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How to Respond to Energy Transitions in Africa: Introducing the Energy Progression Dialogue

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1.1 Introduction: Aim of the Book

The world is transitioning to a low-carbon economy. How are African countries responding to this transition? The book, ‘Energy Transitions and the future of the African Energy Sector: Law, Policy and Governance’, aims at addressing the key concerns for African countries with respect to energy transitions. There have been initiatives on the African continent to embrace this transition as evidenced in not only these countries’ commitment to the 2015 Paris Agreement on Climate Change, but also various efforts in deploying renewable energy and energy efficiency technologies. The transition is already happening in other parts of the globe, including Europe and North America, and it is also partly visible in some African countries. However, many African policymakers are concerned about the decline in investments in fossil fuels. Fossil fuels undoubtedly have a crucial role to play in these countries’ economic
development. Additionally, fossil fuels are vital for tackling energy access challenges on the continent. Goal 7 of the United Nations Sustainable Developmental Goals (SDG) advocates for access to affordable and clean energy for all.¹

Although access to modern energy such as electricity is crucial to addressing other global challenges such as poverty, famine and gender inequality²: data shows that 3 billion people which is more than 40% of the world population, are still relying on polluting and unhealthy fuels for cooking.³ The figures are worrying in Africa as reports show that 600 million people do not have access to electricity, and around 900 million people lack access to clean cooking facilities.⁴ Although the African continent is endowed with massive renewable energy sources including wind, solar and hydropower: the anticipated urbanisation and population growth will necessitate the utilisation of all the available energy resources, including fossil fuels. The International Energy Agency (IEA) data reveals that the African continent will become the most populous region by 2023, as one-in-two people added to the world population between today and 2040 are set to be African.⁵ The anticipated boom in population growth, urbanisation and industrialisation will necessitate an increase in energy demand and consumption on the African continent. Albeit, energy, especially fossil fuels, are the main contributor to climate change as it produces around 60% of greenhouse gases.

African policymakers are therefore faced with the dilemma of addressing the energy and economic challenges on the continent and at the same time addressing the climate change challenges. As evidenced in the data, by 2040 the continent will require more energy including fossil

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¹SDGs UN. United Nations Sustainable Development Goals, 2015.
²Nalule, V.R., 2018. Energy Poverty and Access Challenges in Sub-Saharan Africa: The Role of Regionalism. Springer.
³United Nations Development Programme: SDG 7 on Clean Energy. Can be accessed at, https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-7-affordable-and-clean-energy.html.
⁴IEA. 2019. Africa Energy Outlook 2019, IEA, Paris https://www.iea.org/reports/africa-energy-outlook-2019.
⁵Ibid.
fuels to meet the growing energy demand, and yet, the UN Intergovernmental Panel on Climate Change (IPCC) issued a warning in 2018 that humanity had just twelve years to limit global warming to below 2 °C.\(^6\)

Energy transitions are, therefore focused on the need to address climate change by shifting from fossil fuels to renewable energy sources. There is no doubt that fossil fuels have powered the industrialisation and economic development of many developed countries, and it would only be fair for developing countries such as those in Africa to benefit from these resources.\(^7\) However, it is no longer a question of fairness but rather preparedness. The global efforts to transition to a low-carbon economy is associated with both positive and negative impacts, and African policymakers have to be well-equipped with effective policies and strategies to respond to the energy transition and its associated effects. Positively, a transition to a low-carbon economy presents an opportunity for us to tackle climate change; new jobs will also be created. However, negatively, the transition is likely to escalate energy access challenges and poverty on the African continent, mostly due to reduced levels of finance for fossil fuel energy projects.\(^8\)

The need to tackle climate change and the lowering costs for renewable technology have in recent years made many companies and financial institutions to question their investment plans in fossil fuels. In Norway, for instance, there has been a halt in fossil fuel investments. In June 2020, the Norwegian parliament recommended that the Sovereign wealth fund sells off more than $10 billion of stocks in companies related to fossil fuels.\(^9\) This, in practice, implies that the country is shifting from fossil fuels to clean energy. In this respect, the Wealth Fund can no longer

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\(^6\)Intergovernmental Panel on Climate Change (IPCC). 2018. Global Warming of 1.5 °C—A Special Report. https://www.ipcc.ch/sr15/.

\(^7\)Nalule, V.R., 2020. Transitioning to a Low-Carbon Economy: Is Africa Ready to Bid Farewell to Fossil Fuels? In The Palgrave Handbook of Managing Fossil Fuels and Energy Transitions (pp. 261–286). Palgrave Macmillan, Cham.

\(^8\)Olawuyi, D. 2020. ‘Energy Poverty in the Middle East and North African (MENA) Region: Divergent Tales and Future Prospects’, in Inigo Del Guayo, Lee Godden, Donald N. United Nations, Transforming.

\(^9\)Forbes: Norway Wealth Fund to Dumb Fossil Fuels Stock. 12 June 2020. Can be accessed at, https://www.forbes.com/sites/davidnikel/2019/06/12/norway-wealth-fund-to-dump-fossil-fuel-stocks-worth-billions-in-environmental-move/#4dbb5e9748a3.
invest in companies that mine more than 20 million tonnes of coal annually or generate more than 10,000 MW of power using coal.\textsuperscript{10} Besides Norway, in November 2019, The European Investment Bank (EIB), approved a policy to ban funding for oil, gas and coal projects at the end of 2021. Since 2013, the EIB has funded €13.4bn of fossil fuel projects, and in 2018 alone, it funded about €2bn worth of projects. With the ban, however, no more fossil fuel projects will be funded after 2021, although gas projects could still be funded as long as they are utilising clean technologies such as carbon capture and storage, combining heat and power generation, or mixing in renewable gases with the fossil natural gas.\textsuperscript{11} Besides the reduction in fossil fuel funding, climate activists have also put massive pressure on investors. For instance, in June 2019, Kenya halted the Lamu coal power project due to environmental concerns.\textsuperscript{12} Protests against coal projects have also been evidenced in European countries such as Germany.\textsuperscript{13} 

Besides the decline in fossil fuel investments, a transition to a low-carbon economy is also becoming more attractive due to the lowering costs for renewable energy. Data has emerged that shows that renewable energy is becoming more cost-effective compared to other sources of energy, even in the absence of subsidies.\textsuperscript{14} This is mainly due to the decline in the costs of installation and maintenance of renewables.\textsuperscript{15} Despite all these developments, we have seen that amid a pandemic such as the Coronavirus disease (COVID-19), countries have taken drastic measures to respond to energy security, including making massive investments in fossil fuels. For instance, in June 2020, China expanded its
coal plant capacity to respond to the negative impacts of the COVID-19 pandemic. Statistics indicate that China approved the construction of more coal power plant capacity in the period to mid-June than in all of 2018 and 2019 combined. Additionally, most African countries are still reliant on fossil fuels to meet their energy demand. In South Africa, for instance, most of the electricity is powered by coal. However, the country’s coal-fired fleet is ageing, and as such, there are efforts to diversify the power mix by introducing natural gas and renewables, including concentrating solar power (CSP).

Taking stock of the above, we note that there are mixed signals concerning energy transitions. With the global energy transition debate, African countries are not only worrying about a decline in fossil fuel investments; but they must plan for decommissioning. The future of the African energy sector in the Energy Transition era, therefore, requires African countries to set up strategies, revise their energy laws and policies to comply with the energy transition developments. This book, therefore, highlights the key considerations for African countries concerning developing their extractive sector in the energy transitions era. The book also introduces the energy progression discussion as an alternative to energy transitions, especially for African countries.

1.2 The Future and Role of Fossil Fuels in Africa in the Energy Transition Era

One of the main barriers to energy transition lies in the lack of political will to shift from fossil fuels to renewables. Firstly, most African countries do not emit much carbon dioxide, as the Sub-Saharan African (SSA) region as a whole is responsible for just 7.1% of the greenhouse gas emissions. Secondly, as illustrated in Section one, fossil fuels still have a significant role to play in tackling energy access challenges on the continent. Although fossil fuels are associated with various environmental

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16Financial Times: China Expands Coal Plant Capacity to Boost the Post-Virus Economy. 24 June 2020. Can be accessed at, https://www.ft.com/content/cddc8a02-81b5-48f1-a4a5-60a93a6fa1e.
impacts, what we often ignore is that fossil fuels have a significant role to play in the transition to a low-carbon economy. Firstly, revenues from fossil fuels can be used to finance and invest in clean energy projects. Additionally, the massive natural gas resources on the continent could contribute to climate change mitigation and global energy security.\textsuperscript{17}

Scholars have identified five key drivers to the global energy transition including addressing climate change; meeting domestic energy demand; tackling energy access challenges; the realisation that oil and gas resources across the region are not infinite and could be depleted within the next few decades; and the fall in oil prices.\textsuperscript{18} Some of these drivers are briefly discussed below in as far as they impact on the future of fossil fuels in Africa.

The first one is the need to address climate change as envisaged in the 2015 Paris Agreement. African countries are already subjected to extreme weather conditions, including droughts and floods. A case in point is the El Niño climate event in Southern Africa which left approximately 21.3 million people in the region requiring emergence assistance due to the drought it caused since 2015, hence leading to famine.\textsuperscript{19} In this respect, African countries must set targets and strategies to respond to climate change impacts and the global move to transition to a low-carbon economy. Besides setting targets to increase renewables in the energy mix, African countries have already committed, in their intentionally determined contributions (INDCs), to investing in climate-smart energy systems that lower greenhouse gas (GHG) emissions. In Kenya, for instance, the country’s INDC includes both mitigation and adaptation. Concerning mitigation, the country commits to invest more in renewables, including geothermal, solar and wind energy production. Additionally, the country also commits to making progress towards achieving a tree cover of at least 10% of the land area of Kenya.\textsuperscript{20}

\textsuperscript{17}Olawuyi, D.S., 2020. Can MENA Extractive Industries Support the Global Energy Transition? Current Opportunities and Future Directions. \textit{The Extractive Industries and Society}.

\textsuperscript{18}Ibid.

\textsuperscript{19}United States Agency for International Development. Southern Africa Drought, Fact Sheet. USAID January 2017. \url{https://scms.usaid.gov/sites/default/files/documents/1866/southern_africa_dr_fs04_01-30-2017.pdf}.

\textsuperscript{20}Ministry of Environment and Natural Resources: Kenya’s Intended Nationally Determined Contributions (INDC) 23 July 2015.
Besides climate change, another threat to the future of fossil fuels in Africa is the fall in oil prices due to the global energy transition debate and recently, due to the COVID-19 economic crisis. As noted in Section one, various international financial institutions were already banning investments in fossil fuels due to environmental concerns. The COVID-19 pandemic has exacerbated the situation. For instance, on Monday April 20, 2020, the world experienced a drop in the US crude for May turning to negative. This caused a lot of bankruptcy panic among various oil companies, especially US shale companies. The drop in oil prices was mainly due to the March 2020 Russia–Saudi Arabia oil price wars. Additionally, the COVID-19 pandemic, which has reduced oil demand in the transport sector and manufacturing industry, hence leading to the low oil prices. Consequently, there has been massive stress in the oil industry with many companies losing their value including Halliburton, Noble Energy, Marathon Oil and Occidental (OXY)—which have lost more than two-thirds of their value.

One can arguably say that the above developments do favour the energy transitions efforts which advocate for renewable energy. Additionally, for the first time, renewables overtook coal-fired power generation in the Organization for Economic Cooperation and Development (OECD). According to the IEA April 2020 report, electricity produced from natural gas in 2019 increased by 4.8% and was responsible for 29.0% of the total electricity production. Comparatively, coal production in the same year was 13.4% lower than in 2018 contributing to 22.1% of the total electricity production. Even though African countries were already embracing renewables, the developments above and the volatile oil prices have spurred stronger political emphasis on diversification on the continent.

In this respect, therefore, the main threats to the future of fossil fuels in Africa include climate change; lowering costs of renewables; pandemic-related economic crises such as COVID-19; pressure from

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21Egan, M., Oil Prices Turned Negative. Hundreds of US Oil Companies Could Go Bankrupt. CNN Business. 21 April 2020. Can be accessed at, https://edition.cnn.com/2020/04/20/business/oil-price-crashbankruptcy/index.html. Last accessed on 22 April 2020.

22International Energy Agency (IEA), Key Electricity Trends. 14 April 2020. Can be accessed at, https://www.iea.org/articles/key-electricity-trends-2019. Last accessed on 20 April 2020.
climate change and energy transition activists; ban on funding for fossil fuel projects just to mention but a few.

African countries, therefore, have to be aware of these threats and respond accordingly through among others embracing more regional cooperation to finance crucial fossil fuel projects in their countries; setting up strategies that embrace renewable energy; investing more in research and technology on the continent; adjusting the institutional and regulatory frameworks to be able to respond to these global developments in energy transitions.

1.2.1 The Brief Situation of Hydrocarbons in Developing Countries

As discussed in the previous section, hydrocarbons still have a crucial role to play on the African continent, especially with respect to tackling energy access challenges and responding to the anticipated boom in population growth, industrialisation and urbanisation. In the Table 1.1, we briefly highlight the hydrocarbon situation in selected African countries. The main question to be considered here is, are hydrocarbons still relevant in these countries? How does the decline in investment in hydrocarbons likely to affect the economic and social situation of developing countries? We also need to pay extra attention to the need for more advanced technology aimed at reducing the negative impacts associated with hydrocarbons.\(^{23}\) For instance, coal is well known for its massive negative environmental impacts. Nevertheless, just looking at the data, we notice that as of 2018, there were 1,054,782 million tonnes of coal reserves globally of which Asian countries such as India and Indonesia contributed 9.6 and 3.5%, respectively; while African countries such as South Africa contributed 0.9%.\(^{24}\) Countries across the globe

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\(^{23}\)Coal, for instance, the technology aimed at reducing emissions include high efficiency, low emissions (HELE) and carbon capture storage (CCS) emissions.

\(^{24}\)We note that other parts of the globe are also endowed with massive coal resources. For instance, as of 2018, Europe accounted for 12.8% of the global coal reserves while the Asia Pacific and North America accounted for 42.2 and 24.5%, respectively. See, BP Statistical Review of World Energy, 68th edition, 2019. Can be accessed
| Country    | Resource | Reserves                                                                 | Key highlights                                                                 |
|------------|----------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| South Africa | Coal     | The country has an estimated 30 billion tonnes of coal representing 3.5% of the world’s coal resources | Coal provides 82% of the power generated by state-owned power utility Esko<sup>a</sup> Sixth largest coal-exporting nation in the world; exports account to 6% of total global exports<sup>b</sup> |
| Ghana      | Oil      | Ghana has approximately 2.5bn barrels of proven oil resources; 94% of the oil resources are located offshore and the remainder onshore | There has been an increase in crude oil exports. Consequently, in 2018, from January to August, crude oil exports surpassed cocoa export revenues for the first time |
| Mozambique | Gas      | approximately 204,750 bcf of proven gas resources, of which 90% are located offshore and the remainder onshore | FDI in the country is expected to increase highly |
| Angola     | Oil and gas | Has approximately 17.6bn barrels of oil resources, almost 95% of which are located offshore As of 2017, the country had almost 33,000bfc gas | Oil represents one-third of the economy and 95% of exports SSA’s second-largest oil producer, with the second most extensive oil resources |

<sup>a</sup>Besides electricity the other sectors that rely on coal include; the liquid fuels manufacture sector; and the basic iron and steel industry. Together, these three sectors account for more than 80% of domestic coal demand in terms of value and approximately 70% in terms of volumes

<sup>b</sup>Additionally, indirectly, the coal industry is responsible for creating and sustaining over 170,000 jobs outside the industry. See, Chamber of Mines, National Coal Strategy for South Africa, 2018
are also endowed with massive oil and gas resources, as highlighted in the Table 1.1.

As illustrated in the Table 1.1, the hydrocarbon resources are still significant in these countries’ economic development. The list above is obviously not conclusive as there are other countries that ought to be considered including Congo-Brazzaville which is SSA’s third-largest oil producer and third-largest holder of oil resources with approximately 5.3bn bbl of resources; Equatorial Guinea, which is the second-largest producer of natural gas in SSA; with 14,301 bcf of gas resources as of 2017; Gabon, which holds SSA’s fourth-largest oil resources and is also the fourth-largest oil producer in the region—with 4922 m bbl of proven oil resources, of which 87% are located offshore and 13% onshore; Nigeria which is SSA’s largest producer of oil and gas with approximately 92,000 bcf of proven gas resources, of which approximately 44% are offshore and 56% onshore. The country also has approximately 30.1bn bbl of proven oil resources, of which almost 70% are located offshore.

Revenues from these resources could be used to finance renewable energy projects which are essential for the energy transition. Besides finances, fossil fuels, specifically natural gas, has been recognized as an environmentally preferable product (EPP) for a low-carbon transition. Basically, ‘environmentally preferable’ refers to products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. Natural gas is an EPP because compared to coal and oil, and it remains the cleanest, less polluting and most hydrogen-rich of all hydrocarbon energy sources. Furthermore, the increased injection of natural gas in the primary energy mix contributed to over 40% reduction in CO2 intensity of oil equivalent energy use in the period between 1980 and 2014. In this respect, therefore, natural gas can significantly

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25 UNCTAD, 1995. Environmental Preferable Products (EPPs) as a Trade Opportunity for Developing Countries, Report by UNCTAD Secretariat, UNCTAD/COM/70, Geneva.

26 Moati, W.H., 2018. The Contribution of Natural Gas to the Sustainable Development Goals (SDGs): Arab Countries Case. In 9th International Forum on Energy for Sustainable Development, https://www.unece.org/energywelcome/areas-of-work/forum/annual-fora/2018/sessions-of-the-9th-ifesd/14-nov/the-role-of-natural-gas-in-achieving-sdgs.html.
contribute to not only tackling energy access challenges but also to the global efforts to transition to a low-carbon economy.

In the next section, the chapter will introduce the concept of ‘energy progression’, but before that, the key disruptions in the hydrocarbon sector will briefly be highlighted in the next subsection.

### 1.2.2 Key Disruptions in the Hydrocarbon Sector in Developing Countries

Although hydrocarbons are expected to play a significant role in the next decade, we have to be aware of some of the key disruptions in the development of this sector in developing countries.\(^{27}\) There indeed common challenges, including the volatile oil price; however, there are some disruptions which are unique to developing countries. These include, among others; lack of necessary infrastructure; corruption and lack of transparency; unreliable regulatory regime just to mention but a few. Some of these disruptions are briefly highlighted below:

- **LNG and renewables:** the rising global demand for LNG and a transition to a low-carbon economy which favours the deployment of renewables is likely to have long term negative impacts on the hydrocarbon developments in Asia and Africa—since these compete with the same available investment opportunities like for hydrocarbons.

- **Corruption and lack of transparency:** Corruption not only makes it impossible for local people to benefit from their resources, but it also creates doubt for international energy companies that could consider other investment opportunities in renewables. Some of the most resource-rich countries are also ranked the most corrupt, according to the Transparency International Corruption Perceptions Index (CPI). For instance, out of the 180 most corrupt countries, oil-rich countries were ranked the most corrupt, including Somalia, South Sudan, Guine-Bissau, Equatoria Guinea and Angola which ranked 180, 179, 171, 171 and 167, respectively.

\(^{27}\)Africa’s proven oil and gas reserves account for 7.5 and 7.1% of global reserves, respectively.
• Digitalization: digitalization has been a notable feature of the hydrocarbon sector. However, we note that some developing countries in Asia and Africa are still behind concerning digitalization and this, in a way, has the potential of discouraging future investments. For instance, it has been noted that SSA has an extensive portfolio of ‘digitally behind’ assets and these risks being left obsolete if digitalization is not embraced.28

Though fossil fuels have a significant role to play in meeting the continent’s energy challenges, there are some critical disruptions, as discussed above. However, the perception of the hydrocarbon sector, especially in this energy transition era calls for innovative ideas and concepts to redefine the sector to ensure that developing countries are not left behind in this energy transition era. In the next section, a new concept of ‘energy progression’ is introduced.

1.3 Introducing the Energy Progression
Dialogue: Energy Progression V Energy Transitions

A discussion on energy transition and energy progression necessitates us to understand the key pertinent facts. These are highlighted in the Table 1.2.

Most of the points in the Table 1.2 have already been discussed in the previous sections. This section analyses why developing countries should consider the term ‘energy progression’ instead of the ‘energy transition’ term relied on by many developed countries. With the energy transition, there is this accepted public pressure on countries to act very fast. This has caused a two-sided protest from both climate change activists who are interested in witnessing a fast transition; and the struggling populations that are concerned about the costs of clean energy.

28Deloitte: Africa Oil & Gas state of Play, November 2018. Can be accessed at, https://www2.deloitte.com/content/dam/Deloitte/xe/Documents/energy-resources/africa_oil_gas_state_of_play_Nov2018.pdf.
Table 1.2  Key facts to consider in the energy transition debate

| Goal 7 of the UN SDG is focused on universal access to modern energy: yet 600 M people in Africa lack access to modern energy |
| 2 billion people are likely to live in urban centres by 2040 (one-third of this from Africa) |
| Population growth estimated to increase by around 1.7 billion to reach 9.2 billion people in 2040 (Africa at the centre of this) |
| Impacts of climate change are visible in different parts of the globe |
| Energy transition happening in different phases in developed and developing countries |
| The immediate effect of the transition is a decline in investments in fossil fuels (financial risks) |
| Developing countries still need fossil fuels to tackle energy access challenges; and for the anticipated boom in urbanization, population growth and industrialization |
| African countries are not climate change deniers: there are already initiatives to transition to a low-carbon economy in Africa |
| New strategies needed to ensure that African countries capitalize on their fossil fuels and at the same time be mindful of the environment |
| Efforts are taken at the international level likely to negatively impact African countries |
| African countries contribute less to carbon emissions |
| The progressive nature of energy use is real, so African countries should be allowed to progress not transition |
| Need to review policies and contract provisions for fossil fuels: decommissioning might come earlier than expected |

The energy transition pressure was evident in Europe in 2018 when protests erupted in France by the ‘gilets jaunes’, who have complained about the sharp increase in diesel taxes—taxes motivated by environmental and climate concerns. A transition in the energy sector is capable of having a significant impact on the ways of life of different people, both socially and economically. This has proved right in France and, in this regard, while suspending the fuel tax increase, the French Prime Minister Édouard Philippe, in a statement noted that he understood the protestors’ anger, ‘...it is the anger of the French who work and work hard, but still have difficulty making ends meet, who find their backs against the wall. They have a sense of profound injustice at not being able to live a
dignified life when they are working’. This statement clarifies the realities of not only impoverished people in Europe but also those in African countries, and this, in turn, makes it clear that countries cannot only say goodbye to fossil fuels without finding cheaper alternatives. It is one thing to have ambitious policies on paper, and it is another thing to put these in practice and make them acceptable to struggling populations.

On the one hand, we are evidencing an increase in protests by climate change activists, on the other hand, we are seeing struggling populations such of those represented by the ‘gilets jaunes’ in France also protesting against an increase in diesel prices. On the African continent, besides having over 600 million people lacking access to electricity; data indicates that seven million people die each year due to air pollution including indoor air pollution caused by overreliance on traditional biomass. In economic terms, data shows that 736 million people lived below the international poverty line of US $1.90 a day in 2015: and most of these people were in SSA. In brief, the reasons to reconsider the ‘Energy Transition’ term and replace it with ‘Energy Progression’ include:

- The escalating energy access challenges due to the pressure from the global energy transition debates. Many people are likely to lack access to electricity in 2040.
- The decline in funding for fossil fuel projects. As highlighted in Section one, financial institutions are already banning funding for oil, gas and coal projects.
- The decline in investments in fossil fuels
- Technological barriers to ensure an effective energy transition in Africa.

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29 Willsher, K. 2018. Gilets Jaunes Protests in France to Continue Despite Fuel Tax U-Turn. The Guardian Newspaper, 4 Tuesday. https://www.theguardian.com/world/2018/dec/04/french-government-to-suspend-fuel-tax-increasesay-reports.
30 Nalule, V.R., 2020. Transitioning to a Low Carbon Economy: Is Africa Ready to Bid Farewell to Fossil Fuels? In The Palgrave Handbook of Managing Fossil Fuels and Energy Transitions (pp. 261–286). Palgrave Macmillan, Cham.
31 UNEP, Air Pollution: Africa’s Invisible, Silent Killer. 20 October 2016. Can be accessed at, https://www.unenvironment.org/news-and-stories/story/air-pollution-africas-invisible-silent-killer-1.
32 United Nations: Ending Poverty. Can be accessed at, https://www.un.org/en/sections/issues-depth/poverty/.
• The high costs of renewables.
• The anticipated role of fossil fuels to meet energy demand for the growing population in Africa.
• Role of fossil fuels for economic growth including urbanization and industrialization on the African continent.

The current global energy transition debate does not take into consideration the impacts this is likely to have on the African continent. It is true, there some visible initiatives such as the establishment of the Green Climate Fund (GCF), however, the financial contribution from the developed countries is not enough to address the social, economic and energy challenges experienced on the African continent. Furthermore, one might ask if the GCF contributions are enough to also cater for an increase in population growth expected on the African continent? According to BP, population growth is estimated to increase by around 1.7 billion to reach nearly 9.2 billion people in 2040. The global boom in urbanization is projected to increase, as almost 2 billion more people are likely to live in urban centres by 2040 and Africa is projected to contribute one-third of this increasing urbanization. All these, therefore, have inspired the need to rethink the concept of ‘energy transition’ especially on the African continent, as discussed in the section below.

1.3.1 Understanding Energy Transition

The word ‘transit’ in general connotes the meaning of moving from one place to another. A basic understanding of the word ‘transition’ is vital in understanding energy transitions. The Oxford dictionary defines ‘transition’ as ‘the process or a period of changing from one state or condition to another’. The Cambridge English dictionary, on the other hand,

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33BP. 2018. BP Energy Outlook: 2018 Edition. https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bpenergy-outlook-2018.pdf.
34Oxford Dictionary. 2019. https://en.oxforddictionaries.com/definition/transition.
defines ‘transition’ as ‘a change from one form or type to another, or the process by which this happens’. 35

There is no agreed definition of the term energy transition. The International Renewable Energy Agency (IRENA), for instance, defines energy transition as a pathway towards the transformation of the global energy sector from fossil-based to zero-carbon by the second half of this century. According to IRENA, the focus of this transition is to tackle climate change by reducing energy-related CO₂ emissions and thereby increasing renewable energy and energy efficiency measures while at the same time reducing the consumption of fossil fuels. 36 Geography is vital in understanding energy transition, for instance, in the post-Communist states of Eastern and Central Europe (ECE), energy developments have focused on the geographical position of these countries between exporting states of the former Soviet Union, on the one hand, and the energy-importing states of Western and Southern Europe, on the other; thus, the energy transition has in the past focused on introducing competition in the energy sector through liberalization. 37

The energy transition is therefore influenced by various factors including geography; social and economic situation; political climate; availability of energy resources; the country’s energy strategy. Recognizing the differences in societies, literature has flourished discussing terms such as energy justice, climate justice and just transition. Climate justice takes into account the need to share the benefits and burdens of climate change from a human rights perspective; energy justice refers to the application of human rights across the energy lifecycle 38: and environmental justice aims to treat all citizens equally and to involve them in the development,

35Cambridge English Dictionary, https://dictionary.cambridge.org/dictionary/english/transition. Last accessed on 12 April 2020
36International Renewable Energy Agency. 2018. Energy Transition. https://www.irena.org/energytransition.
37Bridge, G., Bouzarovski, S., Bradshaw, M. and Eyre, N., 2013. Geographies of Energy Transition: Space, Place and the Low-Carbon Economy. Energy Policy 53: 331–340.
38Jenkins, K., McCauley, D., Heffron, R., Stephan, H. and Rehner, R. 2016. Energy Justice: A Conceptual Review. Energy Research & Social Science 11: 174–182; Sovacool, B.K. and Dworkin, M.H., 2015. Energy Justice: Conceptual Insights and Practical Applications. Applied Energy 142: 435–444.
implementation and enforcement of environmental laws, regulations and policies.\textsuperscript{39}

There is a massive literature on the topic of the energy transition; however, we must ask what the problem is with this ‘energy transition’? The main concern with the energy transition is the streetlight effect the concept has attracted in recent years. The streetlight effect or the drunkard’s search connotes to a situation where people pay extra attention to a topic that is in the limelight. In energy terms, most research is focused on energy transition, which is understandable given the need to tackle climate change. However, this has diverted efforts to tackle poverty on the African continent. Little care is paid to the fact that fossil fuels still have a significant role on the continent. Instead, we are experiencing a ban on funding for fossil fuel projects. Although associated with various advantages, including tackling climate change, the global focus on energy transition has raised some concerns including an escalation of energy access challenges in developing countries; and disruptions in these countries’ economic development.

Nevertheless, in recent years, several countries, including those in Africa, have successfully utilized renewables to meet their energy demand. In essence, the positive impact of the energy transition is the ability to tackle climate change. However, this also has financial consequences, as most banks and international financial institutions are now shying away from investing in fossil fuel projects. This, therefore, brings into question the need to consider energy progression, but before that, it is worth briefly exploring the concept of a just transition.

1.3.1.1 How Just Is a Just Transition to a Low-Carbon Economy?

The Oxford Dictionary defines ‘just’ to mean behaving according to what is morally right and fair.\textsuperscript{40} How fair is it to have over 3 billion people lacking access to modern energy? Is it morally right to introduce strategies that will have an impact on investments in fossil fuels

\textsuperscript{39}Heffron, R.J. and McCauley, D., 2018. What Is ‘Just Transition’? Geoforum 88: 74–77.

\textsuperscript{40}Oxford Dictionary. 2019. https://en.oxforddictionaries.com/definition/transition.
knowing that the number without access to modern energy is anticipated to escalate in developing countries? Data shows that, globally, 1.2 billion people have no access to modern energy such as electricity and nearly 3 billion people rely on traditional biomass (such as wood and charcoal) for cooking and heating. This number is high in SSA despite the region’s richness in energy resources with an estimated 65 billion barrels of proven oil reserves, equivalent to around 5% of the world total.

Taking stock of the discussion above, a question arises: as to how we can have a just transition when most scholars, international organizations and financial institutions are focused on cutting down funding and investments in fossil fuels which we know very well are crucial in developing countries. This is, therefore, an indication that we have to revisit the term ‘energy transition’ to ensure that the global move to transition to a low-carbon economy does not in any way escalate poverty and energy access challenges in developing countries.

1.3.2 Energy Progression

To be able to understand and appreciate this new term ‘Energy Progression’, we must have a clear understanding of the relevant words, including progress, progression and progressive. The Cambridge English dictionary defines the term ‘progress’ to mean a ‘movement to an improved or more developed state or a forward position’. \(^{41}\) In this respect, the word ‘progression’ refers to ‘the process of developing or moving gradually towards a more advanced state’. \(^{42}\)

Whereas the word ‘progression’ emphasizes the need to ‘improve’, the word ‘transition’ on the other hand focuses on changing. It is possible for someone to change from one condition to another without addressing the critical circumstances. However, for someone to move forward to an ‘improved’ state, it is essential for that person to be ready and to work towards achieving the ‘improved’ state. How are these words important in energy terms? Well, we note that the global focus on energy transitions is reducing reliance on fossil fuels, without necessarily addressing

\(^{41}\) Cambridge English online Dictionary. https://dictionary.cambridge.org/.

\(^{42}\) Ibid.
the factors that are making it hard to ensure this transition. It would take time, more finances, advanced technology and preparation to jump from fossil fuels to renewables on the African continent.

With respect to energy, we are aware that historically all countries across the globe relied on traditional means of energy, including firewood and charcoal. Some of these countries progressed or advanced to modern energy, including electricity, LNG. However, due to the disparities in the social, economic and political circumstances, some countries ‘progressed’ faster in energy use as compared to other countries. The same holds for urban and rural communities. In this respect, it is common to find that some people in urban areas can readily embrace energy transition compared to people in rural areas. This all points to the progressive nature of energy use as discussed in the next subsection.

1.3.2.1 The Progressive Nature of Energy Use

Energy progression recognizes the differences in societies and the need to consider these differences when shifting from one energy source to another. Understanding and responding to the progressive nature of energy use is crucial in solving the energy access challenges experienced in developing countries.

Europe is an excellent example of the progressive character of energy use, for instance, initially, in the nineteenth century, the focus for European countries was to shift from wood and water power to coal; in the twentieth century the focus was to shift from coal to oil; in the twenty-first century, the focus is to shift from fossil fuels to renewable energy. On the contrary, the focus for most countries in SSA is to shift from wood to electricity grids (even if these are powered by high-carbon intensity energy resources such as coal).\(^4^3\)

One of the recognized and celebrated energy progressions in Europe was a historical shift from biomass to fossil fuels. The nineteenth century was characterized by industrialization necessitating the transition from

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\(^{43}\)Nalule, V.R., 2020. Transitioning to a Low Carbon Economy: Is Africa Ready to Bid Farewell to Fossil Fuels? In The Palgrave Handbook of Managing Fossil Fuels and Energy Transitions (pp. 261–286). Palgrave Macmillan, Cham.
wood and waterpower to coal in the nineteenth century, or from coal to oil in the twentieth.\textsuperscript{44} On the contrary, in developing countries such as those in SSA, many homes in rural communities are still relying on traditional biomass. With the anticipated industrialization and urbanization, these countries will need massive energy, including fossil fuels, to tackle their energy needs. The importance of fossil fuels in industrialization is evidenced in developed countries and their reaction to disruption in energy supply. For instance, historically, developed countries such as the United Kingdom were heavily reliant on coal to the extent that when faced with a ‘coal panic’ in the late nineteenth century, robust solutions were suggested including the urging of military strategists to seize control of coal reserves in foreign lands; and the urging of companies to drive their workers harder to increase the domestic production of coal.\textsuperscript{45} These suggested solutions were however rejected not only by unions inside Britain but also other colonial powers.\textsuperscript{46}

With energy progression, we note that developing and developed countries face different energy challenges. For instance, whereas in developed countries the use of biomass such as charcoal and firewood is predominantly historical and a topic of the nineteenth century, developing countries such as those in SSA, in contrast, on the other hand, are still struggling with a reliance on traditional energy.\textsuperscript{47} The focus of SSA countries is access to electricity. We note that electricity in its natural form tends to appear as lighting and static, the technological advances have enabled primary sources of energy such as coal, nuclear power, running water and of late renewable energy sources to provide this electricity. In this respect, for a country with more than 80% of the population lacking electricity, the focus will not entirely be on the kind of primary energy used to provide this electricity, but instead on ensuring that people shift from wood and biomass usage.

\textsuperscript{44}Bridge, G., Bouzarovski, S., Bradshaw, M. and Eyre, N., 2013. Geographies of Energy Transition: Space, Place and the Low-Carbon Economy. \textit{Energy Policy} 53: 331–340.
\textsuperscript{45}Podobnik, B., 2006. \textit{Global Energy Shifts: Fostering Sustainability in a Turbulent Age}. The Energy and Resources Institute, TERI Press.
\textsuperscript{46}Ibid.
\textsuperscript{47}Nalule, V.R., 2020. Transitioning to a Low Carbon Economy: Is Africa Ready to Bid Farewell to Fossil Fuels? In \textit{The Palgrave Handbook of Managing Fossil Fuels and Energy Transitions} (pp. 261–286). Palgrave Macmillan, Cham.
The main aim of energy progression therefore, is recognizing the progressive character of energy use, implying that it has to happen gradually and in different stages. This, in essence, implies that, in all these stages, there should be adequate support at the national, regional and international levels through among others the availability of finances and technology to ensure that countries progress from one form of energy to another. With energy progression, we pay extra attention to the energy access challenges on the African continent; the role of fossil fuels in industrialization; the role of fossil fuels in urbanization; the role of fossil fuels in meeting the domestic energy demand from the anticipated population growth. In this respect, while advocating for clean technology to utilize fossil fuels, we advocate for more funding to support African countries develop and capitalize their fossil fuels. With energy progression, we also call upon climate change activists to be considerate and think of the many people who are relying on less than one dollar a day due to lack of access to modern energy. Most importantly, with energy progression, we ask international financial institutions to reconsider their policies banning funding for fossil fuel projects because at the end of the day, different countries face different energy challenges and they should all be given a chance to progress from one energy use to another. This does not in any way mean that African countries should not embrace renewables, there are already efforts to deploy renewable energy and energy efficiency technologies on the African continent, and these are discussed in the next section.

1.4 Energy Transition Indicators in African Countries: Legal Analysis

SSA is very rich in renewable energy resources, with solar potential totalling about 10,000 GW; wind potential, totalling about 109 GW, mostly in the coastal countries; geothermal capacity estimated at 15 GW especially in the East African Rift Valley; and exploitable hydropower estimated at 350 GW mainly located in Angola, Cameroon, Ethiopia, Gabon and DRC. Despite these enormous resources and the global commitment to increase the percentage of renewables in the energy mix,
there are some basic requirements that need to be fulfilled if the vision is to be attained. These requirements include, among others: policies that incentivize renewable energy deployment; enabling legal frameworks; innovative financing mechanisms; and electricity supply strategies that prioritize the diversity of resources such as dispatchable renewables.⁴⁸

There are initiatives at both the national and regional levels to deploy renewable energy. For instance, at the regional level, the Economic Community of West African States (ECOWAS) Treaty under Chapter 5 expressly mentions the need for cooperation in the energy sector and environment. Regional treaties are often backed by various energy protocols which detail cooperation in the energy sector at a regional level. A case in point is the 2003 ECOWAS Energy Protocol which is elaborative with respect to the governance of the energy sector at the regional level. Besides the various Regional Treaties and energy protocols, there are other instruments that have an impact on not only the renewable energy sector but energy in general. These take the form of master plans and other regional programmes. In SADC, for instance, the Energy Sector Plan (ESP), which is under the auspices of the SADC Regional Infrastructure Development Master Plan, is intended to address four key strategic objectives including ensuring energy security, improving access to modern energy services, tapping the abundant energy resources, and achieving financial investment and environmental sustainability. One of the sectors covered by the ESP includes renewable energy and energy efficiency.⁴⁹

In this section we briefly highlight the initiatives taken in some of the African countries to transition to a low-carbon economy. We note that some countries are not necessarily transitioning but rather progressing from traditional energy to modern energy. This progression doesn’t in any way dictate the kind of energy to be advanced to, rather it shows that countries are taking baby steps to progress from one dirty energy

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⁴⁸Avila, N., Carvallo, J.P., Shaw, B. and Kammen, D.M., 2017. The Energy Challenge in Sub-Saharan Africa: A Guide for Advocates and Policy Makers. https://www.oxfamamerica.org/static/media/files/oxfam-RAEL-energySSA-prt1.pdf.

⁴⁹Nalule, V.R., 2020. Transitioning to a Low Carbon Economy: Is Africa Ready to Bid Farewell to Fossil Fuels? In The Palgrave Handbook of Managing Fossil Fuels and Energy Transitions (pp. 261–286). Palgrave Macmillan, Cham
source to an improved energy source. In this respect therefore, we note that different countries face different energy challenges and as such they should not be pressured to transition from fossil fuels to renewables, rather, given the historical, social, economic and political situation of some countries, these can progress from one source of energy to another. This progression is on the case by case basis but can be clearly understood from a regional and geographical perspective. This section, therefore, focuses on the legal measures and policies in place to promote renewable energy and energy efficiency.

1.4.1 Legal Measures And Policies to Promote Clean Energy

Having an effective legal framework is key to ensuring the promotion of renewable energy and technologies in the country. This is because the legal and regulatory framework is the basis for not only setting up the necessary renewable energy and energy efficiency institutions in the country but also for the protection of foreign energy investments. In many countries, there are already reliable and efficient laws and policies that are intended to promote the deployment of renewable energy and energy efficiency. Most of these laws have their basis in the national constitutions. For instance, Article 32 of the Constitution of the Arab Republic of Egypt, 2014 emphasizes the ownership of natural resources and exploitation of these resources, including renewables taking into consideration the rights of future generations.\(^{50}\) In Sierra Leone, the 1991 Constitution makes provision for efficient use of natural resources which includes energy.\(^{51}\)

Besides the constitution, there are specific renewable energy laws and policies governing the deployment of renewable technologies. These are highlighted in the Table 1.3.

As illustrated in the Table 1.3, there are various laws and policies that support the deployment of renewable energy and energy efficiency.

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\(^{50}\)The Constitution of the Arab Republic of Egypt, 2014.

\(^{51}\)See, Article 7(1) (a), Act No. 6 of the 1991 Constitution, Sierra Leone.
Table 1.3 Renewable energy and energy efficiency laws

| Country | Sierra Leone | Uganda | Nigeria |
|---------|--------------|--------|---------|
| Laws and policies | Energy Efficiency of 2016; Renewable Energy Policy 2016; The National Energy Policy 2009; The Medium-Term National Development Plan 2019–2023 | Biofuels Act 2018; Renewable Energy Policy 2007—2017; The Atomic Energy Act, 2008; Renewable Energy Policy, 2007; The Energy Policy for Uganda, 2002 | The National Renewable Energy and Energy Efficiency Policy (NREEEP); The National Electric Power Policy 2001; The Environmental Impact Assessment Act; Regulations on Feed-In-Tariff for Renewable Energy Sourced Electricity in Nigeria (REFIT); Nigeria Energy Efficiency Action Plan (NEEAP) (2015–2030) |

Technologies in different countries. For instance, the 2016 Energy Efficiency Policy in Sierra Leone, highlights different objectives including among others: to ensure the development and prudent exploitation of the nation’s energy resources, with diversified energy resources options, in order to enhance energy security and self-reliance, as well as to achieve an efficient energy delivery system with an optimal energy resource mix. The 2016 Renewable Energy Policy on the other hand also highlights objectives that are in line with the global energy transition debate including among others: to guarantee an adequate, reliable, affordable, equitable and sustainable supply of renewable energy in a cost-reflective and an environmentally friendly manner.

The above is just an example of the legal initiatives on the African continent with respect to transitioning to a low-carbon economy. It is, however, worth analysing some of the key provisions of these laws. In
this respect, drawing from different case studies, we identify what most of these laws and policies emphasize:

- **Setting renewable energy targets**

  The existing renewable energy laws and policies in developing countries, just like in many developed countries do set the future targets to be met by a country with respect to the deployment of renewable energy and energy efficiency. We note that in most of these countries, renewable energies do play a significant role in the energy mix and targets are set to increase their role. In Egypt, for instance, during 2019, the country’s total installed capacity of renewables amounted to 3.7 gigawatts (GW), including 2.8 GW of hydropower and around 0.9 GW of solar and wind power. As illustrated in the *Integrated Sustainable Energy Strategy (ISES)*, the Egyptian government has set renewable energy targets of 20% of the electricity mix by 2022 and 42% by 2035. These targets are close to the IRENA renewable energy estimates for the country.\(^5\)

- **Progressively shift from traditional energy to modern energy: diversification in the energy mix**

  These laws also recognize the need for countries to progressively shift from relying on traditional energy sources such as firewood and candles to modern energy sources such as electricity. A good example is the National Energy Policy (NEP) of Ethiopia whose objectives include, among others, ‘to ensure and encourage a gradual shift from the use of traditional energy sources to modern energy sources’.

- **Deployment of energy efficiency technologies**

  Most laws and policies do promote energy efficiency technologies. In Ethiopia, for instance, under the National Regulatory System to Ensure Conservation of Electricity and Energy Efficiency, interventions such as

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\(^5\)IRENA. Egypt Renewable Energy Outlook, 2018. Can be accessed at, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Oct/IRENA_Outlook_Egypt_2018_En.pdf. Last accessed on 11 April 2020.
energy audit activities will be implemented and will involve the establishment of energy efficiency management sections for selected consumers, particularly high energy-consuming organizations. In South Africa, the establishment of energy efficiency incentive programmes by Eskom led to the saving of over three gigawatts of total cumulative energy.\(^5\)

- **Production of electricity from renewable energy sources: incentives to renewable energy projects**

  The available legal framework in most African countries does encourage the production of electricity from renewable energy resources. To achieve this, several incentives and commitments are made. In Egypt, for instance, Renewable Energy Legislation (REL) was passed in 2014 to encourage the production of electricity from renewable energy resources.

- **Tackling energy access challenges in rural areas through renewable energy**

  The presence of renewable energy laws has made it possible to pursue projects aimed at tackling energy access and poverty challenges in Africa, especially in rural areas. For instance, in 2016, Sierra Leone passed the Renewable Energy Policy. The policy is not only posed as a climate change mitigation strategy, but it also emphasizes the need to provide electricity to rural areas that cannot expect grid energy in the near to medium term via mini-grids.

- **Electric Vehicles**

  Besides renewable energy and energy efficiency technologies, some African countries have embraced Electric Vehicles (EVs) to transition to a low-carbon economy. The transport sector is one of the largest contributors to GHG emissions, and this has necessitated steps to find alternative transport, thus leading to the introduction of e-transport. In the EU,

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\(^5\)United States Agency for International Development (USAID). 2017. Examining Energy Efficiency Issues in Sub-Saharan Africa. [https://www.usaid.gov/po](https://www.usaid.gov/po)wer/africa/newsletter/dec2014/smarter-power-in-africa).
for instance, there is an ambitious target to reduce the use of internal combustion engine vehicles by 50% by 2030. Further to this, the alternative fuels directive encourages the Member states to develop systems which enable EVs to feed power back into the grid.\footnote{Leal-Arcas, R., Filis, A. and Nalule, V., 2020. Energy Decentralisation and Decarbonisation. Natural Resources Journal 60(1): 117–166.}

EVs have made their way on the African continent in countries such as South Africa, Kenya, Madagascar and Zimbabwe. In South Africa, electric cars were introduced by Nissan Leaf in 2014. BMW later also entered the market, introducing its i3 and i8 brands. Jaguar Land Rover also has plans to enter the SA electric vehicle market. The brand in partnership with electric vehicle charging authority GridCars, and with an R30-million infrastructure investment plans to invest in EV infrastructure including setting up 82 new public charging stations in the country’s major hubs and along frequently travelled holiday routes.\footnote{Jaguar. 2019. Jaguar Launches EV Charging and Powerway Network in South Africa. \url{https://www.jaguar.co.za/electrification/jaguar-powerway.html}; Nalule, V.R., 2020. Transitioning to a Low Carbon Economy: Is Africa Ready to Bid Farewell to Fossil Fuels? In The Palgrave Handbook of Managing Fossil Fuels and Energy Transitions (pp. 261–286). Palgrave Macmillan, Cham.}

In conclusion, there are indeed numerous initiatives to transition to a low-carbon economy in Africa. Albeit, the crucial role of fossil fuels, as discussed in Sects. 1.1 and 1.2, should not be underestimated on the African continent. The global energy transition moves seem so tough on developing countries, and as such we should consider softer options through energy progression whereby these countries are still given a chance to utilize their fossil fuels in an environmentally sustainable manner.

### 1.5 Outline of the Book

The book reviews the current developments in the African energy sector and highlights how they are likely to be affected by the ongoing global efforts to transition to a low-carbon economy and tackle climate change. The book consists of four parts, of which Part I contains four chapters introducing the book and Part IV, comprising one chapter, provides an
epilogue with overarching conclusions and thoughts on the future of the African energy sector in the Energy Transition era. The rest of the book (Parts II and III) consists of ten chapters setting out these issues in more detail.

This chapter sets out the context and aims of the book. The chapter uniquely examines the progressive nature of global energy use and introduces a new concept which Dr Victoria Nalule christens ‘Energy Progression’ and opines is the most appropriate pathway for Africa to adopt in order to benefit from its massive energy resources.

Chapter 2 highlights the energy challenges on the African continent and discusses the role of regional cooperation. Dr Macdonald Irowarisima, in this chapter, notes that the global commodity markets have revealed new challenges, especially in the energy market as it relates to African countries. This is peculiar to Africa because most African countries are energy commodity-dependent economies. This makes them more vulnerable to the recent developments in the global energy market.

Chapter 3 expounds the various concerns of the energy transition in Africa by Noreen Kidunduhu. Using South Africa, Kenya and Ethiopia as case studies, the chapter demonstrates the barriers to Africa’s energy transition and advocates for blended strategies that would allow African countries to capitalize their fossil fuel reserves while at the same time achieve a path consistent with the Paris Targets.

In Chapter 4, Susan Nakanwagi examines the role of nuclear energy in tackling energy access challenges in Africa in the energy transition era. She notes that, although nuclear energy does not fall within the ambit of renewable energy per se, it is a two-sided sword tackling both the climate change concerns while addressing the access to energy challenges, more so, in Sub-Saharan Africa where a significant portion of the population lacks access to modern and cleaner forms of energy. Effective regulation of the nuclear industry is vital in achieving the broader objectives of the climate change regime and meeting SSA energy needs. However, following the Chernobyl and Fukushima Daichi nuclear power
accident disasters, populations are sceptical in embracing nuclear energy. Further, the utilization of nuclear energy poses questions relating to safety, environmental issues and regulatory inadequacies, among other things. This chapter thus examines the major prospects and challenges of developing nuclear energy in the region while paying specific attention to environmental, safety and nuclear accident liability regulation under international law which should be mainstreamed into national laws for achieving an effective nuclear energy industry.

Part II of the book examines the energy situation at the national level refereeing to different geographical locations in Africa. Part II starts with a discussion on energy legislation and their impact on the industry as explained by Michael Uche Ukponu, Yusuf Sulayman and Kester Oyibo in Chapter 5. The chapter examines Nigeria’s electricity laws and off-grid renewable energy developments. This chapter aims to expose and analyse the ‘conflict of electricity laws’ and how they have caused the slow development of off-grid renewable energy in Nigeria to proffer salient solutions to achieve rapid off-grid renewable Energy development for energy sustainability.

Ms Catherine Nabukalu and Dr Reto Giere, in Chapter 6 analyse the continued reliance on charcoal alongside modern energy in Uganda. This is an essential chapter for the reason that, over 70% of rural populations in Africa are still dependent on traditional biomass energy and may need more time to progress from traditional biomass to fossil fuels.

In Chapter 7, Cosmos Nike Nwedu brings in the Nigerian experience. The main question in this chapter is whether the transition to renewable energy will promote energy security in Nigeria? The chapter argues explicitly that a transition to renewables is of critical importance for a secured and sustainable energy future in the country. The chapter, adopting an analytical method, examines renewable energy prospects for energy security in Nigeria, and how challenges to its exploitation can be overcome through inclusive and effective market policy strategies.

National case studies analysing the deployment of renewables in Africa are discussed. As such, Dr Mostafa Elshazly, in Chapter 7, focuses on Egypt, specifically analysing a transition to a low-carbon economy in the country. The Egyptian Energy sector plays a vital role in the political, economic and social life of the country. The chapter highlights Egypt’s
framework to develop renewable energy resources in order to change the energy mix and meet the tremendous increase in energy demand.

In Chapter 8, Mr Marvin Tumusiime also looks at renewable energy developments in Uganda specifically analysing the challenges and opportunities for small-scale renewable energy.

Part III of the book consists of six chapters that explore the various critical thematic issues as they relate to energy transition in Africa. In Chapter 10, local content advancements and their impact on the African energy sector in the energy transition era are discussed by Dr Rukonge Muhongo. The chapter focuses on local content policies in the East African oil and gas sector and draws examples from developed countries such as Norway.

It is no secret that most African countries have not benefited from their energy resources; the book thus considers the different initiatives aimed at promoting local participation. In this respect, Chapter 11 by Wairimu Karanja & Nduta Njenga, examines Social Licence to Operate in the oil and gas sector and how these are likely to be impacted by energy transitions.

Recognizing that women are the significant energy users in Africa, Ms Alaka Lugonzo & Mr Kennedy Chege discuss gender justice in the energy transition in Chapter 12. The chapter looks explicitly at gender justice through the lens of technological advancement in the extractives sector.

Given the continued role of fossil fuels on the African continent, Chapter 13 by Ayebare Tom Rukundo analyses Uganda’s upstream fiscal regime in the energy transition era explicitly looking at the viability of the country’s upstream projects.

The environmental impacts of fossil fuels and the need to transition to a low-carbon economy are highlighted by Peter Reat Gatkuoth in Chapter 14. Focusing on South Sudan as the case study, the chapter analyses the national and international legal framework to respond to the environmental impacts of oil and gas activities.

Part IV of the book is concluded by Japhet Miano Kariuki in Chapter 15, who analyses the regional efforts to power East Africa specifically looking at the key issues with respect to energy investments and the integrated feed-in-tariff structure for the East African Community.
Part IV of the book offers the epilogue. Victoria Nalule concludes the book in Chapter 16, offering thoughts on the future of the African energy sector beyond extractives.

The foregoing highlights the salient present and future aspects of the African energy sector. With contributions from researchers, academics, practitioners and high-level policymakers, the book brings a unique flavour to the global debate on energy transitions specifically spotlighting the key concerns for African countries. The book is especially relevant to African governments and policymakers, African regional organizations, universities, energy practitioners, international organizations and energy enthusiasts alike.

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