Mapping the Oil and Gas industry to the Sustainable Development Goals: An Atlas

Contents

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INTRODUCTION

What are the Sustainable Development Goals and why are they important to the oil and gas industry?

On September 25, 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development, which seeks to establish global consensus for the next 15 years. The 17 Sustainable Development Goals (SDGs) aim to address some of the world's pressing economic, social and environmental challenges. UN member states are expected to use the SDGs to frame their development agendas, and there is a recognition that the private sector will play an important role in achieving them.

The goals seek to expand on the eight anti-poverty goals of the now expired Millennium Development Goals (MDGs). The SDGs are strongly interrelated; contributing to one SDG is likely to positively impact other SDGs, just as significant progress on any one SDG will require progress on others. Different actors have the opportunity to contribute through multiple entry points, and the SDGs' interrelated nature highlights the importance of multi-stakeholder engagement, collaboration and complementary partnerships across government, civil society and private sector.

The oil and gas industry's operations potentially have positive and negative impacts on a range of areas covered by the SDGs, including on communities, ecosystems and economies. The industry contributes to sustainable development in a number of ways, including: generating direct and indirect jobs; supplying access to energy that enables economic activity and social development; contributing substantial tax and other types of revenue to governments; enabling development of advanced technologies and products; investing in the long-term social and economic success of the communities in which they operate, and managing the impacts of its operations by emphasizing environmental protection, health and safety, and human rights.
However, the SDGs highlight sustainability challenges, where more can be done to mitigate the adverse impacts of oil and gas development. Among the challenges, the most acute are the industry's environmental footprint on biodiversity, and climate change and its associated impacts on communities.

What is the goal of the Atlas?

This Atlas is a joint project of the United Nations Development Programme (UNDP), the International Finance Corporation of the World Bank Group (IFC) and IPIECA, the global oil and gas industry association for environmental and social issues.[1]

The Atlas discusses the links between the oil and gas industry and the SDGs and facilitates a shared understanding of how the oil and gas industry can most effectively support the achievement of the SDGs. It maps the industry's existing contributions and encourages companies to identify additional opportunities to help countries progress towards the Goals. The Atlas can also assist oil and gas companies and their stakeholders in developing a shared understanding of how the industry manages environmental and social challenges while maximizing economic benefits.

Who is the intended audience?

This Atlas is designed as a resource for oil and gas companies, and to create a shared understanding among all industry stakeholders of the links – positive and negative – and opportunities for action. While the MDGs primarily focused on governments, the UN recognized that achieving the much broader SDGs calls for coordinated effort by a wider range of stakeholders. Progressing the SDGs will involve contributions from governments, local communities, civil society organizations, and the private sector,

[1] The document also draws on contributions from the Columbia Center on Sustainable Investments (CCSI) and the Sustainable Development Solutions Network (SDSN).

including the oil and gas industry.[2] The Atlas describes opportunities for oil and gas companies to collaborate with other stakeholder groups and leverage resources to address the goals.

How is the Atlas organized?

The Atlas reviews each of the goals separately and chronologically, to facilitate accessible and comprehensive examination of any goal an individual company has identified as a priority.

The section on each SDG includes the following:

- A brief **explanation of the SDG** reflecting the official UN definition, followed by a summary of the contribution the oil and gas industry can make.
- A list of **key UN-defined SDG targets** (sub-goals) that are relevant to oil and gas, quoted verbatim.
- Examination of the opportunities, with examples from oil and gas companies of **integration of the SDGs into their core business.**
- Opportunities and examples of how oil and gas companies can **collaborate** with other stakeholders and **leverage** resources to address the SDGs.
- A **diagram** summarizing the oil and gas industry's potential contributions to a particular goal. *[Diagrams to be included in published version]*
- **Case studies** illustrating examples of the oil and gas industry's contributions.
- A list of **selected resources** offering further information, methodologies and tools.

How can oil and gas companies use this Atlas?

For each SDG, this Atlas provides a subset of the targets assessed as having particular relevance to the oil and gas industry as a whole. The Atlas does not attempt to identify and map the potential importance of every target; companies should assess each target's importance, as they endeavour to prioritize and integrate the SDGs into their core business.

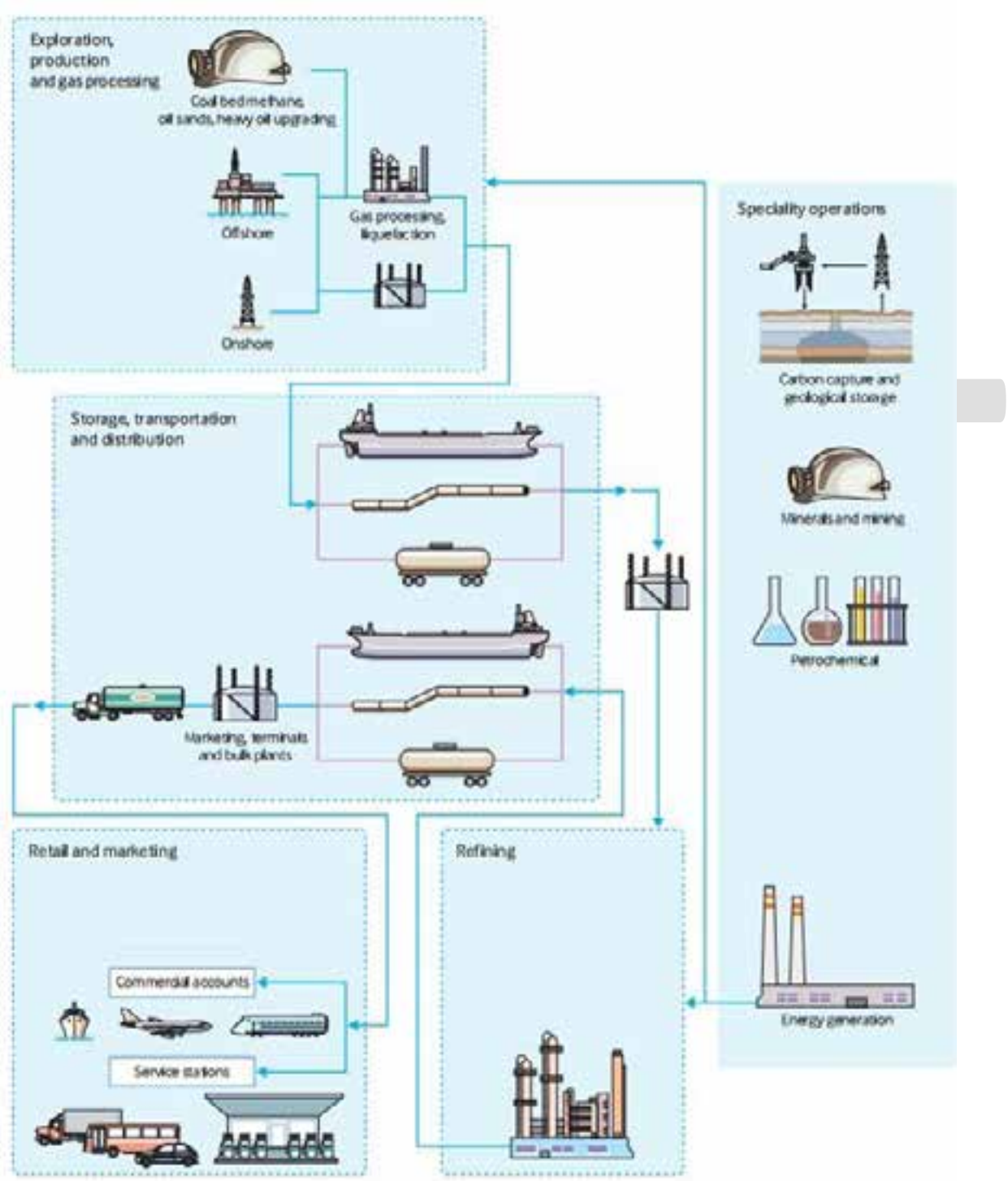
The relevance of each SDG to a company depends on a number of variables, including the location, size, duration and project stage of the company's activities, as well as the company's position in the value chain. Some SDGs might apply to a company globally, while others might only be relevant at the operational level, or to certain projects, or at certain stages of a project's lifecycle; e.g. SDGs prioritized during the exploration stage could be different to those prioritized during the production stage.

Different implications and challenges will apply for companies conducting different operations, such as conventional versus unconventional drilling, or drilling onshore versus offshore. For example, offshore drilling would understandably increase the importance of SDG14, which advocates sustainable use of oceans, seas and marine resources.

Different company-types will need to prioritize and operationalize the SDGs in different ways (see the diagram below for an overview of the industry's value chain). The direct impacts of the operations of a **non-integrated** company focused on one aspect of the industry, e.g. oil exploration, will differ from those of a company solely refining crude oil and, as a result, the companies will differ on how they prioritize the SDGs. **Integrated** companies, which work on all aspects of the chain from upstream to downstream, will have direct impacts on a broader range of SDGs. In addition, **service** companies may have potential impact on a number of the SDGs, based on the type and location of services they provide to the industry.

[2] UN General Assembly, *Transforming our world: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1.

Finally, prioritization of the SDGs by **state-owned** or **national** oil companies (NOCs), which often have exclusive control of that country's oil and gas resources, may be similar to that of international oil companies (IOCs). Additionally, NOCs may have similar priorities to those of their respective governments progressing the national implementation of actions to address the SDGs.



Companies seeking to undertake a thorough analysis of and engagement with the SDGs may consider taking the following steps, using the Atlas as a resource:

How can companies integrate the SDGs into core business?

The breadth of the SDGs envisions that, to be sustainable in the long term, industry's engagement with the SDGs will need to extend beyond its social investments and corporate philanthropy.
The discussion of each goal in this Atlas, therefore, includes ways and opportunities to integrate contributions to the SDG into a company's core business. Integration requires a shared understanding by all stakeholders of how the SDGs can create value and align with the business goals of the company.[3]

Oil and gas companies can help operationalize the SDGs in their core business practices by incorporating them into their corporate systems, policies and processes, including:

- **Company policies, standards and management systems** – Company governance and management systems, standards and strategies that address areas such as environment, health and safety, anti-bribery, gender, and supply and procurement can be used to set goals and monitor progress towards integrating the SDGs into business.
- **Project due diligence** – Different projects will have different impacts on different SDGs. Identifying the social, economic and environmental baselines of the local area and the potential impacts of operations will inform engagement, contribution and mitigation measures. Other baseline assessments considered in this Atlas include human rights, health, lifecycle assessments and landscape scale plans.
- **Risk and opportunity assessments and planning processes** – Risk assessments are crucial to identifying and predicting potential risks and implementing preventative measures. There are opportunities for SDGs to be incorporated into companies' risk assessment procedures.
- **Dialogue and engagement with communities, governments and other stakeholders** – Proactive engagement and consultation with stakeholders, including local communities, indigenous peoples, local and national governments, and civil society are vital to establishing and maintaining trust, understanding concerns and perspectives, and securing and maintaining a company's social licence to operate.

How to collaborate on the SDGs

Oil and gas companies can benefit from collaborating with stakeholders to broaden their impact and enhance their ability to leverage additional resources to achieve the SDGs. Many of the challenges the SDGs address are beyond an individual company's capabilities or control, and outside the sphere of its core business necessities. Multi-stakeholder dialogue with relevant actors, both locally and domestically, can help identify SDGs that are joint priorities and collectively define potential coordinated contributions to the SDGs in the context of the country in question.

Key stakeholders and their roles in relation to the SDGs are:

[3] "SDG Compass: The guide for business action on the SDGs," GRI, UN Global Compact and World Business Council for Sustainable Development (2016), p.22.

- **Governments**, who are ultimately responsible for implementing the SDGs. It is their responsibility to establish an enabling environment, including building accountable and inclusive institutions and governance mechanisms, and developing and steering national action plans. They also draft, implement and enforce the policies, legislation and regulations governing society, including the oil and gas industry, and so are responsible for ensuring the legal framework aligns with the SDGs. This includes establishing environmental and human rights protections, and responsible and transparent management of oil and gas revenues.

Additionally, many governments hold exclusive control over their oil and gas resources through NOCs, which means they not only regulate the industry but also conduct oil and gas operations and partner with other companies. As a result, NOCs will be important contributors to the SDGs.

- **Oil and gas companies**, who have the responsibility to adhere to the law, respect human rights and minimize the negative impacts of their operations. Companies can contribute to the SDGs by understanding and prioritizing them, and then aligning operations with the goals.
- **Civil society organizations**, who monitor the implementation of the SDGs, provide input from under-represented segments of society on the strategies for achieving the goals, disseminate information to the public and help to form multi-stakeholder partnerships. They can also be important partners in thematic working groups and capacity-building efforts, and hold other stakeholders accountable for delivering on their commitments.[4]
- **Local communities**, who are often the stakeholders most directly affected by the impacts the SDGs seek to address. As a result, the active participation and perspectives of *all* community members, including young people, women and workers, can inform the planning, decision-making and implementation of policies and initiatives that contribute to achieving the SDGs. Communities also provide feedback on the impacts of those efforts.
- **Development partners, including multilateral institutions and bilateral donors,** who can provide financial, technical, managerial and capacity-building support to other stakeholders. Development partners can also play an important convening role, facilitating information sharing and coordination, and exploiting synergies between the other stakeholders.
- **Institutional investors,** who have an opportunity to raise awareness of the SDGs and encourage companies throughout their investment chains to take actions that support the goals. They can also play a critical role in developing and implementing a strategy for financing the SDGs.
- **Insurers,** who, as risk managers and carriers, can contribute to the SDGs by embedding relevant goals in their decision-making and increasing understanding of how alignment with the SDGs can affect the financial performance of oil and gas companies. Insurers' ratemaking and risk appraisal procedures can provide data and insight into the impacts the goals address, and identify ways to prevent or reduce those impacts.[5]

The multi-stakeholder approach is addressed in more detail in SDG17. Additionally, for most SDGs, the Atlas includes ideas and case studies of collaboration and partnerships. In brief, collaboration between oil and gas companies and stakeholders can take a number of approaches:

- Formal **partnerships**, generally codified by a signed agreement that details the respective duties and the intended results, are a common method of collaboration.
- Owing to their often longstanding relationships with stakeholders ranging from governments and civil society to development partners and industry members, oil and gas companies are well positioned to use their **reach** to build connections between these groups and to facilitate collaboration to address complex challenges related to the SDGs.

[4] "Getting Started with the Sustainable Development Goals: A Guide for Stakeholders," UN Sustainable Development Solutions Network (December 2015).
[5] "Insurance 2030: Harnessing Insurance for Sustainable Development," Inquiry-PSI Working Paper 15/01 (June 2015); "SDG Industry Matrix," UN Global Compact and KPMG International (September 2015).

- **Information sharing** is critical to meaningful engagement with local communities, the host government or civil society when designing and targeting development initiatives.
- **Participation** in collaborative efforts can include providing technical or project management skills, raising awareness or encouraging employee volunteerism.
- Companies can provide financial support for **social investment programmes** that address impacts related to the SDGs.
- **Foundations, trusts or funds** are another approach companies sometimes take to deliver community investments that successfully mobilize resources and stakeholders to address the SDGs.

Integrated nature of the SDGs: cross-cutting issues and impacts

The 17 SDGs are closely interlinked and frequently indivisible. Many of the opportunities companies have for integration, collaboration or leverage will impact multiple goals. Achieving an individual goal will often rely on, or have implications for, some or all of the other goals and the related supporting conditions. Some areas *must* be fully integrated across the SDGs to maximize likelihood of achievement. How directly a cross-cutting issue relates to a goal can differ significantly, but there will be some degree of relevance to them all.

A good example is the area of **climate change**. While it is included as a stand-alone goal, it has implications for all 17 SDGs and so addressing it is a consideration when approaching each goal. Climate change may disproportionately affect the poor and most vulnerable, undermining efforts to end poverty (SDG1), achieve gender equality (SDG5), and reduce inequality among and within countries (SDG10). Climate change can threaten food security (SDG2), increase stress on water resources (SDG6), alter ecosystems and damage biodiversity (SDG14 and 15). It may also change the distribution patterns of infectious diseases and so affect global health (SDG3). All these impacts may threaten peace and security (SDG16). At the same time, the response to climate change can also drive progress on other SDGs, for example by promoting improved energy efficiency and investment in renewable energies and technologies (SDG7), which can open up new economic opportunities (SDG8).

Transparency is another area that cuts across many of the SDGs and that, if integrated, can help achieve the goals. Transparency in the sector is enhanced by publishing government contracts, revenues and owners associated with the country's oil and gas reserves, for example. To be successful, many transparency efforts, such as the Extractive Industries Transparency Initiative (EITI), require governments, companies and civil society to work together (SDG17). Transparency is an important tool in fighting **corruption** (SDG16), which widens inequality (SDG10), which is linked to higher poverty levels (SDG1), child mortality rates (SDG3), lower school-graduation rates (SDG4) and increased gender inequality (SDG5). Corruption can create additional obstacles to accessing food (SDG2) and clean water for the poorest citizens (SDG6).[6] Corruption frequently diverts resources, increases political instability and deters foreign investment which, in turn, inhibits infrastructure development (SDG9) and creates more dangerous work environments (SDG8).[7] It can also distort market incentives, undermining responsible production and consumption (SDG12) and subverting environmental regulations (SDG14 & 15).

The SDGs' interlinked nature also ensures that, even if an activity were centered on a particular area of focus, e.g. a single **public health initiative**, that activity could make substantial contributions to the success of multiple goals.[8] Consider the example of the Partnership for Clean Fuels and Vehicles (PCFV)

[6] Alex Johnson, "End Corruption for a Sustainable Future," Transparency International (18 February 2016), available at http://www.transparencyinternational.eu/2016/02/end-corruption-for-a-sustainable-future/.
[7] "On Anti-Corruption Day, UN says ending 'corrosive' crime can boost sustainable development," Transparency International (9 December 2015), available at http://www.un.org/sustainabledevelopment/blog/2015/12/on-anti-corruption-day-un-says-ending-corrosive-crime-can-boost-sustainable-development/.

and its Lead Campaign, an initiative to phase out the use of lead in petroleum in more than 100 developing countries.[9]

The direct effect of phasing out leaded petroleum is less air pollution and lower greenhouse gas (GHG) emissions from transportation (SDG13), which has a number of health benefits (SDG3) and positive effects on biodiversity and ecosystems (SDG14, 15).[10] The concentrated use of vehicles in cities means reducing leaded fuel cuts urban air pollution (SDG11), but there are also a number of less direct implications for other SDGs. Reducing lead is linked to reducing poverty rates by lowering the impact on personal incomes from lead-related health problems (SDG1).[11] Globally, the overall economic benefit of eliminating leaded petroleum has significant implications for GDP and economic growth, particularly in developing countries (SDG8).[12] The introduction of cleaner and more efficient vehicles contributes to more responsible production and consumption patterns (SDG12). The success of the Lead Campaign, backed by a public-private partnership that includes more than 72 organizations, illustrates the opportunities of global partnerships for sustainable development (SDG17).

Selected resources

- Impact 2030. Global private sector led collaboration to mobilize volunteers to advance the achievement of the SDGs.
- International Finance Corporation Sustainability Framework 2012. IFC Framework.
- International Finance Corporation 2015. The Art and Science of Benefits Sharing.
- IPIECA 2006. Partnerships in the Oil and Gas Industry.
- The Global Goals for Sustainable Development 2016. Global Goals.
- PwC 2015. Make it your business: Engaging with the Sustainable Development Goals.
- United Nations 2015. Transforming our world: the 2030 Agenda for Sustainable Development.
- World Business Council for Sustainable Development (WBCSD) 2016. Action 2020.

[9] "Lead phase-out: Eliminating lead through partnership," IPIECA and OGP.

[10] Peter Tsai and Thomas Hatfield, "Global Benefits From the Phaseout of Leaded Fuel," Journal of Environmental Health Vol. 74, No. 5 (5 December 2011).

[11] Id.

[12] It is also possible that the elimination of leaded petroleum and the introduction of newer cleaner fuels and vehicles could have raised the price of fuel or required the phasing out older lead petroleum-based vehicles. These costs could have had short-term negative impacts on poor or vulnerable communities; Peter Tsai and Thomas Hatfield, "Global Benefits From the Phaseout of Leaded Fuel," Journal of Environmental Health Vol. 74, No. 5 (5 December 2011).

GOAL 1. END POVERTY IN ALL ITS FORMS EVERYWHERE

While the number of people living in extreme poverty has halved since 1990, there are still more than one billion people in the world who struggle to meet their most basic needs. Addressing poverty means also addressing issues of food security, health, education, safety, the environment and access to affordable, reliable, sustainable and modern energy sources and other types of services. Poverty is also unevenly distributed between regions, within countries and among groups such as women and indigenous peoples. SDG1 is a commitment to ending poverty by 2030, which will entail an integrated approach to addressing its causes.[13]

Businesses (including the oil and gas industry) can play an important role, as private sector investment far exceeds foreign aid in many developing countries. As well as their principle role supplying reliable affordable energy, oil and gas companies also contribute social investments and make substantial tax and other types of revenue payment to host governments. The industry, therefore, has an important role to play in addressing a variety of environmental, social and health challenges (including those related to climate change[14]) and this can have significant implications for poverty reduction.

Key UN SDG1 targets relevant for the oil and gas industry

1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than USD $1.25 a day.

1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.

1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.

1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions.

[13] "Goal 1: No poverty," Sustainable Development Goals Fund, available at http://www.sdgfund.org/goal-1-no-poverty (last accessed 13 June 2016).

[14] "Hallegatte, Stephane; Bangalore, Mook; Bonzanigo, Laura; Fay, Marianne; Kane, Tamaro; Narloch, Ulf; Rozenberg, Julie; Treguer, David; Vogt-Schilb, Adrien. 2016. *Shock Waves : Managing the Impacts of Climate Change on Poverty*. Climate Change and Development;. Washington, DC: World Bank.

Integrate SDG1 into core business

Increase access to energy. Access to basic services including reliable, affordable, sustainable and modern energy is essential to ending poverty. There is a strong correlation between increased energy use and the type of economic growth that reduces income poverty. The poor consume less energy, but spend a higher proportion of their income on it. They also typically rely on inefficient and unsustainable use of traditional fuels such as wood, charcoal and animal waste. Improved access to energy can provide indispensable support to the goal of poverty eradication by increasing productivity and encouraging business enterprise. For more on access to energy see SDG7.[15]

Contribute to fiscal sustainability. In resource-rich, developing countries, the oil and gas industry can contribute significantly to government revenues. In addition to generating royalties and other fees/payments from companies' upstream hydrocarbon resources exploration, development and extraction activities, governments in such countries can also collect taxes from the sales of end-use energy products such as fuels. Revenues derived from oil and gas companies can be a catalyst for economic growth and can finance programmes to reduce the number of people living on less than USD $1.25 a day.[16] However, when not properly managed in an open and transparent way, revenues can be a catalyst for corruption. For a discussion of how oil and gas companies can contribute to increased transparency and combat corruption, see SDG16.[17]

Address climate change. Climate variability and climate-related events can damage agricultural productivity, threaten ecosystems and have a disproportionate effect on those who are least capable of withstanding or recovering from the damage. For more on actions oil and gas companies can take to address climate change, see SDG13.[18]

Invest in local development. Direct local employment in developing countries can be more challenging due to the level of specialization required and the limited availability of suitably skilled workers. However, oil and gas ventures can still be leveraged to provide meaningful indirect employment opportunities and economic growth by integrating local businesses into their supply chains. Inclusive recruitment and hiring practices, and investments in skills development, with attention paid to respecting human rights in communities, can help reduce poverty. In addition, oil and gas companies can further support poverty eradication through well-planned social investment activities. For more information on local development, see SDG8.[19]

Collaborate and leverage

Community development agreements. Community development agreements (CDAs) can be an opportunity to support the self-determined economic development of local communities near oil and gas projects. By engaging in a collaborative process with communities to develop CDAs tailored to their specific local contexts and by then entering into formal agreements, companies can ensure local communities benefit from oil and gas projects. In this way, CDAs can help provide the enhanced development cooperation needed to implement anti-poverty programmes.[20]

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[15] "Sustainable Development in Latin America and the Caribbean," United Nations (August 2013); "OECD Contribution to the United Nations Commission on Sustainable Development 15," OECD (2007).
[16] "Fiscal Regimes for Extractive Industries", IMF (2012).
[17] "Oil and Gas," Transparency International, available at http://www.transparency.org/topic/detail/oil_and_gas (last accessed 13 June 2016); Ranjit Lamech and Kyran O'Sullivan,"Chapter 21: Energy," PRSP Sourcebook, World Bank (2001).

[19] "Leveraging extractive industries for skills development to maximize sustainable growth and employment," Flagship Report Paper Series Paper 7, African Development Bank (August 2015).
[20] Jennifer Loutit, Jacqueline Mandelbaum and Sam Szoke-Burke, "Emerging Practices in Community Development Agreements," Columbia Center on Sustainable Investment (February 2016).

Reduce gender inequality. In developing countries, women are often disproportionately disadvantaged when access to energy is limited or lacking.[21] By improving women's access to energy, combined with gender-sensitive local content and capacity-building policies, oil and gas companies can play an important and value-adding poverty-reduction role. For more on gender equality, see SDG5.[22]

Case studies and initiatives

Investing in social and environmental initiatives: Petrobras – Brazil
Petrobras launched its Petrobras Social and Environmental Program in November 2013, with the objective to contribute to sustainable development and to promote rights by investing in social and environmental initiatives that will generate results for both society and the company. The programme integrates social and environmental dimensions and has seven action lines: Inclusive and Sustainable Production, Education, Rights of Children and Adolescents, Sport, Biodiversity and Social Diversity, Forests and Climate, and Water. The programme addresses crosscutting issues, including gender and racial equity, people with disabilities, indigenous peoples and traditional communities. Petrobras evaluates and measures the programme results by assessing the number of beneficiaries, the number of job opportunities created by the project's activities, the extent of recovered and protected areas with ecological importance, the number of species studied and protected, and technical and scientific publications. It also stimulates and assesses the partnerships established. Since 2007, the programme has benefitted around six million people, generated over 20,000 job opportunities, restored and protected about 700,000 hectares of forest or degraded areas, and contributed to the conservation of more than 700 species of fauna.

Offering microfinance to drive growth: BP – Trinidad and Tobago
Mayaro is a rural agricultural and fishing community located on the southeast coast of Trinidad. Since the 1970s, Mayaro has been the operations-base for many international oil companies; many residents, however, felt that the local community was not benefiting from oil and gas industry investment. Frustrated, the community regularly protested and disrupted industry operations, resulting in significant costs to businesses. BP sought to address this issue and embarked on a comprehensive programme of social investment aimed at helping to create a community where residents could have real opportunities to develop economically and socially. A 2001-study by the University of the West Indies revealed that 40% of the Mayaro population was living below the poverty line, with approximately 30% of its workforce unemployed. BP set up the Mayaro Initiative for Private Enterprise Development (MIPED) in 2002. Trinidad's first privately-developed micro-credit lending organization, MIPED provides loans from USD $300 to $15,000. The programme supports residents in the application process and offers training courses in skills such as book-keeping, marketing and technical advice, to help beneficiaries develop business plans to access the loans. Loan and field officers maintain strong relationships with their clients, supporting individuals to help a business succeed and enabling funds to be repaid and invested back into the community. The programme became self-sustaining six years after start-up and has a 3% default rate. MIPED has distributed over 3,000 loans, created thousands of entrepreneurs and jobs, and has now lent over USD $10 million.

Solar lamps distribution: Awango by Total – Global
More than 1.2 billion people are plunged into darkness as night falls. In 2011, Total launched the "Total Access to Energy" program, a project incubator designed to make energy accessible to everyone, especially disadvantaged populations in developing countries. The distribution of solar solutions under the "Awango by Total" brand is the first major achievement of the program. This social business first commitment is to extend energy access to the least advantaged. Since 2011, 1.9 million solar lamps have already been distributed in 40 countries. The objective is to positively impact the lives of 25 million people in Africa by 2020. These solar solutions can also be used to charge small devices such as mobile phones and are a cleaner and cheaper source of power than kerosene or batteries. Providing a source of lighting

[21] Ranjit Lamech and Kyran O'Sullivan, "Chapter 21: Energy," PRSP Sourcebook, World Bank (2001), p.294.
[22] "SDG5: Achieve gender equality and empower all women and girls," SDG Compass, available at http://sdgcompass.org/sdgs/sdg-5/ (last accessed 13 June 2016).

is a key way of bringing people out of poverty, as it improves opportunities to read or work after sundown. Total is using its service station network (in 2016, solar lamps are available at over 3000 service stations) and is creating numerous partnerships to access hard-to-penetrate distribution networks.

Selected resources

- Extractive Industries Transparency Initiative 2016. Progress Report 2016.
- IPIECA 2008. Guide to successful, sustainable social investment for the oil and gas sector.
- IPIECA 2016. Local content guidance for the oil and gas industry (Second edition).
- UNCTAD Extracting Industries 2012. Optimizing Value Retention in Host Countries.
- IFC 2012. Sustainability Framework.
- World Bank 2001. Chapter 21 Energy: Macroeconomic and Sectoral Approaches.
- World Bank Group 2013. Financing for Development Post-2015.

GOAL 2. END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

Despite the progress made under the MDGs, currently one in nine people do not have enough food to lead a healthy life. With the world's population expected to increase by one-third by 2030, meeting the goal of ending hunger and achieving food security will require not only sustainable and increased agricultural production, but also improving the efficiency of the global food supply chain with particular attention to decreasing food waste.[23]

Hydrocarbons are used to supply energy for all stages of food production, they power agricultural machinery and are the raw materials for fertilizers and pesticides. Food processing depends on packaging that is often hydrocarbon-based, and food transportation and storage systems rely on petroleum fuels. Food preparation and refrigeration also relies on energy. Hydrocarbons have therefore played a critical role in food security by increasing the productivity of modern agriculture and enabling the distribution of food. At the same time, food production costs are sensitive to crude oil price fluctuations, and oil and gas operations, like other industries with geographical footprints, can impact agriculture and agriculture-based livelihoods by competing for land and water usage. Proactive management of potential impacts can give rise to the opportunity to strengthen livelihoods and food security. [24] Collaboration to improve the energy efficiency of the global food value chain and increase its access to reliable, sustainable, affordable and modern energy sources, develop energy-efficient production and consumption systems and reduce the food industry's carbon footprint can all collectively contribute to achieving SDG2.

Key UN SDG2 targets relevant for the oil and gas industry

2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.

2.3 By 2030 double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment.

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[23] "Key facts on food loss and waste you should know," Food and Agriculture Organization of the United Nations, available at http://www.fao.org/save-food/resources/keyfindings/en/ (last accessed on 4 October 2016); "Hunger Statistics," World Food Programme, available at https://www.wfp.org/hunger/stats (last accessed on 13 June 2016); "UN projects world population to reach 8.5 billion by 2030, driven by growth in developing countries," United Nations (29 July 2015), available at http://www.un.org/sustainabledevelopment/blog/2015/07/un-projects-world-population-to-reach-8-5-billion-by-2030-driven-by-growth-in-developing-countries/#prettyPhoto (last accessed 13 June 2016).

[24] "Addressing Project Impacts on Fishing-based Livelihoods," IFC (2015) http://commdev.org/wp-content/uploads/2015/05/P_IFC-SCI_FisheriesReport2015_R2-LoRes.pdf

2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality.

2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.

Integrate SDG2 into core business

Align co-located agricultural and oil and gas development activities. Oil and gas extraction operations can compete with agriculture – particularly small-scale agriculture – for land and water use. Companies with operations close to areas used for subsistence farming or small-scale food production may choose to evaluate how to collaborate with neighbouring communities and enable activities to co-exist in a constructive manner. This is particularly important with regards to soil, freshwater, oceans, fisheries, forests and biodiversity resources.

Shared-use infrastructure to enhance agricultural productive capacity. Increased agriculture productivity not only increases food security and economic growth but also reduces poverty and pressure on natural resources. In fact, the World Bank estimates agriculture is two to four times more effective at raising income than growth in other sectors.[25] Integrated planning and management of land resources is one approach to achieving sustainable agricultural development. In rural areas, where most agriculture happens and where onshore oil and gas extraction generally takes place, this means acting on opportunities to leverage the infrastructure investments of oil and gas companies (see SDG9) for multi-use, shared access, while avoiding/reducing their negative impacts on adjacent agriculture. This could include planning infrastructure, e.g. reservoirs for water storage, to contribute to improved watershed management, or designing infrastructure to support access to energy for irrigation and agriculture production. When needs align, oil and gas companies can work with local governments, stakeholders and each other to identify opportunities for shared infrastructure-use throughout an asset's lifecycle. Such efforts can strengthen a company's social licence to operate.

Address climate change. The effects of climate change can already be seen in agriculture. Weather patterns are increasingly unpredictable and extreme weather events are occurring with greater frequency. Crop productivity has decreased in vulnerable areas and global food prices and food security have been affected. The World Bank predicts that climate change could potentially diminish future crop yields by 25%.[26] See SDG13 for more on how oil and gas companies can address climate change by reducing emissions and supporting adaptation.

Collaborate and leverage

Increase efficiency in oil- and gas-based agricultural products. Agriculture can be extremely oil- and gas-reliant. In addition to the use of fuel and lubricants in farm machinery, many agricultural chemicals – particularly chemical fertilizers – are made with oil products. By participating in and contributing to multi-stakeholder efforts, oil and gas companies can contribute their knowledge to improving the

[25] "Agriculture overview," The World Bank, available at http://www.worldbank.org/en/topic/agriculture/overview (last accessed 13 June 2016).
[26] "Agriculture Overview", World Bank, available at http://www.worldbank.org/en/topic/agriculture/overview (last accessed 11 November 2016); "Climate-Smart Agriculture Sourcebook," Food and Agriculture Organization of the United Nations (2013).

energy efficiency and GHG emissions of such products through the entire value chain (from the wellhead through production and use).

Case studies and initiatives

Transferring knowledge for higher farming yields and more employment opportunities: Eni – Nigeria
In Nigeria, Eni promotes the Green River Project (GRP), founded in 1987 as an integrated entrepreneurial development programme for farmers in the Niger River Delta. The objective of this programme is to transfer technology through vocational guidance and training in order to increase food availability, multiply employment and earning opportunities and facilitate access to social services. The project now involves 35,000 farmers; 500,000 indirect beneficiaries in 120 communities, and 235 cooperatives who are currently receiving assistance, while 3,750 young people and women have received education from 1999 to date.

Energy efficiency through utilizing surplus: Vermillion Rep Energy – France
In France, Vermillion Rep Energy, an oil company, was looking for an economical use for its surplus heat and II partnered with local agricultural engineers to build a tomato farm next to its extraction facilities. This partnership provides the farm with the affordable, reliable and sustainable energy it needs to be competitive with traditional tomato producers in warmer climates. Recovered surplus heat generated by Vermillion's oil processing operations is sold at low cost to the farm, which uses it to create an eco-friendly environment for farming. The farm grows three thousand tons of tomatoes annually, creating 150 local jobs and reducing carbon emissions by 10,000 tons per year.

Establishing food cooperatives to supply local operations: BP – Indonesia
Following the construction of the Tangguh gas plant in Bintuni Bay, BP faced the dual challenges of supporting the 2,000 now unemployed local construction workers and sourcing food for its 1,500 employees. The BP community relations team at Tangguh established food cooperatives in nearby villages, providing work for BP's former workers and food for the plant's personnel. There are now seven such cooperatives, supplying fruit and vegetables and organic fresh seafood, and they have transformed the lives of everyone involved. One example is the Mayri Cooperative, in Teluk Bintuni and Fakfak Regencies, whose business development is supported by Tangguh. The cooperative, owned and managed by indigenous people living in the village, now owns a mini-market and a collection point for fish and vegetables, which are then supplied to Tangguh.

Protecting a local fishing industry during seismic exploration: Repsol – Colombia
When Repsol S.A. acquired rights to explore off the coast of Colombia, it engaged with the 18 local Wayuu communities in the region that might be affected if operations reduced fish-catch by driving off local fish populations or damaging fisheries. Repsol consulted with local fishermen to understand issues such as the location of fishing grounds and compensation, working with them to minimize negative impacts and providing supplies such as nets and motors to support the local fishing industry. As a result, Repsol could proceed in conducting seismic exploration while avoiding issues with local fishing.

Selected resources

- Food and Agriculture Organization of the United Nations 2013. Climate-Smart Agriculture Sourcebook.
- Oxfam 2013. Growing Disruption: Climate change, food, and the fight against hunger.

GOAL 3. ENSURE HEALTHY LIVES AND PROMOTE WELL-BEING FOR ALL AT ALL AGES

Sustainable development cannot be achieved unless everyone's primary health needs are met. SDG3 seeks to ensure healthy lives and well-being for everyone. It includes commitments to health education, universal health coverage, access to safe and effective medicines, an end to the epidemics of HIV/AIDS, malaria and tuberculosis, and to lowering road traffic accidents.[27] Oil and gas companies can contribute to improving health and well-being in a variety of ways, including by providing energy, caring for the health and safety of their workers, investing in community health systems, making fiscal and other payments to governments, and by joining global initiatives to combat infectious diseases.

Oil and gas operations can also contribute to *new* health risks for workers and local communities. Changes to ecosystems, e.g. land clearing, may affect local food production and diet. Industrial activities or traffic accidents can result in injuries. Population influx and higher population densities that can accompany developments can overwhelm local healthcare capacity and result in new or increased incidence of communicable diseases, or situations that can exacerbate non-communicable diseases and social problems such as violence and substance abuse.[28] Strong health management systems, that proactively and holistically assess risks and that complement existing health systems and public health programmes in the areas near oil and gas industry activities, can help address these issues and protect the health of workers and local communities.

Key UN SDG3 targets relevant for the oil and gas industry

3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.

3.4 By 2030, reduce by one-third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.

3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.

3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents.

3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

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[27] "Goal 3: Good health and well-being," UNDP, available at http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda/goal-3.html (last accessed 13 June 2016).

[28] "Managing the public health impacts of natural resource extraction activities," World Health Organization (November 2010).

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.

Integrate SDG3 into core business

Conduct health impact assessments to strengthen capacity to manage health risks. Oil and gas company activities, particularly those in remote or underdeveloped areas, can contribute to health challenges, including indirect impacts due to changes to the local environment and communities. Identifying potential challenges requires understanding the complex social, economic, geographical and biological dynamics of a given area. Effective design and management of operations enables mitigation of potential health risks, such as exposure to air and water emissions, fires, dangerous equipment and infectious diseases. Health impact assessments can be a useful strategy in guiding the development and implementation of a systematic health action plan that integrates a company's internal health policies, its health risk management programmes and any corporate social investments. Protection strategies for the health of employees *and* local communities could be incorporated early on in the design and planning process.

Reduce occupational risks. Any organization's most important resource is its workforce. Health and safety are, therefore, high priorities in the oil and gas industry. Activities often involve large/heavy equipment, significant construction-related projects and hazardous chemicals. Workers may be exposed to chemicals, physical and/or biological agents, geographic, ergonomic and psychosocial risks which could harm health and productivity.[29] Occupational safety and health is critical to the industry. Companies can manage risks by designing safe and healthy work environments, and implementing robust health and safety policies consistent with international standards. Companies can also support worker education and training, provide appropriate personal protective equipment, and enable regular occupational health checks and access to general health care and emergency care.[30]

Protect workers and community members against infectious diseases. Oil and gas activities can alter local ecosystems, leading to population migration as people look for employment opportunities. Such in-migration can create high-density populations in areas that may lack sufficient and necessary infrastructure for water, health and sanitation, and overwhelm local health infrastructure. Furthermore, these changes have the potential to introduce or accelerate the transmission of infectious diseases, including those transmitted person-to-person (especially in high-density areas), vector-borne diseases, and sexually-transmitted diseases.[31]

Companies can protect their workers and community neighbours by developing and implementing prevention and response strategies, e.g. vaccination programmes, and providing support for health-system strengthening and education. Including local and external stakeholders in these initiatives could create effective synergies and reduce the risks to employees, contractors and the community.[32]

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[29] "Health Hazards Associated with Oil and Gas Extraction Activities," United States Department of Labor, available at https://www.osha.gov/SLTC/oilgaswelldrilling/healthhazards.html (last accessed on 13 June 2016).

[30] "Health," IPIECA, available at http://www.ipieca.org/focus-area/health (last accessed 13 June 2016); "Managing the public health impacts of natural resource extraction activities," World Health Organization (November 2010).

[31] "Managing the public health impacts of natural resource extraction activities," World Health Organization (November 2010); "Vector-borne disease management," IPIECA (March 2013); "HIV, TB & Malaria Management & Prevention in the Oil & Gas Supply Chain," Booz & Company (2010); "How the Oil and Gas Industry Can Address Emerging Infectious Diseases," USAID.

[32] "Managing the public health impacts of natural resource extraction activities," World Health Organization (November 2010); "HIV, TB & Malaria Management & Prevention in the Oil & Gas Supply Chain," Booz & Company (2010); "How the Oil and Gas Industry Can Address Emerging Infectious Diseases," USAID.

Protect workers and community members against non-communicable diseases. As communities develop, there is an increased risk for non-communicable diseases related to modifiable lifestyle risk factors including alcohol and tobacco use, change in diet and activity. Studies suggest that oil and gas workers are susceptible to poor lifestyle behaviours, such as an unhealthy diet, shift-work related circadian disruption, lack of physical activity, or alcohol or tobacco abuse. Any of these may lead to health problems, such as cardiovascular diseases and chronic respiratory issues.[33] Proactive, risk-based health promotion and company policies that prioritize health and target lifestyle issues support the long-term well-being of workers. Oil and gas companies can establish wellness programs that include awareness and education, positive health messaging, worksite activities, improved healthy food options, and personalized case management services for chronic diseases, while creating a favourable workplace health policy environment. These programmes reduce costs for medical and benefit plans, and have a positive impact on community and workforce perceptions.[34] Oil and gas companies can also partner with local government to help mitigate worker and community risks, lessen the burden on the local healthcare system, and improve access to healthcare for all.[35]

Address mental health and substance abuse. Studies have shown that oil and gas production workers, particularly offshore workers and those doing shift work, can experience higher levels of fatigue and stress than individuals working in other areas of the oil and gas industry.[36] Long hours, difficult work environments, including in remote areas and/or extreme conditions away from family, can strain the mental health and well-being of individuals, and also have impacts on family members back home. As part of a holistic approach to the health of their workers, oil and gas companies can include education, prevention and support resources for mental health and substance abuse in their health programmes, and collaborate with local resources to provide services to workers and communities.[37]

Design benefits programmes. Oil and gas companies can design health benefits plans to improve access to preventive services (i.e. screening tests and vaccines), disease education and management, and health promotion. Benefits plans also improve access to policies that incentivize healthy behaviours and appropriate self-care, and link healthy lifestyles to benefits. Enabling access to proactive and preventive services is an important aspect of transitioning to a sustainable health culture.

Prevent and mitigate the health impacts of air emissions and effluent discharges. Approaches that oil and gas companies can employ to manage the risks associated with air emissions and effluent discharges and their related health implications are addressed in SDG7, 9, and 11-13.

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[33] Seth Oppong, "Common Health, Safety and Environmental Concerns in Upstream Oil and Gas Sector: Implications for HSE Mangement in Ghana," Academicus International Scientific Journal issue 9 (2014); "Occupational health," IPIECA (2016), available at http://www.ipieca.org/topic/health/occupational-health (last accessed 12 October 2016).

[34] Gallup. The State of the Global Workplace. 2013: Engaged workers have significantly higher productivity, profitability, and customer ratings, less turnover and absenteeism, and fewer safety incidents than those in the bottom 25%

[35] "Managing the public health impacts of natural resource extraction activities," World Health Organization (November 2010).

[36] Seth Oppong, "Common Health, Safety and Environmental Concerns in Upstream Oil and Gas Sector: Implications for HSE Management in Ghana," Academicus International Scientific Journal issue 9 (2014).

[37] "Inclusive business practices in Africa's extractive industries," ILO Policy Note, International Labour Organization (2015); Seth Oppong, "Common Health, Safety and Environmental Concerns in Upstream Oil and Gas Sector: Implications for HSE Management in Ghana," Sam Jonah School of Business, University of Ghana; "Workshop on managing the health impacts of oil and gas and mining projects," World Health Organization (November 2010); Patrick Osewe, "Better Health in Mines and Mining Communities: A Shared Responsibility," World Bank (3 June 2015), available at http://blogs.worldbank.org/health/better-health-mines-and-mining-communities-shared-responsibility (last accessed on 13 June 2016).

Improve road safety. One oil-and-gas-related cause of injuries and death receiving heightened attention is road safety, particularly in areas where operations have caused accelerated development. The global oil and gas industry utilizes a huge fleet of vehicles, driving millions of kilometres. Safe road transport is embedded into oil and gas activities, whether it is transport linked to upstream projects or product delivery to services stations or customers, or even the day-to-day travels of employees.
Transport management systems have been developed and are essential to getting road safety right in the areas where companies operate. Vehicle standards, operating manuals, assessment of transporters, route management, on-board computers and driver awareness and training programmes are part of the procedures and fully integrated in the operations. Moreover, the oil and gas industry has integrated road safety as part of its social responsibility and is contributing to the reduction in deaths and injuries by sharing its expertise and developing programmes in partnership with civil society organizations and public authorities.

Collaborate and leverage

Strengthening public health systems' response to potential health risks and epidemics. Public health assurance is the responsibility of local governments; however, companies can play an important role in supporting governments to develop stronger health systems. For example, oil and gas companies can help train local people and build capacity in areas where occupational health knowledge is limited.[38] Collaboration between oil and gas company health experts and the health departments of the countries of operation can benefit all parties with regard to preventing community diseases and epidemics. Public-private collaboration and local capacity-building can facilitate a more systematic approach to avoiding and managing epidemics, preparing responses to future outbreaks and better leveraging the health investments of both governments and companies.

Case studies and initiatives

An integrated anti-malaria programme for workers and local communities: ExxonMobil – Global
ExxonMobil responded to the risk of malaria affecting its workforce with a workplace malaria programme and an integrated approach, including education, prevention, and access to proper diagnosis and treatment. In addition to investing in malaria programmes for local communities in which it operates, it has contributed more than USD $146 million to support research, educational and treatment programs in countries and communities that lack adequate health care systems. Almost 14 million bed nets, 3.8 million doses of antimalarial treatments and 2.6 million rapid diagnostic kits have been distributed, and more than 520,000 health workers have been trained. The company reports that its programme showed more than a 90% reduction in annual malaria cases among its non-immune workers from 2003 to 2015, with no malaria-related deaths since 2007.

Preventing the spread of HIV/AIDS: Total SA – Morocco
Increased mobility is credited with exacerbating the geographic spread of HIV/AIDS. As a result, truck drivers can face a high risk of contracting the disease and then play a role in transmitting the disease to new areas. In Morocco, the Total Foundation finances a programme of the Pasteur Institute and local anti-HIV/AIDS association ALCS to prevent the spread of HIV/AIDS. More than 80,000 truck drivers have been educated about HIV/AIDS through the programme, and thousands more have been screened for HIV/AIDS or tested for sexually-transmitted diseases.

Managing traffic risks: Total SA – Global
Traffic injury and fatality-rates in Africa and the Middle East are a serious issue, only exacerbated by the increased transportation needs of an oil and gas presence in a region. In 2012, Total SA launched a

[38] "Common Health, Safety and Environmental Concerns in Upstream Oil and Gas Sector: Implications for HSE Management in Ghana," Sam Jonah School of Business, University of Ghana; "Managing the public health impacts of natural resource extraction activities," World Health Organization (November 2010); "Vector-borne disease management programmes," IPIECA (March 2013).

transporter assessment programme to manage traffic risks in Africa and the Middle East through driver skills development, improved safety requirements and optimized fleet rotation and modernisation. Between 2012 and 2015, the programme inspected 98% of Total's transportation contractors in the region and 28% of existing contracts were terminated for non-compliance. As a result, Total saw a 40% decrease in serious accidents between 2013 and 2015.

Innovative products to prevent substance abuse: BP – Australia
Aboriginal communities in the Northern Territory of Australia were facing devastating impacts as a result of petrol sniffing. The local community asked for help in finding a solution. BP responded by developing Opal®, a fuel that contains only light aromatic vapours, denying substance-abusers the 'kick' when it is sniffed. BP now supplies Opal® to around 110 communities in the Northern Territory, South Australia, Western Australia and Queensland, ranging from small populations of 100 people to towns such as Alice Springs with 25,000 residents. The government subsidises Opal® to ensure the price at the pump is the same as regular unleaded. The innovation has been very successful and dramatically improved the quality of life in many communities.

Selected resources

- Global Business Coalition 2010. HIV, TB & Malaria: Management & Prevention in the Oil & Gas Supply Chain.
- IFC 2007. Environmental, Health and Safety Guidelines for Onshore Oil and Gas Development.
- IPIECA 2011. Managing health for field operations in oil and gas activities.
- USAID 2013. How the Oil and Gas Industry Can Address Emerging Infectious Diseases.
- World Health Organization 2010. Managing the public health impacts of natural resource extraction activities.

GOAL 4. ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL

Inclusive, quality education is a catalyst for development and a critical component in achieving the SDGs. A quarter of the world's population is under 15 years old, and direct connections can be made between education, or lack thereof, and poverty, inequality, economic growth and corruption .[39] Education and skills development can contribute to the ability of developing countries to maximize the long-term economic benefits of their natural resources wealth. Unlike taxes or other benefits accrued to a host government, programmes supporting education and skills development can provide more local value by increasing the potential for direct and indirect employment of local workers and suppliers, thus promoting inclusive growth and economic empowerment. At the same time, oil and gas companies can face difficulties finding the necessary technical, operational and commercial skill sets, both in terms of quantity and quality, at all professional levels in the developing countries where some projects and operating facilities are located.

Investing in education and skills-based training in their countries of operation can help oil and gas companies address these issues. This can be done by collaborating with local schools and universities to improve their science, technology, engineering and mathematics (STEM) curricula, supporting technical and vocational training and creating in-house or regional training programmes. In addition to helping companies meet their labour needs, such efforts support companies' social licence to operate and can also assist in meeting local content targets/requirements. These efforts are often achieved through a combination of specific oil and gas company engagement in educational development or strategic social investment activities directed towards educational improvement.

Key UN SDG4 targets relevant for the oil and gas industry

4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.

4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.

4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.

4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and

[39] "World Population Prospects," Department of Economic and Social Affairs of the United Nations (2015).

sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries.

Integrate SDG4 into core business

Establish a company strategy for local content to promote sustainable development. Oil and gas companies may benefit from a strategy that balances their priorities and local content requirements. This requires an analysis of the goods- and services-needs of a project/operating asset, local capacity to meet these needs and the best way to address the gap between demand and supply. Such assessments should focus on the entire value chain, including direct, indirect and induced employment, to see what skills are most needed and are in shortest supply, as well as act on opportunities that might be created by addressing identified gaps.

Invest in workforce education, training, and technical programmes. Mapping existing capabilities allows a company to identify a baseline level of education and technology available and identify and assess skills gaps. The establishment of a company strategy can then outline a variety of approaches to addressing them. For local workers, expanded in-house training programmes, focused on both technical skills and soft skills (e.g. language, communication, management) needed for oil and gas operations, can be valuable. Companies could promote available training and educational opportunities to their workers and consider offering scholarships for certain individuals to attend external or out-of-country training programmes. Companies could also share these baseline assessments with the host government. By improving governmental understanding of the industry's needs and mapping domestic capabilities, companies can provide information essential for governments planning investments in education and targeted training resources.[40]

Invest in education and training in responsible energy use and new technologies. Improved societal knowledge of efficient energy-use practices can support many of the SDGs. Company activities to enhance understanding and promote education on energy efficiency decisions and practices can support improved energy use. By empowering people with education, individuals will be able to make informed decisions about their energy purchases and consumption. Additionally, the rapid development and adoption of new technologies in the industry requires investment in workforce education on their use. This includes the increasing adoption of renewable energy technologies. Companies with expertise in such technologies could provide the necessary training to current oil and gas professionals, as well as prepare the next generation of energy workers.

Collaborate and leverage

Support in-country education and skills development efforts. Efficient skills development programmes that will increase the number of youth and adults with technical and vocational skills must be integrated into overall education and development policies. They must be implemented in conjunction with partners including local educational institutions, the host government and local communities. Working with universities, companies can design courses and specialized programmes tailored to provide the skills required. Companies can partner with local service providers to offer technical and vocational education and training (TVET), which improves employability by providing practical, profession-oriented

[40] "Leveraging extractive industries for skills development to maximize sustainable growth and employment," Bill and Melinda Gates Foundation Flagship Report Paper Series (June 2015).

training and knowledge. By collaborating in the design and support of such programmes, companies can address financial and educational deficiencies and ensure TVET addresses previously identified skill gaps. Companies can also collaborate on and coordinate supplier- development programmes to mentor, train, monitor and help potential suppliers with business improvement plans and tender preparation.[41] This would have the double benefit of reducing the company's expense and expanding a programme's impact by leveraging economies of scale. The harmonization of tender procedures between companies also reduces the tender costs for suppliers.

At the primary and secondary school levels, oil and gas companies can help instill an interest in STEM subjects in children, particularly in girls and in minority groups that are typically under-represented in the industry. Support could include hands-on, project-based learning opportunities for students, teacher training, workshop facilitation and mentoring programmes, and providing classroom resources.

Case studies and initiatives

Supporting STEM (Science, Technology, Engineering, Maths) education: Chevron – Global
In April 2014, Chevron issued a call to action to other businesses to join the company in supporting project-based learning methods to increase engagement in STEM and promote engineering design thinking in classrooms across the US. Chevron supported this call to action by announcing an additional USD $30 million commitment to create national partnerships with STEM-focused organisations, bringing its total investments in STEM-focused partnerships to USD $130 million since 2011. In addition, the company committed USD $20 million to the Appalachia Partnership Initiative to support STEM education and workforce development programmes in 27 counties across southwest Pennsylvania, northern West Virginia and eastern Ohio. At the global level, Chevron has a long history of supporting education and vocational training programs. In Indonesia, for example, Chevron helped to found, develop and fund Polytechnic Aceh -- a STEM-focused higher education institution that trains students for the industrial sector and for reconstruction and development. More than 2,500 students have graduated from the school since 2011.

Vocational training for better employment opportunities: Shell – Philippines
Poor and unemployed young adults from communities close to Shell's Malampaya Deep-water Gas-to-Power project in the Philippines are gaining skills for jobs in areas such as welding, pipe-fitting, and construction as part of a vocational training programme run by the Malampaya Foundation. The programme, called Bridging Employment through Skills Training (BEST), links trainees with industries in need of skilled workers. Since 2007, the BEST programme has produced more than 4,200 scholars, 80% of whom have found work in the Philippines or overseas.

Building local capability: Total SA – Yemen
When the Yemen LNG plant opened in 2009, there was a lack of local personnel sufficiently trained and with the necessary technical abilities to meet the standards for employment. In response, Total S.A., the main shareholder, and its partners established their own training centre. Around 300 engineers, technicians and supervisors have gone through the two-year training program that included not just LNG-related technology training but also language skills and hands-on experience. Thanks in part to this programme, 80% of the 700-plus core employees of Yemen LNG, which operates the LNG plant, are Yemeni citizens.

Offering human rights training to Sharia judges: Statoil – Nigeria
In northern Nigeria, where there is a largely Sharia legal system, basing law on Islamic teachings and guidelines from the Koran, many judges had little formal legal insight and training, and very limited exposure to Nigeria's position on human rights. Therefore, Statoil supported LEDAP, a Lagos-based NGO

[41] "Local Content: a guidance document for the oil and gas industry (2nd edition)," IPIECA (April 2016); Chinyere Ayonmike,"TVET: Model for addressing skills shortage in Nigerian oil and gas industries," Department of Technical and Business Education, Delta State University; "Vocational Training in the Context of Oil and Gas Developments: Best Practice and Lessons Learnt," Living Earth (November 2014).

made up of lawyers, in delivering a series of two-day training seminars for Sharia judges on the topics of human rights, women's rights, just interrogation procedures and legal procedure. A total of 450 Sharia judges, amounting to 20% of the country's total, across seven northern states, were given training. The training was well-received by the Sharia judges; for instance, in the evaluations of two seminars in 2004, all participants stated that the training had given them knowledge that was directly applicable to their daily work as Sharia judges.

Selected resources

- African Development Bank Group and the Gates Foundation 2015. Leveraging extractive industries for skills development to maximize sustainable growth and employment.
- Bill and Melinda Gates Foundation 2015. Leveraging extractive industries for skills development to maximize sustainable growth and employment.
- Centre De Recherches Entreprises et Societes 2008. Skills shortages in the global oil and gas industry: How to close the gap. Parts I, II.
- International Labor Organization and European Union 2011. Skills and Occupational Needs in Renewable Energy.
- IPIECA 2016. Local content guidance for the oil and gas industry (Second edition).
- Living Earth 2014. Vocational Training in the Context of Oil and Gas Developments.

GOAL 5. ACHIEVE GENDER EQUALITY AND EMPOWER ALL WOMEN AND GIRLS

Gender equality and an end to discrimination against women are both basic human rights and are also drivers of sustainable development. SDG5 seeks to empower women and ensure equal rights to economic resources, employment, education, health care and the benefits of economic growth. International and national oil and gas companies frequently work together with governments on these issues where they operate, helping to enhance awareness of the culture and practices of the host country. Company activities often bring expertise into developing countries, including labour standards and expectations that can facilitate the identification of opportunities to improve gender equality and empowerment.

However, women are often under-represented in the oil and gas industry itself.[42] Oil and gas companies can contribute to gender equality in their corporate operations by creating an inclusive culture, free of discrimination, with equal pay and opportunities for all. They can empower women through training and support for career advancement. While extractive industries can provide women opportunities for a better life, including increased employment opportunities, access to revenues, and expanded investment in the local community, extractive industries often contribute to 'gender gaps' through an unequal distribution of assets and risks.[43] To address these issues, companies can develop gender-equitable benefits systems, implement gender-sensitive local content policies, require female inclusion in community engagement activities, and anticipate and manage the gender-differentiated impacts of their activities/operations.

Key UN SDG5 targets relevant for the oil and gas industry

5.1 End all forms of discrimination against all women and girls everywhere.

5.2 Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation.

5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.

5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources in accordance with national laws

5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.

[42] "Minority and Female Employment in the Oil & Gas and Petrochemical Industries," American Petroleum Institute (March 2014), p. 20.
[43] "Extracting lessons on gender in the oil and gas sector", World Bank (2013).

Integrate SDG5 into core business

Develop gender-sensitive local content policies. Structural inequalities can create heightened barriers to women benefitting from the economic opportunities that come with oil and gas projects and operations. Cultural traditions and legal biases can make it difficult for women to have equal access to land or be paid compensation for it. Biases, interrupted education and domestic demands can make it difficult for women to take advantage of local content policies. Female entrepreneurs frequently face lower literacy and financial literacy rates, cultural biases and lower access to financing and market information.
Oil and gas companies can help end discrimination and help women participate in the opportunities provided by the industry by designing gender-sensitive local content policies that include gender-equality targets for employment and give preference in local procurement to companies that meet similar targets. They can also conduct social mapping to identify rightful landowners to receive compensation and consider gender when identifying opportunities for the shared use of infrastructure.[44] Companies could also facilitate low-interest, gender-fair loans, or lease capital-intensive equipment to assist female entrepreneurs.[45]

Support full and effective participation at all levels of decision-making. Women are sometimes excluded from participating in consultations between oil and gas companies and local communities; this may result from traditional cultural restrictions, language barriers, or a lack of gender-sensitivity in the consultation process, such as scheduling consultations that conflict with a woman's domestic obligations. Likewise, when women have grievances, they can face barriers to equal participation in redress mechanisms, including a lack of knowledge of grievance mechanisms and exclusion from the judicial process. Companies can address these issues by requiring female representation from local communities during engagement and hiring female interpreters and/or independent advisors to assist communities. Female facilitators and community affairs officers can help to build relationships with local communities and open up opportunities for women to engage with a company separately from men. Outreach, education and communication with communities on rights, grievance mechanisms and potential benefits could remain ongoing and be conducted in multiple formats throughout the life of an asset.[46]

Increase employment opportunities for women and female representation in management. To address the under-representation of women in the industry, oil and gas companies can implement gender-fair recruitment and worker policies, including equal pay, a diversity plan and quotas for hiring women at all levels. They can encourage a corporate culture that emphasizes flexibility and protects against harassment or discrimination for all individuals.

Greater female representation at leadership level is linked to increased profitability and stronger financial performance, yet the oil and gas industry has one of the lowest proportions of women at director level of all major sectors of the economy.[47] In the 100 largest listed oil and gas companies, women fill only 11% of board seats, most of which are non-executive roles.[48] This situation can be addressed through improved board recruitment processes, for example including guidelines, incorporating gender diversity considerations at every stage of the process and, in some cases, quotas. Mentoring, leadership development and board-specific training programmes can also help career

[44] Jen Scott, Rose Dakin, Katherine Heller and Adriana Eftimie, "Extracting Lessons on Gender in the Oil and Gas Sector," Extractive Industries for Development Series #28, World Bank (May 2013).
[45] Jen Scott, Rose Dakin, Katherine Heller and Adriana Eftimie, "Extracting Lessons on Gender in the Oil and Gas Sector," Extractive Industries for Development Series #28, World Bank (May 2013).
[46] Jen Scott, Rose Dakin, Katherine Heller and Adriana Eftimie, "Extracting Lessons on Gender in the Oil and Gas Sector," Extractive Industries for Development Series #28, World Bank (May 2013).
[47] "Building talent for the top: A study of women on boards in the oil and gas industry," PricewaterhouseCoopers (November 2013).
[48] "Building talent for the top: A study of women on boards in the oil and gas industry," PricewaterhouseCoopers (November 2013).

advancement for women.[49] This improves recruitment and retention of women, and creates a pool of future potential board members who are female.[50]

Collaborate and leverage

***Address negative social impacts including all forms of violence*.** The rapid modernization and monetization of the local economy that can accompany oil and gas development can potentially destabilize social relations, exacerbate existing gender inequalities and increase incidents of crime, alcoholism, domestic violence, prostitution, trafficking and sexual exploitation and sexually- transmitted diseases in local communities. These impacts are typically more heavily felt by women (see SDG3). To address these challenges, companies can partner with non-governmental organizations (NGOs) and host governments to anticipate and mitigate negative impacts e.g. through gender-sensitive public information campaigns on topics such as domestic violence and prostitution. (Women are also disproportionately vulnerable to the environmental impacts of oil and gas operations which are addressed in SDGs 6, 14, and 15.)[51]

Enhance the use of STEM education to empower women in the oil and gas industry. Companies can partner with educational institutions to develop interest among women in STEM subjects at a young age. Companies can support education initiatives, at both primary and secondary school level, designed to correct the under-representation of women in STEM subjects at higher levels.[52] Outreach programmes at all education levels can raise awareness and interest in the opportunities offered by the oil and gas industry. New communications technologies and social media could expand the range and impact of outreach efforts to all students. Companies can also partner with business schools and industry programmes, to identify female candidates already in the industry for leadership positions and provide sponsorship and training.[53]

Case studies and initiatives

Worldwide application of maternity standards: Eni – Global
The protection of the right to maternity for women in the workforce represents a fundamental value for Eni. For this reason, a study was carried out to identify any divergences from the ILO standard – Convention 183 – that governs maternity, or from the laws or corporate policies of countries in which Eni operates. In light of the results of the study, a procedure was adopted in 2015 to guarantee application of the minimum standards set forth in the ILO convention, i.e. 14 weeks' leave from work with two-thirds pay as compensation, to all women employees of Eni around the world.

Promoting women leaders in the oil and gas industry: Multiple – Global
Women remain significantly under-represented in the oil and gas industry, especially in leadership roles. To improve gender equality, the Women's Oil Council initiative was established to provide a forum to promote female leadership in the oil and gas industry. It is also a forum to discuss issues affecting women in the industry and provide networking and accelerated career development opportunities at a senior level. Partners in the Council include leading oil and gas companies such as Shell, BP and Tullow. Some companies also have internal programmes focused on the career advancement of women, such as

[49] "How to Advance Women in the Global Oil & Gas Industry," The Gulf Intelligence (2015).
[50] "Building talent for the top: A study of women on boards in the oil and gas industry," PricewaterhouseCoopers (November 2013).

[52] Jerry Lee, "How oil & gas companies are promoting STEM education," Oil Online (5 November 2014), available at https://www.oilonline.com/news/career/how-oil-gas-companies-are-promoting-stem-education#sthash.cSyIESqp.dpuf (last accessed 13 June 2016); "Vocational Training in the Context of Oil and Gas Developments: Best Practice and Lessons Learnt," Living Earth (November 2014).
[53] "Building talent for the top: A study of women on boards in the oil and gas industry," PricewaterhouseCoopers (November 2013).

Occidental Petroleum's Women of Oxy Network which provides networking opportunities and professional development to more than 300 women.

Supporting female-led entrepreneurship: Oil Search – Papua New Guinea
Local communities, particularly women in local communities, near Oil Search's project in Papua New Guinea needed additional sustainable livelihoods and means of financial freedom. The company partnered with women in communities around its facilities to support the formation of women's agricultural and fishing cooperatives by supplying seeds and other materials. In addition to having gender officers at each project-site to coordinate with women, Oil Search also offers women agricultural training, such as rice and chicken farming and commercial egg production. These cooperatives have proved successful, for instance, one of the cooperatives now supplies the locally-owned catering company that provides Oil Search's catering services.

Improving the work environment for women: Petrobras – Brazil
The Pro-Gender and Race Equality Program is an initiative of the Brazilian Federal Government supported by UN Women and the International Labor Organization (ILO) that aims to promote equal opportunities for men and women in labour environment and relations, establishing new concepts in organizational culture and human resources management. Petrobras secured the Pro-Gender Equality Recognition Standard in all five editions of the Program. This initiative is aligned with Petrobras' corporate value of Respect for Human and Cultural Diversity, stated in the Petrobras Code of Ethics and the Petrobras Guide of Conduct. As result of the programme, Petrobras has engaged in public policy campaigns to address violence against women, installed 29 rooms in its offices for supporting breastfeeding, and extended maternity leave for mothers of premature babies (in addition to the 180 days provided by law) and parental leave by 10 days.

Selected resources

- Gulf Intelligence 2015. How to Advance Women in the Global Oil & Gas Industry?
- Oxfam 2015. Oil, Gas, and Mining Industries: Women's Rights at Risk.
- PWC 2013. Building talent for the top: A study of women on boards in the oil and gas industry.
- World Bank 2013. Extracting Lessons on Gender in the Oil and Gas Sector.
- World Bank 2013. Gender in Extractives Industries.

GOAL 6. ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

Access to clean water is essential to life and to improving health, equality and ending poverty and is thus considered a human right.[54] Yet currently more than 780 million people in the world do not have access to potable water and another 2.8 billion people live in water-scarce environments.[55] Population growth, urbanization, rapid economic development and climate change contribute to water scarcity. A rise in global temperatures by 3-4° C by 2080 could place an additional 1.8 billion people in areas of high water-stress.[56]

Managing the energy-water nexus is set to become ever more important for a successful realization of development and climate goals. The energy sector is a major water-user, mainly for power generation and biofuels but also for fossil fuel production. At the same time, the water supply and treatment sector is a major energy-user and is expected to double its energy needs by 2040.[57]

Both opportunities *and* challenges exist as the oil and gas industry seeks to support access to and sustainable management of water. Though exploration, production and refining of conventional and unconventional oil and gas withdraw comparatively less freshwater than other sectors, it still accounts for about 1% of global freshwater withdrawals. [58] And if not managed well, oil and gas operations can compromise water quality. Unconventional operations, e.g. hydraulic fracturing, which have become a larger part of the industry may affect ground water by impacting aquifer connectivity. Water is essential to all segments of the oil and gas value chain and consequently oil and gas operations may have the potential to affect local water resources, particularly in already water-scarce areas. In turn, water scarcity can threaten the viability of oil and gas operations in some areas.[59]

Key UN SDG6 targets relevant for the oil and gas industry

6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

[54] UN General Assembly, *The human right to water and sanitation: resolution / adopted by the General Assembly*, 3 August 2010, A/RES/64/292.
[55] "Thirsty Energy: Securing Energy in a Water Constrained World," World Bank Brief (29 August 2013), available at http://www.worldbank.org/en/topic/sustainabledevelopment/brief/water-energy-nexus (last accessed 10 June 2016).
[56] Mauro Small, "Cities are Addressing Sustainable Development," Popular Resistance (15 January 2014), available at https://www.popularresistance.org/cities-are-addressing-sustainable-development/ (last accessed 10 June 2016).
[57] https://www.iea.org/media/publications/weo/WEO2016Factsheet.pdf
[58] "Water" BP Global Sustainability, available at http://www.bp.com/en/global/corporate/sustainability/environment/water.html (last accessed 10 June 2016).
[59] Antonia Sohns, Diego Rodriguez and Anna Delgado, "Thirsty Energy (II): The Importance of Water for Oil and Gas Extraction," World Bank Group (2016).

6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

6.5 By 2030, implement integrated water resources management at all levels, including through cross-border cooperation as appropriate.

6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

6.b Support and strengthen the participation of local communities in improving water and sanitation management.

Integrate SDG6 into core business

Develop a company water strategy. Oil and gas companies could benefit from an integrated approach to water management that accounts for the full impact of operations on local water resources through a process of planning, implementation, evaluation and review.[60] This may help to promote 'the coordinated development and management of water, to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems'.[61] An integrated approach taken in conjunction with stakeholder engagement can also inform a company's perspective on and planning for the potential effects of climate change on water resources, which will likely vary between regions and over the life of an asset.

Understand water scarcity risk management. Risk management of global water issues requires an understanding of a company's water needs in relation to the local context throughout each part of the oil and gas value chain. It requires strong water stewardship, an integrated water resource management approach and ongoing risk assessments.[62] Robust water accounting, understanding the different risks presented by different water sources, and considering the wider social, environmental and economic implications of water usage can enable water use optimization.

Oil and gas companies can use a variety of tools to map their water use and assess the risks to both their overall global portfolios and local and global water resources. The tools, including datasets, reporting metrics and mapping programmes, can enable companies to compare site -specific water use with information on water use, sanitation and population near the site. They allow companies to calculate their level of water consumption, efficiency and intensity. It also enables companies to establish water risk factors, permitting them to prioritize actions and communicate with stakeholders. The responsible sourcing of water can protect a company's social licence to operate and can contribute to meeting regulatory requirements, particularly when operating in areas of water scarcity.[63]

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[60] "Water Management Framework", IPIECA, available at http://www.ipieca.org/water-management-framework (last accessed 12 June 2016).
[61] "A Water Secure World," Global Water Partnership (June 2010), available athttp://www.gwp.org/en/Press-Room/A-Water-Secure-World/ (last accessed 12 June 2016).
[62] "Efficiency in water use. Guidance document for the upstream oil and gas industry," IPIECA (October 2014).
[63] Ruth Romer, "Can integrated water resource management be of value to business, specifically the oil and gas sector?", International Journal of Water Resources Development (March 2014); "Integrated Water Resource

Substantially increase water use efficiency. To improve water use efficiency, companies can take a 'reduce, replace, reuse, recycle' approach to water use. For example, in some applications, freshwater could be substituted with lower quality or brackish water. Additionally, and to the extent possible considering the net environmental effect, companies could take advantage of opportunities to reuse or recycle wastewater. Applications may include drilling for unconventional resources where high water volumes are needed for the short-duration hydraulic fracturing stage of operations, and also for more sustained water needs such as those of a refinery.[64] By applying these and other such approaches, companies may decrease reputational risks as well as potentially reduce operating costs.

Manage produced water and wastewater. Effective wastewater management (including produced water) involves appropriate treatment, discharge and monitoring. This helps to protect the receiving environment, which may include local water supplies, from possible pollutants and contamination. Managing wastewater may also include ensuring appropriate containment to prevent any unintended releases - via leaks or spills - from reaching or impacting the environment. Alternative uses of treated water may also be explored, such as reinjecting water back into the reservoir; reusing water for other operations, such as road maintenance in desert environments; or possibly reusing water for irrigation.[65]

Collaborate and leverage

Improving understanding of the water-energy nexus. Energy and water are heavily interdependent. Water is necessary for the extraction, transportation and processing of oil and gas.[66] At the same time energy, often from oil or gas, is necessary for the collection, transportation, treatment and distribution of water.[67] As a result, water stress or scarcity could have serious implications for oil and gas, raising costs and threatening viability of, or constraining, operations. In turn, energy restrictions threaten the viability of, or constrain, water delivery and treatment systems. The vulnerabilities of the water-energy nexus are likely to be exacerbated by increased demand for both resources as a result of everything from population growth to climate change to water- and energy-intensive industries such as hydraulic fracturing. [68] Companies can work with other stakeholders, including governments, to better the understanding of the water-energy nexus, joint water-energy policies, and opportunities for both energy-lean water and water-lean energy technologies.[69]

Participatory approach to water management. An integrated water management approach would involve government leadership and participation from a range of actors to properly oversee usage and protect supply. Oil and gas companies can collaborate with governments by becoming involved in, for example, river basin councils such as those established in places like Mongolia, Brazil and Australia to foster joint decision-making across private, public and civil society stakeholders. Decisions on how to allocate water among users, how to balance demands for economic development with social and environmental uses and determining plans for managing the basin require robust stakeholder engagement and consultation.

Management (IWRM)," United Nations, available at http://www.un.org/waterforlifedecade/iwrm.shtml (last accessed 12 June 2016); "Water Management Framework", IPIECA, available at http://www.ipieca.org/water-management-framework (last accessed 12 June 2016); "Identifying and assessing water sources," IPIECA (March 2014).

[64] "Efficiency in water use. Guidance document for the upstream oil and gas industry," IPIECA (October 2014).

[65] Antonia Sohns, Diego Rodriguez and Anna Delgado, "Thirsty Energy (II): The Importance of Water for Oil and Gas Extraction," World Bank Group (2016).; "Water," BP Global, available at http://www.bp.com/en/global/corporate/sustainability/environment/water.html (last accessed 12 June 2016).

[66] "Water for Energy," International Energy Agency (2016), Available at http://www.worldenergyoutlook.org/resources/water-energynexus/ (last accessed 11 October 2016).

[67] "Water for Energy: Is energy becoming a thirstier resource?" International Energy Agency (2012), p.2.

[68] "Water for Energy: Is energy becoming a thirstier resource?" International Energy Agency (2012); "The Water-Energy Nexus: Challenges and Opportunities," U.S. Department of Energy (2014).

[69] "The Water-Energy Nexus: Challenges and Opportunities," U.S. Department of Energy (2014).

Shared-use water infrastructure. When planning and building water-related infrastructure whether for water usage, recycling or treatment, companies can look for potential synergies with local water infrastructure needs. This approach could reduce freshwater usage by improving water efficiency, while also reducing costs and competition for water resources. Opportunities for collaboration might include partnerships on water reclamation projects, such as the construction of shared waste treatment facilities, and connecting operations to municipal water systems to allow treated wastewater to be used for non-potable purposes, such as industrial operations or landscaping.

Case studies and initiatives

Working with others to manage local water use and improve refinery water efficiency: BP – Australia
In response to an increased demand for water by agriculture and industry and decreased inflow to the dams supplying water, the government of Western Australia started tightening restrictions on water withdrawals in 1997. At the time, the largest industrial user of potable water was BP's Kwinana Refinery. The restrictions put pressure on BP to identify and act on viable opportunities to lower its overall water usage. A cross-departmental team identified water reduction, reuse and replacement opportunities and implemented a water minimisation and reuse plan for the refinery. Additionally, BP partnered with the local government, the Water Corporation and other industrial partners on the Kwinana Water Reclamation Project, which included a new water treatment plant at the refinery and connections to the local water-distribution system. As a result, the refinery's total water use dropped 42%, and its potable water use dropped by 93% from 1996 to 2014. In the long term, it also reduced water supply costs by reducing the amount of wastewater requiring treatment.

Water efficiency in hydraulic fracturing: Range Resources – USA
Range Resources, which conducts hydraulic fracturing operations in the Marcellus shale region in Pennsylvania, faced a challenge to decrease the pressure of its operations on local water supplies. Therefore, it increased its reuse of water, utilizing flowback, production brine and drill-pit water. In 2009, 28% (by volume) of the 158 million gallons of fracking fluid used was made up of water recovered from the drilling and/or hydraulic fracturing of previous wells. In addition to lessening use of local water supplies, this saved the company USD $3.2 million by cutting water purchases, wastewater disposal charges and transportation costs.

Extending access to potable water for indigenous people: Repsol – Colombia
The Wayuu indigenous people of Colombia have limited access to potable water. Repsol and the United Nations Development Programme (UNDP) signed an agreement to carry out the Communities Benefit Plan (PBC) in the Guajira Peninsula in the north of the country. The agreement focuses on measures to improve access to drinking water for the Wayuu people, including through construction of two micro-aqueducts and maintenance of four water reservoirs that benefit more than 1,600 people from 18 communities. Capacity was also built in local indigenous communities to enable maintenance of 1,200 water wells and windmills. This agreement is especially relevant because it was the first time that UNDP signed a partnership agreement with the oil industry in Colombia related to UNDP's agreement with the National Hydrocarbons Agency to ensure that companies develop Community Benefit Plans.

Using reed beds as a natural water filter: Shell – Oman
The Nimr oil field produces enormous volumes of water as a by-product, which had to be energy-intensively reinjected into deep-lying aquifers. Since 2011, Shell has used an innovative method of water treatment relying on a purpose-built reed bed facility which processes 100,000 cubic metres of water per day. The oil-heavy water is first hydrocyclone-treated, before being allowed to slowly flow through the 360-hectare reed bed. The remaining oil bio-degrades there, leaving the treated water suitable for use in drilling new wells. The system is very efficient, with Petroleum Development Oman (PDO) estimating the energy saved to equate to 23 billion cubic feet of gas over a 10-year period. The source of clean, treated water saves on pumping clean water from other sources. The project has received numerous awards, including the Global Water Award.

Selected resources

- GEMI 2016. Local Water Tool for Oil and Gas.
- IFC 2016. Water and Mining in Mongolia's South Gobi Region.
- International Journal of Water Resources Development 2014. Can integrated water resource management be of value to business, specifically the oil and gas sector?
- IPIECA 2014. Efficiency in water use: Guidance document for the upstream onshore oil and gas industry.
- IPIECA 2016. Global Water Tool for Oil and Gas Version II.
- IPIECA 2016. Water Risk Assessment.
- IPIECA 2013. The IPIECA Water Management Framework for onshore oil and gas activities.
- World Bank Group 2016. Thirsty Energy (II): The Importance of Water for Oil and Gas Extraction.

GOAL 7. ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

Energy is a key driver of sustainable development, without which most of the other SDGs cannot be achieved. Access to affordable, reliable, sustainable and modern energy is essential for economic growth, employment, education, poverty reduction, and health and safety.[70] Yet in 2015, about 1.1 billion people had no access to electricity. Additionally in 2015, an estimated 2.8 billion people globally – 41% of the world's population – had no access to modern energy sources and instead use solid fuels such as wood, charcoal and animal dung for cooking and heating.[71]

The universal global challenge is to ensure access to affordable, reliable, sustainable, modern energy, while moving towards a global energy system with net-zero GHG emissions[72] in the second half of this century[73] (see SDG 13 for more information). A long-term strategy is needed and will have to include a substantial increase in the use of lower-carbon energy sources and renewables (e.g. wind, solar, hydroelectric and geothermal), along with investments to drastically improve energy efficiency (an unprecedented reduction in both energy and carbon intensity will be required to stay within the 2°C target[74], with respectively per annum declines of 3% and 2.5%[75]). Given its prominence, a shift away from biomass for cooking fuels and other heavily-polluting sources of energy is also required.

Energy and climate are inextricably linked. Developing countries often face difficult trade-offs between financial, environmental, social and political costs of energy options, as well as other factors that impact the economic decision to pursue one fuel source over another, including the resources available, existing infrastructure, etc. Expanding energy services in developing countries while significantly lowering global GHG emissions is a daunting task, calling for judicious judgments and balancing of objectives. Both developed and developing countries will have to adjust their approach to securing energy access and designing energy systems. On the one hand, expanded energy services in the poorest countries is absolutely vital for their development; without access to affordable, reliable, sustainable and modern energy, the rest of the SDGs, and the end of poverty, are unachievable. On the other hand, the mass scale-up of modern energy services in developing countries will need to be balanced by all countries against the global goal of addressing the risks of climate change.

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[70] Gwénaëlle Legros, Ines Havet, Nigel Bruce, and Sophie, "The Energy Access Situation in Developing Countries: A Review Focusing on the Least Developed Countries and Sub-Saharan Africa," United Nations Development Programme (November 2009).

[71] "Sustainable Development Goal on Energy (SDG7) and the World Bank Group," World Bank Group (26 May 2016).

[72] Net zero carbon emissions is achieved by balancing a measured amount of carbon released with an equivalent amount sequestered or offset.

[73] "Energy for Sustainable Development," UN Sustainable Development Knowledge Platform, available at https://sustainabledevelopment.un.org/topics/energy (last accessed 12 June 2016).

[74] The Paris Agreement recognizes the importance of limiting the global rise in temperature to less than 2°C, and ideally within 1.5°C, in an effort to reduce the risks and impacts of climate change. http://unfccc.int/paris_agreement/items/9485.php

[75] IEA World Energy Outlook 2016, https://www.iea.org/newsroom/news/2016/november/world-energy-outlook-2016.html

Government, industry and civil society all have a role to play. The diversity of energy challenges around the world calls for an approach tailored to individual country and regional circumstances. In countries with access to potentially large supplies of low-cost renewable energy, these should be developed with global encouragement and public and private capital inflows. In places of great energy poverty with existing or newly-discovered low-cost hydrocarbon reserves, these resources should be considered for development. The goal should be to promote modern energy services (SDG 7) and the end of poverty (SDG 1) by giving poorer regions sufficient time to shift to net-zero emissions, while ensuring the world as a whole adopts a path consistent with the aims of the Paris Agreement[76]. Finally, in regions that expect to address energy poverty through an expansion of coal-fired power,[77] all low GHG-emitting energy sources, including renewable energy and natural gas, should be supported to slow coal's rapid growth,. Natural gas is a cleaner fossil fuel, with approximately half the carbon footprint of coal and potentially lower when paired with variable, intermittent renewable energy in an integrated power system.[78]

Key UN SDG7 targets relevant for the oil and gas industry

7.1 By 2030, ensure universal access to affordable, reliable and modern energy services.

7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.

7.3 By 2030, double the global rate of improvement in energy efficiency.

7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.

7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries and small island developing states.

Integrate SDG7 into core business

Improve access to energy services through shared infrastructure. Many of those without modern energy access are located in developing countries where oil and gas companies have a long history of operating, giving them familiarity with local challenges. Companies can improve energy access by working with local communities to determine how to best align their investments in a project with community needs, and taking advantage of opportunities to develop shared-use energy infrastructure.[79]

Grow the share of natural gas in the energy mix. Natural gas is a flexible, abundant, widely available and low-emissions fuel that can help to reduce GHG emissions, while still increasing access to energy. A new and efficient natural gas plant emits 50-60% less CO2 than a new coal plant.[80] Natural gas can also play a role enabling the broader integration of renewable energy into energy systems. The intermittency

[76] http://unfccc.int/paris_agreement/items/9485.php

[77] Currently, six Asian countries (China, India, Indonesia, Pakistan, the Philippines, and Vietnam) burn more coal than the rest of the world combined and together they account for more than 80% of the new coal power planned between now and 2020. When built, they would emit more carbon emissions than those allocated to the whole global electricity sector by the IPCC's 2°C trajectory.

[78] Frequently asked questions: How much carbon dioxide is produced when different fuels are burned?, US Energy Information Administration, available at https://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11 (last accessed 26 December 2016).

[79] "The role of the oil and gas industry in tackling energy poverty," Accenture (2014), p. 9.

[80] Cost and performance baseline for fossil energy plants, Volume 1: Bituminous coal and natural gas to electricity. Revision 2, National Energy Technology Laboratory, (November 2010).

of wind and solar energy sources requires a reliable, backup source that can be dispatched quickly to balance fluctuations in generation and demand, and improve system stability.[81] At the same time, intermittency may also be addressed in other ways, such as storage technologies and networks that balance local intermittency through regional integration of renewable energy sources.

There is also the potential to develop new natural gas fields to underpin the scale up of modern energy services for power generation, transport, and cooking fuels. To progress energy access, gas-rich, energy-poor, low-income countries may consider developing their domestic energy systems on the basis of their gas reserves, even if that will delay for some decades their transition to net-zero GHG-emission energy systems. Since natural gas produces CO2 emissions, its longer-term global use needs analysis within the context of climate change targets, and would need to be accompanied by carbon-capture-utilization-and-storage (CCUS) or other emissions-reduction technologies.

Increase the share of alternative energies and technologies in the global energy mix. In 2014, renewable energy sources such as solar, wind, geothermal, hydropower and biofuels accounted for almost half of all new power generation capacity. They can also extend energy access in areas of low demand or low population.[82] In some cases, renewables may provide off-grid or micro-grid energy access in a more cost-effective manner than extension of energy grids to these areas, while also supporting better health and environmental outcomes than the traditional use of biomass fuels.[83] Oil and gas companies may find it advantageous to explore opportunities for research and development and commercial investment in deploying alternative energy technologies.

Improve energy efficiency in operation and production. The extraction and transformation of hydrocarbons is a significant energy consumer — the oil and gas industry used 6.9% of the total energy it produced in 2011.[84] Improving efficiency in production and operations is one way to address energy poverty in both developing and developed countries. Reducing energy losses, and thus energy costs, in refining, processing, transmission and distribution also creates financial incentives for efficiency.[85] Energy-saving measures with a strong GHG element are covered in more detail under SDG 13.

Collaborate and leverage

An integrated, multi-stakeholder approach to energy poverty. Universal access to affordable, reliable, sustainable and modern energy services will require the coordinated efforts of a range of stakeholders across different sectors. These multi-stakeholder efforts could focus on the following:

- Creation of long-term energy access strategies that are consistent with the aim to 'strengthen the global response to climate change (SDG 13). All countries will need to move to low GHG-emissions energy systems, though today's low-income and energy-poor countries should be given more time to achieve their development objectives;
- Provision of affordable energy for domestic consumption: access can be enabled by reflecting the true cost of energy in a transparent manner, making the most of the assets already in place in each country, and by governmental pursuit of lowest-cost options;
- Creation of attractive investment climate for new energy services: an environment that will attract a broad range of funding mechanisms is critical. There is a need for clear and consistent

[81] "Natural gas: Into the future (The Paris Puzzle)," IPIECA (June 2015); "Energy Technology Perspectives 2012" International Energy Agency (2012).
[82] "Energy and Climate Change," International Energy Agency (2015).

regulations, competitive terms, appropriate allocation of risks, and availability of credible buyers;

- Creation of the right policy/regulatory framework that supports the development of low greenhouse gas emissions energy sources;
- Regional integration: not every country has low-cost renewable energy sources or natural gas resources, but every region does. Regional integration in renewable energy, and access to complementary natural gas, is a key step in power sector reform that would substantially reduce costs through economies of scale and increased share of power-offtake in total power generation e.g. regional power pools. This requires political will by governments in the region to develop energy systems that are regionally connected.

Case studies and initiatives

Designing for energy efficiency in projects: BP – Oman
BP has designed its Khazzan gas project in Oman to be an inherently low-emission concept. For example, it has built a central processing facility where water and condensate are removed from the gas produced at all well sites in order to create market-quality gas. Centralised gas processing takes away the need for processing equipment at each individual well site, which can be a source of additional methane emissions in gas production. Additionally, the processing facility at Khazzan is powered by the gas BP produces, and provides electricity that powers well-site equipment such as valves and pneumatic devices.

Investing in high-grade biofuels: Eni – Italy
Eni has been extending the range of inputs used to make biofuels. In 2014, Eni S.p.A. converted the Porto Marghera refinery in Venice to produce high-grade biofuels. The project involves the production of bio-oil from the organic fractioning of municipal solid waste, sewage sludge, wastewater and other agro-food waste. The refinery is capable of producing 300,000 tons of green diesel per year using refined vegetable oil. In its second phase the refinery will also be able to use animal fats, used oil, algae-based oils and certain types of biological waste.

Supplying affordable, reliable and clean electricity to the Bonny Island community: Shell - Nigeria
Nigeria LNG Limited (a joint venture between the Government of Nigeria, Shell, Total and Eni) established the Bonny Utility Company, an independent local company that supplies affordable, reliable and cleaner electricity to the Bonny Island community. Power generated by gas turbines at the Nigeria LNG plant and an oil export terminal on the island operated by Shell Petroleum Development Company is sent to a grid that serves businesses and homes in the area, benefiting around 93,000 people at affordable prices. Providing access to electricity has led to economic growth, enhanced security and a safer environment for the Bonny Island Community

Using solar power to bring energy to off-grid communities: Total SA – Tanzania and Kenya
In 2012, only 15.3% of Tanzanians and 23% of Kenyans had access to electricity. Therefore, Total S.A. recently acquired an interest in two companies that offer solar-powered energy solutions for rural areas with limited or no access to conventional energy grids. The companies market micro-grid, home and battery storage systems powered by solar energy. Off Grid Electric powers lights for 10,000 new customers a month in Tanzania and Powerhive launched a project that will see 100 micro grids supply power for 90,000 homes in Kenya.

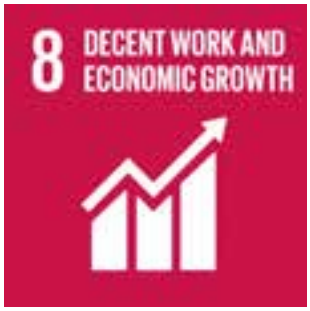
Energy Access Platform: working together to ensure access to affordable, reliable, sustainable and modern energy for all: Total SA and Shell - Global
Oil companies, including Total S.A. and Shell, have partnered with the OPEC Fund for International Development (OFID), the World Petroleum Council (WPC) and the International Gas Union (IGU) on the Oil and Gas Industry Energy Access Platform (EAP) to support achievement of SDG7. The EAP is intended to leverage the knowledge, experience and technology of its members to provide a platform for

collaboration on energy access solutions, improved energy efficiency, increased deployment of renewables and long-term energy policy.

Researching how to improve vehicle efficiency: Concawe – Global
Concawe, an environmental and social research group focused on the European refining sector, collaborated with the European Council for Automotive R&D and the European Commission's Joint Research Centre to develop the Well-to-Wheels initiative. Well-to-Wheels examines the energy use and GHG-emissions of different fuels and engine parts, such as powertrains, throughout their entire value chain (from the wellhead to their use in vehicles) to assess the viability, cost and benefits for energy use and emissions of different fuel and engine options. The goal of the assessment was a consensus on well-to-wheels energy use and emissions assessment of those fuels and engine parts.

Selected resources

- Accenture 2014. The role of the oil and gas industry in tackling energy poverty.
- Columbia Center on Sustainable Investment 2016. A Regulatory, Operational and Commercial Framework for the Utilization of Associated Gas.
- Gas Naturally 2016.
- International Energy Agency 2015. World Energy Outlook.
- Oil and Gas Climate Initiative.
- Sustainable Energy for All.
- UN Energy 2014. Energy: A Brief Discussion on Goals, Targets and Indicators.
- UN Technical Support Team. Issues Brief: Energy.



GOAL 8. PROMOTE SUSTAINED, INCLUSIVE AND SUSTAINABLE ECONOMIC GROWTH, FULL AND PRODUCTIVE EMPLOYMENT AND DECENT WORK FOR ALL

Sustainable development requires job creation and inclusive economic growth. More than 200 million people were unemployed in 2015 and more than 600 million new jobs will have to be created in the next 15 years to meet the needs of a growing working-age population.[86] Decent work opportunities that meet internationally-recognized labour standards and offer skills development will be necessary. Employment is a crucial path out of poverty and towards shared prosperity. The key will be encouraging entrepreneurship, technological innovation and increased productivity.[87]

While the oil and gas industry is less labour-intensive than many other industries, it tends to generate much higher fiscal revenues, attracts significant foreign direct investment and accrues foreign exchange reserves, which are important for the overall economic growth of host countries. Oil and gas companies can also contribute to providing decent work for women and men by following best practices in labour, health, and safety.

In addition to those contributions, companies have the opportunity through their core business activities to help build competitive, long-term sustainable resource-based economies via local content practices. Local content policies, which promote the sourcing of goods and services from local businesses, can help foster economic growth and development, especially when pursued in the context of improving the enabling environment.

Local employment is often a priority for local communities and governments, and many developing countries have local content policies requiring certain levels of local employment. In addition to direct employment opportunities, greater opportunities for job creation can exist through local sourcing of goods and services, capacity-building and encouraging economic diversification away from dependence on upstream oil and gas. Investing downstream, in refining and storage capacity, can also provide opportunities for job creation and local business development.[88]

Access to energy, a key benefit delivered by the oil and gas industry, also drives economic growth and job creation at a scale that far exceeds the direct and more immediate indirect impacts of the industry's operations. Access to energy enables and increases productivity in a variety of ways. For example, adequate lighting can increase the number of working hours available. Modern heating and cooking appliances can reduce the time spent gathering solid fuel.[89]

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[86] "SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all," SDG Compass (2016), available at http://sdgcompass.org/sdgs/sdg-8/ (last accessed 13 June 2016).

[87] "Goal 8: Decent work and economic growth," UNDP (2015), available at http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda/goal-8.html (last accessed 13 June 2016).

[88] "Local Content: a guidance document for the oil and gas industry (2nd edition)," IPIECA (April 2016).

Oil and gas companies also have an opportunity to influence the policies and practices of their suppliers. Suppliers can be responsive to well-articulated expectations from their customers around labour standards and non-discrimination. Oil and gas companies can help underline those expectations by conducting human rights due diligence that includes examining the performance of their key suppliers.

Key UN SDG8 targets relevant for the oil and gas industry

8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value-added and labour-intensive sectors.

8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services.

8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead.

8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value

8.7 Take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labour, eradicate forced labour and, by 2025, end child labour in all its forms, including the recruitment and use of child soldiers.

8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.

8.9 By 2020, substantially reduce the proportion of youth not in employment, education or training

8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all.

Integrate SDG8 into core business

Conduct skills assessment and communicate reasonable expectations. Local communities often respond to the arrival of oil and gas companies with unrealistic expectations of imminent and widespread economic development, and host governments increasingly include local content provisions in concession agreements.[90] But oil and gas companies often operate in remote and/or economically underdeveloped locations where the conditions make meeting those expectations or requirements difficult, if not impossible. Companies often conduct a skills assessment and compare it to the needs of the project. They also communicate the different stages of the oil or gas project, the different economic opportunities in each stage and the company's local content development plan to local communities, educational organizations and government at the outset. Early and ongoing dialogue can set more reasonable expectations and avoid disappointment that could affect a company's social licence to operate.[91]

[90] "Manage risk, navigate uncertainty, improve your business," Innovation Forum (2016), available at http://innovation-forum.co.uk/perch/resources/if-sustainable-extractives-brochure-2016.pdf (last accessed 13 June 2016).

[91] "Inclusive business practices in Africa's extractive industries," ILO Policy Note, International Labour Organization (2015).

Foster full and productive local employment and workforce development. An educated and experienced workforce with transferable skills can be a major driver of economic growth. However, direct employment in oil and gas operations can often be limited, and the local workforce can lack the technical and managerial capacity necessary to meet a company's standards. This is particularly true in the early stages of a project and in countries without an industrial base.[92] Companies and governments often address the capacity issue through education, training programmes and gap closures (see SDG4). Such programmes are also an opportunity to recruit women or other groups who are traditionally under-represented in the industry. Clear and transparent policies on recruitment, employment and employee capacity-building can remove confusion about qualifications and demonstrate the company's commitment to local employment.[93]

Encourage local procurement and supplier development. Incorporating local businesses into the supply chain, either through the direct procurement of goods and services by the company or through indirect procurement via contractors, can contribute to inclusive economic growth. However, it often requires a commitment by the company and government to strengthen the capacity of local businesses to make them competitive and to bring them up to required health, safety, labour and quality standards. This is often done through enterprise development programmes or modification of the company's policies to fit the operational situation.[94] Policies could also establish what 'local' means, because the developmental impact of procurement from companies located near the project will likely be quite different from procurement from a company merely located within the host state.[95]

Collaborate and leverage

Supporting economic diversification to achieve higher levels of economic productivity. A robust strategy for avoiding over reliance on a company's oil and gas operations includes enabling entrepreneurs to identify new opportunities in the supply chain or for value-adding projects, developing the capacities of micro, small and medium enterprises and otherwise expanding the local oil and gas sector. It also seeks opportunities to create business clusters with other sectors that align with oil and gas, either further down the value chain or in its supply chains. Helping to diversify the local economy prepares it for a time in the future when the company depletes the oil or gas resources and ceases its operations.[96] (See also SDG9 and 11)

Multi stakeholder dialogue to promote development-orientated policies. Unless companies and policymakers communicate about industry and development priorities, government local content policies and the company programmes/practices to enhance local content may be sub-optimal for achieving SDG8. Policymakers can work to better understand the industry, and companies can become more familiar with a country's development goals. Development agencies can help facilitate this dialogue.

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[92] Silvana Tordo, Michael Warner, Osmel Manzano and Yahya Anouti, "Local Content Policies in the Oil and Gas Sector," World Bank Group (2013).

[93] "Inclusive business practices in Africa's extractive industries," ILO Policy Note, International Labour Organization (2015).

[94] "Local content strategy: a guidance document for the oil and gas industry (1st edition)," IPIECA (October 2011).

[95] "Inclusive business practices in Africa's extractive industries," ILO Policy Note, International Labour Organization (2015).

[96] Francisco Galrao Carneiro, Rohan Longmore, Marta Riveira Cazorla and Pascal Jaupart, "Future without oil? Diversifying options for Trinidad and Tobago," Economic Premise vol. 142, World Bank (May 2014); Jose Sa and John McCreery, "How national oil companies can fuel economic development," Bain & Company (December 2011), available at http://www.bain.com/publications/articles/how-national-oil-companies-can-fuel-economic-development.aspx (last accessed 13 June 2016).

Case studies and initiatives

Empowering women by facilitating bank services in remote areas: ExxonMobil - Global
ExxonMobil's 2012 Roadmap for Promoting Women's Economic Empowerment found that one of the key issues facing women entrepreneurs was the challenge of accessing banking services due to geographic distance and high bank fees. As a result, the ExxonMobil Foundation, in partnership with TechnoServe, Mercy Corps and the Centre for Global Development, began a pilot programme to provide women entrepreneurs with access to mobile savings. The programme provides mobile savings access and accompanying financial literacy-training to 3,000 women farmers and entrepreneurs in Indonesia and Tanzania. The hope is that providing access to banking services through mobile phones will enable women to save more, invest their savings and therefore see increased business incomes.

Assessing and addressing local skills gaps: Multiple – Tanzania
Tanzania has struggled to take advantage of the employment opportunities presented by its gas industry. It needs to increase the pool of local labour with skills that are up to international standards, qualifying individuals for semi-skilled employment opportunities in the field. The first step in addressing the issue is an assessment identifying gaps in the existing training and education system that would need to be addressed. For the Tanzania LNG Project, the five energy companies involved collaborated with the Tanzania Vocational Education and Training Authority and the international NGO VSO to conduct a skills gap assessment of educational and vocational needs of the country's gas sector. While the focus of the assessment was on occupations in several disciplines relevant to gas, they were chosen for their transferability to other sectors. In addition to identifying gaps, the assessment also identified opportunities, priorities and recommendations for companies to take to address those gaps.

Industry guidance for successful local content strategies: IPIECA – Global
There are a range of initiatives working to define policies and practices for promoting sustained, inclusive and sustainable economic growth. Examples include the OECD's Policy Dialogue on Natural Resource-based Development, a group that includes companies, governments and civil society organizations which are developing a framework to help formulate and implement collaborative strategies for shared resource-based value creation. IPIECA's Local Content Task Force also recently updated its *Local Content Strategy: A guidance document for the oil and gas industry*. Other important areas of work by the industry include initiatives related to human rights, community consultation and grievance mechanisms – all of which help to ensure inclusive economic growth.

Collaborating on Skills for Oil and Gas Africa: Multiple – Mozambique, Tanzania, Kenya and Uganda
Recent oil and gas discoveries in Mozambique, Tanzania, Kenya and Uganda offer opportunities for economic development, but these countries are poorly placed to take advantage owing to a lack of domestic skilled labour. Therefore, Total, Tullow, Eni, Shell, Anadarko, BP and the LNG Joint Venture group have come together to support the Skills for Oil and Gas Africa (SOGA) project, a partnership between the UK Department for International Development, the German Ministry for Economic Cooperation and Development and Norway. The SOGA project aims to get around 32,000 East Africa residents into sustainable work by 2020, with 35% of those women and 40% aged 15-24, through investment in STEM teaching and TVET to give residents the skills to work in the oil and gas industry. The project will also support the development of local small and medium enterprises (SMEs) to enable them to enter the oil and gas supply chain.

Instilling a safety culture: Chevron – Bangladesh
When Chevron began construction of the Bibiyana Field in 2005, many of the local villagers employed on the project took time to develop a workplace safety culture. Prospective workers were unaccustomed to wearing protective shoes, safety glasses and fire-retardant clothing. Therefore, Chevron invested in fostering a cultural paradigm shift, not only within the plant but also in local communities, by establishing a Health, Environment and Safety training centre, requiring employees and contractors to undergo the Fitness for Duty process and holding a daily safety meeting onsite. Teaching processes emphasized repetition and visual aids to help accommodate the 56%-literacy level in Bangladesh. Crucially, a key aspect of the process was extending training into the community at large rather than just to employees, to achieve a more complete and fundamental shift to a safety culture. As a result,

Chevron has amassed 40 million work hours since the last Days Away From Work injury in 2008, and has had no significant environmental incidents, fires or spills.

Selected resources

- International Finance Corporation 2011. A guide to getting started in local procurement.
- International Labor Organization 2015. Inclusive business practices in Africa's extractive industries.
- IPIECA 2016. Local content guidance for the oil and gas industry (Second edition).
- Shared Value Initiative 2015. Extracting with Purpose.
- UNCTAD Extracting Industries 2012. Optimizing Value Retention in Host Countries.
- World Bank 2013. Local Content Policies in the Oil and Gas Sector.

GOAL 9. BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION

Economic growth is dependent on local infrastructure and sustainable industrialization. Development requires basic energy, transportation, sanitation, health and communications infrastructure. Addressing the economic and environmental challenges of development also requires technology and innovation. However, many emerging economies face outdated, overburdened or non-existent infrastructure and a lack of technological skills or the institutions to teach them. Investment in infrastructure and innovation will be critical for sustainable growth, poverty reduction and public health.

Robust and quality infrastructure has spill-over effects for the entire economy and, especially for the oil and gas industry, it creates efficiencies and decreases operational costs. Poor infrastructure poses obstacles, raises investment costs and increases the risk profile of oil and gas projects. Building shared-use infrastructure, whereby the industry allows other stakeholders to use the infrastructure built for its operations, can be a cost-effective way to improve infrastructure access while also benefiting local communities. Improved domestic technological capabilities and greater industrial diversification, in addition to promoting broad-based economic growth, can benefit companies by increasing local capacity to support operations.

Key UN SDG9 targets relevant for the oil and gas industry

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries.

9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets.

9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.

9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and increasing the number of research and development workers per 1 million people and public and private research and development spending.

9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.

Integrate SDG9 into core business

Upgrade infrastructure and technology to make them sustainable. Technological advancements and efficient infrastructure are paths to meeting energy demand while avoiding or reducing environmental and social impacts and related risks. Ensuring that infrastructure is climate-resilient is key to supporting adaptation to climate change. Additionally, by applying new, more efficient techniques for finding and producing oil and gas, companies can improve the environmental and social stewardship of their entire value chain. Examples of these techniques include multi-well drilling and production pads with a smaller environmental footprint, co-generation to improve energy efficiency, development of fuel cells and biofuels, and carbon capture and storage.[97] For more on energy efficiency and energy access efforts by oil and gas companies, see SDGs 7 and 13.

Evaluate potential opportunities for shared use. Lack of infrastructure such as power plants, water treatment facilities and roads and ports, and a lack of funding for large-scale infrastructure investments can inhibit economic development and human well-being. In some instances, it cause the delay or cancellation of oil and gas projects. Developing infrastructure in conjunction with a host government can result in cost savings and other benefits. Oil and gas companies also can provide opportunities to leverage economies of scale or scope. For example, in most instances, a shared infrastructure investment at a larger scale will be less costly overall than investing in two separate, adjacent solutions. Likewise, completing two discrete but adjoining infrastructure projects (e.g. laying out fibre-optic cables when constructing a pipeline) concurrently can also reduce overall costs. A shared-use approach has the greatest chance for success if governments and other key stakeholders are consulted and development planning begins at the earliest stages of a project.[98] (See also SDG 2 and 5).

Collaborate and leverage

Enhance technological capabilities and knowledge transfer. The complexity of oil and gas operations requires a high level of technology and expertise, which increases the barriers to entry to the value chain that local small and medium enterprises face. Capacity-building to develop SMEs and integrate them into local procurement channels can promote inclusive industrialization (see SDG8). Another way is supporting STEM education and skills development (see SDG4). The oil and gas industry is investing in new technologies that can increase energy efficiency and conservation and are low-carbon and climate-resilient in nature. With emerging economies expected to help drive energy demand, it is particularly important that these advancements are made and shared in the near future. Transfer can take place through licensing or selling technologies to local companies or suppliers, joint research and development efforts, joint ventures, partnerships between international and state-owned oil companies or through academic exchanges or public-private partnerships.[99]

Expand off-grid energy access. In rural and isolated areas with low demand and little or no existing energy infrastructure, extending an electricity grid may not be feasible or practical. In these areas, energy needs – particularly for cooking and heating – are typically met through biomass, notably charcoal, which can cause health or environmental problems. Micro-grids, cleaner fuels such as butane, and renewable energy technologies such as solar and wind power are solutions that can provide the reliable, affordable energy needed for development, while addressing important societal challenges

[97] "The Outlook for Energy: A View to 2040," ExxonMobil (2016).
[98] "NRGI Reader: Extractives-Linked Infrastructure," Natural Resource Governance Institute (March 2015).
[99] "Energy Investments and Technology Transfer Across Emerging Economies: The Case of Brazil and China," International Energy Agency (2013); "About the Climate Technology Centre and Network," CTCN website, available at https://www.ctc-n.org/about-ctcn (last accessed 13 June 2016).

such as climate change and poverty. Such initiatives also offer a path towards balancing the growing energy needs of emerging countries with action on climate.[100]

Case studies and initiatives

Local procurement and supplier development: Multiple – Angola
Angola has few potential suppliers and business services. Therefore, Chevron, BP, ExxonMobil and Total S.A. partnered with state oil company Sonangol and a US-based NGO, PYXERA Global (then called Citizens Development Corps) to establish Centro de Apoio Empresarial (CAE), an enterprise development project. The programme offered business training and advisory services to Angolan businesses and a certified directory of qualified suppliers and company liaison services to the multinational oil and gas companies. Between 2005 and 2010, 312 contracts totalling USD $212 million were awarded to Angolan businesses in the programme.

Bringing shared-use information technology infrastructure: Petronas – Malaysia
Access to internet and telecommunications technology (ICT) infrastructure is important for bringing developing countries out of poverty, yet many households in developing countries do not have any internet access. As ICT infrastructure is also important for improving efficiency and savings for oil and gas companies, Petronas, Malaysia's national oil company, partnered in a joint venture with one of the country's main telecommunications companies, Celcom, to build a trunk fibre-optic network along a gas pipeline route. This benefits Petronas by meeting the company's IT and telecom needs, while Celcom can lease the spare capacity to mobile service operators and other companies. The 1,400 km of cables now provide coverage for almost 90% of the country.

Improving local infrastructure by providing sustainable off-grid energy: Shell – Philippines
The Batak community on Palawan island, one of the Philippines' oldest indigenous peoples, are isolated in the jungle and so lacked access to affordable, reliable, sustainable and modern energy. As part of its Access to Energy Initiative, Shell established a micro-grid that the Batak community can sustainably operate using a hydropower generator supplemented by solar power and linked to rechargeable batteries to provide electricity. As a result, the whole community has sufficient electricity, all of which is cheaply provided and sustainably produced.

Working with academia to enhance technical training: Statoil – Russia
Meeting the demand for skilled personnel by the oil and gas industry in Russia requires stronger vocational training and education. Therefore, Statoil is collaborating with several universities in Russia to build a degree programme on petroleum management. The efforts include providing technical assistance to Pomor State University towards developing a petroleum management-focused Bachelor of Business Administration degree and building staff capacity at the university. The Norwegian University of Science and Technology has been responsible for the project's execution, with the Norwegian Ministry of Foreign Affairs covering half the external costs and Statoil the rest. Since the programme's inception, the number of entrants has doubled.

Partnering for efficient research and development: Repsol – Global
Fundación Repsol runs an Entrepreneurs Fund aimed at supporting entrepreneurs with innovative technological projects in the field of energy and energy efficiency. Additionally, since 2011 Fundación Repsol has been working in partnership with the BC3, Basque Centre for Climate Change, a top think tank and research institute rated second in world rankings created by the ICCG (International Center for Climate Change Governance). The BC3 promotes research on the causes and consequences of climate change. Fundación Repsol has worked in partnership with the BC3 and the University of the Basque Country to develop the Low Carbon Program, aimed at finding ways of using energy more efficiently.

[100] Douglas Barnes, Robert van der Plas and Willem Floor, "Tackling the Rural Energy Problem in Developing Countries," International Monetary Fund (1997); "Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector," World Bank Group (July 2013).

The programme includes the following initiatives: developing a doctoral thesis, producing publications aimed at both the general public and academics, and organising an annual workshop.

Selected resources

- NRGI Reader 2015. Extractives-Linked Infrastructure.
- United Nations Industrial Development Organization 2012. Promoting Industrial Diversification in Resource Intensive Economies.
- World Bank Group 2013. Local Content Policies in the Oil and Gas Sector.
- World Bank Group 2013. Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector.

GOAL 10. REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES

Oil and gas development and access to affordable, reliable, sustainable and modern energy has been demonstrated to significantly and positively impact economic growth and human well-being. Revenues from the production of oil and gas resources, foreign direct investment and establishment of supply industries can be used to reduce poverty and support social developments that help reduce inequalities, e.g. in access to health services and education. At the same time, many resource-rich countries with weak governance and lack of transparency have not been able to drive inclusive growth and reduce income inequality.[101] The development of the oil and gas sector, especially when a dominant part of the economy, can lead to local currency inflation and reduce the international competitiveness of other, often more employment-intensive, sectors, contributing to growing inequalities. Oil and gas revenues can be distributed unevenly at the national, sub-national or local level, benefiting some regions or groups and excluding others.[102] Resultant growing inequality can ultimately threaten social and political stability and lead to conflict.[103]

Transparency enables greater accountability in the management of public and social resources and curbing corruption. By promoting greater accountability, it supports greater economic efficiency, better sector and host country governance and, ultimately, a fairer distribution of economic rents across society. The oil and gas industry has a role to play in promoting and operating in a transparent manner, in compliance with global standards and applicable regulatory requirements. SDG10 seeks to remedy income disparity and the underlying inequality of opportunities that leads to it.[104]

Key UN SDG10 targets relevant for the oil and gas industry

10.1 By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average.

10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.

[101] "Chapter 6: Income Inequality and the Condition of Chronic Poverty," Towards Human Resilience: Sustaining MDG Progress in an Age of Economic Uncertainty, UNDP (2011); "Sarah Peck and Sarah Chaves, "The Oil Curse: A Remedial Role for the Oil Industry," Carnegie Endowment for International Peace (September 2015).
[102] "Natural Resource Revenue Sharing: Executive Summary," Natural Resource Governance Institute (September 2015).
[103] Paul Collier and Benedikt Goderis, "Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum," Centre for the Study of African Economies Working Paper Series (August 2007).
[104] "Goal 10: Reduced inequalities," UNDP, available at http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda/goal-10.html (last accessed 13 June 2016); "Oil and Gas Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights," European Commission.

Integrate SDG10 into core business

Ensure full and transparent tax payments. Governments in resource-rich, emerging economies can depend heavily on the revenue from oil and gas extraction, and this can fund long-term investment projects that can facilitate economic growth and reduce inequality. Transparency regarding these payments and transfers can be useful in checking whether transfers have indeed occurred and in holding companies and governments (at the national, provincial and local level) to account.[105] How oil and gas companies can contribute to addressing this issue is discussed in SDG16.[106]

Assess inequality impacts in project planning. Economic growth is not necessarily uniform; it can vary between regions, genders, and ethnic, religious and age groups. Oil and gas activities can potentially shift existing income distributions, which can create problems for vulnerable groups such as women, older or low-skilled workers who might be less capable of transitioning to new job opportunities. The resultant inequality can in some instances/locations potentially lead to violence or instability, perhaps also negatively impacting the oil and gas operation. Understanding such dynamics and incorporating them when designing benefit-sharing makes social investments and their impacts more sustainable in the long run. Predicting and managing inclusive growth, particularly when dealing with the large potential windfalls of oil and gas revenues, can be a difficult challenge. Conducting socio-economic and human rights impact assessments can identify marginalized groups who could face heightened risks and more severe negative impacts, and may require special consideration and mitigation measures. Such assessments can help guide a company's strategy for its local socio-economic initiatives. Based on assessment findings, a company can shape its approach so programmes, such as local employment and procurement, training and investments in local development and infrastructure, encompass marginalized and vulnerable groups.[107]

Set expectations and communicate with local communities. Inequality can potentially threaten social and political stability at both the local level near an oil and gas facility and more generally at the national level. The causes could include the disconnect between the economic impact of an oil or gas activity and local expectations, or unequal revenue distribution. This can lead to frustration and increased social tensions, even when incomes are rising and income inequality is actually narrowing. The possibility that this frustration is expressed through violence or instability can be higher when the affected groups are distinct (ethnically, religiously, etc), have little influence over a government, and particularly when there is existing support for separatist, extremist or independence movements.[108] Revenue transparency and stakeholder engagement featuring inclusive dialogue can help avoid increasing tensions by setting reasonable expectations related to the potential local and national benefits of an oil and gas venture and identifying ways a company and local communities can best work together.

Mitigate the impacts of climate change. Climate change may exacerbate inequality, as poor people tend to be the most vulnerable to its impacts. Women, rural communities and marginalized or indigenous groups are more heavily reliant on agriculture and wild resources, which can be climate-sensitive by their very nature. Such groups are often poorly-equipped to deal with the consequences of

[105] "Guidance note 10 on subnational reporting", EITI, (2016), available at https://eiti.org/sites/default/files/documents/guidance-note-10-subnational-reporting-2016_0.pdf

[106] "Goal 10 – Why Addressing Inequality Matters," UN Chronicle, available at http://unchronicle.un.org/article/goal-10-why-addressing-inequality-matters/ (last accessed 13 June 2016); Michael Ross, "How Mineral-Rich States Can Reduce Inequality," *Escaping the Resource Curse* (2007).

[107] Michael Ross, "How Mineral-Rich States Can Reduce Inequality," *Escaping the Resource Curse* (2007); "Supporting development in societies where we work," BP Global, available at http://www.bp.com/en/global/corporate/sustainability/society/supporting-development-in-societies-where-we-work.html (last accessed 13 June 2016); "Oil and Gas Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights," European Commission.

[108] "Goal 10 – Why Addressing Inequality Matters," UN Chronicle, available at http://unchronicle.un.org/article/goal-10-why-addressing-inequality-matters/ (last accessed 13 June 2016);

natural disasters and deserve particular attention as a result (for more on actions oil and gas companies can take to help address climate change, see SDG13.)[109]

Collaborate and leverage

Enhance revenue management and improve local governance. Extractive companies generate revenue through payment of taxes and royalties to government, but sometimes these contributions are not seen or felt by local populations. Typically, tax revenue contributes to a national pool or, when targeted locally, may be difficult to track, owing to weak government-capacity or a lack of transparency. Companies and local authorities share a common goal, namely that resources paid are invested wisely to benefit the local population. Increasing local benefits may help local authorities to secure their political mandate and support a company's social licence to operate. Moreover, helping local governments to invest wisely and provide essential public services alleviates the pressure on the private sector to provide public goods as a substitute for an underperforming public sector. Building local government capacity that understands and anticipates how rising oil and gas revenues will affect income distribution and can direct resource revenues to achieve broader economic growth and avoid Dutch Disease – where oil and gas development causes an influx of foreign currency which increases the value of local currency – is more sustainable and less likely to undermine democratic processes.[110] A by-product of working with local government is the possibility of forging a more collaborative relationship to manage risks and opportunities over time. Through its revenue management programmes, IFC has gathered useful lessons with respect to building local government capacity and promoting civil society demand for good governance.

Case studies and initiatives

Increasing openness in contracting: Multiple – Global
The Open Contracting Partnership advocates for public contracts and supports the adoption of the Open Contracting Data Standard. Multilateral development institutions have also adopted more stringent requirements for supporting investments in extractive industries. For example, since the early 2010s the International Finance Corporation has required its extractive industry clients to publicly disclose contracts or a summary of key terms as well as material payments made to governments. The European Bank for Reconstruction and Development established a very similar rule for hydrocarbons investments in its 2013 Energy Strategy (for more on transparency see SDG16).

Inclusive operations - employing local indigenous peoples: BP – Indonesia
Tangguh is Indonesia's second largest liquefied natural gas supply facility. With the advent of an expansion project, there was a need to understand how any new activity could impact the local community, particularly the indigenous Papuan community. BP consulted with 62 villages in the Bintuni Bay areas to discuss the project and better understand local concerns and requests. The assessment highlighted that the increased industrialization could lead to socioeconomic change that could potentially marginalize the Papuan community. In response, BP altered its approach to engaging with the local community and developing its social programmes, expanding the scope beyond villages in the

[109] Chelsea Harvey, "Climate change is going to make inequality even worse than it already is," The Washington Post (8 December 2015), available at https://www.washingtonpost.com/news/energy-environment/wp/2015/12/07/climate-change-is-going-to-make-inequality-even-worse-than-it-already-is/ (last accessed 13 June 2016); Timothy Gore, "Extreme Carbon Inequality: Why the Paris climate deal must put the poorest, lowest emitting and most vulnerable people first," Oxfam International (December 2015).
[110] Richard Dobbs, Jeremy Oppenheim, Adam Kendall, Fraser Thompson, Martin Bratt and Fransje van der Marel, "Reverse the curse: Maximizing the potential of resource-driven economies," McKinsey Global Institute (December 2013); Michael Ross, "How Mineral-Rich States Can Reduce Inequality," *Escaping the Resource Curse* (2007); "The Oil Curse: A Remedial Role for the Oil Industry," Carnegie Endowment for International Peace (30 September 2015), available at http://carnegieendowment.org/2015/09/30/oil-curse-remedial-role-for-oil-industry/iig7 (last accessed 13 June 2016).

immediate vicinity of the facility to include members of all four indigenous tribes that reside in the coastal area. In an effort to empower indigenous people, BP supported the establishment of two sustainable businesses: one that manufactures uniforms for its Tangguh workers and others, and another that will provide air-conditioning maintenance to service the growing local industry. BP is also working to build the local indigenous workforce and has committed to an 85% Papuan workforce by 2029. To achieve this goal, the company developed an internship programme to recruit university graduates from Papua and Papua Barat for BP's Tangguh LNG site. This gives graduates from a variety of disciplines - such as electrical and mechanical engineering, geology and economics - hands-on experience to prepare them for future careers at BP or one of its business partners. More than 55 Papuan graduates have been recruited since the internship programme began in 2009. Currently 55% of the workforce are Indonesian nationals from the Papuan province.

Promoting equal opportunities by bringing STEM education to indigenous children: Chevron – Australia

Chevron Australia is supporting programmes and initiatives to engage children in science, technology, art and innovation. Since 2006, Chevron Australia and Scitech have delivered an innovative science education programme that inspires students to consider and pursue careers in the oil and gas industry. The Aboriginal Education Program aims to create a measurable change in the level of engagement in science education among Aboriginal schoolchildren in remote communities. Scitech overcomes the geographical, cultural and socioeconomic barriers by travelling to remote locations to involve Aboriginal schoolchildren in culturally-appropriate STEM education. The programme has brought science workshops and professional learning sessions to more than 6,500 students and teachers.

Improving opportunities by establishing a community investment fund: Repsol – Bolivia

Repsol made an Agreement of Friendship and Cooperation with the Assembly of the Guarani People of Itika Guasu (APG-IG), which committed Repsol to making financial contributions towards the development of the APG-IG and the communities it represents through establishment of a USD $14.8 million investment fund. This is the first investment fund with an indigenous organisation in Latin America and income obtained will be invested in areas such as health, education, housing and economic development.

Selected resources

- International Association for Impact Assessment 2015. Social Impact Assessment: Guidance for assessing and managing the social impacts of projects.
- IPIECA 2012. Indigenous Peoples and the oil and gas industry.
- Michael Ross 2004. How Mineral-Rich States Can Reduce Inequality.
- Oxfam 2015. Extreme Carbon Inequality.
- United Nations 2008. Declaration on the Rights of Indigenous Peoples.

GOAL 11. MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

More than half the world's population lives in urban areas, and this figure is expected to grow to approximately two-thirds by 2050. Cities are responsible for 70-80% of the world's economic output and 80% of its energy consumption and greenhouse gas production.[111] As a result, adapting to changing patterns of energy use and providing access to energy differently will be necessary to meet the sustainable development agenda.

Opportunities exist for more integrated infrastructure, more efficient municipal and residential energy usage, and the development of more effective public transportation systems. Oil and gas companies can provide inputs to the long-term planning for urban development.[112] They can contribute to this planning by identifying opportunities to improve how cities generate and use energy, use infrastructure, reduce waste and reduce their carbon footprint. Companies can provide cleaner and more efficient power generation through the increased provision of natural gas. Anticipation and mitigation by companies can also help address the issues that can accompany the urbanization that often occurs around oil and gas developments.

Key UN SDG11 targets relevant for the oil and gas industry

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.

11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning.

11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, develop and implement, in line with the forthcoming Hyogo Framework, holistic disaster risk management at all levels.

[111] "Future Cities," Shell Global, available at http://www.shell.com/energy-and-innovation/the-energy-future/future-cities.html (last accessed 13 June 2016).
[112] "New lenses on Future Cities," Shell International B.V. (2014).

Integrate SDG11 into core business

Protect and safeguard the world's cultural heritage. Oil and gas industry activities can potentially affect the culture and traditions of local communities – particularly indigenous communities – by disrupting traditional practices or damaging areas of archaeological, historical, artistic and/or religious significance. Cultural heritage management and preservation processes, implemented with stakeholders' input, can protect traditional practices and the tangible aspects of local cultures, as well as enhance a company's social licence to operate. Processes can include developing cultural heritage management plans, incorporating cultural heritage into environmental, social and health impact assessments (ESHIAs) and targeting social investments in support of cultural preservation efforts.[113]

Address risks related to operations in urban environments. Increased urban development can lead to urban encroachment on oil and gas operations. To address the increased risks and costs that can be associated with oil and gas operations located near urban centres, companies can be proactive in planning how to address such risks at the earliest stages of the development planning process and build engagement channels with stakeholders, including local communities and public and municipal officials.[114] Operating facilities near to urban areas may also necessitate the implementation of enhanced safeguards.[115] These could include creating 'buffer zones' to provide a separation from homes, schools and businesses, developing and periodically revisiting emergency response plans for dealing with accidents and undertaking regular information-sharing and public engagement campaigns targeting local residents, business owners and municipal officials.[116] Studies show that low-income and minority communities are more vulnerable to the impacts of oil and gas industry activities near to urban areas, and so companies with new projects or facility expansions that could possibly experience such situations should plan ahead to reduce the potential of negative impacts.[117]

Support inclusive and sustainable urbanization in response to operations. Some oil and gas projects in some locations can give rise to the in-migration of job seekers and entrepreneurs. Such sudden population growth can potentially overrun existing communities and overwhelm local governments. It can also affect a community's ability to access health, clean water, education and traditional livelihoods. In-migration can also bring a range of social issues including crime, breakdowns in established social networks and disproportionately negative impacts on women. The potential impacts of rapidly established, informal population centres can be anticipated in some locations, and planning to address the related challenges of such 'spontaneous' communities can be undertaken at an early stage in the development planning process.

Companies can leverage their experience to work with local government and communities to plan and monitor growth and to develop and implement mitigation strategies if warranted. This could include partnering with local organizations on public health campaigns or devising temporary housing strategies that meet short-term needs without requiring investment in infrastructure that will not be needed after an intense construction period. Through economic growth, local content and education initiatives (discussed further in other SDGs), companies can help communities diversify their economies and prepare for the inevitable transition to the operations phase of an asset and, ultimately, project-closure.[118]

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[113] "Indigenous Peoples and the oil and gas industry: context, issues and emerging good practice," IPIECA (April 2012).

[114] "Urban encroachment," IPIECA (October 2009).

[115] "New Rules for 'Urban' Oil and Gas Drilling in Ohio," Environmental News Network, (18 July 2005), available at http://www.enn.com/business/article/16333 (last accessed on 13 June 2016); "Drilling Down: The Community Consequences of Expanded Oil Development in Los Angeles," Liberty Hill (2015).

[116] "Drilling Down: The Community Consequences of Expanded Oil Development in Los Angeles," Liberty Hill (2015).

[117] Sean Eckhardt, "Guess Who Bears the Brunt of Urban Oil Drilling?" Takepart (16 November 2015), available at http://www.takepart.com/article/2015/11/16/oil-drilling-low-income-neighborhoods (last accessed 13 June 2016).

Collaborate and leverage

Coordinate planning for urban and regional development. Historically cities have often grown organically, but future sustainable urban development will require more rigorous planning and coordination. In the future, cities will need to address energy inefficiencies through high-efficiency municipal and residential systems, robust public transportation systems, improved waste management and integrated infrastructure. Oil and gas companies can identify opportunities for shared-use urban infrastructure and participate in multi-stakeholder efforts to address the issue of urban air quality (see also SDG7).[119]

Case studies and initiatives

Working together with the local community: ExxonMobil – USA
The New York Greenpoint neighbourhood was seriously harmed by petroleum contamination during the first half of the 20th century. ExxonMobil has been undertaking a complex decades-long remediation project in the area, alongside supporting urban development to make Greenpoint a more sustainable town. The dual-pump recovery system has proven most effective in remediation efforts, which have also involved water treatment and addressing soil vapour issues. In addition, community support efforts have included funding and STEM support for local schools, projects to rehabilitate local parks, adopting Greenpoint Library, supporting the local YMCA and providing uniforms and equipment for the Auxiliary Police of the NYPD.

Energy-efficient hydrogen-based transport: Shell – Germany
Hydrogen has the potential to be an important low-carbon transport fuel. Hydrogen-electric vehicles are quick to refuel and can drive a similar distance range to conventional cars. Hydrogen-electric vehicles could also help improve local air quality, as they produce water rather than polluting emissions from the tailpipe. In the future, when electricity from renewable sources is used to produce the hydrogen, these cars could generate close to no carbon emissions. Shell is taking part in several initiatives to encourage the adoption of hydrogen-electric energy as a transport fuel. In Germany, for example, the government is supporting the deployment of a national network of hydrogen-electric fuelling stations across the country by 2023. Shell is working on this project with joint venture partners H2 Mobility Germany – Air Liquide, Daimler, Linde, OMV and Total. The group currently operates three hydrogen-filling stations in Germany and has two hydrogen-filling stations in Los Angeles, California. The potential for similar projects in the US, UK, Switzerland, Austria, France, Belgium, Luxembourg and the Netherlands is being assessed.

Reducing environmental impacts: The Partnership for Clean Fuels and Vehicles: IPIECA – Global
Lead is now believed to be a cumulative toxin that can be harmful if ingested at any age. The removal of lead is important to public welfare because it will allow the introduction of widely-available vehicle catalytic exhaust technology to improve air quality. In 2002 IPIECA joined with numerous international organizations, governments, industry associations and NGOs to establish the Partnership for Clean Fuels and Vehicles (PCFV). The PCFV was established with three key objectives: phase out leaded gasoline worldwide; reduce fuel sulphur levels to less than 50 parts per million; and introduce cleaner vehicles alongside these cleaner fuels. The PCFV holds regional, sub-regional and in-country planning and technical workshops, produces guidance documents and engages with government decision makers. By these means, the PCFV succeeded in enabling sub-Saharan African countries to phase out leaded gasoline by December 2005, and estimated that the effect of PCFV amounted to a reduction of 190,690 metric tonnes by 2015. Significant progress has also been made in reducing sulphur levels and phasing out leaded gasoline worldwide.

[119] "Future Cities," Shell Global, available at http://www.shell.com/energy-and-innovation/the-energy-future/future-cities.html (last accessed 13 June 2016); "New lenses on Future Cities," Shell International B.V. (2014).

Selected resources

- Centre for Liveable Cities and Shell 2014. New Lenses on Future Cities.
- IPIECA 2004. Clearing the air: strategies and options for urban air quality management.
- IPIECA 2009. Urban encroachment.

GOAL 12. RESPONSIBLE CONSUMPTION AND PRODUCTION – ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

Economic and population growth means increased demand for resources that may already be stretched or, in some cases, fail to meet basic needs. Improving resource efficiency in production, consumption and supply chains is necessary, but will be insufficient to match the anticipated growth in demand. Changing consumption and waste patterns, particularly consumer lifestyles in the growing global middle-class and in industrialized countries, is essential for sustainable management of the world's resources (e.g. circular economy).[120]

Responsible consumption is an important issue for the oil and gas industry. Not only does the industry benefit from increased energy efficiency, particularly in less-accessible and more energy-intensive operations, but economic growth also requires increasing energy demands. Addressing the much larger issue of energy demand by improving energy efficiency, resource conservation and use of renewable energy resources requires a shift in consumer behaviour. One way that governments can shift consumer behaviour is to consider reducing fossil fuel subsidies, as they can encourage waste and discourage low-carbon growth. .Companies can help to meet these challenges by improving the efficiency of their operations and by supporting energy efficiency via implementing product stewardship principles, developing cleaner fuels, and sharing energy efficiency knowledge and building capacity among consumers.

Key UN SDG12 targets relevant for the oil and gas industry

12.2 By 2030, achieve the sustainable management and efficient use of natural resources.

12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.

12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

[120] "SDG 12: Ensure sustainable consumption and production patterns," SDG Compass (2016); "Goal 12: Responsible consumption, production," UNDP (2015), available at http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda/goal-12.html (last accessed 13 June 2016).

12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production

12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Integrate SDG12 into core business

Integrate product stewardship approach. More than 80% of the energy produced by the oil and gas industry is consumed in the form of final products such as gasoline.[121] Therefore, to understand and address the full environmental and social footprint of their products, oil and gas companies often examine not just production but their products' entire lifecycle, from resource extraction and production to marketing and distribution and finally to their end use. By incorporating the concept of product stewardship –an approach to managing the impacts of their products throughout their lifecycle – into their management systems, oil and gas companies are able to position themselves to work with their suppliers, distributors and customers to meet their needs, while reducing waste and facilitating responsible and efficient use of their products. By integrating robust waste management processes throughout the value chain, including transporting, storing, processing, recycling, recovery and end-of-life disposal of waste, companies can reduce costs, increase recycling and energy recovery rates, and improve efficiency.[122]

Introduce environmentally-sound and efficient chemical and waste management. Sustainable production begins with operational efficiency; i.e. minimizing inputs, including energy and water (see SDG7). It extends to reducing waste outputs, such as wastewater discharges and emissions as well as the sound management of chemicals, throughout the entire oil and gas industry value chain, from extraction to refining to distribution. Robust chemical and waste management processes integrated throughout the value chain maximize efficiencies and reduce risks and costs. For example, the waste output of plastics can be reduced using technologies that can convert the high energy content of plastics at the end of their product life into useful new products like fuels or feedstock for new plastics. This reduces waste and the need for new inputs, and increases efficiency.[123]

Improve supply chain sustainability. Given their reliance on the inputs provided by suppliers and contractors, oil and gas companies typically ensure that, in addition to business requirements, the social and environmental standards of vendors throughout their supply chain align with those of the company by including these in supplier contracts. Also, by coordinating supply chain logistics and emphasizing suppliers close to operations, companies can shorten the supply chain, thereby improving the environmental, social and economic sustainability.[124]

[121] "The Outlook for Energy: A View to 2040," ExxonMobil (2016).
[122] "The oil and gas industry: from Rio to Johannesburg and beyond – contributing to sustainable development," IPIECA (April 2003); "Sustainable Consumption and Production: Energy and Industry," UN Department of Economic and Social Affairs (May 2006).
[123] "Oil and gas industry guidance on voluntary sustainability reporting," IPIECA (2015); "Petroleum refinery waste management and minimization," IPIECA (September 2014); "Energy Recovery," American Chemistry Council, available at https://www.americanchemistry.com/Policy/Energy/Energy-Recovery/ (last accessed 13 June 2016).
[124] "Oil and gas industry guidance on voluntary sustainability reporting," IPIECA (2015).

Collaborate and leverage

Coordinate approaches to sustainability. The combined effort of multiple stakeholders is required to improve patterns of oil and gas consumption. Coordinated approaches between oil and gas companies, government and NGOs, such as the Fuels and Vehicles Working Group, facilitate the strategic addressing of issues related to fuel-sustainable mobility, future fuel consumption issues and their impacts. They can help develop good practices, work towards industry consensus and inform regulatory standards.[125]

Case studies and initiatives

Making more efficient use of natural resources through cogeneration: ExxonMobil – Global
Cogeneration technology captures heat generated from the production of electricity for use in production, refining and chemical processing operations. Due to its inherent energy efficiency, the use of cogeneration leads to reduced GHG- emissions. ExxonMobil has interests in approximately 5,500 megawatts of cogeneration capacity in more than 100 installations at more than 30 locations around the world; this capacity is equivalent to the annual energy needed to power 2.5 million homes in the US. The company's cogeneration facilities enable the avoidance of approximately six million metric tons per year of GHG emissions.

Environmentally sound chemical management: API – Global
The American Petroleum Institute (API), the oil and gas trade association, is working with the United Nations Environment Programme Strategic Approach to International Chemicals Management (SAICM) to ensure that chemicals are used and managed safely and efficiently. By contributing to, and aligning its efforts with, SAICM goals, API is assisting in the enhancement of chemical management capacities in developing countries and in the harmonization of global chemical management policies. API requires its members to follow its environmental principles, including those on chemical management, and work with governments and other stakeholders to develop relevant laws and policies.

Finding uses for waste products - CO2 as a raw material: Repsol – Global
As a result of increasing incidence of carbon capture technology, there are greater opportunities for CO2 utilization. Therefore, Repsol has focused on the development of a new class of eco-design polymers for which CO2 is a raw material: polycarbonate polyols. A full lifecycle assessment of the polycarbonate polyol methodology was performed to assess the environmental impact of the system across a range of impact categories, such as global warming, abiotic depletion, freshwater eco-toxicity and human toxicity. The conclusion was that, compared to conventional polyols and alternative polycarbonate polyols, Repsol's proposed system had the best overall performance across the environmental impacts analysed.

Selected resources

- International Finance Corporation 2012. Performance Standards on Environmental and Social Sustainability.
- IPIECA 2013. Saving energy in the oil and gas industry.
- IPIECA 2015. Oil and gas industry guidance on voluntary sustainability reporting (3rd ed.).

[125] http://www.ipieca.org/publication/clearing-air-strategies-and-options-urban-air-quality-management; http://www.ipieca.org/publication/fuel-sulphur-strategies-and-options-enabling-clean-fuels-and-vehicles

GOAL 13. TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS*

Economic and population growth combined with reliance on fossil fuels (coal, oil, and gas) have driven the increase in anthropogenic greenhouse gas emissions since the pre-industrial age. The resultant concentrations of carbon dioxide (CO2), nitrous oxide (N2O) and methane (CH4) in the atmosphere have contributed to global warming. CO2 emissions, of which around 80% are from fossil-fuel use,[126] are estimated to account for more than half of global warming. SDG 13 focuses on addressing these issues in the context of global development, using the United Nations Framework Convention on Climate Change (UNFCCC) as a channel for generating discussion and agreement around these topics.[127]

In December 2015, Parties to the UNFCCC came together in Paris for the 21st Conference of Parties (COP 21). After years of negotiations, parties to the UNFCCC committed to 'prepare, communicate and maintain successive nationally determined contributions' (NDCs) and to 'communicate nationally determined contributions every five years'. Additionally, Parties agreed to 'regularly provide … a national inventory report of anthropogenic emissions' and provide 'information necessary to track progress made in implementing and achieving its NDC'.[128] In addition to these key commitments, the Agreement also calls on countries to facilitate the advancement of adaptation, mobilization and flow of finance and technology transfer.

COP 21 resulted in a global agreement which, for the first time, committed all Parties to take action on climate change. The core aim of the agreement is:

'to strengthen the global response to the threat of climate change' by 'holding the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels', including by 'increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience' and 'making finance flows consistent with a pathway towards low GHG-emission and climate-resilient development'.

As noted in the Paris Agreement, achieving these aims involves achieving a 'balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.'[129] This is often referred to as achieving net- zero GHG emissions.

A net-zero GHG-emission world entails two major changes. First, GHG emissions from all sources, but most importantly from fossil fuel-use given its prominent contribution to climate change[130], will need to

[126] R.E.H. Sims, R.N. Schock, A. Adegbululgbe, J. Fenhann, I. Konstantinaviciute, W. Moomaw, H.B. Nimir, B. Schlamadinger, J. Torres-Martínez, C. Turner, Y. Uchiyama, S.J.V. Vuori, N. Wamukonya, X. Zhang, "Climate Change 2007: Mitigation," Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (2007), p.261.
[127] "Goal 13: Take urgent action to combat climate change and its impacts," United Nations (2015), available at http://www.un.org/sustainabledevelopment/climate-change-2/ (last accessed 23 December 2016).
[128] "Paris Agreement," *FCCC/CP/2015/L.9/Rev.1.*

[130] "CO2 Emissions from Fuel Combustion" International Energy Agency (2015).

be reduced dramatically. All major technological approaches – energy efficiency, renewables, large-scale CCUS, nuclear power and others – will have a role to play. Second, residual GHG emissions will need to be offset either r through the enhanced use of natural carbon sinks (i.e. environmental formations that absorb and store more C02 from the atmosphere than they release) or through technologies such as bioenergy with CCUS. The protection of existing natural carbon sinks and the development of new ones, such as forests, will be especially important until CCUS becomes economically viable for large-scale deployment.

While the Paris Agreement was a significant political step in universally acknowledging and addressing the risks of climate change, it is clear that additional action beyond the current NDCs will be needed to achieve the aims of the Agreement. Where current NDCs generally cover the timeframe to 2030, their projected aggregate impacts, without further action, are widely recognized as inadequate to achieve temperature rise well-below the 2°C aim. Acknowledging the need for greater effort, each country has agreed to increase the ambition of their NDCs at five-year intervals. Countries have also been called upon to prepare long-term low-emission development strategies to the middle of the century.

The enormity of the energy challenge should not be underestimated. Energy is at the heart of the modern economy and essential to achieve the SDGs. As recognized in SDG 7, countries need affordable and reliable energy to run modern economies, and countries want to ensure that the transition to net zero emissions will not sacrifice economic development, high employment, and other social objectives. Moving from a high-emission world economy to a net zero emission economy over the course of the century will require concerted scale-up actions by government, business, and civil society.

To help implement some of the elements that will be needed to drive towards a net-zero emission future, the oil and gas industry has a unique role to play. Given the industry's global leadership in petroleum geology, resource extraction, and pipeline transmission, the industry has a vital role in testing the feasibility of large-scale carbon-capture-and-storage. Indeed, the oil and gas industry may be the only sector with the requisite expertise and global scale of operations to test and implement large-scale CCUS within a public-private partnership framework. Moreover, oil and gas companies are well positioned to be leaders in the effort to adapt and strengthen resilience to the effects and risks of climate change and reduce impacts.

* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

Key UN SDG13 targets relevant for the oil and gas industry:

13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

13.2 Integrate climate change measures into national policies, strategies and planning.

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.

13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries, including focusing on women, youth and local and marginalized communities.

Integrate SDG13 into core business

Plan strategically for a net zero emissions future. The aims of the Paris Agreement envision governments will develop comprehensive national strategies to significantly reduce greenhouse gas emissions. The transformation will be a process over several decades that will require long-term planning. The long operational lifespan of oil and gas infrastructure means those investments may need to consider various emissions scenarios decades ahead in the future.[131]Business strategies will need to harmonize with national strategies, including the NDCs to 2030 and the Long-Term Low Greenhouse Gas Emission Development Strategies to 2050 called for in the Paris Agreement. Companies could consider their current resources, infrastructure investments, future fossil-fuel demand, technology, and research and development, in order to identify strategies that take into account the transition of the global energy system. Companies can work with governments, academia and civil society to promote supporting technologies such as large-scale CCUS, in an effort to contribute to the policies and actions needed for cost-effective, technology-based pathways to the global aims.[132]

Self-assess carbon resiliency. The Paris Agreement recognized that countries need to assess their vulnerabilities to climate change and undertake adaptation planning processes.[133] Similarly, oil and gas companies may consider developing a comprehensive understanding of the implications of climate change for their businesses.[134] This includes the implications of the physical risk of climate change for their infrastructure and operations across a range of scenarios. A growing number of companies are setting internal shadow prices on their carbon emissions as a tool for screening projects and identifying impacts of potential carbon tax or reduction regulations in the future.[135] Setting different carbon prices to forecast the effects of possible future government emission restrictions (such as mandatory carbon pricing) or levels of demand scenarios could also be incorporated into companies' investment decision-making, risk assessment, and adaptation processes.

Mitigate emissions within oil and gas operations. The vast majority of GHG emissions associated with hydrocarbons are created when energy-users produce and consume energy products and much societal attention should be given to adjusting consumer behaviour. However, oil and gas companies also have a role to play in mitigating emissions in the production of those products. For years, the oil and gas industry has worked to reduce emissions within its own operations through energy efficiency improvements and flaring, venting and fugitive-emissions reductions. As noted in SDG 7, improving efficiency in production and operations has many benefits. Efforts specific to managing GHG emissions, particularly in the context of natural gas, can include:

- **Minimizing flaring.** As much as five percent of the natural gas produced globally is estimated to be lost to flaring every year. The flaring of natural gas can sometimes be necessary during the initial commissioning of a well or for safety reasons and generally companies have already taken action to reduce flaring in their operations. However, routine flaring (the burning off the associated natural gas during oil production) still occurs and wastes valuable energy. Options to reduce the flaring of associated gas include capturing and using for power generation, liquefying for transport or re-injecting back into the reservoirs.[136]

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[131] "Pathways to deep decarbonization," Deep Decarbonization Pathways Project (September 2015); "More energy, lower emissions: Catalyzing practical action on climate change," Oil and Gas Climate Initiative (October 2015); "A post-Paris overview and analysis of BP's climate reporting," ShareAction (April 2016); "The Heat is On," Critical Resource (November 2015).

[133] "Paris Agreement," *FCCC/CP/2015/L.9/Rev.1, Art.* 7.9.

[134] "Paris Agreement," *FCCC/CP/2015/L.9/Rev.1,* Art. 4.

[135] "Making the energy sector more resilient to climate change," International Energy Agency (2015); "Effective policy: The driver of results (The Paris Puzzle)," IPIECA (June 2015); "Putting a price on risk: Carbon pricing in the corporate world," CDP (September 2015), p. 4.

[136] "Zero Routine Flaring by 2030," The World Bank, available at http://www.worldbank.org/en/programs/zero-routine-flaring-by-2030; "More energy, lower emissions: Catalyzing practical action on climate change," Oil and Gas Climate Initiative (October 2015).

- **Minimizing methane emissions.** In oil and gas operations methane emissions can be the result of controlled venting or through leaks or escape in the various stages of the gas value chain. Companies can implement completions technology that captures gas released between drilling and production. Infrared cameras and continuous methane detectors used to identify leaks during production, processing and transportation can also result in a substantial drop in methane emissions.[137]
- **Developing carbon capture, use and storage.** One of the greatest opportunities for oil and gas companies to develop low greenhouse gas emitting energy is through the development and deployment of large-scale carbon capture, use and storage. Carbon capture, use and storage technologies reduce emissions by capturing, compressing and then sequestering CO2 in geological formations deep within the earth for permanent storage. CCUS technology will be a key technology in the pursuit of lowering global GHG emissions. Industry collaboration with governments around the world on the research, development, financing and deployment of CCUS would be vital to overcome the significant barriers to the large-scale deployment of CCUS. Public investment and policy support would be particularly important in successfully addressing issues related to economic viability and regulatory uncertainty. The Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report attaches considerable importance to CCUS deployment with costs for delivering atmospheric CO2 stabilization pathways without CCUS shown to be much higher than when it is utilized, assuming that CCUS can be deployed effectively at large scale.[138]

Strengthen resilience and adaptive capacity to climate change impacts. Climate change may impact a company's infrastructure, assets, operations and supply chains.[139] For example, rising sea levels may threaten offshore facilities or pipelines in coastal areas. To improve the resilience of their facilities and local infrastructure, companies are considering, identifying and evaluating a wide variety of risks, including those that may be influenced by climate change. Adaptation and management strategies can then be developed, implemented and monitored.

Collaborate and leverage

Partner in research and development and education outreach. Addressing climate change will require unprecedented collaboration from all parts of society. Research is needed on current climate change issues and the future of the energy system. New low GHG emission energy sources and emission reduction technologies will need to be developed and disseminated. Oil and gas companies are collaborating with universities and research institutions, governments, customers and consumers to find solutions. These efforts can include public-private partnerships, joint research and development projects and knowledge-sharing through industry associations. Many of these efforts already exist, but opportunities to explore greater coordination to help identify goals and harmonize efforts might also be considered.[140]

Developing countries require access to reliable, affordable energy for their economic development (SDG7) and in resource-rich countries oil and gas can be a primary source of government revenue. The Paris Agreement acknowledges that achieving net zero greenhouse gas emissions has to be accomplished in the context of the priorities of sustainable development and poverty eradication. It

[137] "Managing our emissions: Energy conservation and beyond (The Paris Puzzle)," IPIECA (June 2015); David Lyon, "EPA Draft Says Oil & Gas Methane Emissions are 27 Percent Higher than Earlier Estimates," Environmental Defense Fund (23 February 2016), available at http://blogs.edf.org/energyexchange/2016/02/23/epa-draft-says-oil-gas-methane-emissions-are-twenty-seven-percent-higher-than-earlier-estimates/ (last accessed 13 June 2016).
[138] "Fifth Assessment Report," Intergovernmental Panel on Climate Change (2014), available at https://www.ipcc.ch/report/ar5/ (last accessed 10 October 2016).
[139] "Fifth Assessment Report," Intergovernmental Panel on Climate Change (2014), available at https://www.ipcc.ch/report/ar5/ (last accessed 10 October 2016).
[140] "More energy, lower emissions: Catalyzing practical action on climate change," Oil and Gas Climate Initiative (October 2015); "The Heat is On," Critical Resource (November 2015).

does not call on developing countries to take on absolute emission-reduction targets, but rather enhance emission-mitigation efforts, and encourages them to transition over a time period to economy-wide reductions that reflect their specific circumstances. The gradual transition to lower GHG emission energy systems in these countries will require coordinated effort from their governments and developed country governments, as well as companies, international organizations and donor states. Companies can help developing countries by working with other stakeholders to identify and implement effective policy actions and supporting technical assistance, capacity building and strategic planning for governments.

***Support effective policy measures*.** An enabling policy environment is needed to support the technology innovation, development and deployment to transform the energy system at lowest cost. Countries at different stages of development and with different states of energy independence will decide how best to design climate and energy policy to pursue sustainable development as part of a global effort. Policies that give clear price signals on reducing net emissions, including carbon pricing or removal of fossil fuel subsidies, can often help to achieve the policy objectives. A carbon price, through either a carbon tax or a cap-and-trade system, would ultimately need to be global to avoid unequal international competition that would allow emissions-intensive business to move to less-regulated 'emissions havens'. Companies could support and encourage effective policy measures, such as a global carbon price, by sharing the industry's experience with such tools and engaging with stakeholders on policy issues.

Help consumers lower their emissions. Reducing the emissions of oil and gas activities is important but only 10-20% of the total emissions from oil and gas come from production and operations. The remaining 80-90% comes from the end use of oil and gas products. Transportation alone consumes 60% of produced oil and is responsible for more than a quarter of global energy usage.[141] For that reason oil and gas companies are working with motor vehicle manufacturers to develop more energy efficient fuels and advanced engine lubricants and introduce vehicles with more advanced emissions standards. This work can be scaled up. Companies can also provide technical assistance to customers and conduct education and awareness campaigns for consumers to maximize the efficient and responsible use of oil and gas products[142] (see SDG12).

Case studies and initiatives

Adapting for climate change: education on risk management for natural disasters: Repsol – Guyana
Repsol's programme of education on risk management for natural disasters builds on measures to mitigate and adapt to climate change, when designing new homes. The programme includes preparations and drills on the right courses of action in the event of a natural disaster, and developing coordination and response teams with the community.

Carbon capture and enhanced oil recovery: Saudi Aramco – Saudi Arabia
In 2015, Saudi Aramco launched the Middle East's first carbon capture and enhanced oil recovery project. Carbon capture and sequestration is the process of capturing waste CO2 from large sources, such as power plants, storing it and depositing it underground where it will not enter the atmosphere. In addition to this process, the captured CO2 will be injected into flooded oil reservoirs instead of water to enable oil recovery, thereby saving water. In the pilot project, 40 million cubic feet of CO2 will be captured per day at the Hawiyah NGL plant, which will then be piped 85 km to the 'Uthmaniyah field for use in extraction. Saudi Aramco will monitor the project to learn how much of the CO2 remains sequestered underground, and expects to roll it out, incorporating lessons learnt, across Saudi Arabia over the next three to five years.

[141] "More energy, lower emissions: Catalyzing practical action on climate change," Oil and Gas Climate Initiative (October 2015).
[142] "Pathways to deep decarbonization," Deep Decarbonization Pathways Project (September 2015), p. 9; "More energy, lower emissions: Catalyzing practical action on climate change," Oil and Gas Climate Initiative (October 2015).

Innovating the plastics-manufacturing process to reduce energy use and associated emissions: ExxonMobil – Global
Scientists from ExxonMobil and the Georgia Institute of Technology developed a potentially revolutionary new technology that could significantly reduce the amount of energy and emissions associated with manufacturing plastics. Results of the research were published in the peer-reviewed journal *Science*. Using a molecular-level filter, the new process employs a form of reverse osmosis to separate para-xylene, a chemical building block for polyester and plastics, from complex hydrocarbon mixtures. The current commercial-scale process used around the world relies on energy and heat to separate those molecules. If brought to industrial scale, this breakthrough could reduce industry's global annual CO2 emissions by up to 45 million tons, which is equivalent to the annual energy-related CO2 emissions of about five million US homes. It could also reduce global energy costs used to make plastics by up to USD $2 billion a year, as the process is about 50 times more energy-efficient than current state-of-the-art membrane-separation technologies.

Reducing flaring during LNG transport: Multiple – Qatar
Approximately one percent of the LNG loaded onto ships evaporates due to the difference in temperature between the LNG and the ship tank, leading to waste. At ExxonMobil's joint venture operations in Qatar, a jetty boil-off gas (JBOG) recovery facility has recently been introduced to recover the natural gas that was previously flared during LNG vessel loading at the marine berths located at the Ras Laffan Port. The JBOG recovery facility collects the boil-off gas and returns it to the LNG plants to be used as fuel or converted back into LNG. During one year of operation, the JBOG facility has recovered more than 500,000 metric tons of gas and reduced LNG vessel loading-related flaring by around 90%.

Raising drivers' climate change awareness: Multiple – Global
A significant reduction in emissions from transport could be achieved by simple changes in road usage. More than 40 European oil companies, constituting almost 100% of EU refining capacity and over 75% of EU motor fuel sales, are partnered with the European Commission on FuelsEurope's Save More Than Fuel campaign. Launched simultaneously in 29 European countries in 2008, this initiative raises awareness of climate change and educates drivers on how to improve their fuel efficiency. FuelsEurope aims to promote environmentally-sustainable refining and use of oil and gas products.

The Paris Puzzle – industry collaboration on finding a low-emissions pathway: IPIECA – Global
Oil and gas together currently provide over 50% of global primary energy supply, but have contributed through CO2 emissions to climate warming. Meeting energy demand while addressing climate risks is a challenge. IPIECA recognises that a low-emissions global energy system would look significantly different from today, and believes that the oil and gas industry must be a key part of the climate change solution. The industry's history of innovation, global reach, knowledge and technical expertise uniquely positions it to help develop and provide credible future energy solutions. Therefore, to support the industry in this, IPIECA has created a series of papers, highlighting that: all energy sources will be needed to meet growing demand; climate change must be addressed; energy efficiency innovation and a switch to natural gas must play a vital role in a shift to a low-carbon economy; and carbon capture and storage technology is a key technology for reducing emissions.

Reducing methane emissions: Multiple – Global
Methane is at least 84 times more potent than CO2, so reducing methane emissions is key to lowering total GHG emissions. The Climate and Clean Air Coalition (CCAC) is a global effort of governments, civil society and private-sector organizations to improve air quality and protect the environment. It created a voluntary initiative for oil and gas companies on methane, the Oil & Gas Methane Partnership, providing technical support to companies to reduce methane emissions. The initiative currently has the following partner companies: BP, Eni, Pemex, PTT, Repsol, Southwestern Energy, Total SA and Statoil. Partner companies are obliged to report publicly each year the share of their assets that are conforming to the CCAC's suggestions for methane-emission reduction, with the expectation that the share will increase year-on-year.

Reducing company CO2 emissions: Statoil – Global

In 2008, Statoil, as part of an industry initiative, committed to improving its energy efficiency by reducing its CO2 emissions by 800,000 tonnes by 2020. By managing use, streamlining operations and introducing new technologies, the company achieved this goal by 2015 and set a new target of an additional 400,000 tonnes by the original date. The new total of an overall reduction of 1,200,000 tonnes of CO2 by 2020 will be equivalent to the emissions of 750,000 vehicles.

Collaborating to improve vehicle fuel efficiency: Total SA, BP and IPIECA – Global
Oil and gas companies are collaborating with vehicle manufacturers to improve fuel efficiency through improved engine design and optimizing the efficiency of fuel and lubricants. Using technology that reduces friction, Total S.A. has developed fuel economy oils for 15 different types of vehicles that can reduce fuel consumption by up to 3%. BP recently introduced a new fuel technology that cleans the dirt particles in engines and could increase gas mileage by 5%. A number of oil and gas companies and industry associations, including IPIECA, provide technical input to the Partnership for Clean Fuels and Vehicles (PCFV), a public-private collaborative effort that promoted the phasing-out of leaded fuels. In the 10 years following the launch of PCFV, almost all of the 100-plus countries that used leaded fuel have transitioned to unleaded fuels. Only six countries continue to use leaded gasoline.

Selected resources

- Carbon Disclosure Project 2015.
- Center for International Relations and Sustainable Development 2016. Implementing the Paris Climate Agreement – Achieving Deep Decarbonization in the Next Half-century.
- Climate Change 2015. The climate responsibilities of industrial carbon producers.
- Columbia Center on Sustainable Investment 2016. A Regulatory, Operational and Commercial Framework for the Utilization of Associated Gas.
- Columbia Center on Sustainable Development 2016. Timeline: Fossil Fuel Companies and Climate Change.
- Critical Resource 2015. The Heat is On: Catalysing Leadership by Fossil Fuel Companies on Climate Change.
- Deep Decarbonization Pathways Project 2015. Pathways to deep decarbonization.
- International Energy Agency 2015. Energy and Climate Change.
- IPIECA 2015. Energy and GHG Efficiency Compendium.
- IPIECA 2007. The Oil and Gas Industry and Climate Change.
- IPIECA 2015. The Paris Puzzle.
- Oil and Gas Climate Initiative 2015. More energy, lower emissions: Catalyzing practical action on climate change.
- UN Framework Convention on Climate Change 2015. The Paris Agreement.
- World Resource Institute. The Carbon Budget.

GOAL 14. CONSERVE AND SUSTAINABLY USE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

More than two-thirds of the earth's surface is covered by oceans, and there is a clear link between the integrity of marine ecosystems and human well-being. More than three billion people rely on marine resources for their livelihood and oceans contribute to poverty reduction, food security and economic growth.[143] Oceans absorb 30% of the CO2 produced by humans, provide three billion people with their primary source of protein and, through marine and coastal resources, are responsible for 5% of global gross domestic product.[144] However, these ecosystems are being threatened through pollution, acidification, degradation of marine environments and climate change. SDG14 seeks to promote sustainable management and protection of marine and coastal ecosystems and biodiversity.[145]

More than one-third of oil and gas extracted today comes from offshore deposits.[146] Offshore drilling, especially deep and ultra-deepwater drilling, often faces greater technical challenges and severe conditions. It also creates the risk of damage or disruption to marine habitats and migration routes through noise, pollution or spills, and the increased vessel traffic can heighten risks of collisions with marine wildlife. Rigorous health, safety, social and environmental management systems help the oil and gas industry to assess the risk of operations and to subsequently develop operational standards and plans to avoid or reduce the risk of impacts to the marine environment. Improper management of these operations can damage sensitive marine areas. Apart from addressing environmental impacts, offshore operations can impact fish resources and fishing-based livelihoods. Additionally, offshore operations can take place in areas that have otherwise been little explored. The information derived from research and development and technology used in those operations, as well from baseline surveys and monitoring, can contribute to the broader knowledge of marine science.

Key UN SDG14 targets relevant for the oil and gas industry

14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.

14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.

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[143] "Goal 14: Life Below Water," UNDP (2015), available at http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda/goal-14.html (last accessed 7 October 2016).

[144] "Goal 14: Conserve and sustainably use the oceans, seas and marine resources," United Nations (2015), available at http://www.un.org/sustainabledevelopment/oceans/ (last accessed 7 October 2016).

[145] www.sustainabledevelopment.un.org/sdg14 (last accessed 13 June 2016).

[146] "Marine Resources – Opportunities and Risks," World Ocean Review (2014), p. 10.

14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.

14.7 By 2030, increase the economic benefits to Small Island Developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.

Integrate SDG14 into core business

Incorporate environmental assessments into management plans. The offshore oil and gas industry operates in a variety of environments, including coastal waters, deep water and estuaries, which support unique ecosystems and biodiversity. Mitigating potential impacts on the environment in the areas around offshore operations requires integrating local environmental and social considerations into the baseline surveys and environmental impact assessments. Environmental management plans built on those assessments and that incorporate the marine ecosystems affected could be implemented to cover the operation's entire life cycle, including waste water treatment and discharge, oil spill prevention during drilling and transportation, and decommissioning and rehabilitation operations. The system could incorporate the mitigation-hierarchy approach that establishes a framework for managing biodiversity risks and impacts through avoidance, minimization, restoration, and, when appropriate, through biodiversity offsets.[147]

Minimize and address the rate of ocean acidification. Oceans absorb heat and CO2. About 30% of the CO2produced by fossil fuels ends up in the ocean, which makes the water more acidic. There has been a 26% increase in acidification since the industrial revolution began and it can have dramatic effects on biodiversity, affecting fisheries and aquaculture and damaging the fishing and tourism industries.[148] The transition to a lower GHG emissions energy system by governments, industry and society can help reduce the rate of acidification.[149]

Accident prevention, preparedness and response. Established standards and operations integrity management systems, combined with a culture of safety and risk management, are important tools for accident prevention. Prevention also requires attention to and continuous improvement in every phase of operations where oil is produced, transported or stored. Exploration and production facilities should use advanced technologies, materials and multiple backup safety systems to prevent spills. Technologies to monitor pipelines can enable operators to identify weak spots before leaks develop. Companies may also consider improvements in the design of cargo vessels and marine terminals.[150]While prevention remains the priority, companies can be prepared to respond in the event of an incident by having in place and exercising an oil spill response plan. The overall goal of spill response is to limit the potential impacts of an accidental release, by employing the most effective suite of response tools in a given

[147] "Managing Biodiversity & Ecosystem Services (BES) issues along the asset lifecycle in any environment," IPIECA (November 2014); "Preserving the marine environment," Total SA (March 2010); "Biodiversity offsets and the mitigation hierarchy: a review of current application in the banking sector," PricewaterhouseCoopers LLP (March 2010).
[148] "Goal 14: Life Below Water," UNDP (2015), available at http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda/goal-14.html (last accessed 5 November 2016).
[149] "Goal 14: Life Below Water," UNDP (2015), available at http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda/goal-14.html.
[150] http://rio20.ipieca.org/fact-sheets/oil-spill-prevention-and-response-0

situation. Through projects such as the Global Initiative established by associations such as IPIECA and the International Maritime Organization (IMO), companies can work together to implement good practices, train and build their emergency response capacity and promote the ratification of IMO conventions that assist countries in effective national and regional oil spill response frameworks. Industry-established oil spill response organizations can provide timely mobilization and deployment of specialized equipment and trained personnel.[151]

Collaborate and leverage

Transfer and share marine technology: Oil and gas companies frequently collaborate with each other as well as partner with academic experts and, when relevant, with local scientists and communities to develop technologies and conduct studies to improve protection and understanding of the marine environment. The findings from these partnerships are then frequently made available to benefit the broader community. Examples include the Arctic Oil Spill Response Technology Joint Industry Programme, a collaborative effort to increase industry knowledge on how to respond to Arctic oil spills.[152]

Coordinate biodiversity research. Protecting marine and coastal environmental resources requires knowledge of the environment as well as changes that may be occurring. This may require extensive, ongoing scientific research, often in partnership with scientific institutions. Dialogue with other scientists and stakeholders around the world who are also conducting similar research on marine ecosystems and biodiversity can deepen companies' understanding of the local biodiversity and potential impacts of offshore oil and gas operations. Likewise, studies conducted by industry can significantly contribute to the broader understanding of a region's marine ecosystems. In some cases, industry has also partnered with local scientists to use facilities as offshore laboratories for exploring the marine environment. Given the vast amount of research, a central repository may be useful to coordinate, manage and share information and take advantage of opportunities.[153]

Case studies and initiatives

Joint Industry Programme to reduce impact of sound pollution on marine life: Multiple – Global
Sound pollution from oil and gas operations, particularly seismic exploration, can potentially have negative physical and behavioural effects on nearby marine life. In 2005, a number of oil and gas companies formed the Joint Industry Programme (JIP) to support research into this issue and the development of mitigation tools. Working with NGOs, international experts and other stakeholders, the JIP has developed the software system PAMGuard, now used around the world. It detects marine mammals in proximity to seismic operations allowing companies to halt operations to avoid overexposure.

Biodiversity data access - Proteus Partnership: Multiple – Global
In 2003, the UN Environmental Programme and World Conservation Monitoring Centre (WCMC) convened mining, oil and gas, and spatial data management companies to form the Proteus Partnership. This organization is a mechanism for providing access to global biodiversity data sets to inform industry decision-making. It is focused on improving the accuracy of the World Database on Protected Areas (WDPA), sharing biodiversity developments and trends, and compiling data on marine ecosystems. In

[151] "Preventing and managing accidental pollution," Total SA, available at http://www.total.com/en/society-environment/environment/local-environmental-footprint/preventing-and-managing-accidental-pollution#sthash.bFwGreTp.dpuf (last accessed 13 June 2016); "Preserving the marine environment," Total SA (March 2010).
[152] Arctic Response Technology, available at http://www.arcticresponsetechnology.org/ (last accessed 7 October 2016).
[153] "Protecting all ecosystems," Total SA, available at http://www.total.com/en/society-environment/environment/local-environmental-footprint/protecting-all-ecosystems#sthash.mWDsItRr.dpuf (last accessed 13 June 2016).

addition to the WDPA, which now contains information on 130,000 protected areas, the organization has also developed the Integrated Biodiversity Assessment Tool which helps oil and gas companies make better-informed decisions regarding their offshore and onshore biodiversity impacts.

Coral conservation: Total SA – Yemen
Environmental baseline surveys for the construction of a liquefied natural gas plant at Balhaf, Yemen, identified coral colonies containing almost 80 different species that could be threatened by the project. In response, Total SA developed a mitigation plan that included redesigning part of the plant, for example discharging the plant's cooling water further out in the sea to avoid temperature increases affecting the coral. It also installed retaining walls and silt curtains to protect the banks during construction. In addition, more than 1,500 coral colonies that would still have been in exposed areas – including one weighing four tons – were transplanted distances of 600-800 meters, the first coral transplant of this scale. The area is now a verified conservation area and the coral will be monitored and reported on throughout the production life of the plant. The project led Yemen LNG to partner with the International Union for Conservation of Nature on an observatory for marine biodiversity.

Working together to enhance oil spill response capability: the Marine Well Containment Company: Multiple – USA
Oil spills as a result of industry activities present a potentially serious social and environmental threat. Therefore, Shell, Chevron, ConocoPhillips and ExxonMobil came together in 2010 to found the Marine Well Containment Company (MWCC), a not-for-profit organisation that provides deepwater well containment services in the US Gulf of Mexico. They have since been joined by Anadarko, Apache, BHP Billiton, BP, Hess and Statoil. Since 2011, the MWCC has been continuously ready to respond to a deepwater well control incident, with dedicated specialised equipment capable of being deployed up to 10,000 feet in depth from their continuously-prepared deployment ship. The MWCC represents a strong example of oil and gas industry cooperation to deal with a threat to all.

Selected resources

- IFC 2015. Addressing project impacts on fishing-based livelihoods.
- IPIECA 2016. Biodiversity and ecosystem services fundamentals.
- IPIECA and International Maritime Organization 2015. Global Initiative.
- Total S.A. 2010. Preserving the marine environment.

GOAL 15. PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS

Terrestrial ecosystems and biodiversity contribute essential economic, ecological and cultural benefits, aid in regulating climate and provide important supporting services such as nutrient cycling. The loss of biodiversity and damage to land ecosystems, driven by land degradation, rising drought, desertification and deforestation, undermines the goals of food security, poverty reduction, water access and good health. Achievement of SDG15 will require the protection of critical ecosystems.

Some oil and gas company operations take place in or alongside sensitive environments.[154] If not managed correctly they may contribute to habitat fragmentation, introduce and/or spread alien/invasive species and affect local carbon cycles and sequestration.[155] The rise of hydraulic fracturing can extend its potential risks for local biodiversity into new areas.[156] Sustained efforts to protect local ecosystems and promote wildlife preservation and biodiversity are necessary by a variety of players, including the oil and gas industry. This can be done by designing projects/facilities to avoid and reduce their impacts, putting ecological risk management strategies in place, effectively reclaiming sites at the end of the life of a producing asset and, as a last resort, instituting biodiversity offsets, particularly in locations with recognized sensitive or noteworthy ecological features.[157]

Key UN SDG15 targets relevant for the oil and gas industry

15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.

15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.

15.3 By 2020, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world.

[154] "Sensitive environments: Challenging operations," IPIECA, available at http://rio20.ipieca.org/sites/default/files/fact-sheets/pdfs/ipiecaogpfactsheetsensitiveenvironments.pdf.
[155] Nathan Jones, Liba Pejchar and Joseph Kiesecker, "The Energy Footprint: How Oil, Natural Gas and Wind Energy Affect Land for Biodiversity and the Flow of Ecosystem Services," BioScience (28 January 2015).

[157] "Biodiversity and ecosystem services fundamentals. Guidance document for the oil and gas industry," IPIECA (April 2016).

15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.

15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species.

15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts.

Integrate SDG15 into core business

Effective biodiversity and ecosystem management. Companies can integrate biodiversity and ecosystem services (BES) conservation principles and considerations into their business management systems. Effective BES management can help to ensure the ongoing availability of ecosystem services, meet stakeholder expectations, avoid project delays, protect a company's or a project's social licence to operate and potentially create new business opportunities. Good management practices entail building BES into governance and business processes, engaging and understanding stakeholder expectations, understanding BES-related reference conditions, assessing dependencies, opportunities, potential impacts and related risks, and then mitigating and managing these impacts/risks by selecting approach, and monitoring and reporting on performance.[158]

Implement the mitigation hierarchy. Although oil and gas exploration, development and production activities can affect surrounding environments, there is opportunity to manage and mitigate potential impacts through application of the mitigation hierarchy (avoid, minimize, restore, and offset as a last resort) while also identifying opportunities for conservation of the natural environment. This is even more important as oil and gas exploration opens new areas that may feature noteworthy/sensitive biodiversity. Implementing a mitigation hierarchy, such as the one set out in IFC Performance Standard 6, during the project planning process helps to manage BES impacts and related risks.

Minimizing impacts through new technologies. Increasingly, companies are taking advantage of technological advancements to reduce the impacts and related risks of their activities/operations on local biodiversity. For example, directional drilling techniques allow for the location of multiple wells on one pad, resulting in a much-reduced operational footprint. Techniques such as enhanced oil recovery can also boost the volume of oil recovered from a well, thereby reducing land impacts by maximizing oil recovery without necessarily having to drill new wells.[159]

Biodiversity offsets. If, after all avoidance, minimization and restoration measures have been taken, oil and gas operations still have a net negative environmental impact, companies can consider biodiversity offsets. Offsets are intended to achieve no net loss of biodiversity by compensating for residual environmental impacts by recreating affected habitats in a new location. Offsets can be a useful mechanism for balancing economic development and environmental conservation. They can also improve access to land, help safeguard a company's social licence to operate and help manage risks to supply chains and corporate reputation.[160]

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[158] "Biodiversity and ecosystem services fundamentals. Guidance document for the oil and gas industry," IPIECA (April 2016); "Biodiversity Position," ConocoPhillips, available at http://www.conocophillips.com/sustainable-development/our-approach/living-by-our-principles/positions/Pages/biodiversity.aspx (last accessed on 13 June 2016).

[159] Dan Whipple, "Sideways oil drilling value examined," UPI (14 November 2003) available at http://www.upi.com/Science_News/2003/11/14/Sideways-oil-drilling-value-examined/84541068829200/ (last accessed 13 June 2016); "Biodiversity and Habitat Conservation," Occidental Petroleum Corporation website, available at http://www.oxy.com/SocialResponsibility/Environmental-Stewardship/BiodiversityandHabitatConservation/Pages/default.aspx (last accessed 13 June 2016).

Collaborate and leverage

Multi-stakeholder knowledge sharing. Oil and gas companies can benefit from an increased understanding of biodiversity and ecosystems, their actual and potential BES-related impacts and related risks and best practices for appropriate management. Multi-stakeholder partnerships such as the Cross Sector Biodiversity Initiative, a partnership between IPIECA, the International Council on Mining and Metals and the Equator Principles Association, provide opportunities to pool resources, share scientific knowledge and develop biodiversity management tools and guidance. Such cooperative efforts can also be useful in addressing the secondary impacts of oil and gas operations, such as increased access to wildlife for hunters/poachers and predators. Unlike direct impacts, secondary impacts are the result of a more complex confluence of factors that makes them more difficult to address. Multi-stakeholder efforts can provide the scientific knowledge needed to identify such impacts and their related risks, define spheres of responsibility to best address them and coordinate approaches. Additionally, initiatives such as Proteus Partners, established to share terrestrial and marine biodiversity data and knowledge on how to analyse and interpret that data, can build capacity and inform future efforts.[161]

A landscape-scale conservation approach. There is a growing trend that conservation and impact management efforts could be considered holistically instead of employing a site-based approach. Conservation and mitigation efforts could be more effective if they consider not just the impacts on and risks to habitats and biodiversity near a site, but also the broader landscape, which includes local communities, economies, biodiversity and ecosystems, as well as factors that could reduce or amplify the effects of oil and gas industry activities. The result is a strategy that can direct regional conservation priorities and manage cumulative effects. This landscape-scale approach requires collaboration and information-sharing with other stakeholders, including companies in other industrial sectors, conservationists and local communities.[162]

Case studies and initiatives

Protecting biodiversity against invasive alien species: Chevron – Australia
Chevron Australia and predecessor companies have had onshore oil and gas operations on Barrow Island off the northwest coast of the country for over 50 years. Since 1910, Barrow Island has been designated as a Class A Nature Reserve, the highest level of environmental protection offered by the Australian government. One of the biggest threats to the survival of some of the island's flora and fauna is the introduction of alien species that could potentially disrupt the ecosystem. To ensure that Barrow Island is protected, Chevron applies a quarantine management system (QMS), which it integrates into its existing environmental management system. The QMS includes the early detection of alien/invasive species and extensive control and eradication measures. For example, food is allowed only in controlled areas and equipment shipped to the island is shrink-wrapped and fumigated to protect against the importation of alien/invasive species. The system is dynamic and the company continually examines it for improvement opportunities. There have been zero introductions or proliferations of non-indigenous species on the island or in its surrounding waters since the Chevron-operated Gorgon Project on Barrow Island began. The QMS has earned international recognition and Chevron is sharing it with organizations world-wide to help stem the global threat to biodiversity from invasive species.

Sharing knowledge, tools and best practice to conserve biodiversity: IPIECA – Global

[161] Joseph Kiesecker, "Development by design: blending landscape-level planning with the mitigation hierarchy," Frontiers in Ecology and the Environment (20 August 2009).
[162] Nathan Jones, Liba Pejchar and Joseph Kiesecker, "The Energy Footprint: How Oil, Natural Gas, and Wind Energy Affect Land for Biodiversity and the Flow of Ecosystem Services," BioScience vol. XX (26 February 2015); "Biodiversity Position," ConocoPhillips Corporation, available at http://www.conocophillips.com/sustainable-development/our-approach/living-by-our-principles/positions/Pages/biodiversity.aspx (last accessed 13 June 2016).

The introduction of IFC's Performance Standard 6 on Biodiversity Conservation created the need to develop and disseminate best practices for applying the Standard. In 2013, IPIECA, ICMM and the Equator Principles Association formed the Cross-Sector Biodiversity Initiative (CSBI) to share tools and knowledge on good practices. An industry forum, CSBI is designed to provide leadership on the application of the mitigation hierarchy to the impacts of projects on biodiversity and ecosystem services. CSBI has produced tools including the Project Timeline Tool, EBRD/CSBI Good Practices for the Collection of Biodiversity Baseline Data and the Cross-Sector Guide for Implementing the Mitigation Hierarchy.

Reforestation and reclamation of boreal forests: Multiple – Canada
The Oil Sands Leadership Initiative (OSLI) is a collaboration of oil sands developers; ConocoPhillips Canada, Nexen Inc., Shell, Canada, Statoil Canada, Suncon Energy Inc. and Total E&P Canada. The aims of this partnership were to use on-the-ground initiatives to enhance environmental performance, and reduce biodiversity impacts in the boreal forests of the oil sands region. Specifically, OSLI aimed to accelerate reforestation through a project known as the Faster Forests programme. This collaborative effort allowed for execution more broadly at the landscape, rather than project, level. The project adjusted over time in order to achieve the best results possible. The partnership successfully adopted a new technique of planting frozen seedlings during the winter months, altering the selection of tree and shrub species for a more boutique approach, and planting a broad variety of species, not only commercial species. When selecting species, the programme also considered aboriginal peoples' values and traditional land uses and included regulators and other stakeholders in the process.

Protecting biodiversity and investing in environmental education: ExxonMobil – Papua New Guinea
Exxon Mobil has developed an LNG project in Papua New Guinea, including gas production and processing facilities and 700 km of pipelines. In order to protect the biodiversity of the areas in which it operates, Exxon Mobil introduced a Biodiversity Programme and, through it, has developed a protected area for the Kikori River Basin, which will aid the protection of the threatened pig-nosed turtle. The project also invests in environmental education at the Port Moresby Nature Park, which has hosted over 6,000 local children to date, in order to raise awareness of environmental issues.

Selected resources

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- IFC 2012. Overview of Performance Standards on Environmental and Social Sustainability.
- IFC 2006. A Guide to Biodiversity for the Private Sector.
- IPIECA 2005. A guide to developing biodiversity action plans for the oil and gas sector.
- IPIECA 2016. Biodiversity and ecosystem services fundamentals: Guidance document for the oil and gas industry.

GOAL 16. PROMOTE PEACEFUL AND INCLUSIVE SOCIETIES FOR SUSTAINABLE DEVELOPMENT, PROVIDE ACCESS TO JUSTICE FOR ALL AND BUILD EFFECTIVE, ACCOUNTABLE AND INCLUSIVE INSTITUTIONS AT ALL LEVELS

Human rights violations, insecurity and weak governing institutions inhibit economic growth. Peace, justice and effective governance based on the rule of law might be both the outcome of, and a necessary precondition for, all the other SDGs. SDG16 aims to achieve these outcomes by focusing on efforts to reduce violence and corruption, promoting the rule of law and transparent, responsive institutions and encouraging inclusive decision-making.

Companies thrive in stable, peaceful environments, and responsible business practices can contribute to stability and avoiding conflict. Governments have the primary responsibility for maintaining peace and security, while companies contribute by following and respecting the law, adhering to anti-bribery and anti-corruption laws and practices, identifying and mitigating adverse human rights impacts of their activities, and conducting regular and inclusive engagement with stakeholders.

However, oil and gas operations may be faced with situations where there is conflict in their operating areas. While the responsibility of companies to respect human rights does not change when operating in such situations, meeting that responsibility presents heightened challenges. This is true whether it is a company-community conflict related to company operations, or unrelated social or political conflict in the region. In these situations, robust risk and impact assessments are important and companies may need to conduct conflict analysis and take specific measures to address the heightened risks. If they face security threats, companies need to ensure that their security services, public or private, uphold human rights standards while protecting the safety of their operations and personnel while applying standards such as the Voluntary Principles on Security and Human Rights (VPSHR).[163]

Key UN SDG16 targets relevant for the oil and gas industry

16.1 Significantly reduce all forms of violence and related death rates everywhere.

16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all.

16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime.

16.5 Substantially reduce corruption and bribery in all their forms.

16.6 Develop effective, accountable and transparent institutions at all levels.

[163] "Oil and Gas Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights," European Commission, 2012; "Guide to operating in areas of conflict for the oil and gas industry," IPIECA (March 2008).

16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels.

16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.

Integrate SDG16 into core business

Integrate human rights perspective in impact assessments. The UN Guiding Principles on Business and Human Rights recognize the responsibility of companies to respect human rights in the areas where they operate. Most oil and gas companies have policies and corporate values committed to human rights. However, given the range of different contexts in which companies operate, it is important that they address the human rights impacts specific to the local environment, and take steps to address these issues in their own activities and within their supply chain. The relevant human rights issues can be integrated into the existing risk and impact assessment approaches, such as the project's ESHIA or, where relevant, a deeper-dive human rights impact assessment (HRIA) may be done. The deep-dive HRIAs can be an important tool for effective human rights due diligence. Such an assessment can consider the potential impacts of operations, issues resulting from business relationships, such as with business partners, and other factors that might contribute to adverse human rights impacts potentially linked to the business activities. It can be advantageous for such deep-dive HRIAs to start at the earliest stages of the project, where there is greater risk of human rights issues. Companies need to take care in determining where the human rights issues may be well covered in an ESHIA, or might need a further deeper HRIA.[164]

Community engagement and consent. There is increasing emphasis on the importance of meaningful engagement with local communities, through transparent, inclusive consultation, as a way for companies to respect the rights of communities potentially affected by their activities and avoid conflict perhaps arising from a lack of broad support and participation. Companies need to ensure timely and responsible management of community queries and concerns, undertaken in accordance with formal grievance-handling procedures required by the regulatory authorities. Specific sensitivities in community engagement are also important when dealing with indigenous peoples, to respect the protected rights of indigenous communities such as described in the UN Declaration on the Rights of Indigenous Peoples[165], and ILO convention 169[166]. Companies may need to understand and respect the free, prior and informed consent processes in the engagement with indigenous peoples communities.[167]

Integrate anti-corruption systems. Illicit financial flows, i.e. money that is earned from or used in illegal acts such as corruption, tax evasion and illegal exploitation of resources like oil and gas, can undermine peace and security, particularly in developing countries. The complexity, scale, areas of operation and range of relationships involved in the oil and gas industry means ensuring business is conducted in a fair and ethical manner with zero tolerance of corruption is an important aspect of sound business practices and risk management for oil and gas companies. In addition to complying with relevant anti-corruption laws and international legal frameworks, companies can embed anti-corruption policies into their core business procedures and implement compliance programmes which can guard against the legal, economic and reputational risks associated with corruption.[168] In addition, oil and gas companies can

[164] "Oil and Gas Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights," European Commission, 2012; Integrating human rights into environmental, social and health impact assessments, IPIECA 2012.
[165] http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf
[166] http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169
[167] "Indigenous Peoples and the oil and gas industry: context, issues and emerging good practice," IPIECA (April 2012); "Community Consent Index 2015," Oxfam International (July 2015).
[168] "Managing bribery and corruption risks in the oil and gas industry," EY (2014).

protect themselves by encouraging business partners and subcontractors to implement anti-corruption policies and supporting multi-stakeholder financial transparency and anti-corruption initiatives.[169]

Collaborate and leverage

Improve institutions through NOCs. NOCs, many of which are state-owned, often partner with multinational oil and gas companies. Independent oil and gas companies can contribute to enhancing the capabilities of NOCs by evaluating the potential for training, technology and operational experience transfer, as well as prudent management practices, including good practices for management of human rights issues and due diligence. Joint venture or capacity-building agreements or memoranda of understanding are good opportunities for independent companies to highlight human rights issues with NOC partners. In addition to sharing global standards related to a variety of topics, NOCs can be a conduit for the development of the human rights capabilities of other institutions in the host country.[170]

Increase effective, accountable and transparent institutions. Bribery, corruption or poor business practices can prevent the citizens of resource-rich countries from fully realizing the benefits of that resource wealth. Transparency can play a vital role in discouraging corruption, promoting accountable management and strengthening good governance that supports economic growth. Regularly publishing the payments made by companies to governments and the revenues governments receive from companies can allow the public to hold both parties accountable. Transparency in contracts, beneficial ownership (the name and identity of the actual owners of companies), and commitments can help deter corruption in extractive deals, or abuses in transfer pricing and tax evasion, and improve the investment climate. Transparency around plans and policies, particularly related to issues such as the environment and local content, can also be important for communicating with local stakeholders, managing risk and maintaining a social licence to operate (see SDG17). [171]

Ensuring compliance with the Foreign Corrupt Practices Act (FCPA) and other international legislation such as, for example, the 2013 EU Accounting and Transparency Directive, as well as companies' internal compliance programmes, ethics code of conduct and human rights policies, enable companies to determine the necessary actions to detect potentially risky situations.[172]

Case studies and initiatives

The Voluntary Principles on Security and Human Rights: Multiple – Global
Collaboration with public security forces can present a range of challenges for companies, but working with them is frequently necessary. Therefore, governments, NGOs and a number of oil and gas companies worked together to establish the Voluntary Principles on Security and Human Rights in 2000. Numerous international oil and gas companies are signatories to the Principles, which detail good practice for the conduct of risk assessments and interaction with security forces.

Community engagement in conflict-affected areas: Occidental -- Colombia
Occidental has operated for many years in a conflict-affected region of Colombia. Both for symbolic reasons and because it provided revenue to the regional and national governments, the company was

[169] "Illicit Financial Flows," World Bank (April 2016), available at http://www.worldbank.org/en/topic/financialmarketintegrity/brief/illicit-financial-flows-iffs (last accessed on 13 October 2016).
[170] "How National Oil Companies Can Fuel Economic Development," Bain & Company (1 May 2012), available at http://www.forbes.com/sites/baininsights/2012/05/01/how-national-oil-companies-can-fuel-economic-development/#721dbd8038d8 (last accessed 13 June 2016); "Oil and Gas Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights," European Commission.
[171] "2016 Progress Report," EITI (February 2016); "Preventing corruption: promoting transparent business practices," IPIECA (April 2012); "Trust Challenge Facing the Global Oil & Gas Industry," World Economic Forum (April 2016).
[172] Foreign Corrupt Practices Act, 15 U.S.C. § 78dd-1 (1977).

sometimes targeted by guerrillas who shut down its oil pipeline and attacked employees. When the company signed a deal for a new oil project, it partnered with two local NGOs to conduct a risk and human rights assessment that included extensive stakeholder consultations and holistic examination of issues. As a result, Occidental was able to identify a new community investment approach and manage community expectations, thus greatly reducing the ability of guerrilla groups to exploit community grievances to foment unrest.

Policies for Revenue Transparency and Anti-Bribery and Corruption: Shell – Global
Bribery and corruption can be serious problems, presenting both ethical and business challenges. Shell has introduced a zero-tolerance policy on corruption and bribery, and does not 'accept the direct or indirect offer, payment, solicitation or acceptance of bribes in any form'. Facilitation payments and political donations are also prohibited. In order to ensure and prove compliance, Shell has undertaken voluntary disclosure of all payments made to governments since 2011, and advocates for mandatory country-by-country global reporting. External voluntary codes and organizations such as the OECD Guidelines for Multinational Businesses and Statement of Tax Principles for International Business and the EITI are considered useful.

Participatory environmental and social monitoring in rural Andean communities: Hunt Oil – Peru
The Peru LNG Project, operated by Hunt Oil, is a 408-km pipeline that traverses the Andes to a liquefaction plant and marine terminal on the Pacific coast. The pipeline crosses diverse landscapes and ecosystems, and also 34 rural Andean communities and 15 localities. The communities in Ayacucho and Huancavelica are among the poorest in Peru and heavily depend on subsistence agricultural practices for their livelihood. Given the social context, and possible impacts, early in the project planning phase the company implemented the Participatory Environmental and Social Monitoring Programme (PESMP). This allowed communities to receive accurate information and participate in the monitoring of the overall environmental and social performance of the project during construction. It also guaranteed that community concerns were heard and addressed. The PESMP is the first of its kind to be carried out in the construction of an oil and gas project in Peru. It is considered highly successful and could be used as a model for similar projects in South America and beyond.

Selected resources

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- IFC 2007. Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets.
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- IPIECA 2012. Indigenous Peoples and the oil and gas industry.
- IPIECA 2013. Integrating human rights into environmental, social and health impact assessments.
- Natural Resource Governance Institute 2014. Natural Resource Charter.
- Guidance on beneficial ownership, 2016. EITI.
- Modern Slavery Act 2015. Explanatory Notes.
- Shift 2013. Oil and Gas Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights.
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- Voluntary Principles on Security and Human Rights 2000. VPSHR.
- World Bank 2016. The World Bank Group's response to illicit financial flows: A stocktaking.
- World Resource Institute 2009. Breaking Ground: Engaging Communities in Extractive and Infrastructure Projects.

GOAL 17. STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT

The SDGs cannot be achieved through isolated actions. In an increasingly globalized and interconnected world, commitment to global partnership and coordinated effort by governments, companies, investors, international organizations and civil society are necessary. Success will require solutions and business strategies from all parties aligned with the SDGs. Investment, job creation, skills, infrastructure development and technological innovation are ways that oil and gas companies can help drive sustainable development. Partnering with other stakeholders connects complementary skills, reduces risks for companies, and allows them to better leverage their core competencies. Above all, partnering can lead to higher-quality, longer-term sustainable outcomes than any stakeholder could achieve on its own.[173]

All of this applies to the oil and gas industry. In addition to the regular economic activities envisioned in the 2030 Agenda for Sustainable Development as the private sector's contributions to the SDGs, the energy these companies produce will play a large role in the success of all the goals. Access to reliable, sustainable, modern and affordable sources of energy is a necessary condition for poverty reduction, economic growth, environmental preservation and improved health. This will require concerted action to bring together and leverage core skills and create platforms for setting shared goals. In addition to multi-stakeholder initiatives, there are opportunities for oil and gas companies to develop partnerships within their value chains or through sectoral initiatives that bring together leaders to establish or raise industry standards.[174]

Key UN SDG17 targets relevant for the oil and gas industry

17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection.

17.3 Mobilize additional financial resources for developing countries from multiple sources.

17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial

[173] "Partnerships: Working together to provide more," IPIECA, available at http://rio20.ipieca.org/fact-sheets/partnerships (last accessed 13 June 2016).
[174] Jane Nelson, Beth Jenkins and Richard Gilbert, "Business and the Sustainable Development Goals," Business Fights Poverty (2015); "Partnerships in the oil and gas industry," IPIECA (April 2006); "SDG Compass: The guide for business action on the SDGs," GRI, UN Global Compact and World Business Council for Sustainable Development (2016)

resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.

17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.

Integrate SDG17 into core business

Building government capacity. Great opportunities exist for oil and gas companies to work with the governments of resource-rich, emerging economies to help them develop the capacity to monitor and properly manage the revenues from the country's resource wealth. They can provide technical assistance, training or funding support for initiatives that help countries develop efficient and effective tax collection and revenue management frameworks and that build the capacity of government staff to implement and enforce them. These collaborative efforts contribute to poverty reduction, stronger government institutions, greater transparency and improved rule of law.

Develop and disseminate sustainable energy technologies. Energy is a critical pre-condition for achieving the SDGs. Access to reliable, affordable, modern and sustainable energy sources can drive economic growth, poverty reduction, improved education, health and safety. As the world's population grows and economic development increases energy demand, the challenge of energy poverty will only become more acute. The world will need to develop new ways of increasing energy access while addressing the issue of climate change. Oil and gas companies, with their investment capital, technical expertise, experience of working in emerging economies and history of innovation, are well-positioned to be at the forefront of multi-stakeholder efforts to identify and scale up sustainable energy solutions that move all the other SDGs forward.

Collaborate and leverage

The discussion of each SDG in this Atlas includes potential collaboration and partnership opportunities for achieving the goals. In addition, the following are opportunities and approaches for companies to work with other stakeholders at global, national, regional and local levels to achieve the SDGs.

- **Participate in dialogue.** Dialogue between companies, governments, development partners and civil society will be important for determining the role of oil and gas industry in national action plans for the SDGs.
- **Strengthen coordination between initiatives.** Companies can help improve the coordination and alignment of global, regional and local level initiatives related to sustainable development of oil and gas resources to ensure their complementarity and avoid unnecessary overlap.
- **Incorporate SDGs into policies.** Companies can provide their expertise and industry insights to assist governments in achieving the SDGs.
- **Apply the SDG indicators.** Companies can review and collaborate with other stakeholders to determine how to apply them.

Case studies and initiatives

Working together for Sustainable Energy for All: Multiple – Global
In 2011, to catalyse new action to transform global energy systems by addressing climate change, eliminating energy poverty and promoting development of sustainable energy, the UN launched Sustainable Energy for All (SE4All). SE4ALL is a platform that includes representation from the public sector, civil society, international organizations and the private sector, including a number of oil and gas companies and industry associations, such as Eni, Shell, Statoil and the World Petroleum Council. These partnerships enable SE4All to leverage large-scale investments, extract bold commitments from its

members and allow for substantial knowledge-sharing. More than 100 countries, including 85 developing countries, have joined SE4ALL, and 43 rapid assessments or gap analyses have been carried out. The programme has mobilized USD $120 billion a year in sustainable energy investments and has also launched the Global Energy Efficiency Accelerator Platform.

Extractive Industries Transparency Initiative (EITI): Multiple – Global
The multi-lateral, multi-stakeholder EITI is a voluntary standard that promotes the transparent and accountable management of countries' revenues from their natural resource wealth. It provides a platform for host governments, companies and civil society to work together to facilitate economic growth by improving governance and reducing corruption related to natural resource revenues. It does this by overseeing and reconciling the payments made by oil and gas companies to the government, as well as the payments received by the government. Currently, 37 countries have published EITI annual revenue reports detailing more than USD $1.5 trillion in government revenue.

Global gas flaring reduction partnership: Multiple – Global
Approximately 140 billion cubic metres of natural gas are flared annually as part of oil and gas operations, wasting energy resources and adding an additional 300 million tons of CO2 to the atmosphere. The Global Gas Flaring Reduction Partnership (GGFRP) is a public-private partnership that brings together oil and gas companies, international organizations such as the World Bank and national governments to share knowledge and best practices on reducing natural gas flaring. The GGFRP is attempting through joint action to improve regulatory frameworks and financing mechanisms for investment in flaring reduction, provide technical assistance for the development of domestic gas markets as an alternative to flaring and develop best practice standards. GGFRP partners have developed a global standard for reducing flaring which has been endorsed by 15 GGFRP companies who have committed to zero flaring in future projects.

Educating policymakers and regulators on the energy industry for effective institutions: ExxonMobil – US
Oil and gas regulation and policy is extremely complicated and is continuously changing alongside technological developments. Since 2013 ExxonMobil, together with General Electric and the Environmental Defense Fund, has funded the establishment of four courses for regulators and policymakers: Petroleum Geology and Engineering Concepts, Petroleum Technology, Environmental Management Technology and Communications and Hot Topics. These courses are aimed primarily at new regulatory or policymaking personnel, and have been developed and taught by the Colorado School of Mines, Pennsylvania State University and the University of Texas at Austin. The courses are a few days long, and combine an online element with classroom training and field experience, and are designed to provide practical skills to improve on-the-job performance.

Collaborating on oil spill response capability: IPIECA – Global
Though there are numerous oil spill-related international conventions, the ratification of these remained low, with harmful effects on global oil spill preparedness. Therefore, IPIECA joined in partnership with the IMO and technical partners such as the International Tanker Owners Pollution Federation, to establish the Global Initiative (GI) in 1996. The GI was launched with the aim of encouraging and facilitating the development and implementation of national, regional and sub-regional oil spill contingency plans, and increasing the ratification of relevant international conventions, by means of facilitating cooperation between local or national government authorities and the oil industry. Significant progress has been achieved, including designation of Governmental Responsible Authorities, development of national legislation and ratification and effective implementation of relevant IMO conventions by the recipient countries.

Selected resources

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- VPSHR 2012. Implementation Guidance Tools.