SASB's Industry Brief provides evidence for the material sustainability issues in the industry. The brief opens with a summary of the industry, including relevant legislative and regulatory trends and sustainability risks and opportunities. Following this, evidence for each material sustainability issue (in the categories of Environment, Social Capital, Human Capital, Business Model and Innovation, and Leadership and Governance) is presented. SASB’s Industry Brief can be used to understand the data underlying SASB Sustainability Accounting Standards. For accounting metrics and disclosure guidance, please see SASB’s Sustainability Accounting Standards. For information about the legal basis for SASB and SASB's standards development process, please see the Conceptual Framework.

SASB identifies the minimum set of sustainability issues likely to be material for companies within a given industry. However, the final determination of materiality is the onus of the company.

**Related Documents**

- [Non-Renewable Resources Sustainability Accounting Standards](#)
- [Industry Working Group Participants](#)
- [SASB Conceptual Framework](#)

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INTRODUCTION

Fossil fuels have driven economic activity since the early part of the 20th century, and will continue to be important in meeting global energy needs in the future. The use of petroleum and natural gas as a source of energy is widespread across all economic activity and both hydrocarbons have served as key inputs for industrial and technological processes and innovations. Oil & Gas Services companies have played a vital role in the past several years in the technological advances that have increased access to oil and gas and contributed to energy independence, particularly in the U.S.

However, with the emergence of new global threats such as climate change, water scarcity, and resource constraints, and greater public concern about the environmental and health impacts of industrial activities, regulatory action and business needs around companies’ sustainability performance are intensifying around the world. Given the resource-intensity of industries in the Non-Renewable Resources sector, and their potential wide-ranging environmental and social externalities, this sector has been the focus of regulation and public attention. Management (or mismanagement) of material sustainability issues, therefore, has the potential to affect company valuation through impacts on profits, assets, liabilities, and cost of capital.

Investors would obtain a more holistic and comparable view of performance with firms in the Oil & Gas Services Industry reporting metrics on the material sustainability risks and opportunities that could affect value in the near- and long-term in their regulatory filings. This would include both positive and negative externalities, and the non-financial forms of capital that the industry relies on for value creation.

Specifically, performance on the following sustainability issues will drive competitiveness within the Oil & Gas Services industry:

**SUSTAINABILITY DISCLOSURE TOPICS**

### Environment
- Emissions Reduction Services & Fuels Management
- Water Management Services
- Chemicals Management
- Ecological Impact Management

### Leadership and Governance
- Business Ethics & Payments Transparency
- Health, Safety, and Emergency Management
- Management of the Legal & Regulatory Environment
• Managing energy consumption and providing services and technologies to reduce greenhouse gas (GHG) and hazardous air emissions from customers’ operations;

• Innovating in product and service offerings to improve water efficiency of, and reduce water contamination from, oil and gas production activities, especially in regions of water stress;

• Ensuring the environmental and human health-related safety of chemical products used in extraction;

• Mitigating ecological impacts of extraction activities;

• Ensuring strong oversight of business ethics issues, including illegal facilitation payments;

• Ensuring worker health and safety, and promoting a strong safety culture, including emergency preparedness and response; and

• Ensuring that lobbying and political contributions to manage a complex legal and regulatory environment are aligned with long-term societal interests and company value.

INDUSTRY SUMMARY

Oil and gas services companies provide support services, manufacture equipment, or are contract drillers for oil and natural gas exploration and production (E&P) companies. The drilling and drilling support segment comprises companies that drill for oil and natural gas onshore and offshore on a contract basis. Companies in this segment may also manufacture jack-up rigs, semisubmersible rigs, and drill ships. Companies in the oilfield services segment manufacture equipment that is used in the extraction, storage, and transportation of oil and natural gas. They also provide support services such as seismic surveying, equipment rental, well cementing, and well monitoring.

The Oil & Gas Services industry operates globally, just like the E&P industry does. In the U.S., industry activities are concentrated in the Gulf States and Great Plains regions. The majority of the industry’s $650 billion in global revenues are derived from the oilfield services segment. Gross profit margins for ten leading oil and gas services companies averaged 21 percent in fiscal year (FY) 2013, with operating margins averaging 12 percent.

The distinction between oil and gas service companies and E&P companies lies largely in the activities performed during petroleum extraction. E&P companies usually own or lease the well site, drilling rights, materials, and equipment, including drill rigs, pipelines and vehicles. E&P companies hire oilfield services providers to manage a variety of tasks over the course of the production cycle. Oil and gas service providers depend on E&P companies’ spending for revenue generation. Over the last

1 Industry composition is based on the mapping of the Sustainable Industry Classification System (SICSTM) to the Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.
10 years, capital expenditures on exploration and development activities grew 16 percent on a Compound Annual Growth Rate (CAGR) and services companies’ revenue rose almost 13 percent over the same period. Based on contractual provisions and pertinent law, primary producers are legally accountable for much of the production process. Thus, service companies’ direct involvement in the production process has important business and sustainability implications for the Oil & Gas Services and E&P industries alike.

Most service companies operate on a fee or contract basis, with pricing determined by a competitive bid process. Key factors in the bid process include price, service delivery, technical proficiency, quality, availability of equipment, and environmental, health, safety, and security performance and standards.

Contracts vary in nature; for example, a turnkey contract consists of a lump sum payment for completion of the well, while a day-rate contract is paid per 24-hour period. Under a footage contract, contractors are paid for the depth of the well. Contractors are incentivized to perform the required tasks for the lowest cost. Demand for services is determined largely by the market prices of crude oil and natural gas. Higher prices elevate E&P revenues and exploration and production budgets, which drives additional production, leading to greater demand for drilling and oilfield services. With higher demand for services, day rates for rig utilization rise. Given persistently low U.S. natural gas prices since 2011, gas field operators face continued pressure on both day rates and rig utilization. On the other hand, high crude oil prices have supported expanded oil drilling operations both in the U.S. and abroad.

Globally, four out of the top five U.S. publicly-listed companies in the Oil & Gas Services industry are U.S.-based, with revenues totaling approximately $116 billion for these four companies. Industry fragmentation in the U.S. is low, with the three largest players holding 60 percent market share and numerous small companies comprising the rest. Barriers to entry for firms are great in the offshore drilling markets, due to high capital equipment costs and extensive permitting. However, land operations are significantly cheaper, and smaller players are able to enter the space. Small operators can provide lower-cost engineering, research, management, and information services. New legislation by the U.S. Environmental Protection Agency (EPA) restricting drilling permitting to E&P companies could raise barriers to entry in the services industry over the next several years. Consolidation has been limited, with one notable exception, Schlumberger’s 2010 acquisition of Smith International.

Wages are a major component of industry costs, as highly-skilled oilfield workers and engineers are required for the majority of operations. Wages were expected to account for 23 percent of industry revenue in 2014. Similarly, purchases of materials and parts, including chemical compounds, cement, casings, and parts for drill rigs are expected to account for nearly 30 percent of revenues in 2014.
The 2010 Deepwater Horizon spill, with massive pollution of coastal fisheries and wetlands, brought much attention to the oil and gas industry, culminating in a five-month moratorium on deep-water drilling in the U.S. Gulf. There were major financial liabilities for the companies involved, including oil and gas services companies. A 2012 report by the Greater New Orleans Economic Alliance revealed that federal regulators approved only half as many offshore drilling permits since 2010 as compared to the period before, and took nearly twice as long to approve.\(^1\) The number of drilling permits directly affects service companies’ business volume.

Companies in the industry develop “conventional” and “unconventional” oil and gas resources. Unconventional extraction is required for deposits with low permeability or poor fluid characteristics and requires the application of advanced technology, including horizontal and directional drilling. Examples include oil shales, gas shales, oil sands, tight gas sands, coal-bed methane, and gas hydrates. The development of unconventional resources has expanded in the U.S. over the past 15 years as a result of higher oil and gas prices and advances in drilling techniques.

Hydraulic fracturing, or fracking, is an unconventional drilling technique that has garnered much public attention over the past decade due to its contribution to U.S. domestic energy production, as well as its potential negative environmental and health impacts. During fracking, fluids are injected at high pressure into rock formations, fracturing the rock to release the hydrocarbons within. The fracking fluid used is a blend of mostly water (approximately 90 percent), chemical additives such as friction-reducing agents, and granular proppants such as sand that keep fissures in the rock from closing once well pressure is reduced.\(^1\) After an initial burst of production, the oil or gas flow rate generally declines rapidly. Common remedies include fracking a well multiple times, or drilling numerous wells in close proximity, often from the same drill pad.

Natural gas is regarded as key to the country’s energy independency goal, as well as transition away from coal. A 2013 Potential Gas Committee estimate puts total U.S. natural gas production reserves at 2,384 trillion cubic feet.\(^1\) Estimates are frequently revised upwards, as extraction technology improves and new gas fields are discovered.

The development of fracking technologies has allowed oil and gas service companies and their customers to access previously uneconomical reserves. About 60 percent of U.S. drilling is now targeted at unconventional plays\(^1\) and approximately 90 percent of onshore wells require some form of fracking.\(^1\) Oil and gas service companies have benefitted tremendously from the U.S. natural gas boom and the development of unconventional reserves. Fracking in unconventional drilling is more service-intensive, requiring more oilfield products and services; it is estimated that a typical horizontal well needs 10 to 30 fracking stages (compared to a single stage in conventional wells) and 10 times more proppant.\(^1\)
LEGISLATIVE AND REGULATORY TRENDS IN THE OIL & GAS SERVICES INDUSTRY

The Oil & Gas Services industry is subject to extensive federal, state, and local regulation in the U.S. and abroad. Emerging social and environmental issues related to the industry and the trend towards offshore and unconventional resource extraction have increased public and regulatory pressure on oil and gas services firms and their E&P customers. The following section provides a brief summary of key regulations and legislative efforts related to this industry.

Regulations cover environmental impacts, chemical safety, governance, and operational safety.

Under the U.S. Clean Air Act (CAA), the EPA regulates air emissions from operations in the country. Government-instituted cap-and-trade systems governing emissions of nitrogen oxides (NOx), sulfur oxides (SOx), volatile organic compounds (VOC), and carbon dioxide (CO2) exist in some areas, including a regional NOx trading program in the U.S. Northeast and a nationwide acid rain program. The European Union’s (EU) emissions trading system is the world’s largest program for trading emissions allowances, with the goal of reducing emissions of covered sectors by 21 percent by year 2020 from 2005 levels. The European Union’s (EU) emissions trading system is the world’s largest program for trading emissions allowances, with the goal of reducing emissions of covered sectors by 21 percent by year 2020 from 2005 levels. Furthermore, the EPA’s Mandatory Greenhouse Gases Reporting Program (GHGRP), finalized in 2009, requires major suppliers and emitters of greenhouse gas (greater than 25,000 tons annually) to monitor and report emissions.

Existing and future laws and regulations that seek to limit GHG emissions and other harmful air pollutants, as well as those providing incentives for energy efficiency or alternative energy, could also affect oil and gas services companies indirectly. This could be through decreased demand for their services from impacts on E&P customers, or increased demand for technologies and services that lead to resource efficiency and reduce environmental and social externalities.

In general, environmental regulations are becoming more stringent over time. The EPA issued new rules in 2012 under the CAA related to New Source Performance Standards (NSPS) for Volatile Organic Compounds (VOCs) and National Emissions Standards for Hazardous Air Pollutants (NESHAP) for oil and gas production, addressing for the first time air pollution (including VOCs, HAPs and methane) from the development of unconventional resources.

Moreover, in March 2014, the Obama Administration put forward a Climate Action Plan, with a Strategy to Reduce Methane Emissions as a key element. Under this plan, additional cost-effective techniques will be encouraged to reduce methane emissions from the oil and gas sector. The EPA will assess potential sources of methane emissions and may require the use of leak detection and prevention technologies by companies in the sector, including those in the Oil & Gas Services industry.
The industry’s management of hazardous process waste is regulated under the EPA’s Resource Conservation and Recovery Act (RCRA). RCRA regulations affect the generation, transport, treatment, storage, and disposal of such wastes. In addition, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, commonly referred to as Superfund, establishes legal responsibility for the environmental remediation of contaminated sites.21

The 1990 U.S. Oil Pollution Act and related state legislation provides public and private parties with necessary leverage against companies involved in oil spills and other contamination. Liability may be extended even to firms not found negligent or directly responsible for spills (“strict liability”). Throughout the 1980s and 90s, Congressional bans on offshore drilling prevented companies from operating in a majority of the outer continental shelf, although drilling was allowed to continue in large parts of the Gulf of Mexico and Alaskan coastline. However, these moratoria were allowed to expire in 2009,22 resulting in a push into deep-sea oil and gas extraction. The Deepwater Horizon oil spill in 2010 led to another moratorium being imposed on deep-sea drilling, although this was lifted within six months.23

The Energy Policy Act of 2005 provided incentives for fossil fuel development, such as royalty relief for leases in deep-water areas, and incentives for gas production from deep wells in the shallow waters of the Gulf of Mexico.24 Furthermore, fracking wells are not classified as injection wells due to the 2005 Energy Policy Act, which exempted them from regulation under the Safe Drinking Water Act. Companies are allowed to withhold information about the chemical composition of fracking fluids when they are considered “trade secrets.”25

New legislative and regulatory efforts in this area are likely to create risks and costs for oil and gas services companies and their E&P customers. There has been debate about whether fracking contaminates groundwater supplies, especially due to difficulty in establishing causality without baseline data. However, bills such as the Fracturing Responsibility and Awareness of Chemicals (FRAC) Act, have been introduced in Congress to repeal the exemption for fracking operations under the Safe Drinking Water Act.26 In May 2013, the Bureau of Land Management (BLM) published a revision of an earlier proposed rule – “Oil and Gas; Well Stimulation, Including Hydraulic Fracturing on Federal and Indian Lands” that addresses three primary subjects: 1) the disclosure of chemicals used in hydraulic fracturing; 2) well construction and integrity testing; and 3) flowback water management.27 Furthermore, the EPA, at the request of Congress, is conducting a study on the impacts of fracking on drinking water resources, investigating the full lifespan of
water in fracking, with a draft report expected to be released for public comment and peer review in 2014.\textsuperscript{28}

Many states are implementing their own regulations on fracking as health concerns mount.\textsuperscript{29} For example, New York State issued a state-wide fracking moratorium in 2008.\textsuperscript{30} In Texas, operators are required by law to use an otherwise voluntary industry registry called FracFocus for disclosing fracking fluid additives. In general, however, while many companies involved in fracking provide disclosures on FracFocus, not all do so, and a National Petroleum Council report recommends “[i]ncreasing the participation in FracFocus to all natural gas and oil companies that engage in hydraulic fracturing, and adding into the system all wells currently in drilling or production…[i] as important for community engagement.”\textsuperscript{31}

The U.S. Toxic Substances Control Act of 1976 (TSCA) regulates the use of toxic material in commerce, and authorizes the U.S. Environmental Protection Agency (EPA) to ban, label, and test substances. New chemicals coming to market must be reviewed, and the EPA maintains regulatory control over new chemicals at the pre-manufacture stage, with the authority to ban substances. The EPA adds roughly 700 chemicals per year to the TSCA register.\textsuperscript{32} The TSCA balances the need for chemical safety transparency and the protection of company intellectual property.\textsuperscript{33} Banned substances or otherwise regulated production can negatively impact Oil & Gas Services industry revenue. Slow modernization of the TSCA has led many states to adopt their own chemical policy, including a focus on safer alternatives.\textsuperscript{34}

Other countries regulate use of hazardous substances, sometimes with more stringent requirements than in the U.S., which could affect industry players operating there. The EU’s Regulation on Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) program is the most comprehensive chemicals regulation, and affects the importation of chemicals into the EU. The system, introduced in 2006, will control production, marketing, and application of chemicals within the E.U., including products imported from outside the bloc. Companies are required to submit registration of chemicals produced or imported in volumes greater than one metric ton, including substances in mixtures. Registered chemicals of high concern may eventually be banned from sale unless a company exemption is granted.\textsuperscript{35} Implementation of REACH registration requirements is staggered by production volume over several years. Approximately 30,000 chemicals are expected to be registered by 2018.\textsuperscript{36}

Apart from environmental regulations, the Oil & Gas Services industry is also required to adhere to specific operational employee health and safety standards. In the U.S., these standards are enforced by the Occupational Safety
and Health Administration (OSHA) of the U.S. Department of Labor. In addition, companies with global operations are subject to the Foreign Corrupt Practices Act (FCPA) of 1977, which makes it unlawful to pay foreign government officials to assist in obtaining or retaining business. 37

Pursuant to Section 1504 of the Dodd-Frank Act, the U.S. Securities and Exchange Commission (SEC) issued rules in September 2012 for resource extraction issuers to disclose certain payments made to foreign governments or the U.S. federal government for the commercial development of oil, gas, or minerals. However, this rule was vacated by the U.S. District Court for DC in July 2013. In issuing its rule, the SEC considered guidelines for payments transparency under the Extractive Industries Transparency Initiative (EITI), to which a growing number of companies and countries are signatories. 38 (See the “Business Ethics & Payments Transparency” issue below.) Similar anti-corruption regulations in other jurisdictions, like the U.K. Bribery Act, are also important for this industry.

SUSTAINABILITY-RELATED RISKS AND OPPORTUNITIES

Industry drivers and recent regulations suggest that while traditional value drivers will continue to impact financial performance, intangible assets such as environmental, human, and social capitals, company leadership and governance, and the company’s ability to innovate to address environmental and social issues are likely to contribute increasingly to financial and business value.

Broad industry trends and characteristics are driving the importance of sustainability performance in the Oil & Gas Services industry:

- **Use of natural capital:** Oil and gas services companies’ use of natural capital inputs, including energy and water, can generate higher operating costs and other operating risks, both for themselves and for their customers. Oil and gas services companies that effectively manage the use of natural resources may benefit from higher revenues and lower costs.

- **Environmental externalities:** Oil and gas extraction generates negative environmental externalities harmful to human health, including air and water pollution. As a result, more stringent regulation could affect future oil and gas production, and, in turn, demand for oilfield services. Reducing the environmental impact of oil and gas extraction can be a driver of business growth.

- **Innovation for environmental performance:** Innovation is a key driver in the Oil & Gas Services industry. By innovating in the E&P process to lower environmental and social impacts of production, industry players have the potential to provide economic, environmental, and social benefits that can make them more competitive in the long-term.
• **Governance challenges from global and risky operations:** Many industry players operate in global markets, often in countries with weak governance. Workers operate in dangerous working environments and safety performance has wide societal implications. Corporate oversight of process safety, business ethics, and the industry’s regulatory influence can therefore reduce operating risks, and can help protect shareholder value in the long term.

As described above, the regulatory and legislative environment surrounding the Oil & Gas Services industry emphasizes the importance of sustainability management and performance. Specifically, recent trends suggest a regulatory emphasis on the reduction of environmental and human health impacts, which will serve to align the interests of society with those of investors.

The following section provides a brief description of each sustainability issue that is likely to have material implications for companies in the Oil & Gas Services industry. This includes an explanation of how the issue could impact valuation and evidence of actual financial impact. Further information on the nature of the value impact, based on SASB’s research and analysis, is provided in Appendix IIA and IIB. Appendix IIA also provides a summary of the evidence of investor interest in the issues. This is based on a systematic analysis of companies’ 10-K and 20-F filings, shareholder resolutions, and other public documents, as well as the results of consultation with experts participating in an industry working group convened by SASB.

A summary of the recommended disclosure framework and accounting metrics appears in Appendix III. The complete SASB standards for the industry, including technical protocols, can be downloaded from www.sasb.org. Finally, Appendix IV provides an analysis of the quality of current disclosure on the sustainability disclosure topics in this brief in SEC filings, by the top companies in the industry.

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**ENVIRONMENT**

The environmental dimension of sustainability includes corporate impacts on the environment. These could result from the use of non-renewable natural resources as inputs to the factors of production (e.g., water, minerals, ecosystems, and biodiversity) or environmental externalities and harmful releases in the environment, such as air and water pollution, waste disposal, and GHG emissions.

Oil and gas extraction depends heavily on environmental capital for inputs to production. At the same time, oil and gas operations generate wide-ranging environmental impacts
affecting land, air, and water resources, as well as human health. The type and magnitude of impacts can vary depending on the type of resource, onshore versus offshore extraction, and extraction methods. Oil and gas services companies and their customers are facing public pressure on their impacts from fracking operations.

E&P companies are typically legally responsible for the majority of impacts from production activities, due to the contractual nature of their relationships with business partners, including oil and gas services providers. However, since oil and gas services companies are involved, to varying degrees, in many of the extraction activities which generate environmental impacts, they can enable improvements in the environmental performance of their customers. As trends such as climate change drive the implementation of more rigorous environmental regulation, E&P companies are increasingly demanding enhanced environmental performance from oil and gas services providers. Service companies that outperform in this regard can gain key business advantages in this highly competitive industry.

Emissions Reduction Services & Fuels Management

Direct emissions and associated regulatory risks for oil and gas services providers are low relative to upstream oil and gas E&P companies. However, oil and gas services companies play a key role in managing the emissions profile of their customers.

Emissions from the operations of their customers can be significant. Emissions include greenhouse gases that can contribute to climate change, as well as other air pollutants that can have significant localized human health and environmental impacts. E&P emissions stem primarily from fuel combustion in stationary and mobile internal combustion engines, gas processing equipment, and venting, flaring, and fugitive methane. The main components of GHG emissions from oil and gas extraction activities are carbon dioxide (CO₂) and methane (CH₄). Typically, natural gas itself is composed of 70 to 90 percent of methane, so methane emissions imply lost revenues for E&P companies. With natural gas production from shale resources expanding, the management of fugitive methane emissions from oil and gas production has emerged as a major operational, reputational and regulatory risk for E&P companies.

Recent regulations also underscore the importance of air emissions management for oil and gas services and E&P companies alike. In 2012, the EPA issued new rules related to New Source Performance Standards (NSPS) for VOCs and National Emissions Standards for Hazardous Air Pollutants (NESHAP). The standards now cover unconventional resource extraction including hydraulic fracturing and related sources such as gas well completions, pneumatic controllers, compressors, and storage vessels. Oil and gas producing companies have a deadline of Janu-
ary 1, 2015, to implement Reduced Emission Completions (RECs), which is a well completion technique that uses specialized equipment to capture natural gas and other emissions from well sites. Some firms have argued that a general undersupply of emission-capturing equipment will limit the speed at which conversions can be made.\textsuperscript{40}

Increasing regulation, public pressure, and high costs of fuels associated with GHG and other air emissions present substantial risk to E&P companies. This is driving them to seek solutions to lower their emissions, including converting pumps and engines to run on natural gas instead of diesel fuel.

Oil and gas services companies compete for contracts with E&P companies partly on the basis of providing cutting-edge, efficient technologies that can help customers reduce costs and improve process efficiencies. Services companies can gain a competitive advantage and protect their revenue and market share by providing customers with services and equipment that reduce the emissions and fuel consumption of E&P operations, and by capturing saleable gas that may otherwise be flared or escape through leaks.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Total fuel consumed, percentage renewable, percentage used in on-road equipment and vehicles, and off-road equipment;
- Description of strategy to address air emissions-related risks, opportunities, and impacts; and
- Percentage of engines in service that meet Tier 4 compliance for non-road diesel engine emissions.

**Evidence**

The relative magnitude of GHG emissions from the oil and gas E&P industry exposes it to direct regulatory risk, from reporting obligations, and more stringent GHG and other air emissions permits programs (for example, cap and trade), at the state, national and international levels. Oil and gas producers are required to report GHG emissions annually to the EPA under the GHGRP at the facility-level when emissions of GHG exceed 25,000 metric tons. Data for 2011 shows that GHG emissions from “Petroleum and Natural Gas systems” were 217 million metric tons CO\textsubscript{2}-equivalent (CO\textsubscript{2}e), accounting for 6.6 percent of the total under the national GHGRP, and ranking second after power plants.\textsuperscript{41} Oil and gas service companies have relatively low direct emissions, but may be affected indirectly by these same, increasingly stringent regulations.

Several companies already recognize these risks in their SEC filings. For example, in its FY 2013
Form 10-K, Schlumberger, one of the industry’s largest companies, mentions that “legislation and regulations that are focused on restricting greenhouse gas emissions (…) may significantly curtail demand for and production of fossil fuels such as oil and gas in areas of the world where our customers operate and thus adversely affect future demand for our services, which may in turn adversely affect our financial condition.” Similar disclosures are made by other major industry players such as Halliburton, Baker Hughes and National Oilwell, to name a few.

Through improved energy efficiency, use of cleaner fuels, or process improvements to reduce fugitive emissions and venting and flaring, oil and gas service companies can provide direct benefits to their customers in the form of lower costs and reduced regulatory risk.

The upstream oil and gas sector’s greatest opportunity for reducing GHG emissions lies in reducing flaring and venting of natural gas at production sites. The entire value chain of natural gas and petroleum systems is the largest source of methane emissions (a more potent GHG than CO₂) from industry in the U.S., and accounts for 30 percent of total methane emissions. Methane emissions from natural gas well sites are generally accounted for under E&P companies’ Scope 1 emissions. However, through provision of cutting-edge methane capturing and leak monitoring and detection services and equipment to meet market demand, service companies have an opportunity to minimize their customers’ fugitive methane emissions and their overall GHG emissions, increase production, and reduce exposure to regulatory risks. At the same time, services companies will benefit from increasing revenues.

Furthermore, according to 2005 EPA data, air pollution abatement costs, including operating costs and capital expenditures, for the petroleum and coal products industry was the highest among all U.S. industrial sectors, comprising approximately 32 percent of the $12.5 billion total air pollution abatement cost for all sectors. This represents both an opportunity and risk for services companies. They can increase revenues by providing additional abatement technologies and processes, as increasingly stringent regulations require higher expenditures from E&P companies on pollution mitigation. At the same time, they will have to compete on providing lower-cost equipment and services, or risk losing market share.

Oil and gas service companies have developed various technologies designed to lower the fuel and emissions intensity of the extraction process. Regarding its environmental stewardship, Baker Hughes states, “Whether we’re advancing the technology for carbon capture and storage, developing low emission fuel additives, or drilling geothermal wells, we’re looking for environmental solutions to meet the needs of our clients and our planet.”

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* The atmospheric lifetime of methane is 12 years and its 100-year Global Warming Potential (GWP) is 21 (i.e. the comparative impact of methane on climate change relative to CO₂), making it a more potent GHG compared to CO₂.
Well sites use largely diesel-fueled equipment; diesel fuel can be expensive. At the same time, rapidly increasing production of natural gas from unconventional plays and constraints on midstream transport infrastructure mean that companies sometimes cannot get the gas to market quickly enough, resulting in significant flaring of gas. This presents an opportunity for lowering emissions and saving costs, by replacing diesel fuel in equipment with gas produced at the well site. Apache Energy, a major U.S. oil and gas producer, partnered with Halliburton and Schlumberger, two of its largest drilling partners, to convert fracking equipment to run on a combination of natural gas and diesel, called dual fuel technology, in order to lower energy costs by as much as 40 percent.47 Similarly, Baker Hughes converted diesel pumps to run on natural gas at a well site in Texas in 2012. The conversion reduced GHG emissions by 20 percent and cut diesel use by 65 percent at the well site.48

Furthermore, carbon sequestration (carbon gases are pressurized and injected into underground rock formations) is of growing interest to regulators and the oil and gas industry. Schlumberger is one of the top research and development spenders on carbon sequestration.49

**Value Impact**

Oil and gas service companies have a direct role in managing air emissions from their own operations and those of exploration and production companies. For E&P companies, regulatory compliance may include capital expenditures for emissions reduction equipment, while operating costs could rise. Regulation may also lead to higher fuel or energy costs. A strong portfolio of emissions management services and equipment could therefore lead to higher revenues and enhanced reputation for services companies. In the longer term, competitive advantages generated by superior environmental performance can improve cash flows and credit profile.

**Water Management Services**

Oil and gas extraction often requires large quantities of water, exposing producers to the risk of reduced water availability, regulations limiting usage, or related cost increases, particularly in water-stressed regions. Producers also face risks and costs associated with wastewater disposal. Companies in the Oil & Gas Services industry have developed technologies and processes such as closed-loop water recycling systems to reduce customers’ water consumption and disposal costs. These offerings provide service companies the potential to gain market share and increase revenues, as management of drilling and waste water is emerging as a major concern for their customers.

While water has historically been an abundant commodity in many parts of the world, it is increasingly becoming a scarce resource, due to population growth and rapid urbanization,
and potentially shifting supply due to climate change. It is estimated that by 2025, important river basins in the U.S., Mexico, Western Europe, China, India, and Africa will face severe water problems as demand overtakes renewable supplies. Many important river basins can already be considered “stressed.” Water scarcity can result in higher supply costs and risks of shortages for companies with water intensive operations.50

Water management is an important consideration for service companies, especially in on-land hydraulic fracturing, given the high volumes used and the potential for groundwater contamination. U.S. Department of Energy figures show that the global oil and gas industry produces two to three times more water than oil.51 Proper water management in water-stressed regions is especially critical due to social and environmental externalities. Oil and gas services companies that provide hydraulic fracturing services face direct risks to their revenue streams when serving customers in water stressed regions.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Average volume of water used per volume of gas or oil extracted, broken down by fresh water and recycled water use; and

- Description of strategy to address water consumption and disposal-related risks, opportunities, and impacts.

Evidence

According to a 2014 Ceres report which surveyed 39,294 oil and gas wells in the U.S., water sourcing risks generally fall under three main categories – physical, regulatory, and reputational. Physical risks, defined as the lack or overabundance of water in a particular region and its resulting impacts on water access and quality, are the most prominent. The top three oil and gas services firms by revenue – Schlumberger, Halliburton, and Baker Hughes – collectively account for 55 percent of all hydraulic fracturing wells and are responsible for approximately half of all water used in fracking in the U.S.52 Ceres’ survey estimates that nearly half of the wells are located in areas with “high and extremely high” water stress and that the majority of the top 10 service providers operations are located in “medium or higher” water stress regions. Water scarcity concerns have led to bans on fracking in specific regions; for example, mounting drought concerns in Grand Prairie, Texas, caused the city to ban entirely water use in fracking in 2011.53

On average, one to eight million gallons of fresh water are used to frack a well once, depending on the type of rock formation and how many times the well is stimulated. Of the amount injected, roughly 80 percent remains trapped in the well. The remainder flows back to the surface as “flowback water” shortly after the well stimulation is completed.54 Produced water, on the other hand, flows from wells continuously while production is ongoing, and can be treated and reused in fracking operations.55
Traditional water disposal and treatment systems include biological and chemical treatment, landfill disposal, filtration, thermal separation, or injection into underground formations. Waste injection disposal has grown in popularity in the U.S. as onshore fracking boomed, creating a surge in waste water generation. Impermeable rock formations prevent water pumped into injection wells from entering groundwater or seeping to the surface.

Class II waste injection wells and are regulated by the EPA’s Underground Injection Control Program (UIC). There are approximately 144,000 class II wells in operation in the U.S., with daily injection of over 2 billion gallons (2012 data). Class II wells are used for Enhanced Oil Recovery (EOR), waste disposal, or hydrocarbon storage.

Injection of contaminated waste water may have significant environmental or human health consequences if well casings or cement seals fail. A 2007-2010 review of more than 220,000 well inspections in the U.S. found that on average one well integrity violation was issued for every six examined. This practice will likely come under increased scrutiny in the future, perhaps requiring alternative water disposal methods.

Extraction water costs include surface transportation, treatment, recovery, and disposal, while excess water entering active wells reduces oil and gas output. Water pollution costs for E&P operators can be high: XTO Energy was required to spend approximately $20 million to improve waste water disposal systems after the EPA discovered that the company had released between 6,300 and 57,373 gallons of water contaminated with strontium, bromide, barium, chloride, and other dissolved solids into the Susquehanna River watershed for more than two months in 2010, in violation of the CWA. The company was also required to recycle at least 50 percent of its operation wastewater thereafter. These risks to E&P companies create a demand for improved water management services.

Water presents a business opportunity to oil service companies due to their direct involvement in many aspects of water management; as a result, some companies are innovating on water management technology. Water management technologies aim to lower water needs per well and reduce the amount of produced water generated in order to lower disposal and treatment costs, improve the oil-to-water ratio, and comply with regulatory requirements. For example, a field test of Halliburton’s CleanWave Water Treatment service saved over 800,000 gallons of water and generated between $500,000 and $700,000 in savings for an oil and gas operator in the U.S. Permian Basin.

Schlumberger has developed a more water efficient fracking method that pumps proppant in pulses, improving fissure flow and durability. A 60-day case study in the Eagle Ford Formation in Texas revealed some of the benefits of the new process: oil and gas production rose by 43 percent and 61 percent, respectively; five
million gallons of water was saved per well; proppant usage fell by 35 percent; and fracturing fluid consumption dropped by 58 percent.61

Value Impact
Service companies that are able to reduce water use per well and enable recycling of produced water and other wastewater can increase their revenue-generation potential, by reducing risks to their E&P customers and meeting market demand in relation to water management. While negative financial impacts on service companies from water use and contamination are generally limited by the contracts that bind service companies with primary producers, it is possible that future changes to the regulatory code will expose service companies to costly regulation provisions.

Chemicals Management
Oil and gas services companies manufacture and sell drilling and hydraulic fracturing fluids for use in oil and gas extraction. They may also provide oilfield and drilling services that use fracking fluids supplied and owned by E&P operators. While the risk of groundwater contamination from a properly drilled well is low, contamination of water resources can result from contact with hydraulic fracturing fluids and produced water. Concerns about certain chemicals used in hydraulic fracturing fluids have led to fracturing bans, regulation, and legislative proposals for disclosure of chemicals used in some regions, both domestically and abroad.

The exact chemical composition of hydraulic fracturing fluids is often proprietary information, and companies compete on creating the most effective formulas. In the U.S., some companies are voluntarily disclosing hydraulic fracturing chemicals through an industry registry, FracFocus. Under increasing public and regulatory pressure in the U.S. and abroad against drilling fluid toxicity, companies that produce effective, non-hazardous chemical formulas can lower the risk of regulations affecting demand for their products. In fact, they may be able to increase their market share and revenues. Efficiency in the use of fracking fluids during extraction can also help to limit operational risks.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Average amount of fracking fluid and proppant consumed per volume of gas or oil extracted;
- Percentage of hydraulically fractured wells for which there is public disclosure of all fracking fluid chemicals used; and
- Description of strategy to address chemical-related risks, opportunities, and impacts.
Evidence

The use of fracking fluids containing harmful chemicals is an area of increasing concern in many U.S. counties and other regions internationally where fracking occurs. A Congressional study shows that between 2005 and 2009, oil and gas companies used fracking products containing 29 chemicals that are known or possible human carcinogens, regulated under the Safe Drinking Water Act for their human health risks, or listed as HAPs under the CAA. The exact chemical composition of fracking fluids is often proprietary information, and was not previously disclosed, as it was treated as a trade secret. This made it difficult to assess the impacts on water quality from fracking operations.

Regulators have sought to address these concerns through several actions and proposed rules, with potential for significant costs and business risks to oil and gas services companies. Despite the 2005 federal Safe Drinking Water Act exemption for underground injection of chemicals, at the state level, 17 states representing 96 percent of unconventional production have fracking regulations that address the issue of chemicals disclosure. In September 2009, the New York State Department of Environmental Conservation released draft permit conditions that would require disclosure of chemicals used, specific well-construction protocols, and baseline pre-testing of surrounding drinking water wells.

Since then, federal agencies have also taken action to investigate and introduce new rules on chemicals disclosure. The BLM’s proposed rules for fracking on federal and Indian lands, released in May 2013, deal with the disclosure of chemicals used in fracking. Under the proposed rules, BLM would have the ability to demand the specific chemical details of any materials being proposed for trade secret exemption. The rules also address well construction and integrity testing to ensure fluids used in fracking are not contaminating groundwater.

Wells located on federal lands account for 13 percent of U.S. natural gas production. These rules are therefore expected to impose significant costs on companies. The BLM estimates annualized costs to the Oil & Gas industry of only between $12 million to $20 million; other cost estimates vary widely and are much higher, with some industry players estimating costs of $345 million per year, including lengthy production delays. Other cost estimates range from $2.7 billion to $12 billion.

The EPA is also expected to propose rules in 2014 regarding chemical disclosures and control of wastewater discharge, in addition to completing its study on risks to drinking water from fracking, which could result in additional rulemaking. These are likely to apply more broadly to any company conducting fracking, not limited to federal lands.
Furthermore, in May 2014, the EPA announced that it will seek public comment for an Advance Notice of Proposed Rulemaking surrounding disclosure of hydraulic fracturing chemical formulas under the TSCA.\(^9\)

In the short term, required chemical disclosure may reduce or eliminate the proprietary advantages that some services companies have due to their drilling fluid formulas, while companies may have to develop alternatives to harmful chemicals, if present. Elsewhere, under its REACH program (see Legislative and Regulatory Trends section above), the European Commission has warned that the use of some fracking chemicals may be illegal in the EU.\(^0\)

Were certain drilling chemicals to be banned from use in Europe or other markets, oil service companies may experience operational difficulties, or higher costs.

Disclosure on chemicals could help oil and gas services companies and their customers comply with evolving regulations on the topic. It is unclear whether or not some chemical substances may be banned from use. Regulatory trends, such as the EPA’s TSCA announcement, suggest that disclosure may ultimately become mandatory.

Some industry players recognize risks stemming from this issue in their SEC filings and are beginning to take proactive steps in disclosing chemicals used and minimizing fluid use in services. In its FY 2013 10-K, Baker Hughes states that, “Some federal, state, and foreign governmental bodies have adopted laws and regulations or are considering legislative and regulatory proposals that, if signed into law, would among other things require the public disclosure of chemicals used in hydraulic fracturing operations…”\(^1\)

Similarly, Halliburton mentions in its FY 2013 Form 10-K: “We have made detailed information regarding our fracturing fluid composition and breakdown available on our internet web site. We also have proactively developed processes to provide our customers with the chemical constituents of our hydraulic fracturing fluids to enable our customers to comply with state laws as well as voluntary standards established by the Chemical Disclosure Registry.”\(^2\)

In an effort to address public and regulatory concern, more companies are developing safer drilling fluids and improving public disclosure of chemical use. Baker Hughes announced in April 2014 that it would disclose all of the chemicals in its hydraulic fracturing fluids.\(^3\)

Meanwhile, the company offers a water soluble friction reducer that lowers the amount of chemical needed. The product is specifically qualified by the Center for Environment, Fisheries & Aquaculture Science for use in environmentally sensitive regions in Canada, the North Sea, the U.S., and elsewhere.\(^4\) Similarly, Halliburton’s CleanStim hydraulic fluid service applies drilling fluids made from chemicals used in the food industry, which the company says provides an added margin of safety from environmental and human health impacts.\(^5\)
**Value Impact**

The use of hazardous chemicals in oil and gas extraction can increase regulatory risk due to environmental and human health externalities, including groundwater contamination. Companies may face legal challenges, resulting in increased contingent liabilities. The introduction of regulatory requirements to disclose chemicals used in drilling in one or more areas of operations can result in a curtailment of business activity, with an acute impact on revenues. Similar impacts can result if certain chemicals are banned from use.

Conversely, companies that develop safe alternatives can achieve competitive advantages and long-term revenue growth as E&P companies seek to minimize risks from chemicals used in fracking and other drilling technologies.

**Ecological Impact Management**

Oil and gas extraction activities can have significant impacts on biodiversity and ecosystems, particularly when companies operate in ecologically sensitive areas or have resource-intensive operations, such as oil sands extraction. These impacts include habitat loss and alteration through land use for exploration, production, disposal of drilling and associated wastes, and decommissioning of wells. Many species and habitats are also threatened by oil spills and leaks.76

Oil and gas E&P operations can generate significant wastes, the primary categories being produced water (discussed above under “Water Management Services”), drilling waste, which includes rock cuttings and fluids produced from drilling a new wellbore, and associated wastes, which cover a variety of small waste streams. While operational best practices have reduced the amount of waste generated over time, waste from operations can nonetheless affect biodiversity. The large volumes of drill cuttings, along with potentially hazardous substances in the muds that coat the cuttings as they are extracted, can make disposal of such waste challenging, particularly for offshore operations.77

Furthermore, decommissioning of onshore and offshore oil and gas wells can have negative environmental and social impacts if not properly managed, including land use impacts, soil and groundwater contamination, and erosion.78

Areas such as the Arctic and certain shorelines with mangroves and swamps are highly ecologically sensitive, and externalities from E&P or service company operations in these areas can be extremely damaging to biodiversity and ecosystems. Operations in these areas also entail more complex and expensive cleanup operations should there be hydrocarbon spills or leaks. As oil and gas companies attempt to access more remote, ecologically sensitive locations like the Arctic and deep-water resources and develop unconventional resources, such as oil sands requiring larger land area and gener-
ating more waste, risks that E&P operations will affect biodiversity could be exacerbated.

Significant spills or explosions as a result of accidents can also affect biodiversity, and therefore company value. Such significant risks, with low probability of occurrence but high potential impact, are discussed under the disclosure topic of “Health, Safety, and Emergency Management.”

Producers and service companies face regulatory risks from legislation and permitting to protect ecosystems in the U.S. and abroad, and from regulations specifically related to well decommissioning or underground waste injection. For oil and gas services companies, material impacts could arise in the event of environmental contamination as a result of their manufacturing operations or services, creating remediation obligations. Services companies may also be affected due to an impact on demand for their services as a result of government regulations limiting development of hydrocarbon resources in ecologically sensitive areas.

Oil and gas services companies have an opportunity to offer cost-effective and efficient production and decommissioning technologies and services that mitigate impacts on biodiversity by reducing land use, drilling wastes, and spills. In this way, they can lower associated risks for themselves and their customers and gain competitive advantage, allowing them to expand revenues.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Average disturbed acreage per oil and gas well site; and
- Description of strategy to address risks and opportunities related to ecological impacts from core activities.

**Evidence**

Services companies can face both direct remediation liabilities as a result of their operations, as well as indirect impacts on demand for their services as a result of their performance on ecological impact management in field services.

Oil and gas services companies could face material regulatory risks related to ecological impacts from the storage, transportation, and disposal of fracking fluids, chemicals, and wastes. In April 1998, Doyon Drilling, Inc. pleaded guilty to 15 counts of violating the Oil Pollution Act of 1990. The company, which was contracted by BP to drill wells in the Beaufort Sea off Alaska, had illegally disposed of waste oil and hazardous substances by injecting the waste around the outer rim of oil wells on Endicott Island. The waste in this case included waste oil, paint thinner and toxic solvents containing lead and chemicals such as benzene, toluene, and methylene chloride, constituting illegal disposal under the RCRA.
Doyon paid a $1 million fine and spent $2 million on an environmental compliance program and employee training. In February 2014, the Pennsylvania Department of Environmental Protection fined Halliburton $1.8 million for numerous violations related to processing, disposing, and transporting hydrochloric acid without properly classifying it as a hazardous material.

Service companies may also face significant legal obligations under CERCLA. Halliburton reported that in 2012, its subsidiaries were named as potentially responsible parties along with other third parties for nine federal and state Superfund sites. The company established an environmental reserve of around $6 million in relation to those sites. Halliburton highlighted that it may be liable for amounts in excess of the $6 million, due to additional regulatory action or third party claims.

While media attention from the Deepwater Horizon focused mainly on BP, an E&P firm, several oil and gas services companies were also accused of wrongdoing and negligence that led to the spill’s environmental and social damages. After years of litigation not all charges have been upheld, but, notably, Transocean Deepwater Inc. was penalized with the second largest environmental fine in U.S. history (second only to the $4 billion fine on BP) for its role in the event. The company was required to pay $400 million and other penalties for violations of the CWA.

Furthermore, oil and gas services companies may be contracted to provide decommissioning or waste management activities. Decommissioning can be expensive for E&P companies, and inadequate well decommissioning could create material liabilities for them from ecological impacts. For example, a 2010 study of decommissioning costs for oil and gas facilities in the Pacific OCS region shows that estimated costs for 23 OCS platforms were in the range of $12 million to $156 million, with the total cost for all platforms being around $1.3 billion.

Oil and gas services companies that enable their customers to reduce these costs while minimizing risks and environmental liabilities could benefit from increasing demand for their services.

Drilling waste management can require large areas of land and wastes may contain harmful substances, which can lead to ecological impacts. The accumulated volume of solid drilling waste from the Oil & Gas industry is estimated to be approximately 140 million barrels per year, enough to fill almost 9,000 Olympic swimming pools. According to a 1995 API survey (most recent year for which data was available), 68 percent of drilling wastes are buried or evaporated onsite. Only 25 percent of new wells were drilled with a closed mud system, which did not require reserve pits to store and dispose of used drilling muds and cuttings. This indicates a potential for improved operational efficiencies, including reuse or recycling, and minimizing generation of new wastes.
Cognizant of the increasing waste handling challenges that E&P customers face, some services companies provide waste management services. Baker Hughes provides a Fluids Environmental Service, which addresses the complete oil and gas industry waste management cycle. The service covers solids control, cuttings reinjection and conveyance, cuttings processing, and liquids processing. Some of the benefits are said to include reduced mud losses and local disposal of cuttings with minimal environmental impact. The company's Eco-Centre facility located in Scotland processes drill cuttings to reduce oil content to less than 0.5 percent, allowing for disposal in approved landfills.

Services companies can also enable E&P customers to reduce their ecological impacts by developing more efficient drilling technologies and processes that minimize land use. Typically, operators will clear three to five acres of land for a new well pad, including space for wellheads, flowback water pits, drill cuttings, produced water, pumps, generators, and vehicles. Acreage may vary from region to region and well to well.

Advances in angular and horizontal drilling (together called directional drilling) have reduced the number of surface well pads required in hydraulic fracturing extraction since multiple well bores can be drilled from one pad. These techniques reduce the acreage of land that must be cleared for a wellsite and access roads. Furthermore, limiting the number of traditional vertical wells reduces the risk of groundwater contamination because there are fewer direct well bores piercing the water table. However, ecological concerns about E&P operations continue, providing service companies with the potential market opportunity to offer advanced technologies that minimize land use and related ecological impacts.

Most services companies identify risks from this issue in their SEC filings. For example, Schlumberger reports in its FY 2013 Form 10-K that environmental laws, and their requirements, are becoming “increasingly complex, stringent and expensive to implement” and that these laws may provide for “strict liability for remediation costs, damages to natural resources or threats to the public.”

**Value Impact**

Ecological impact management can have both direct and indirect impacts on service company operations. Direct impacts can arise from environmental remediation responsibilities, which can create significant contingent liabilities. Companies can also face one-off costs due to regulatory penalties or lawsuits.

A strong ecological management record and product and service offerings that reduce clients’ ecological impacts can lead to higher pricing power and expanded market share. This can affect the long-term revenue growth of service companies.
**HUMAN CAPITAL**

Human capital addresses the management of a company’s human resources (employees and individual contractors), as a key asset to delivering long-term value. It includes factors that affect the productivity of employees, such as employee engagement, diversity, and incentives and compensation. It also includes the attraction and retention of employees in highly competitive or constrained markets for specific talent, skills, or education. Furthermore, human capital issues address the management of labor relations in industries that rely on economies of scale and compete on the price of products and services. Lastly, they include the management of the health and safety of employees and the ability to create a safety culture for companies that operate in dangerous working environments.

Extraction activities involve harsh working environments and drilling flammable oil and gas under high pressure. This poses significant health and safety risks for workers. A safety culture is critical to proactively guard against accidents or other incidents with negative environmental and social impacts. A company’s ability to protect employee health and safety and to create a culture of safety for employees at all levels of the organization can directly influence the results of its operations.

Company performance in ensuring workforce health and well-being and process safety, as well as preparedness for emergency situations such as catastrophic releases of hazardous substances, is addressed by the disclosure topic of “Health, Safety, and Emergency Management.” The topic is discussed under the Leadership and Governance category of issues below, as the safety culture of an oil and gas services company can impact both environmental and social capitals, in addition to its human capital.

**LEADERSHIP AND GOVERNANCE**

As applied to sustainability, governance involves the management of issues that are inherent to the business model or common practice in the industry and that are in potential conflict with the interest of broader stakeholder groups (government, community, customers, and employees) and, therefore, create a potential liability, or worse, a limitation or removal of license to operate. This includes regulatory compliance, lobbying, and political contributions. It includes risk management, safety management, supply chain and resource management, conflict of interest, anti-competitive behavior, and corruption and bribery.

Oil and gas services companies operate globally; customers include foreign state oil companies and companies that are subject to less stringent corruption and bribery regulation, or where illegal business activity is relatively more common. Maintaining strong corporate oversight of business ethics can better protect shareholder value.
Due to its environmental and social externalities, the industry is subject to multiple current and proposed regulations as previously discussed. Some special interest groups and corporations advocate on behalf of the industry regarding regulatory policy. Sustainable management of regulatory and political influence includes consideration of long term social and environmental externalities due to this influence.

Furthermore, management of complex, potentially dangerous oil production is paramount to preventing accidents that can impact human populations and the environment. Companies that successfully minimize the occurrence of accidents are better positioned to protect shareholder value.

**Business Ethics & Payments Transparency**

With operations across the globe, oil and gas services companies interact with many government and local officials, either directly or through agents, in order to secure contracts with state-owned oil companies and multinational corporations. Bribery and corruption are common in some regions, and in others, taxes and other payments to governments may not be used for the benefit of the local population. Enforcement of anti-corruption, anti-bribery, and payments-transparency laws and initiatives in the U.S. and abroad could lead to significant one-time costs, or higher ongoing costs. Violations of these laws and initiatives could even affect a company’s social license to operate. Oil and gas services companies are under pressure to ensure that their governance structures and practices can address corruption and willful or unintentional participation in illegal or unethical payments to government officials or private persons, or in unfairly influencing them through gifts or other means. Operating in corruption-prone countries can exacerbate the risk.

Oil and gas services companies face pressure from U.S. regulators and international governments to reduce occurrences of bribery and corruption. The industry depends on contracts, licenses, and permits from companies, governments or government agencies to work for national oil companies or private E&P firms. Vast networks of agents are hired to develop industry contacts. Bribery is viewed as standard business practice in some foreign markets, however it distorts market prices for services and diminishes competitiveness.

Business ethics and transparency in payments to governments or individuals are likely to be material to companies in this industry due to the importance of government relations for the conduct of business, and the emergence of several anti-corruption, anti-bribery and payments-transparency laws and initiatives in the U.S. and globally. These include: the United Nations Global Compact: 10th Principle; the World Economic Forum’s (WEF): Partnering against Corruption Initiative (PACI); the
Organization for Economic Co-operation and Development (OECD) Guidelines; the Extractive Industries Transparency Initiative (EITI); and both the U.K. Bribery Act and the U.S. Foreign Corrupt Practices Act (FCPA), among others.  

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Amount of net revenue in countries that have the 20 lowest rankings in Transparency International’s Corruption Perception Index; and

- Description of the management system for preventing corruption and bribery throughout the value chain.

**Evidence**

The U.S. government has been using the FCPA to enforce anti-corruption in the oil and gas industry since the late 1970s. Recently, however, there has been increased discussion around anti-corruption regulations and disclosure requirements. In August 2012, for example, the SEC issued a rule to implement Section 1504 of the Dodd-Frank Act, which requires any companies that file an annual report with the SEC to separately file a certified report of all payments totaling $100,000 or more made to the U.S. or a foreign government to develop projects. Although this rule was vacated by the U.S. District Court for DC in July 2013 the SEC said it would try to rework its proposal to address shortcoming identified by the ruling.

On a company-specific level, Baker Hughes admitted in 2007 to bribing numerous foreign officials in five countries in connection with securing contracts. A $41 million fine was levied against the firm, and a third-party company was assigned to monitor company payments in the future. In addition, the company was forced to sever ties with most of its vast network of foreign agents who helped the company secure new business abroad. As a result of this incident, Baker Hughes greatly strengthened its governance disclosures to investors.

Moreover, in December 2010 Halliburton agreed to pay $35 million dollars, including $2.5 million of legal fees, to the Nigerian government in order to settle bribery allegations related to the construction and expansion of its Bonny Island natural-gas liquefaction facility. Even though the charges were dropped and no further criminal and civil charges were filed by the Nigerian government, this case indicates that the actions of subsidiaries and contractors may affect the company’s value through litigation-related costs, because regulators are focusing on investigating bribery and corruption allegations in the oil and gas sector.
Weatherford International, an oil and gas drilling services company, was ordered in early 2014 to pay nearly $253 million to settle U.S. investigations into foreign bribery and trade sanction violations. After the investigation, the SEC concluded that the nonexistence of internal controls at the company fostered an environment where firm employees across the globe engaged in unlawful bribery acts. Among the allegations, the SEC claimed that Weatherford earned $59.3 million in profit from business obtained through bribes, and that Weatherford subsidiaries obtained $118 million in revenue in countries where it was illegal for U.S. companies to operate.93

It is common for some extractive companies, including those in the Oil and Gas industries, to recognize risks stemming from anti-corruption and anti-bribery laws in their SEC annual filings. Most of them, however, provide boilerplate language in the context of increasingly stringent regulations in the U.S. and abroad (mainly referencing the FCPA and the UK Bribery Act). Some companies go further in discussing the implementation of internal control and training policies and procedures on the topic and only a few provide comparable information. For example, in its FY 2013 Form 10-K Baker Hughes uses a slightly modified version of one of the proposed performance metrics mentioned above. The company mentions that they do business in over 80 countries around the world, “including approximately 19 of the 40 countries having the lowest scores in the Transparency International’s Corruption Perception Index survey for 2013.”94 All companies that provide disclosure on the topic, however, agree that violations of anti-corruption and anti-bribery laws can result in criminal and civil sanctions that could have a material adverse effect on their business, consolidated results of operations or consolidated financial condition.

Value Impact

Companies can benefit by carefully crafting their government involvement strategy, and regularly re-assess their anti-corruption risk and implement compliance programs. The loss of foreign business networks can significantly harm new commercial prospects, lowering revenues and leading to lost market share.

Health, Safety, and Emergency Management

Maintaining workforce health and safety is especially challenging in the Oil & Gas Services industry due to the harsh working environments and hazards of handling chemicals and hydrocarbons. In addition to acute impacts, workers may develop chronic health conditions as well as mental health problems, the latter especially when working in offshore locations. A company’s ability to protect its workforce
health and safety and to create a culture of safety and well-being among employees at all levels can help prevent accidents, mitigating costs and operational downtime, as well as enhance workforce productivity. High accident or fatality rates can lead to lost business, as safety performance is one of the criteria typically used by E&P customers to hire services companies.

Moreover, the risk of technical failures during oil and gas extraction is high due to inherent operational complexities and hazards, exposing oil and gas service companies to significant potential liability, related to both the environment and human health. Oil and gas services providers compete on the ability to perform activities on a consistently safe basis, with instances of spills, leaks, injuries, and fatalities closely monitored. A strong safety culture and emergency management systems can help reduce the occurrence of and financial and reputational risks of accidents, and improve competitive position.

Despite extensive industry-wide training and safety precautions, and due to the intrinsic nature of operations, injury and fatality rates remain a concern for the oil and gas companies, including those in the services industry. This is particularly true after highly publicized events like the Deepwater Horizon oil spill in 2010. Companies that can lower their non-fatal and fatal injury rates, implement successful policies and training programs focused on employee health and safety, process safety, emergency preparedness and response may be better able to protect shareholder value both in the near- and long-terms.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Injury, fatality and near miss frequency rates, and vehicle incident rate, for full-time, contract, and short-service employees; and
- Discussion of management systems used to integrate a culture of safety and emergency preparedness throughout the value chain and project lifecycles.

Evidence

Many of the top companies in the industry recognize in their latest Form 10-Ks that there has been heightened public focus on the safety of the oil and gas industry as a result of the 2010 Deepwater Horizon incident in the Gulf of Mexico. This increased focus is centered on an industry with already risky operations. A Bureau of Labor Statistics (BLS) and Center for Disease Control (CDC) report found that during 2003-2010 the U.S. onshore and offshore oil and gas extraction industry (including E&P companies, drilling contractors and well-servicing companies) had a collective fatality rate seven times higher than for all U.S. workers: 27.1 versus 3.8 deaths per 100,000 workers. According to BLS data, the fatality rate for the Oil & Gas Services industry in 2011 alone was 33 per 100,000 workers, more than nine times the average rate for all industries.
Offshore operations were the main focus of the BLS/CDC report which found that there was a statistically significant increase in the number of fatalities per rig. Interestingly, the report found that “despite a 63 [percent] decrease in the number of active offshore drilling rigs during 2003–2010, the number of annual fatalities during offshore operations remained stable.” A total of 87 fatalities occurred in the oil and gas industry during this period. Of this number, 79 percent of workers were employed by oil well drilling and services companies. The leading causes of these accidents were transportation events followed by injuries caused by equipment, fires and explosions, and exposures to harmful substances or the environment. Many oil and gas services workers are hired as contractors, both to E&P employers and oil service companies. Contract workers are approximately twice as likely to be involved in fatal accidents as company employees.

In January 2013, concerned about the industry’s safety record, the U.S. Department of Labor’s Occupational Safety and Health Administration (OSHA) called for a voluntary “stand down” for all oil and gas employers in fields all across Texas and four other states to draw attention to potentially life-threatening risks. Furthermore, in 2012, OSHA implemented a Regional Emphasis Program (REP) in several of the most active unconventional oil and gas drilling regions in the U.S. in response to heightened safety concerns at fracking sites. The REP expands the frequency of facility and safety code inspections. In May 2014, the Obama administration directed OSHA to investigate health and safety risks of fracking after four fracking-related deaths in North Dakota and Montana since 2010. OSHA also directed drilling companies to determine potential risks of exposure to fracking chemicals and hydrocarbons, and recommended additional hazard awareness training and alternative fluid storage methods.

Oil and gas industry workers, including those in services firms, are not just exposed to physical risks during their daily operations. Studies suggest that offshore oil workers exhibit significantly higher anxiety levels than onshore workers, and behaviors and attitudes associated with heart disorders (e.g. “Type A coronary-prone behavior”) were found to be a significant predictor of reduced mental well-being and increased accident rates offshore. Ensuring the physical and mental well-being of workers is particularly important in an industry where there is high competition for talent.

Implementing policies, training programs, and other actions to achieve a strong corporate safety culture is essential to reduce risks to a company’s workforce, operations, and financial condition. Moreover, due to the nature of the industry, oil and gas services companies need to collaborate with E&P and other services firms to reduce these risks. Investigations of the April 2010 Deepwater Horizon oil spill revealed that two oil and gas services companies, Transocean and Halliburton, “lost sight of operational risk, compartmentalizing information that would have been useful to other companies carrying out their respective tasks.” Halliburton, which was hired to cement the faulty well, ran initial cement quality tests that revealed flaws in the product’s quality. Despite these findings, the cement was used in the well and may have contributed to the catastrophic blowout. Halliburton also failed to
alert BP of the test results. Eleven workers were killed in the blowout: two were employed by a subsidiary of Schlumberger, and nine were Transocean employees.

Since 2011, E&P firm BP has accrued over $42 billion in potential loss reserves related to the incident. The company in turn is seeking approximately $40 billion in damages from Transocean, Halliburton and Cameron International. Most recently, in April 2013, the state of Florida filed a lawsuit against both BP and its contractor Halliburton over the 2010 oil spill demanding over $5 billion for “misconduct that led to this environmental and economic disaster.” While some of these litigations have been dismissed – Cameron International was dismissed from all claims in April 2013 – reputational damages and costly litigation costs are likely to affect a company’s performance.

Most companies in the industry talk about the importance of health, safety, and emergency preparedness in their Form 10-Ks. Schlumberger, for example, mentions in its FY 2013 Form 10-K that their operations “involve production-related activities, radioactive materials, explosives and other equipment and services that are deployed in challenging exploration, development and production environments (...) accident[s] involving these services or equipment, or a failure of a product, could cause personal injury, loss of life, damage to or destruction of property, equipment or the environment, or suspension of operations.” The potential negative impact of safety management is described by Halliburton in its FY 2013 Form 10-K when discussing the Gulf of Mexico incident. The company informs its shareholders that the spill resulted in offshore drilling delays, temporary drilling bans, and increased federal regulation of their own and their customer’s operations.

Value Impact

Companies may face significant litigation and regulatory liabilities, increased compliance, insurance, and remediation costs, and damage to reputation from accidents related to poor safety management. A poor accident record may reduce revenues as customers seek to hire companies with strong accident management. This can lead to reduced cash flows and damaged credit profile. Companies with high risk of costly process safety incidents may face higher borrowing costs. Conversely, companies with strong process safety performance may benefit from increased business and lower operating costs. Higher revenues and reduced costs improve profits and credit risk.

Management of the Regulatory & Legal Environment

Political contributions and lobbying are an important component of how some companies manage their legal and regulatory environment. Furthermore, companies may engage in regulatory capture. This occurs when special interest groups influence policymaking and regulation through implicit biases. These are groups who have significant resources and a stake in the regulation of their industry. In more extreme cases companies may offer
bribes or other payoffs to regulators or policymakers. These actions can sometimes lead to negative social and environmental impacts. For example, in oil and gas, Minerals Management Service’s capture and failure is associated with the 2010 Deepwater Horizon oil rig fire and subsequent spill.\textsuperscript{108}

Companies in the Oil & Gas Services industry spend significant sums of money on lobbying and campaign contributions related to climate change and other environmental laws or regulations (such as those related to fracking fluids and waste management). They may also benefit, at least in the short term, from otherwise influencing regulators and policymakers on these issues. Such actions and subsequent changes or delays to regulations may lead to positive outcomes for oil and gas services companies and their shareholders in the short term. However, their broader societal implications could create medium- to long-term regulatory and reputational risks with a negative impact on value.

The scientific consensus is that human-induced climate change is occurring. As a result, there is a need for urgent action to curb emissions to acceptable levels. So, efforts to delay or loosen climate-related regulations may prove counterproductive to the industry in the medium to long term by creating regulatory, and therefore demand, uncertainty. Efforts to influence other environmental regulations unfairly, such as those regulations related to fracking fluid use, could affect companies’ reputation and social license to operate.

Companies with a clear strategy for engaging policymakers and regulators that is aligned with their goals and activities for long-term sustainable outcomes, and accounts for societal externalities, could benefit from a stronger, long-term license to operate. Such companies will likely be better prepared for medium- to long-term regulatory adjustments to deal with high-impact issues such as climate change and water scarcity and contamination. Such companies could thereby achieve a lower risk profile relative to peers.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Total amount of spending on political campaigns, lobbying, and contributions to tax-exempt groups including trade associations; and
- Five largest political, lobbying, or tax-exempt group expenditures.

**Evidence**

Oil and gas services companies, together with other oil and gas firms, are heavily involved in lobbying and campaign contributions. Oil and gas companies spent about $145 million on lobbying in the U.S. in 2013. The Oil & Gas industry was the third highest (out of 121) in terms of its total lobbying expenditures for 2013. Lobbying expenditures from the industry have increased substantially since the early 2000s, and have remained at higher levels in the past few years.\textsuperscript{109} One estimate suggests that Weatherford International spent around
In fact, as growing concern about fracking demonstrates, the Oil & Gas Services industry can come under pressure over time due to exemptions gained previously for laws related to waste management and water quality (such as those discussed in the Legislative and Regulatory Trends section). As discussed previously, despite the exemptions, new legislative and regulatory proposals and the introduction of increasingly stringent rules related to these issues are beginning to affect company value.

Furthermore, there appears to be strong investor interest in the issue. Between 2011 and 2013, the SEC received a record-breaking 643,599 comment letters on a petition calling for a corporate disclosure rule on political contributions and lobbying. A majority of comments support the rule.116 (Note that this was not industry-specific). Services companies have also faced shareholder resolutions on their political contributions, with strong and increasing votes in favor. For example, Proxy Monitor data shows that in 2009, 2010, and 2011, shareholder proposals on political spending at Halliburton received votes in favor of 24 percent, 32 percent, and 34 percent, respectively.117

After signaling that it might consider formally proposing a rule, the SEC recently dropped the issue from its list of priorities for 2014, along with some other issues. Despite this, the agency is not precluded from acting on the matter. There are also some other initiatives underway to require disclosure on the issue, including legislation introduced by some senators. The Treasury Department indicates that it might restrain certain tax-exempt groups if they do not disclose their donors.118

$1.09 million on lobbying in 2013, Halliburton, around $400,000, and National Oilwell Varco, around $300,000.110

There is debate about how lobbying efforts and campaign contributions impact companies. In the current economic and political environment, more money is flowing into politics. So, if companies are seen as having undue influence on regulators and policymakers, they are likely to face reputational harm. For example, few public companies have directly contributed to super PACs, a practice now permitted under the Supreme Court’s Citizens United decision. Instead, they have made contributions to trade associations and industry groups engaged in lobbying efforts, possibly due to concerns that this could damage their brand.111 Reputational impacts are especially relevant in cases where lobbying campaigns are misaligned with corporate social responsibility initiatives.112, 113

The SEC has previously recognized that political activity may be significant to an issuer’s business, even if this is not apparent from an economic viewpoint.114 According to an article by the New York Times, while companies that lobby intensely outperform those that do not, “the evidence suggests most companies do not get any return from their lobbying expenditures.”115 Therefore, without demonstrating a clear link between lobbying and political expenditures and positive, long-term outcomes for shareholder value, oil and gas services companies expending significant sums attempting to influence policy are likely to affect shareholder value negatively through impacts on costs.
**Value Impact**

Managing the legal and regulatory environment through lobbying, campaign contributions, or regulatory capture in a way that creates negative social or environmental externalities could erode companies’ social license to operate over the long term. This could affect revenues and growth. Companies could face acute, substantial impacts on value if environmental regulations that favor short-term industry profitability are subsequently reversed, or if the regulatory environment becomes more burdensome. This increases the risk profile of companies, with an impact on their cost of capital.

At the same time, studies show that the Oil & Gas industries have a relatively lower representation of women and minorities in the workforce and on the Boards of companies compared to other industries. Gender-based discrimination within the industry, family care responsibilities, and societal conditioning, among other factors, are cited as making the work environment in the Oil & Gas industries less attractive for women.

In the context of upcoming human capital needs of the Services industry and the lack of diversity in the workforce, companies that have a comprehensive recruitment and development strategy, which may include recruiting from a diverse talent base; ensuring equal career advancement opportunities; partnering with educational institutions; and employing and training local hires in international operations, could improve efficiencies and lower disruptions to operations in the future, as the skills gap becomes more acute.

While there is an emerging awareness and understanding of the business risks from the expected skills shortage, SASB’s analysis of companies’ 10-K and 20-F filings, shareholder resolutions, and other public documents shows that the evidence of interest in the topic is as yet weak. The business impacts of the skills shortage and implications for diversity in the workforce and training and development of workers in developing countries will likely become more apparent in the future.

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**SASB INDUSTRY WATCH LIST**

The following section provides a brief description of sustainability issues that did not meet SASB’s materiality threshold at present, but could have a material impact on the Oil & Gas Services industry in the future.

**Employee Recruitment, Development and Inclusion:** Companies in the Oil & Gas Services industry, as with E&P companies, are facing an impending shortage of experienced and skilled workers. A significant proportion of the workforce is close to retirement and there is a need for more workers due to rapid growth in the industry.

At the same time, studies show that the Oil & Gas industries have a relatively lower representation of women and minorities in the workforce and on the Boards of companies compared to other industries. Gender-based discrimination within the industry, family care responsibilities, and societal conditioning, among other factors, are cited as making the work environment in the Oil & Gas industries less attractive for women.

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APPENDIX I: Five Representative Companies | Oil & Gas Services

<table>
<thead>
<tr>
<th>COMPANY NAME (TICKER SYMBOL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schlumberger (SLB)</td>
</tr>
<tr>
<td>Halliburton (HAL)</td>
</tr>
<tr>
<td>Baker Hughes (BHI)</td>
</tr>
<tr>
<td>National Oilwell Varco (NOV)</td>
</tr>
<tr>
<td>Weatherford International (WFT)</td>
</tr>
</tbody>
</table>

This list includes five companies representative of the Oil & Gas Services industry and its activities. This includes only companies for which the Services industry is the primary industry, that are U.S.-listed but are not primarily traded Over-the-Counter, and where at least 20 percent of revenue is generated by activities in this industry, according to the latest information available on Bloomberg Professional Services. Retrieved on June 19, 2014.
## APPENDIX IIA:
Evidence for Sustainability Disclosure Topic

<table>
<thead>
<tr>
<th>Sustainability Disclosure Topics</th>
<th>EVIDENCE OF INTEREST</th>
<th>EVIDENCE OF FINANCIAL IMPACT</th>
<th>FORWARD-LOOKING IMPACT</th>
</tr>
</thead>
</table>
|                                 | HM (1-100) IWGs %    | Ei Revenue & Costs Assets & Liabilities Cost of Capital EFI Probability & Magnitude Exter-
|                                 |                      |                            | nals FLI                |
| Emissions Reduction Services & Fuels Management | 50* (-) (-) | High | • | • | • | High | • | Yes |
| Water Management Services | 43 (-) (-) | Medium | • | | | High | • | Yes |
| Chemicals Management | 30 (-) (-) | Medium | • | • | • | High | • | Yes |
| Ecological Impact Management | 55* 67 3 | High | • | • | • | High | • | Yes |
| Business Ethics & Payments Transparency | 60* 93 2 | High | • | • | • | High | • | No |
| Health, Safety, and Emergency Management | 100* 80 1 | High | • | • | • | High | • | Yes |
| Management of the Legal & Regulatory Environment | 5* (-) (-) | Medium | • | • | • | Medium | • | Yes |

**HM:** Heat Map, a score out of 100 indicating the relative importance of the topic among SASB’s initial list of 43 generic sustainability issues; asterisks indicate “top issues.” The score is based on the frequency of relevant keywords in documents (i.e., 10-Ks, shareholder resolutions, legal news, news articles, and corporate sustainability reports) that are available on the Bloomberg terminal for the industry’s publicly-listed companies; issues for which keyword frequency is in the top quartile are “top issues.”

**IWGs:** SASB Industry Working Groups

%: The percentage of IWG participants that found the disclosure topic to likely constitute material information for companies in the industry. (-) denotes that the issue was added after the IWG was convened.

**Priority:** Average ranking of the issue in terms of importance. One denotes the most important issue. (-) denotes that the issue was added after the IWG was convened.

**EI:** Evidence of Interest, a subjective assessment based on quantitative and qualitative findings.

**EFI:** Evidence of Financial Impact, a subjective assessment based on quantitative and qualitative findings.

**FLI:** Forward Looking Impact, a subjective assessment on the presence of a material forward-looking impact.

* The Evidence section above highlights other evidence of interest, including shareholder resolutions and comment letters to the SEC.
## APPENDIX IIB:
Evidence of Financial Impact for Sustainability Disclosure Topics

<table>
<thead>
<tr>
<th>Evidence of Financial Impact</th>
<th>Revenue</th>
<th>Operating Expenses</th>
<th>Non-operating Expenses</th>
<th>Assets</th>
<th>Liabilities</th>
<th>Cost of Capital</th>
<th>Risk Profile</th>
<th>Industry Divestment Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Market Size</td>
<td>Pricing Power</td>
<td>COGS</td>
<td>R&amp;D</td>
<td>CapEx</td>
<td>Extraordinary Expenses</td>
<td>Tangible Assets</td>
<td>Intangible Assets</td>
</tr>
<tr>
<td>Emissions Reduction Services &amp; Fuels Management</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Water Management Services</td>
<td>•</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Chemicals Management</td>
<td>•</td>
<td></td>
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<td></td>
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<tr>
<td>Ecological Impact Management</td>
<td>•</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Business Ethics &amp; Payments Transparency</td>
<td>•</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Health, Safety, and Emergency Management</td>
<td>•</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management of the Legal &amp; Regulatory Environment</td>
<td>•</td>
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<td></td>
</tr>
</tbody>
</table>

**MEDIUM IMPACT** **HIGH IMPACT**
### APPENDIX III: Sustainability Accounting Metrics | Oil & Gas Services

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>ACCOUNTING METRIC</th>
<th>CATEGORY</th>
<th>UNIT OF MEASURE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emissions Reduction Services &amp; Fuels Management</strong></td>
<td>Total fuel consumed, percentage renewable, percentage used in: (1) on-road equipment and vehicles, (2) off-road equipment</td>
<td>Quantitative</td>
<td>Gigajoules (GJ), Percentage (%)</td>
<td>NR0104-01</td>
</tr>
<tr>
<td></td>
<td>Description of strategy or plans to address air emissions-related risks, opportunities, and impacts</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>NR0104-02</td>
</tr>
<tr>
<td></td>
<td>Percentage of engines in service that meet Tier 4 compliance for non-road diesel engine emissions</td>
<td>Quantitative</td>
<td>Percentage (%)</td>
<td>NR0104-03</td>
</tr>
<tr>
<td><strong>Water Management Services</strong></td>
<td>Average volume of water used per volume of gas or oil extracted by (1) fresh water, (2) recycled water</td>
<td>Quantitative</td>
<td>Cubic meters (m³) per million cubic feet (MMscf) or million barrels (MMbbl)</td>
<td>NR0104-04</td>
</tr>
<tr>
<td></td>
<td>Description of strategy or plans to address water consumption and disposal-related risks, opportunities, and impacts</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>NR0104-05</td>
</tr>
<tr>
<td><strong>Chemicals Management</strong></td>
<td>Average amount of hydraulic fracturing fluid and proppant consumed per volume of gas or oil extracted</td>
<td>Quantitative</td>
<td>Cubic meters (m³), Kilograms (kg) per MMscf or MMbbl</td>
<td>NR0104-06</td>
</tr>
<tr>
<td></td>
<td>Percentage of hydraulically fractured wells for which there is public disclosure of all fracturing fluid chemicals used</td>
<td>Quantitative</td>
<td>Percentage (%)</td>
<td>NR0104-07</td>
</tr>
<tr>
<td></td>
<td>Discussion of strategy or plans to address chemical-related risks, opportunities, and impacts</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>NR0104-08</td>
</tr>
<tr>
<td><strong>Ecological Impact Management</strong></td>
<td>Average disturbed acreage per (1) oil and (2) gas well site</td>
<td>Quantitative</td>
<td>Acres</td>
<td>NR0104-09</td>
</tr>
<tr>
<td></td>
<td>Description of strategy or plan to address risks and opportunities related to ecological impacts from core activities</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>NR0104-10</td>
</tr>
<tr>
<td><strong>Health, Safety, and Emergency Management</strong></td>
<td>(1) Total Recordable Injury Rate (TRIR), (2) Fatality Rate, (3) Near Miss Frequency Rate, and (4) Total Vehicle Incident Rate (TVIR) for (a) full-time employees, (b) contract employees, and (c) short-service employees</td>
<td>Quantitative</td>
<td>Rate</td>
<td>NR0104-11</td>
</tr>
<tr>
<td></td>
<td>Discussion of management systems used to integrate a culture of safety and emergency preparedness throughout the value chain and project lifecycles</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>NR0104-12</td>
</tr>
</tbody>
</table>
## APPENDIX III: Sustainability Accounting Metrics
### Oil & Gas Services (cont.)

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>ACCOUNTING METRIC</th>
<th>CATEGORY</th>
<th>UNIT OF MEASURE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Ethics &amp; Payments</td>
<td>Amount of net revenue in countries that have the 20 lowest rankings in Transparency International’s Corruption Perception Index</td>
<td>Quantitative</td>
<td>U.S. dollars ($)</td>
<td>NR0104-13</td>
</tr>
<tr>
<td>Transparency</td>
<td>Description of the management system for prevention of corruption and bribery throughout the value chain</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>NR0104-14</td>
</tr>
<tr>
<td>Management of the Legal &amp; Regulatory Environment</td>
<td>Amount of political campaign spending, lobbying expenditures, and contributions to tax-exempt groups including trade associations</td>
<td>Quantitative</td>
<td>U.S. Dollars ($)</td>
<td>NR0104-15</td>
</tr>
<tr>
<td></td>
<td>Five largest political, lobbying, or tax-exempt group expenditures</td>
<td>Quantitative</td>
<td>U.S. Dollars ($)</td>
<td>NR0104-16</td>
</tr>
</tbody>
</table>
APPENDIX IV: Analysis of 10-K Disclosures | Oil & Gas Services

The following graph demonstrates an aggregate assessment of how the top ten U.S.-domiciled Oil & Gas Services companies, by revenue, are currently reporting on sustainability topics in the Form 10-K.

<table>
<thead>
<tr>
<th>TYPE OF DISCLOSURE ON SUSTAINABILITY TOPICS</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil &amp; Gas Services</td>
<td></td>
<td></td>
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<tr>
<td>Emissions Reduction Services &amp; Fuels Management</td>
<td>N/A</td>
<td></td>
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<tr>
<td>Water Management Services</td>
<td>N/A</td>
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<tr>
<td>Chemicals Management</td>
<td>N/A</td>
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<tr>
<td>Ecological Impact Management</td>
<td>67%</td>
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<tr>
<td>Business Ethics and Payments Transparency</td>
<td>93%</td>
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<tr>
<td>Health, Safety, and Emergency Management</td>
<td>80%</td>
<td></td>
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<tr>
<td>Management of the Legal &amp; Regulatory Environment</td>
<td>N/A</td>
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</tbody>
</table>

IWG Feedback*

*Percentage of IWG participants that agreed topic was likely to constitute material information for companies in the industry.
References

1. Data from Bloomberg Professional service accessed on June 12, 2014, using the ICS <GO> command. The data represents global revenues of companies listed on global exchanges and traded over-the-counter from the Oil & Gas Services industry, using Levels 3 and 4 of the Bloomberg Industry Classification System.

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