

Risk Management of Fossil Fuel Industry from Future Renewable Superpowers

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Abstract

After brief overview of landmark Paris Agreement 2015 related to climate change on Agenda 2030 the paper is designed to present two versions of the future i.e. fossil fuel vs renewable. It demonstrates that how the Organization of the Petroleum Exporting Countries (OPEC) which is a group of 14 nations that together contain almost half the world's oil production and most of its reserves could be replaced by renewable superpowers i.e. a related possible group created for the major producers of renewable energy raw materials, shifting power away from the Middle East

and towards central Africa and, especially, South America. Of course it is unlikely to happen peacefully. Indeed control of oilfields as a driver behind many during 20th-century conflicts were driven by a desire for new sources of food, raw materials, minerals and later oil. The risks of switching to renewable energy may cause something similar. As a result new group of elements become valuable for turbines, solar panels or batteries, rich countries may ensure they have secure supplies through a new era of colonization. Overview shows that China has already started a massive investment in [African mining](#) what may be termed “[economic colonization](#)”. In addition more recent agreements with countries such as [Peru](#) and [Chile](#) have spread Beijing’s economic influence in South America, thus setting up major trade agreements to ensure raw material supply. Finally the paper presents risk management and best practices based on lessons learnt from reinsurance business of risk sharing and using New Economic Partnership for Africa Development (NEPAD) sponsored UNIDO African Productive Capacity Initiative (APCI) initiatives of Conference of African Ministers of Industries (CAMI) in Africa

Keywords: Risk management, fossil fuel, renewable super powers, APCI, Africa

1.0 Introduction

Fossil fuel based sustainable Oil & Gas industry in Libya is at threshold of its biggest days. It is being shaped by new technologies, new opportunities, new challenges and new risk management. Climate change have the potential to create significant disruption and uncertainty in the oil and gas sector. These include: a) Cost impacts such as reduced plant efficiency from temperature rise and environmental impacts from the overflow of drainage systems from increased precipitation. 2) Social impacts related to increased water stress and physical risks from, for example, increased flood levels, sea level rise and changing storms patterns. In addition, climate change does impact the communities and environments in which the industry operates. Stakeholder expectations around climate change both by shareholders and governments are also changing and are likely to continue to change.

Understanding both physical risks and vulnerabilities of the oil and gas sector helps develop and implement adaptation strategies to manage the physical impacts of climate change. As per UNESCO recent estimates achieving the Sustainable Development Goals (SDGs) will take between US\$5 to \$7 trillion, with an investment gap in developing countries of about \$2.5 trillion. It calls for a global partnership for sustainable development of oil & gas in Libya. As per the recent estimates and forecast by the American Energy Agency Libyan oil reserves rose from 48 billion barrels to 74 billion barrels. After announcing that the Libyan reserve of oil stored with rocks and meet with current techniques is 26 billion barrels where they occupy Libya is the fifth world center in shale oil reserves after Russia, America, China, and Argentina where the new quantity is added to stock to raise the virtual life of Libyan oil production from 70 years to 112 years. This makes the rise of Libyan to three times as much as 177 trillion cubic feet after 55 trillion cubic feet, by adding 122 trillion cubic feet of reserve reserves. Oflate after the Paris Agreement of 2015 some 230 supporting scientific studies show feasibility of the 100% renewable energy scenarios that

pose a big risk to Oil & Gas future as a business being impacted by climate change. Aim is to present not only threats strategy and challenges being posed by current energy system, fed mostly by so called polluting oil & gas industry based on fossil fuels, to clean, renewable energy but also to support the development of Oil & Gas and implementation of standards that help prevent and reduce disaster risks and ensure better preparedness and management of crises, including those related to climate change. The objective of the paper is to a) Raise awareness and disseminate knowledge related to risks, methodologies and approaches that help risk management including adapt to climate change b) Improve confidence in the use of climate data using big data approach by identifying its limitations and develop improved methodologies that reduce and quantify uncertainty c) Understand the potential risk that climate changes pose for all aspects of the industry including risk management.

1.1 The Challenge

There is unprecedented international support to address climate change. International commitments are incorporated within the Sustainable Development Goals, while the 2015 Paris Agreement aimed to unite the world's nations in a single effort to tackle climate change. Two subsequent agreements seek to limit international carbon emissions from aviation and reduce HFCs – one of the more potent greenhouse gases.

Yet, delivering on these agreements will require unprecedented cooperation.

The challenge now is clear. How can companies, governments and civil society work together most effectively to meet these commitments?

1.2 The Strategy

The UNFCCC Focal Point Libya in line with World Economic Forum [Climate Project](#) is using the Forum platform and global network to launch the multi stakeholder action needed to achieve market-led, low-carbon and climate-resilient growth. This will accelerate progress towards the targets set by international climate agreements.

1.3 The Impact

The Climate Project is supporting two critical networks taking climate action.

The Alliance of CEO Climate Leaders is an informal network of leading CEOs committed to ensuring private sector support for climate work. These 79 CEOs believe in global climate action. The Forum helped establish and strengthen this alliance, which joined together to call for “bold” action from governments ahead of the Paris Agreement, and is now committed helping implement the agreement.

The Friends of Climate Action is a multi-stakeholder platform that brings together public and private non-state organizations, providing informal coordination, collaboration and knowledge sharing to help deliver global climate action.

1.4 Oil and Gas Climate Initiative

A new report by the “[Global Fossil Fuel Divestment and Clean Energy Investment Movement](#)” compiled by Araba Advisors has found that close to 1000 institutional investors with \$6.24 trillion in assets have committed to divest from fossil fuels. This is up from \$52 billion in 2014, representing a 120-fold increase in just four years. The System Initiative on Shaping the Future of Environment and Natural Resource like Oil & Gas in Libya Security aims to find new ways to protect and value the global environmental commons. UNDESA Focal Point in Libya is engaged in this by convening leading experts, innovators, investors, businesses, policy makers and civil society to support interventions that flip existing norms to create systemic change that reverses negative environmental trends.

The Oil and Gas Climate Initiative (OGCI) is a bottom-up, voluntary, industry-driven initiative, which will enable the Oil and Gas industry to work collaboratively to address climate concerns. It is an unprecedented and unique collaboration. The initiative serves as a platform to collaboratively advance technological solutions and to catalyze meaningful action and coordination on climate change. This is the only initiative to provide a full spectrum on what the sector is currently doing about climate change, and what it is prepared to do, collaboratively, going forward.

Following the entry into force of the Paris Agreement, there is now a clear need for action and investments that can enable its implementation. To do so, the OGCI has announced the formation of OGCI Climate Investments to invest one billion dollars over the next decade to accelerate the development of innovative game-changing technologies that have the potential to reduce emissions on significant scale. This collaborative investment effort has the concrete potential to unleash public-private collaboration for climate action from the oil and gas sector. The one billion dollar commitment will work as a lever for additional funds, as – with support from the Forum – OGCI Climate Investments will actively work in partnership with key public and private stakeholders in order to multiply the level and impact of investments. The selected low emissions technologies will also be adopted and deployed by the OGCI companies within their businesses and operations.

The OGCI is comprised of 10 oil and gas companies (BP, CNPC, Eni, Pemex, Petrobras, Repsol, Saudi Aramco, Shell, Statoil, and Total). Together, they represent more than one fifth of the global oil and gas production. CEOs are personally invested in steering and leading the initiative. This engagement and leadership has truly transformed the way in which these companies approach collaboration on climate-related issues.

2.0 AN APPRAISAL OF 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

The 2030 Agenda for Sustainable Development, including the Sustainable Development Goals (SDGs), was unanimously adopted by all member states including Libya at the United Nations Sustainable Development Summit on September 25, 2015. The Agenda presents a radical new approach to transforming our world. While focusing on the basic pillars of sustainable development, which are economic, social and environmental, the plan also integrated additional elements, being peace, justice and institutions. Overall, the 2030 Agenda aims at being universally applicable and indivisible by “leaving no one behind”.

Libya based UNCSD Rio+20 Future We Want Focal Point in cooperation with OKYD Ambassador Tripoli City, Libyan National Youth Leadership Council (LNYLC), Libya Charity Foundation, Aurinko SE Libya Firm for Technocracy, UNFCCC Gender Focal Point Libya, Dihya Women Empowerment, & LifeCare has endorsed these principles, as illustrated by its Key Messages conveyed at the 2017 & 2018 High Level Political Forum at New York USA..

2.1. Stakeholders Will

UNCSD Rio+20 Future We Want Focal Point Libya in cooperation with OKYD Ambassador Tripoli City, Libyan National Youth Leadership Council (LNYLC), Libya Charity Foundation, Aurinko SE Libya Firm for Technocracy, UNFCCC Gender Focal Point Libya, Dihya Women Empowerment NGO, International Business Education Center (IBEC), Libyan Civil Aviation & Meteorological Society (LCAMS), Peace Now NGO STACO, ECOES & LifeCare have taken action to affirm its commitment to attaining the SDGs. UNCSD Rio+20 Focal Point & its Libyan Civil Aviation & Meteorological Society (LCAMS), UN National Sustainable Development Commission (UNCSD) for the coordination, monitoring and reporting on Libya Sustainable Development Goals (L-SDGs) LSDGs Commission is to ensure the implementation of the SDGs, and stronger cooperation with the interested members of three present governments & especially UN supported Government of National Accord (GNA) based at Tripoli, private sector, civil society and community organizations.

2.2 Leaving No One Behind

Consultation with all member states has been at the core of the adoption of the SDGs on a global level. UNCSD Focal Point & OKYD Ambassador with the support of Libya Charity Foundation, Aurinko SE Libya Firm for Technocracy, UNFCCC Gender Focal Point Libya, LNYLC & LifeCare has adopted a similar approach and has engaged all national and international stakeholders in its attempt to nationalize and align the Libyan SDGs (L-SDGs) with national planning processes, policies and strategies. Consequently, UNCSD Focal Point OKYD Ambassador, LNYLC, IBEC & LifeCare has conducted around numerous workshops, seminars, symposiums and conferences with civil society organizations, public & private sector actors, academia, media, youth, students and women's groups.

2.3. Building Stronger Partnerships

Multi-stakeholder partnerships is the key to mobilizing and sharing knowledge, expertise, technologies and financial resources to support the realization of the Libyan-SDGs. Coordination between the relevant institutions is and will be crucial to further raising awareness of the Sustainable Development Agenda and its goals, targets, indicators and means of implementation. In this context, Libya has UNCSD Focal Point & its Intended Nationally Determined Contribution (INDC) that has framed cross-ministerial activities on Libyan-SDGs with an oversight commission, 'L-SDGs National Coordination Commission (NCC). The Commission is being supported by OKYD Ambassador SAQR International based LNYLC Libya Charity Foundation,

Aurinko SE Libya Firm for Technocracy, UNFCCC Gender Focal Point Libya & LifeCare based secretariat and technical working groups that work on data collection, data verification, reporting and follow-up mechanisms. Coordination mechanisms is developed to facilitate the implementation of L-SDGs and to report on the national targets and indicators. The NCC provides a high level platform for direct and sustained engagement between the various government stakeholders, the private sector actors, civil society organizations, NGOs, academia, youths and the international community, with the common purpose of attaining the L-SDGs.

2.4. Setting National Targets

The L-SDGs program has been defined as a global aspiration. It is expected that each government will adapt the targets to its own national circumstances. NCC is in the process of finalizing its nationalization of the L-SDGs, targets and indicators. The nationalized targets and indicators for the SDGs in Libya are being divided into eight budgetary sectors for possible support once the political stability is attained. The negotiation process required several coordination meetings between UNCSO Focal Point, OKYD Ambassador & the line ministries involved in each of budgetary sector, and development partners.

2.5. Challenges and the Way Ahead

Former UN Secretary General, Ban Ki Moon, rightly stated that “implementation is the litmus test of the new agenda”. Every country will encounter unique challenges in implementing the 2030 Agenda for Sustainable Development. Libya is no exception. In some areas institutional capacity is insufficient. Data collection, analysis and dissemination is being strengthened with UNFCCC COP 23 Nov 2017 meeting & Bonn Germany based Big Data Center & UNESCO. Partners Forum 2018. See Fig 1 and Fig 2. The political will to attaining the SDGs is jeopardized by security, safety, and political instability, social and economic challenges. Moving forward, the roadmap will be further refined soon after the political stability role of law, governance safety & security established to coordinate the work of different national and international entities working towards the implementation and monitoring of the 2030 Agenda.



Fig 1. UNESCO. Partners Forum 2018



Fig 2. UNESCO. Partners Forum 2018

3. New & Emerging “Renewables Superpowers

Appraisal further shows that there is need for a world where every country has not only to comply with the Paris climate agreement, but also to moved away from fossil fuels entirely, and embrace wind and solar power. This change may affect global politics. Solar energy primarily uses silicon technology, for which the major raw material is the rock quartzite. Lithium represents the key limiting resource for most batteries – while [rare earth metals](#), in particular “lanthanides” such as neodymium, are required for the magnets in wind turbine generators. Copper is the conductor of choice for wind power, being used in the generator windings, power cables, transformers and inverters. In considering this future it is necessary to understand winners and losers by a switching from carbon to silicon, copper, lithium, and rare earth metals. The countries which dominate the production of fossil fuels are shown in chart blow:

Fossil fuels: largest reserves by country

| Oil (billion barrels) | X.1 | Gas (trillion cubic metres) | X.2 | Coal (billion tonnes) | X.3 |
|-----------------------|-----|-----------------------------|-----|-----------------------|-----|
| Venezuela | 301 | Iran | 34 | US | 252 |
| Saudi | 267 | Russia | 32 | China | 244 |
| Canada | 172 | Qatar | 24 | Russia | 160 |
| Iran | 158 | Turkmenistan | 18 | Australia | 145 |
| Iraq | 153 | US | 9 | India | 95 |

Chart: The Conversation - Source: BP Statistical Review of World Energy, June 2017 - [Get the data](#)

The countries that would become the new “renewables superpowers” are those that have the largest reserves of quartzite (for silicon production) are found in China, the US, and Russia – but also [Brazil and Norway](#). The US and China are also major [sources of copper](#), and are pushing Chile, Peru, Congo and Indonesia to the fore. Chile also has, by far, the [largest reserves of lithium](#), ahead of China, Argentina and Australia. Lower-grade “resources” – which can’t yet be extracted – bumps Bolivia and the US onto the list. Finally, [rare earth resources](#) are greatest in China, Russia, Brazil – and Vietnam. Of all the fossil fuel producing countries, it is the US, China, Russia and Canada that could most easily transition to green energy resources. This means a completely new set of countries will also find their natural resources that are in high demand.

Overview shows that the Organization of the Petroleum Exporting Countries (OPEC) is a group of 14 nations that together contain almost half the world's oil production and most of its reserves. It is possible that a related group could be created for the major producers of renewable energy raw materials, shifting power away from the Middle East and towards central Africa and, especially, South America. This may not happen peacefully. Control of oilfields was a driver behind many 20th-century conflicts and, going back further, European colonization was driven by a desire for new sources of food, raw materials, minerals and – later – oil. The switch to renewable energy may cause something similar. As a new group of elements become valuable for turbines, solar panels or batteries, rich countries may ensure they have secure supplies through a new era of colonization. China has already started what may be termed “[economic colonization](#)” by a massive investment in [African mining](#), while more recent agreements with countries such as [Peru](#) and [Chile](#) have spread Beijing's economic influence in South America.

3.1 A new era of colonization

Given the above scenario two versions of the future can be envisaged. The first possibility is the evolution of a new OPEC-style organization with the power to control vital resources including silicon, copper, lithium, and lanthanides. The second possibility involves 21st-century colonization of developing countries, creating super-economies. In both futures there is the possibility that rival nations could cut off access to vital renewable energy resources, just as major [oil](#) and [gas](#) producers have done in the past. On the positive side there is a significant difference between fossil fuels and the chemical elements needed for green energy. Oil and gas are consumable commodities. Once a natural gas power station is built, it must have a continuous supply of gas or it stops generating. Similarly, petrol-powered cars require a continued supply of crude oil to keep running. In contrast, once a wind farm is built, electricity generation is only dependent on the wind (which won't stop blowing any time soon) and there is no continuous need for neodymium for the magnets or copper for the generator windings. In other words solar, wind, and wave power require a one-off purchase in order to ensure long-term secure energy generation.

The shorter lifetime of cars and electronic devices means that there is an ongoing demand for lithium. Improved recycling processes would potentially overcome this continued need. Thus, once the infrastructure is in place access to coal, oil or gas can be denied, but you can't shut off the sun or wind. A country that creates green energy infrastructure, before political and economic control shifts to a new group of “world powers”, will ensure it is less susceptible to future influence or to being held hostage by a lithium or copper giant. But late adopters will find their strategy comes at a high price. Finally, it will be important for countries with resources not to sell themselves cheaply to the first bidder in the hope of making quick money – because, as the major oil producers will find out over the next decades, nothing lasts forever.

4. Risk Management Risk Free Effective Sustainable, Affordable, Secure and Inclusive Energy System

Risk free heat, light and mobility are the essential building blocks of human progress. The global

energy system of the future is and will be influenced by urbanization, shifts in energy demand growth from developed to less-developed countries, increased use of natural gas and renewables, the declining cost of renewable technologies, and innovations such as digitalization, automation and artificial intelligence.

UNDESA Focal Point in cooperation with World Economic Forum (WEF) is leading the System Initiative on Shaping the Future of Energy that aims to accelerate development of the policies, private-sector action and public-private cooperation required to achieve a sustainable, affordable, secure and inclusive energy future, which is essential for economic and social development. The WEF led System Initiative Stewardship Board has recently identified following four priorities: 1) Providing clarity on the energy transition in different contexts and geographies 2) Identifying and enabling the means required to achieve these transitions 3) Contributing to the design and development of the policies, market systems and technology enablers that can effectively deliver required change & 4) Understanding and addressing the societal consequences of the energy transition

Present state of the art review shows that despite significant achievements in sustainable energy innovation and market scaling of technologies such as solar, wind energy storage and others, the rate of change is not fast enough. Considering two thirds of Greenhouse Gas emissions are from energy, and demand will continue to grow up to 35% by 2040, a wider spread of technologies and solutions need to be matured for commercial deployment, at a much faster pace.

There is dire need to build on insights from dialogue events and expert interviews to highlight the critical role of good policies, funding mechanisms and alliances to increase investments and enable the energy innovation ecosystem to prosper, as well as proposing new 'bold ideas' which, if effectively implemented could trigger a significant step change in innovation for sustainable energy.

4.1 Managing risks of businesses processes due to Impending climate change in Libya

As per new analysis by FM Global every \$1 a business spends on hurricane protection reduces loss exposure by an average of \$105. As per a new study Hurricane Harvey serves as a stark wake-up call about the need to enhance flood resilience, including limiting or preventing federal insurance coverage of new properties in flood zones. Port of Rotterdam has taken up a clean-up operation after an oil freighter punctured its hull while mooring, releasing a “considerable” amount of heavy fuel oil. A U.S. District Court in California has registered a climate change lawsuits against five oil companies by the cities of San Francisco and Oakland. Japan’s Osaka Gas Co. has said that it would take eight to 12 days to resume piped gas supplies to more than 110,000 customers in the Osaka region following a halt after a magnitude 6.1 earthquake shook the nation’s second-biggest metropolis.

Climate change is a human-induced process, largely resulting from the emission of greenhouse gases (GHGs) such as carbon dioxide, methane and fluorocarbons. Libya like other oil & gas producing countries are under increasing pressure to curb their emissions of these gases and to enhance carbon sinks in a drive to mitigate the effects of climate change.

However, combating the threats of human-induced climate change requires more than mitigation. It is equally important to reduce society's vulnerability to climate change through adaptation. Adaptation addresses the impacts of climate change, including climate variability and weather extremes.

Climate change is a top priority for the United Nations system itself. All United Nations agencies, funds and programmes are active to [green the UN system](#).

In Libya neighbor Italy alone, the earthquake that hit the Central regions in August 2016 caused economic losses for over 23 billion euros, while in the European Union, almost 150 billion euros were lost to disasters over the past decade.

Because disasters such as floods know no borders, effective response requires transboundary or regional coordination and cooperation. The OKYD Ambassador led UNDESA Focal Point like UNECE supports the implementation the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR), adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015 (<http://www.wcdrr.org/conference>) and endorsed by the UN General Assembly in June 2015. In particular, the UNECE contributes to the [United Nations Plan of Action on Disaster Risk Reduction for Resilience](#). The Plan calls on the United Nations system, both as individual organizations and collectively, to “make disaster risk reduction a priority.”

Within this framework, UNDESA Focal Point in Libya joins UNECE to play a crucial role in disaster preparedness in its region and – through its recommendations, treaties and best practice – well beyond its boundaries, particularly in the areas like [1. Standards and regulatory frameworks for DRR](#) [2. Housing and land management](#) [3. Water Convention](#) [4. Technological disaster risk reduction – industrial accident prevention and preparedness](#) [5. Human rights](#) [6. Measurement and statistics](#) and [7. Protective functions of forests](#). In a move designed to provide insurers with an affordable policy administration offering that enhances operations, Libya insurance industry is introducing a cloud-based solution that can scale according to business requirements. Globally, insurers are embracing the cloud and Libya too has responded by developing an affordable cloud-based policy administration solution that enhances operations and scales according to business requirements. This solution is ideal for life insurers looking for a cost-effective and scalable way to begin their digital transformation journey. And for those already on the path, the customizability of the Lifecare Tripoli Libya is offering through a range of plug-in modules, means they can take their business to the next level with data-driven insights. The Lifecare offering is based on user-friendly design principles which enable a smooth transition to a more connected environment. The focus is on output as opposed to a product or process-driven approach. This means the insurer can draw important insights from the vast amount of data at its disposal to better position the business in the market. The plug-in modules include a lead management solution, group quoting tool, fraud and risk solution, digital forms, a broker/agent portal and mobile money integration.

Because we value customer feedback, the Lifecare offering will be enhanced on an ongoing basis based on user submissions. This means the development of new plug-in modules as well as other enhancements will be influenced by our user community. The cloud empowers insurers to embrace a new way of doing things. Our user-driven approach, combined with the cost-effectiveness of a

hosted environment, means our clients are in full control of their digital journey throughout the process.

Lifecare has over 5 years' experience as a leading provider of insurance software solutions in the Libyan healthcare oil & gas industry and financial services industry. Our footprint extends to MENA, Megreb, Euro Med & African countries. Lifecare has introduced an enhanced service offering allowing financial services companies the opportunity to respond quickly to changing markets. Lifecare has the knowledge, experience, and technology to help its clients do better business.

5. THE WAY FORWARD

Paper highlights the way forward to answer questions like how the world can in general and Libya in particular achieve inclusive economic growth mainly based on fossil fuels while combating climate change and other oil & gas industry and natural resource challenges? The global environment in general and Libyan environment in particular and economic security are indelibly intertwined, with increasing greenhouse gases, environmental degradation and natural-resource depletion putting sustainable growth and existing business models at risk.

OKYD Ambassador led UNDESA Focal Point & UNFCCC Gender Focal Point in line with the World Economic Forum's System Initiative on Shaping the Future of Environment and Natural Resource Security brings together leading experts and practitioners to provide systems leadership, curate platforms for multi-dimensional cooperation and engage in focused interventions. The System Initiative aims to: improve the effectiveness of the international community's in general & Libya in particular response to environmental challenges; support public-private action that accelerates the climate action agenda, improves ocean health, realizes deforestation-free supply chains, enables more water-secure economies and helps unlock a trillion-dollar opportunity in the circular economy; and explore how Fourth Industrial Revolution innovations can be harnessed to address environmental issues, including redefining what effective global environmental governance looks like. Responding to these challenges requires breaking down traditional silos and building new forms of cooperation and innovation across the public and private sectors to quickly effect change at scale. The System Initiative is the way forward to serve as a platform to support this action.

Finally there is dire need to consolidate Libya's insurance market and move toward a more risk-based supervisory system for oil & gas industry in the country. Paper demonstrates the aim to help implementing Global Goal 13 Climate Actions of UNDESA for oil & gas industry at LifeCare insurance. The physical changes caused by climate change and political/regulatory measures aimed at adapting to it & reducing emissions are helping to develop areas in terms of their relevance for business activities.

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