

Creating the 21st Century Energy System

The role of the oil and gas industry in tackling energy poverty



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Executive Summary

Launching the Sustainable Energy for All (SE4ALL) initiative in September 2011, United Nations (UN) Secretary-General Ban Ki-moon stated that “energy is the golden thread that connects economic growth, increased social equity, and an environment that allows the world to thrive.”¹ Energy access is critical to social and economic development, but a shocking 1.3 billion people do not have access to electricity and a further 2.6 billion people do not have access to clean cooking facilities. Of these, 95% are located in sub-Saharan Africa and developing Asia,² regions of the world which paradoxically also hold nearly 20% of global oil and gas reserves.³

Recognizing this paradox, oil and gas companies have been active in tackling the energy poverty challenge. As a founding member of the Global Alliance for Clean Cookstoves, Shell has provided both financial and technical support to foster the adoption of clean cookstoves and fuels in 100 million households by 2020. Eni has used captured gas from its M'Boudi field in the Republic of Congo as a feedstock in electricity generation, supporting the provision of power to the local community.

Meanwhile, Total recently launched Awango by Total to deliver solar lighting and phone charging solutions to the base of the pyramid (BoP).⁴ While these efforts are commendable, they are not sufficient to move the dial on energy poverty alleviation. Emphasizing this point, the International Energy Agency (IEA) estimates that under a business-as-usual scenario, there will still be 1 billion people living without access to electricity and 2.5 billion people living without access to clean cooking facilities in 2030.⁵

To effectively build on these leading examples and drive a step-change, a multi-stakeholder approach championed by strong leadership is required. With a mission to bring together leaders from government, business and civil society “to achieve a broad-based transformation of the world's energy systems and build a more prosperous, healthier, cleaner and safer world for this and future generations,”⁶ the UN's SE4ALL initiative provides a strong foundation from which to build this multi-stakeholder approach. However, to ensure this platform is effectively utilized, leadership is critical. Oil and gas companies are best placed to bring that leadership. Not only do they have the capability, convening power, and capital, they also stand to reap the benefits of opening up the US\$37 billion market⁷ associated with providing access to modern energy.

With a long history of operating in these countries and a business need to continue accessing reserves, oil and gas companies have an opportunity to incorporate energy poverty alleviation in their negotiations with governments. Improving access to energy provides the holistic service to host communities for which governments are looking and supports broader economic and social development. This in turn secures the industry's sustainable access to reserves and social license to operate, increasing revenue potential from existing and new revenue streams, facilitating risk management and supporting increased brand enhancement – increasing shareholder value in both the short and long terms.

In addition, oil and gas companies have the ability to make a difference. With decades of experience operating in these countries, oil and gas companies have enviable convening power, bolstered by access to senior government officials, enabling them to align stakeholder interests and render these collaborative solutions viable. They also have the technical and commercial expertise, and access to capital required to work with communities to define and support their needs, supporting long-term and sustainable impact.

Within this context, oil and gas operators are well positioned to lead the way, working across stakeholder groups to drive a step-change in achieving universal access to energy by 2030. Only such an integrated, multi-stakeholder approach – supported by strong leadership – will truly be able to secure an end to energy poverty.

"Energy is the golden thread that connects economic growth, increased social equity, and an environment that allows the world to thrive."¹

UN Secretary-General Ban Ki-moon

Figure 1 – The UN Sustainable Energy for All (SE4ALL) Initiative⁸

The UN Sustainable Energy for All is a global initiative launched in 2011 by UN Secretary-General Ban Ki-moon to mobilize private sector, public sector and civil society to catalyze action and achieve three key objectives by 2030:

- Ensuring universal access to modern energy
- Doubling the global rate of improvement in efficiency
- Doubling the share of renewable energy in the global energy mix.

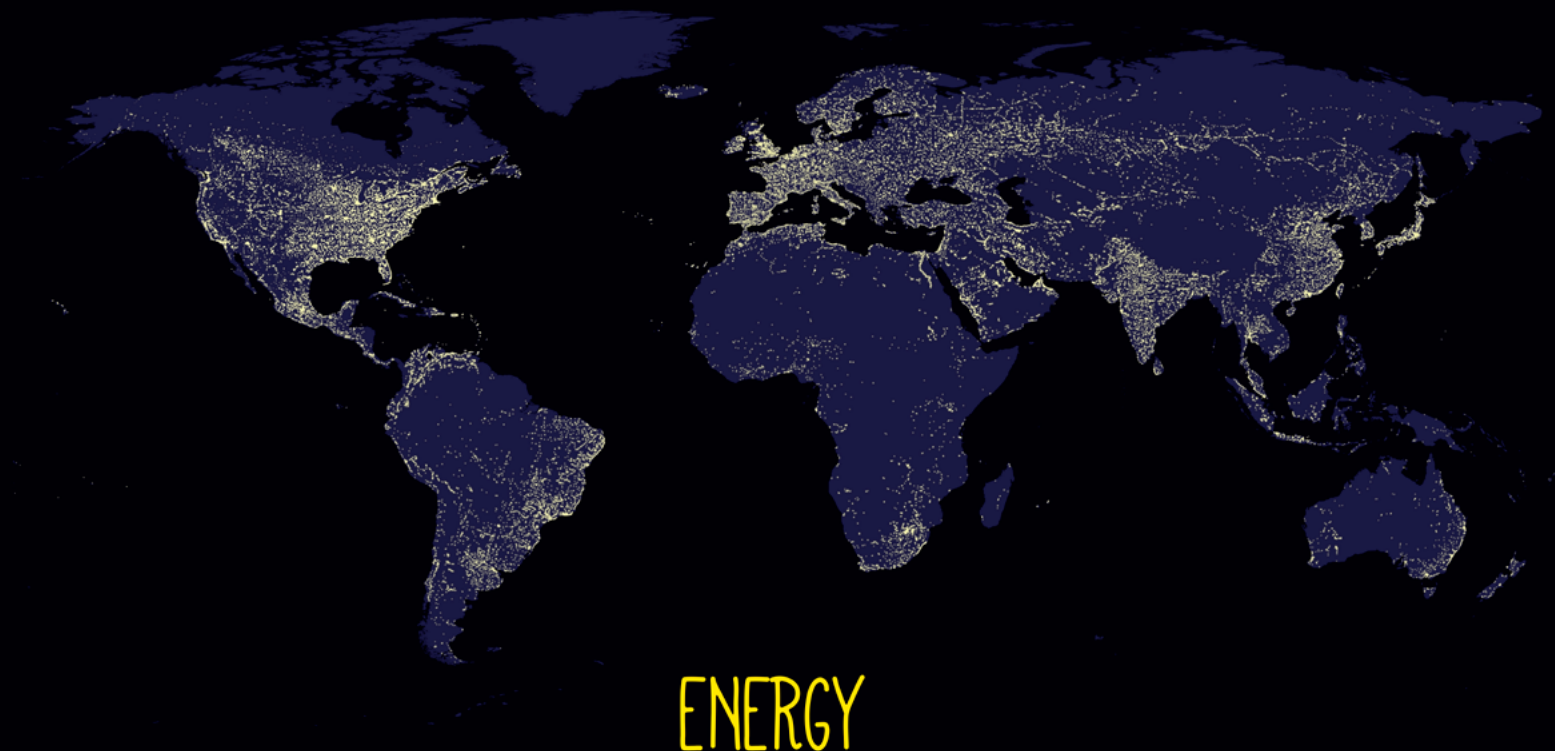
To date, SE4ALL has secured commitments and gathered support from over 75 countries. However, country commitments need to be matched by commitments from the private sector and non-government organizations (NGOs) to achieve the ambitious mandate set by SE4ALL.

Accenture has played a key role in establishing the SE4ALL secretariat and in rallying private sector engagement across priority areas. Through a partnership with the UN Global Compact (UNGC), Accenture defined a set of opportunities for the private sector – across 19 different industries – to address these priority areas.

Five major opportunities were identified for the oil and gas industry:

- Use more renewable energy sources and emphasize energy efficiency throughout the entire fuels supply chain.
- Reduce the flaring of gas from operations and identify opportunities to reuse captured gas on-site or provide energy to local communities.
- Invest in research and development and utilize core competencies to bridge the gap from fundamental research to commercialization of liquid renewable transportation fuels and renewable generation technologies.
- Promote international trade in sustainable energy products.
- Use innovative business models and create new products and services to improve energy affordability and enable access to clean cooking and heating solutions.

Accenture has since played an active role in establishing innovative partnerships to capture these opportunities and tangibly contribute to meeting the 2030 targets.



ENERGY

1.3 BILLION

people globally lack
access to electricity

95%

of these people are located
in sub-Saharan Africa and
developing Asia

20%

of the world's oil and
gas reserves are held
in sub-Saharan Africa
and developing Asia

The Need for an Integrated, Multi-Stakeholder Approach

Energy poverty is an enormous challenge – but its resolution brings global rewards

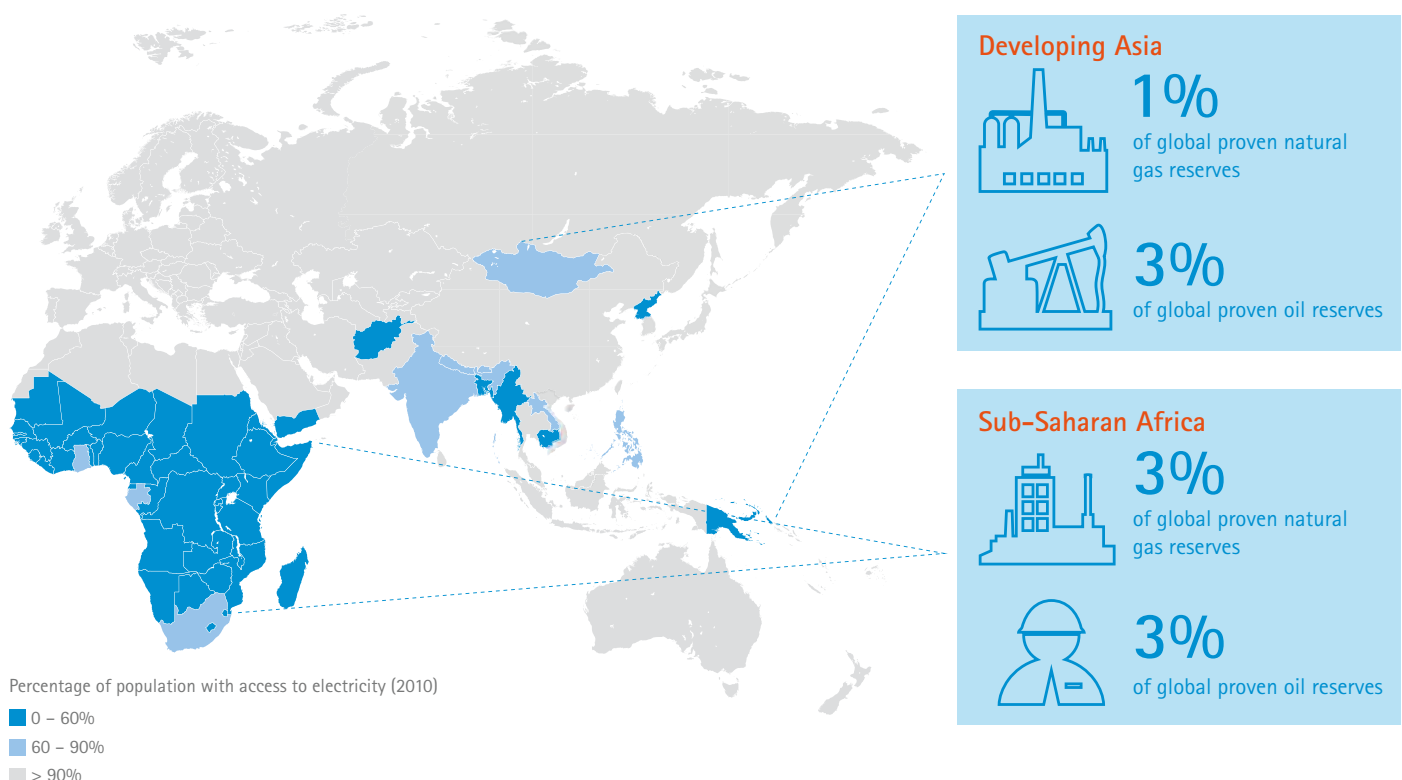
The size of the issue is now well-documented. Of the 1.3 billion people without access to electricity and the 2.6 billion people without clean cooking facilities, 95% reside in sub-Saharan Africa and developing Asia, regions that are, paradoxically, historically rich in natural resources (see Figure 2 below). To illustrate the point, Nigeria, one of Africa's largest oil-producing countries, has one of the 1 lowest net rates of electricity generation per capita in the world with 50% of its population (80 million people) living without access to electricity. Moreover, despite producing an average of 2 billion barrels of oil per day, only 11% of Nigeria's energy consumption is attributed to oil, with biomass and waste accounting for 83%.⁹

The IEA estimates the cost of providing universal access to modern energy by 2030 at US\$1 trillion or US\$48 billion annually. With only an estimated US\$14 billion of funds available per year, the world faces an annual funding gap of US\$34 billion.¹¹ Added to this challenge is the fact that traditional energy systems are not expected to be sufficient to bridge this gap. Instead, the IEA estimates that over 70% of rural electrification will need to be delivered by off-grid and micro-grid solutions, highlighting the need for new, innovative approaches to energy access provision.

While the challenge is daunting, the opportunities its resolution brings are inspiring. The World Bank's International Finance Corporation (IFC) recently

estimated the market size for modern energy services at US\$37 billion – roughly equivalent to the amount those without access today spend on kerosene for lighting and biomass for cooking.¹² In addition to the direct revenue opportunities providing access to energy brings, the domino effects – namely broader economic and socio-economic development – can lead to yet more opportunities. This potential has been referenced in a number of studies, proving that there is a positive correlation between energy access and both Human Development Index (HDI) ranking and Gross Domestic Product (GDP) per capita. Figure 3 builds on these studies, adding a third dimension of population size to provide further insight into the magnitude of the challenge in real terms.

Figure 2 – Energy Access vs Global Oil and Gas Reserves in Sub-Saharan Africa and Developing Asia¹⁰



Capturing this value takes more than just financial investment and requires an integrated, multi-stakeholder and cross-sector approach

Although quantifying the cost of investment is critical, access to energy will not be resolved simply through increased capital flows. If it were that easy, it would already have been done. The situation in the 10 largest oil and gas exporting countries in sub-Saharan Africa is a case in point. The IEA estimates \$30 billion of capital spend would be required to provide universal access to all deprived households in these countries.

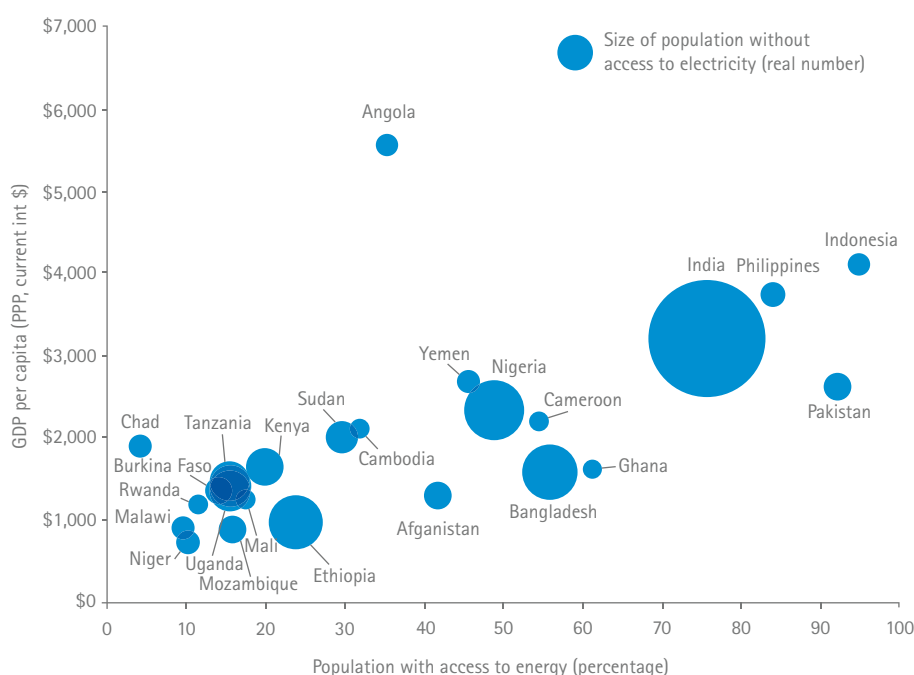
While this sounds substantial, it represents a cumulative investment equal to just 0.7% of their export revenues, implying that finance is not the only factor holding back progress. Other factors – including institutional barriers and the lack of a coordinated effort or a long-term vision for sustainable investment and development – have also played critical roles in hindering progress.¹⁴

The conflation of these factors calls for an integrated, multi-stakeholder and cross-sector approach to energy poverty and supporting these countries through their energy transitions. Indeed, multiple sectors and interests need to be aligned to create a supportive enabling environment and strengthen market supply and demand.

The World Economic Forum and Accenture's recent assessment of Myanmar's energy system is a pertinent example of the need for this approach. With an estimated 50%¹⁵ to 74%¹⁶ of Myanmar's population living in the dark, access to energy is defined as a critical pillar of the country's energy transition strategy. The report calls for the development of an integrated energy plan to strategically address the multiple energy-related reforms

needed in the country. For example, bringing electricity to both rural and urban communities means improving the attractiveness of investment in the energy sector, securing supply of feedstock and developing skills within the country to build and maintain the required energy infrastructure. However, achievement of this integrated plan depends on alignment of multiple stakeholder interests from the private sector, NGOs and government stakeholders. Difficulty in achieving this alignment to date has led to minimal success in the venture.¹⁷

Figure 3 – Correlation Between Per Capita GDP and Energy Access in Developing Asia and Sub-Saharan Africa¹³



A correlation analysis demonstrates a quasi-linear relationship between GDP per capita and access to energy.

Countries suffering from low access to energy also suffer from low GDP per capita.

Figure 4 – Accenture Development Partnerships' Energy Access Vision

Building on its SE4ALL commitments, Accenture's international development practice, Accenture Development Partnerships (ADP), launched the Energy Access for Development Impact (EADI) initiative. Through this initiative, ADP envisages an end to energy poverty and the proliferation of 'powered communities,' enabling livelihood improvements and broader economic and social development. This vision can only be achieved through coordinated, multi-stakeholder efforts. As such, ADP aims to establish cross-sector partnerships to jointly tackle the issue of energy poverty through developing innovative solutions and sustainable business models. Addressing complementary aspects of the challenge, these partnerships will work together to build the ecosystem and achieve the overarching vision of an end to energy poverty.



The Oil and Gas Industry's Unique Position to Take a Leading Role

The oil and gas industry has a vested interest in tackling energy poverty

The oil and gas industry has a long history operating in sub-Saharan Africa and developing Asia – where the energy access challenge is most pronounced. For example, international exploration and production activities have been ongoing in Nigeria since the 1930s.¹⁸ In order to secure licenses to operate in these regions, operations have been required to invest in local economies through both local content development and community investment programs. An assessment of social spend alone revealed that while the level of spend varies in line with the size of the company's broader country investment, some companies reported investments as high as US\$500 million in 2012 alone.¹⁹

This activity – and required investment – is not likely to diminish any time soon. The share of global oil and gas reserves held in sub-Saharan Africa alone increased by 33% between 2000 and 2012.²⁰ Added to this is an evolving operating landscape, with the evolution of shale gas resulting in larger operational footprints. Within this new context, needs-based philanthropy to maintain the social license to operate is no longer sufficient and oil and gas companies will need to rethink their relationships with host communities. The energy poverty challenge provides the industry with the opportunity to do so.

The industry's interest in tackling energy poverty can be summarized in three key value drivers: revenue growth, risk management; brand enhancement and revenue growth.²¹

Risk management

Tackling energy poverty can help to manage operational risk and create shareholder value in both the short and long terms. In the short term, an emphasis on tackling energy poverty will have a direct impact on the quality of life across communities, helping to minimize potential unrest. A reliable source of energy supply will also support business operations and improve conditions for company employees – particularly during the development stage of the value chain. Together, these impacts will support greater operational savings from both a time and financial perspective, helping to manage shareholder expectations quarter to quarter. In the long term, broader economic and social development will enable provision of services such as health and education, thereby reducing work stoppages through access to a stronger, more educated workforce and lowering procurement costs through the development of a more robust supply chain. In the context of increased cost pressures and ever more stringent local content sourcing requirements, this has become a business imperative, with a little upfront investment paying substantial dividends over the longer term.

Brand enhancement

A related value driver is the need to establish a strong brand in order to secure licences and access to reserves in the short term. By committing to tackling the energy poverty challenge as an enabler to broader economic and social development, the industry has the opportunity to strengthen its current local content offerings, better positioning itself vis-à-vis local governments. In the long term, these efforts will further help companies protect their brands, which is instrumental to retaining their social licences to operate.

Revenue growth

In the long term, local communities present new markets for oil and gas operators. By building new energy solutions and innovative business models, oil and gas companies can provide access to energy to the (BoP) – those considered to be in the lowest income bracket, creating new revenue streams. The IFC's market size estimate of US\$37 billion tells a compelling story, with the potential for new markets in poorer communities growing over time as purchasing power increases. It enables consumers to ascend the 'energy ladder' and move away from dirtier energy sources such as biomass to cleaner, more efficient energy sources. The sale of products such as liquefied petroleum gas for use as household and transportation fuels provides particularly interesting opportunities for oil and gas companies. The Global Alliance for Clean Cookstoves has been instrumental in developing this opportunity, helping to establish LPG as a clean, efficient and safe cookstove fuel,²² thereby creating a new market base for the oil and gas industry. The relative strength of each business driver will be highly context dependent. In many cases, the case for investment may prove more compelling for national oil companies (NOCs), as supporting broader economic development is at the heart of these organizations' missions. Saudi Aramco's "golden quadrant" strategy is an example of this commitment to broader economic and societal development as the NOC assesses the value of projects based on the extent to which they meet three priority areas: responding to the global energy market, commerciality and national development. However, while national development interests are generally more aligned with the strategy of NOCs, investment in energy access can also provide greater competitive advantage for international oil companies (IOCs).

The industry has a broad set of capabilities – ranging from its relationships with cross-sector stakeholders to technical and commercial expertise and access to capital – which it can more strategically leverage to tackle the challenge

In addition to clear value drivers for investment, the industry has a broad set of existing capabilities that it could apply more strategically to the energy access challenge for greater impact – for both itself and the communities it serves.

Stakeholder relationships

The complexity of the oil and gas operating environment demands rigorous stakeholder management across diverse groups – from government to local community representatives. While this presents challenges for the industry, it also presents an opportunity – particularly with regard to tackling energy poverty. With experience in this field and access to senior government officials, the industry is well placed to lead and manage integrated, multi-stakeholder solutions, which are critical to scaling access to energy. In this context, the industry's convening power can also be used to drive collaboration beyond the oil and gas industry itself, to leverage the different skills and knowledge pools across the private sector.

An example of this convening power is the multi-stakeholder partnership led by *Petróleo Brasileiro* (Petrobras) and the Brazilian National Development Bank (BNDES). PROMINP, the Mobilization Program for the Oil and Gas National Industry, was formed in 2002 to support and accelerate the development of an oil and gas supply chain and workforce to respond to the increasing local content requirements. The organization brings together government, industry, academia and financial institutions around three key objectives: to advance technical and professional qualifications of suppliers

and workers roll out favorable regulatory; financing and fiscal environments; and monitor the course of local industry performance against international standards. While PROMINP addresses the commercial need of mitigating the risks of the local content requirements, it also addresses key development needs.²³

Technical and commercial expertise

A strong combination of technical and commercial expertise further positions the industry to take a leading role in tackling energy poverty. In terms of technical expertise, the industry has a long history of developing its own infrastructure to support operations in frontier locations; for example, by building mini-grids to provide energy to its sites. The industry could leverage these capabilities, providing access to energy to the local communities – at minimal additional cost. These capabilities, combined with commercial acumen such as an understanding of how to develop sustainable business models and implement at scale could be applied to energy access solutions to ensure that they are technically robust, there is sufficient local capacity to support them and that they are sustainable. In addition to applying its capabilities to specific programs, the industry could apply its expertise to the policy sector, providing support and training to policymakers themselves, helping to ensure long-term sustainability of investments and programs.²⁴ Application of this expertise to the energy poverty challenge could better position the industry from a government perspective.

Access to capital

The extraction of oil and gas reserves has huge potential for local economies. This potential has unfortunately not been realized across much of sub-Saharan Africa with Angola being a case in point. Despite being the third largest economy in Africa, with oil and gas contributing to over 46% of Angola's GDP in 2012,²⁵ only 38% of the country's population has access to modern energy sources.²⁶ This paradox indicates a need to manage capital more strategically, and transparently.

Firstly, the oil and gas industry should more strategically align any contributions to the local economy – typically channelled through core operations, local content development, and social community investment. This requires internal coordination of spend to increase impact, and meet both business and community interests. For example, while oil and gas social investment priorities have traditionally largely been centered on health and education, supplementing these with a focus on access to energy can have greater impact for little additional cost, thereby increasing total return on investment. A school building with access to a continuous and reliable energy supply is a better outcome than just a school building. Marrying social investment and local content spend would have even greater impact, enabling oil and gas companies to align business interests to country development goals through, for example, the establishment of local supply chains.

Secondly, the industry should continue to support and encourage efforts to ensure full disclosure of oil and gas rents and enable more systematic transparency and accountability, such as through the Extractives Industry Transparency Initiative (EITI).²⁷ This will better help determine how capital is being spent and how rents are being utilised to drive capital optimisation and ensure development goals are met. These combined efforts can help to realize the effects that the oil and gas industry can have on local communities.

These capabilities highlight that the oil and gas industry is in a unique position to add value by harnessing its existing competencies and presence on the ground to help understand the context and needs of local communities and ensure solutions with tangible and measurable outcomes. In turn, the socio-economic development that comes from relieving energy poverty can drive real value in the oil and gas industry's operations by generating new revenue opportunities, whilst supporting broader risk management and brand enhancement.





Defining the Industry's Role

The industry has an important role to play at both the global and local levels

Given the industry's vested interest and the breadth of its capabilities, it is uniquely positioned to take a leading role in tackling energy poverty. This role is two-dimensional, with efforts required at both the global and local levels.

Figure 5 – The Oil and Gas Industry Role in Tackling Energy Poverty



At the global level, the industry should advance the agenda and share knowledge

The complexity of the challenge at hand calls for an integrated, multi-stakeholder and cross-sector approach. Platforms such as SE4ALL have proven to be critical in supporting this approach, with leaders across stakeholder groups coming together to exchange knowledge and ideas, share leading practices and identify specific ways to collaborate to advance the energy poverty agenda. Shell and Statoil are among the industry leaders with representation on the SE4ALL Advisory Board. Others, including Eni, are further supporting this agenda through the UN Sustainable Development Solutions Network, with Eni's CEO appointed to lead the Energy For All in sub-Saharan Africa initiative, driving and recommending solutions at the regional level.

This knowledge sharing is not restricted to boardrooms however, and oil and gas companies have the opportunity to share some of their more operational – and non-competitive – data to advance the agenda too. One example of this is information acquired during exploration.

Exploration activities are high-risk by nature, and as such can offer few rewards whilst demanding high costs for both the company and the community. In these cases, oil and gas companies still have an opportunity to give back to local communities by sharing knowledge acquired regarding local infrastructure and land – information which can be hugely beneficial to advancing broader development goals.

Village Infrastructure is one initiative that is doing this through the use of Geographical Information Systems (GIS). It gathers and displays information such as terrain and infrastructure to help identify the best models for infrastructure development by region. The utilization of GIS is highly applicable to rural electrification projects, such as solar micro-grids that require specific environmental considerations and environment-dependent practices to operate and maximize capacity. By supporting initiatives such as these, oil and gas companies have the opportunity to contribute to these communities at no additional cost.

At the local level, the industry should take a more proactive approach to addressing the energy poverty challenge

While the industry should take a more proactive approach to addressing energy poverty at the local level across its operations, the magnitude of this role will realistically be context driven and dependent upon the size of investment made.

Given this, it is useful to consider a range of local-level roles, with increasing levels of engagement required.

1. Strategically invest in an integrated manner

Oil and gas investment in local economies is driven through multiple channels – namely core operations, local content development and social community investment. While investment can be extensive, they are often rolled out in a siloed manner. More strategic alignment of these investments would generate greater impact for both the industry and the local communities. Development of more comprehensive country-facing strategies – defined as a portfolio of integrated country-facing initiatives which enable the company to achieve its objectives while creating value for the country – is one way in which companies can begin to align company objectives to the needs of the local community and the country's broader economic development goals to maximize impact.

2. More systematically leverage capabilities to support access to energy

Taking a more proactive role, the industry should consider broader application of its capabilities to support community needs, ranging from stakeholder management to technical and commercial expertise to access to capital. In so doing, it should align investment to core business operations and identify a clear exit strategy by ensuring solutions are underpinned by sustainable business models. Several companies, including Total and Eni, are emerging as industry leaders in leveraging core business capabilities to support access to energy.

Total, for example, is currently leveraging its distribution infrastructure. Awango by Total was set up by the French IOC in collaboration with the German development agency Deutsche Gesellschaft für Internationale Zusammenarbeit to deliver solar lighting and phone-charging solutions for the BoP by leveraging local financing and distribution networks as well as training to ensure correct use and maintenance of the technology.²⁸

A second example is Eni's role in providing energy access to local communities in the Republic of Congo whilst developing the local workforce. As part of its global commitment to phase out flaring, Eni signed an agreement with the Congolese government to use captured gas as feedstock in electricity generation. The gas collected from the M'Boudi field powers two plants in which Eni owns a 20% non-operating stake. Beyond its investment in the infrastructure necessary to capture and transport the gas and in strengthening the electricity transmission and distribution

networks, Eni's commitment involves a skills development programme which offers engineers and technicians from the Congolese utility the opportunity to work in Italy at Enipower, Eni's utility arm. By developing the skills of the Congolese utility's workforce, Eni is ensuring the local skills and capacity required to sustain the business over the long term.²⁹

Whilst these examples highlight pockets of excellence, more is required to embed them into investment and planning cycles, helping to achieve scale. The industry should play a more proactive role in this respect, systematically leveraging core business capabilities from the start. This requires industry leaders to embrace the energy access agenda and set a company-wide mandate to embed it into operations.

3. Establish and lead ecosystem development

In order to really drive transformative change, the oil and gas industry is well positioned to establish and lead an integrated approach to tackling energy poverty. This includes leading development of innovative solutions and business models, as well as playing a key role in catalyzing action, convening key stakeholders and coordinating a more comprehensive solution driven by shared value and supported by shared investment. Solutions should be considered at both the broad industry and cross-industry levels. For example, oil and gas companies operating in the same market could coordinate community investments at the industry level to more cohesively and holistically tackle community needs – from access to power for the end user to powering health clinics and schools.

Bonny Island Utility Company, Nigeria

An example of this type of approach is the development of the Bonny Island Utility Company in Nigeria. The company was set up as a collaboration of locally active oil and gas industry players – including Shell, ExxonMobil, Total, Eni and Bonny LNG – as well as the local community, and the national government. The utility is supported by a governance structure which provides these three stakeholder groups – community, government and private sector – equal representation, ensuring decisions taken are aligned to the interests of all stakeholder groups. With a capital investment of just \$6.5m, the initiative is in turn supporting better healthcare and education, and driving an increase in local microeconomic activity such as the opening of a local ice-cream store.

This 'ecosystem developer' role is at the heart of the new integrated and multi-stakeholder approach that is needed. Going beyond existing efforts, it requires a holistic assessment of the local context, leveraging energy as an enabler of broad socio-economic development. In this role, the oil and gas industry would be uniquely positioned to capture new business opportunities as well as to strengthen existing operations, inherent in societies with better socio-economic development.

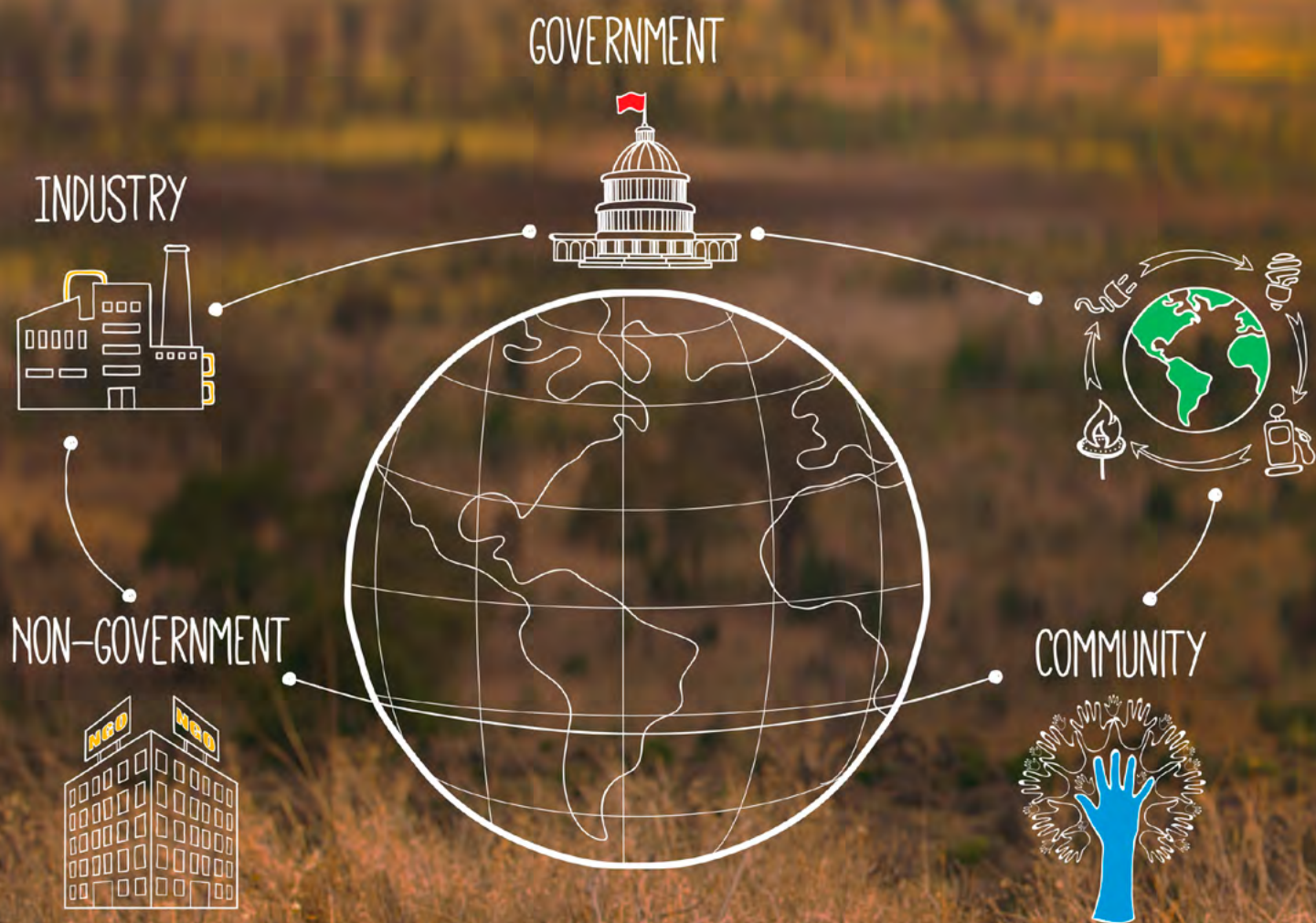
"The Bonny Island Utility Company has delivered affordable energy to over 10,000 households."

A Call to Action: Leading the Way

Despite the efforts made and the momentum generated to date to tackle energy poverty, the issue remains critical. The IEA estimates that under a business-as-usual scenario, there will continue to be 1 billion people living without access to electricity and 2.5 billion people living without access to clean cooking facilities by 2030.³⁰ This demands a step-change in approach. It requires rallying behind the SE4ALL's goal to achieve universal access to energy by 2030 and a move away from point solutions in favour of more collaborative, sustainable models where partners work together to align interests and create an ecosystem that facilitates measurable progress. This means assessing the challenge more holistically and partnering across sectors and stakeholder groups to target and scale expertise to specific solutions.

While building this multi-stakeholder approach is not easy, platforms such as SE4ALL provide the foundation for change. Good leadership is essential to success, however with a track record of proven successes in expanding access to energy, the oil and gas industry has a unique opportunity to build on these efforts and leverage the SE4ALL platform to lead the energy transition in sub-Saharan Africa and developing Asia. By more strategically investing in its communities, leveraging its core capabilities and working across stakeholder groups to drive a more proactive, ecosystem approach, the industry has the ability to embed the issue into its way of doing business and achieve measurable progress.

This is not only the right thing to do but it provides companies with an opportunity to differentiate themselves as they compete for access to resources. It helps to redefine their social license to operate, thereby securing their future as well as the future of the communities they serve.



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Accenture Development Partnerships (ADP) collaborates with organizations working in the international development sector to help deliver innovative solutions that truly change the way people work and live. Its award-winning business model enables Accenture's core capabilities—its best people and strategic business, technology and project management expertise—to be made available to clients in the international development sector on a not-for-profit basis. Since its launch in 2003, Accenture Development Partnerships has completed over 650 completed projects in 70+ countries, working with over 130 clients on short and long-term assignments.

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Accenture Energy Strategy

Contributors

Costanza Cappello, Priyesh Chaudhary, James Collins, Ian Lobo, Mike Moore, Sinead Ni Mhuircheartaigh, Gabriella Oken, David Taylor Jr, Dan Willette.

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