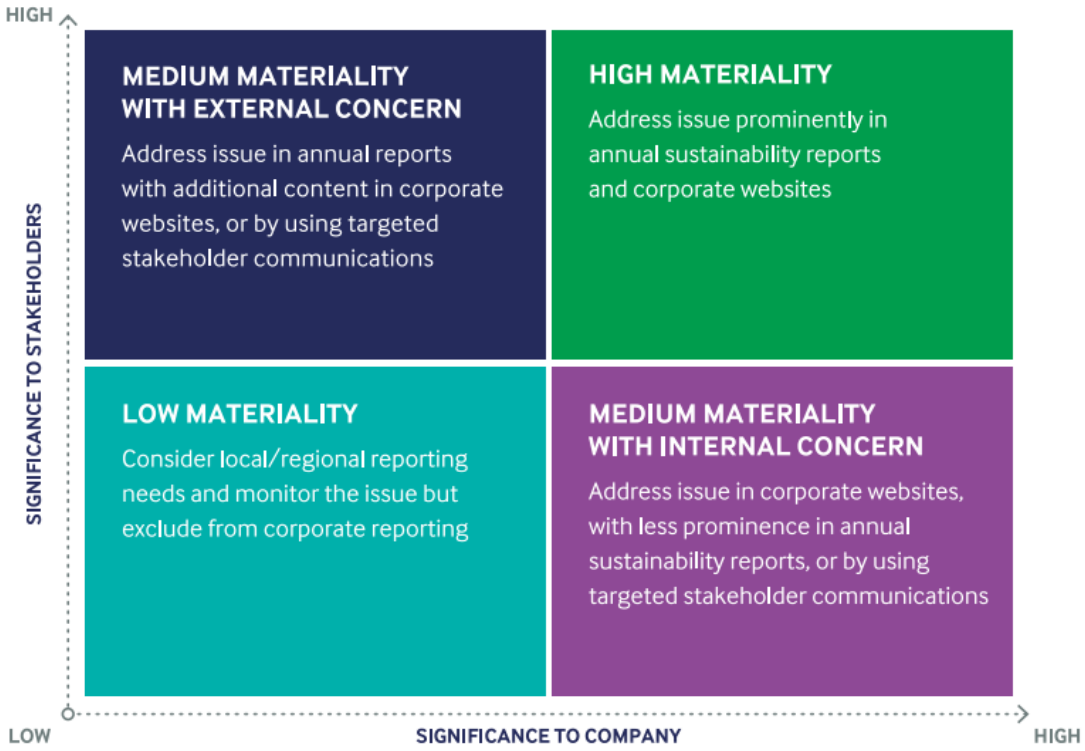


Figure 1.7: Materiality matrix

Monitoring, Reporting, Verification (MRV)

- MRV = monitoring, reporting, verification use to demonstrate reductions on ongoing basis.
- Term used in carbon offset and ESG world.
- Monitoring = periodic, continuous (e.g., meter fuel used).
- Verification = third-party verification, requires time to complete and meet reporting deadlines
  - May be required by SEC rules and future EPA GHG reporting regulations and Waste Emissions Charge (CH4 fee).

ESG Scoring

- No one formal, standardized ESG scoring method – yet
- Some scoring systems use letters: AAA = good; D = worse
- Most ESG scoring by third-party rating organizations
  - Bloomberg ESG Data Services
  - MSCI ESG
  - KPMG
  - EcoVadis
- Some companies prepare internal ESG score.
- Outside orgs may prepare score based on publicly available information.
- SEC may give guidance and requirements for ESG scoring.

ESG Pushback

- Fiduciary duty
- Lawsuits against activist shareholders
- Supply chain for electric vehicle (EV) materials
- High profile divestment from renewable energy projects
- Layoffs by electric vehicle makers
- Large car maker reported loss in 2023 of $1.3 billion from EVs.

The “E” of ESG

- Focus currently on GHG emissions
- Also includes metrics for:
  - other air pollutants (NOx, CO, SO2, VOC, benzene, etc.)
  - industrial and hazardous waste generation/disposal
  - water discharges (e.g., produced water, industrial wastewater)
  - water usage
  - chemical usage
  - oil/chemical spills
  - Biodiversity (endangered species)

Oil and Gas Greenhouse Gases

- Carbon dioxide (CO2) - combustion of fossil fuel
  - Global warming potential (GWP) = 1
- Nitrous oxide (N2O) - combustion of fossil fuel
  - Global warming potential (GWP) = 298
- Methane (CH4) from venting of natural gas
  - Global warming potential (GWP) = 25

1 mton CH4 = 25 mtons CO2e

2024 reporting to EPA, change CH4 GWP to 28.

CO2 Reporting Trigger to USEPA

Fuel combustion equal to approx. 25,000 metric tons CO2:

- 2,450,000 gallons of diesel
- 2,840,000 gallons of gasoline
- 459,300,000 scf of typical natural gas

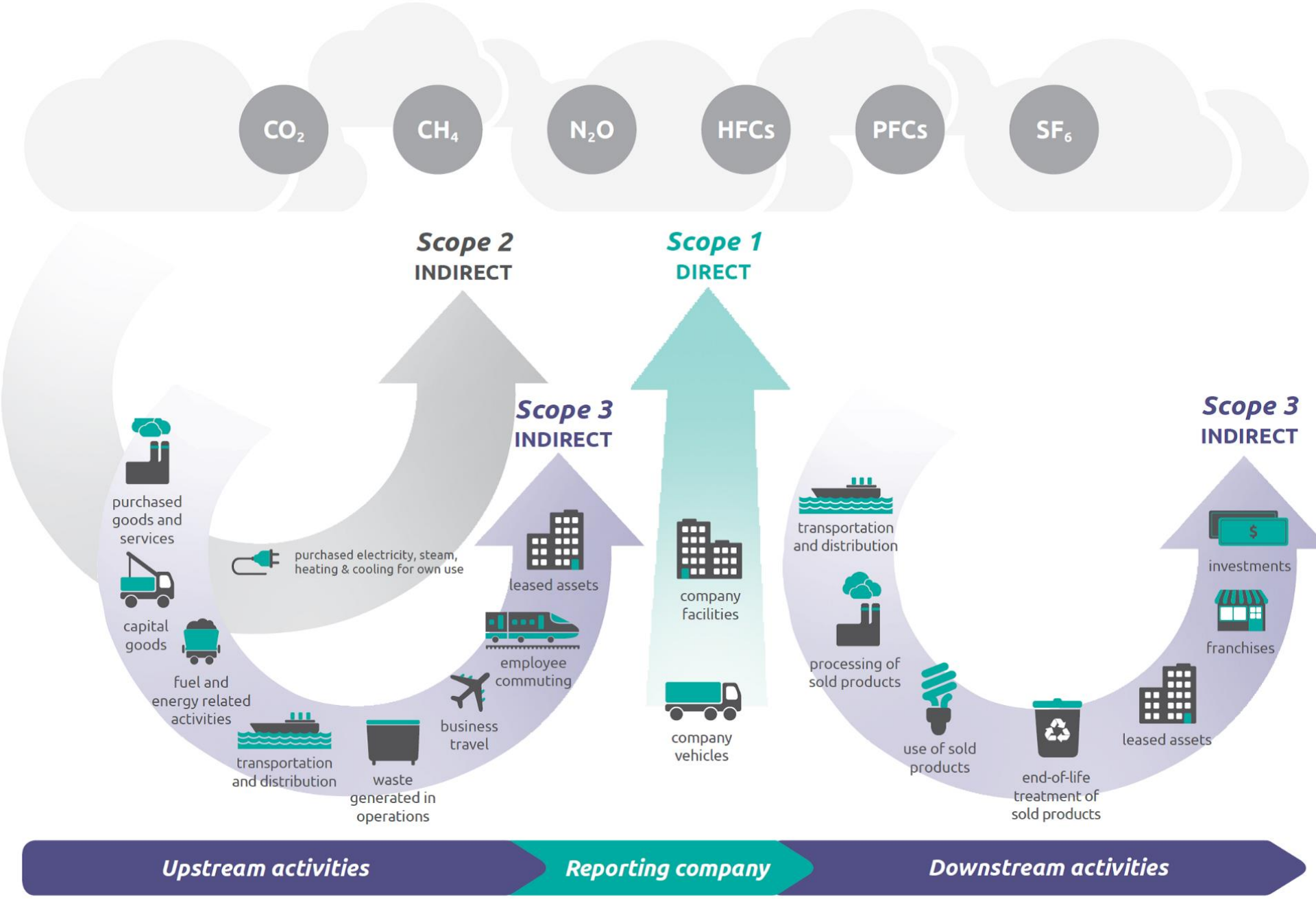
Use EPA or industry emission factors (EF) for GHG calculations.

EPA EF = 0.01021 mt CO2/gal no. 2 diesel

Diesel CO2 = (2,450,000 gal)(0.01021 mt CO2/gal) = 25,015 mt CO2

Greenhouse Gases Scope Emissions

- Scope 1 emission – direct emissions that occur from sources owned by the company
- Scope 2 – purchased electricity, heat, steam, cooling
- Scope 3 – indirect emissions resulting from company operation


CO_2
CH_4
N_2O
HFCs
PFCs
SF_6
Scope 2
INDIRECT
Scope 1
DIRECT
Scope 3
INDIRECT
Scope 3
INDIRECT
purchased goods and services
capital goods
fuel and energy related activities
transportation and distribution
waste generated in operations
business travel
employee commuting
leased assets
purchased electricity, steam, heating & cooling for own use
company facilities
company vehicles
transportation and distribution
processing of sold products
use of sold products
end-of-life treatment of sold products
leased assets
franchises
investments
Upstream activities
Reporting company
Downstream activities

GHG Scope 1 Emissions Examples

- Drilling rigs internal combustion engines (owner/operator)
- Manufacturing emissions from fuel combusted
- Venting of natural gas (tanks, blowdowns, leaks, etc.) – O&G
- Fleet vehicles/vessels – delivery, maintenance, service
- Company owned/rented offices/shorebases
  - Equipment testing that burns fuel (forklifts, manlifts, air compressors, space heaters)
  - Central heating – furnace, boiler
  - AC units – refrigerants that contribute to global warming
  - Fire suppression equipment (HFCs)

GHG Scope 3 Emissions Examples

- Automobile and air travel by company employees
- Delivery vehicles delivering products to sites
- Marine supply vessel trips to offshore drilling rigs
- Helicopter flights to facilities offshore
- Delivery of raw materials to company
- Emissions from construction of new facility
- End use of company products (e.g., natural gas as fuel)

GHG Scope 3 Emissions

Scope 3 emission sources O&G:

- Indirect GHG emissions from a company's products and services.
- No agreed methodology to calculate Scope 3 emissions.
- Materiality counts: where to draw the line?
- One company's Scope 1 is another company's Scope 3.
  - Double counting?
- Can require Life Cycle Analysis (LCA) – expensive
- Growing calls on more Scope 3 emissions quantification

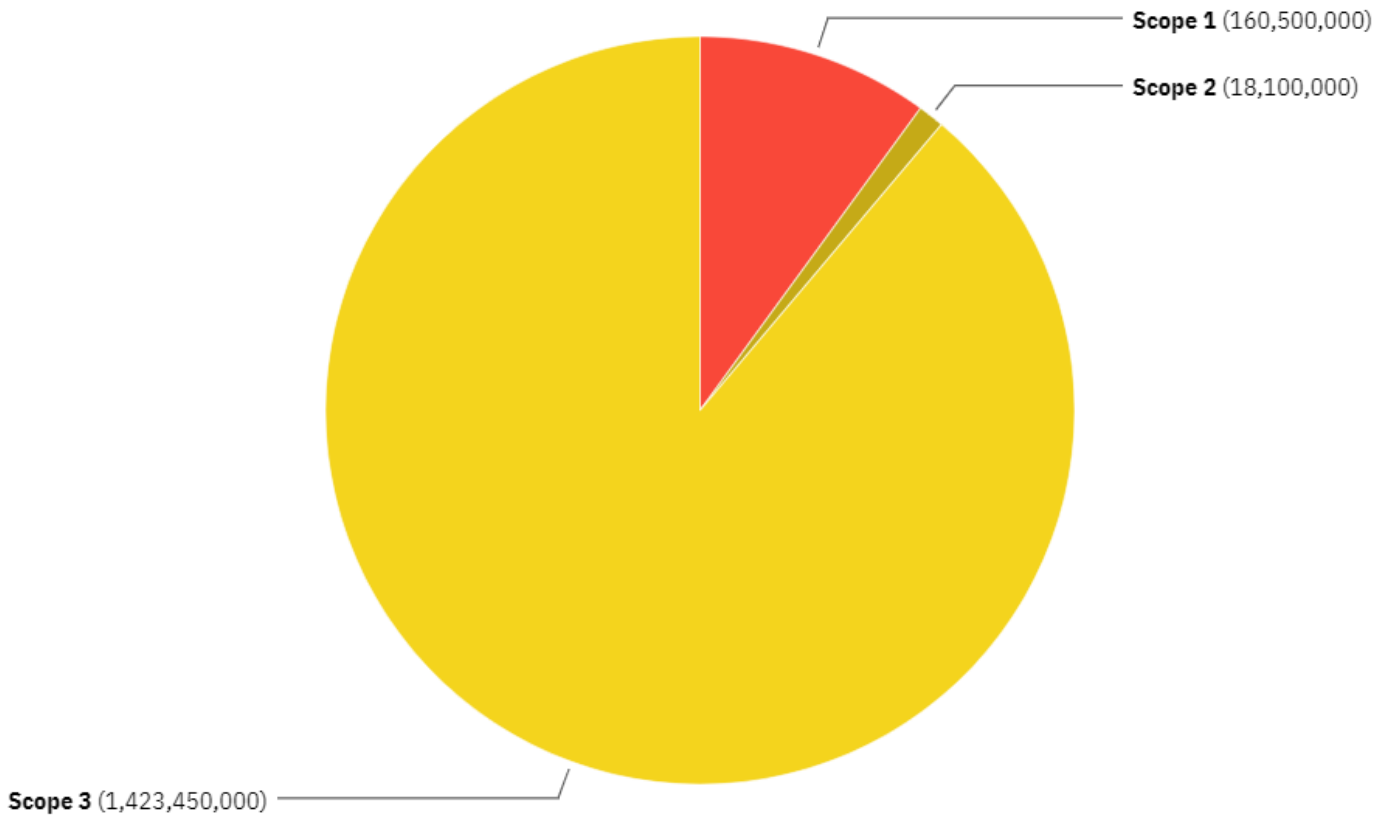
Ref: IPIECA Est. Petroleum Industry Value Chain (Scope 3) GHGs

GHG Scope 3 Emissions

- Pressure to reduce Scope 3 from all sectors.
- Some companies require suppliers to report the supplier's Scope 1 and 2 emissions and have a plan to reduce emissions.
- Some companies actively looking at suppliers for:
  - Low carbon intensity (e.g., mtCO2e/mt product) for the product (e.g., Low GHG steel).
  - Goals and system to reduce Scope 3 emissions

The overwhelming majority of oil and gas emissions come from Scope 3 sources

Emissions by Shell on operated and equity assets, tonnes of carbon dioxide equivalent, 2020



Source: Shell; some Scope 3 emission estimates not available

OFFSHORE TECHNOLOGY

[Offshore Technology Scope 3 emissions]

Other Environmental ESG Components

- Calculate criteria air pollutants and hazardous air pollutants (HAPs) for company facilities.
- Solid wastes generated by the company. This can include:
  - Municipal waste
  - Industrial nonhazardous solid waste
  - Used oil
  - Hazardous waste
  - Nonhazardous oilfield waste
  - Universal waste (e.g., batteries, pesticides, mercury containing equipment, fluorescent lamps, aerosol cans)
  - Water usage
  - Wastewater discharges (e.g., Fluids retained on cuttings, sewage)
  - Chemical usage
- Reportable spills of oil and hazardous materials

Management of GHGs and Other Metrics

1. Conduct a materiality assessment (GHG, water, waste)
   a. Define areas material to company business.
   b. Determine facilities and associated descriptive and activity data needs.
   c. Gather data.
2. Quantify air pollutants, water usage, waste generation, chemical use based on materiality assessment.
3. Setup system to track, monitor, **verify** and report emissions and reductions.
4. Examine operations for opportunities to reduce energy use, water use, waste generation and air emissions.
5. Set goals to reduce energy use, water use, waste generation and air emissions.
6. Take credit for actions taken that reduce emissions, water usage and waste.

Summary and Conclusions

- The world needs the O&G industry!!
- ChatGPT and other AI need beaucoup megawatts.
- Environmental issues (air, water, waste) under ESG will be a large focus in future.
- More reporting GHG emissions – regulatory or private sector driven.
- More push to reduce GHG emissions – Scope 1, 2 and 3.
- Quantifying GHG emissions for all economic sectors (small and large companies) is prudent.

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