Renewable energy deployment policy-instruments for Cameroon: Implications on energy security, climate change mitigation and sustainable development

Frankline Enow-Arrey
GETPPP, Green School, Korea University
Ministry of Water Resources and Energy of Cameroon, Divisional Head of Service for water

ABSTRACT

Cameroon is a lower middle-income country with a population of 25.87 million inhabitants distributed over a surface area of 475,442 km^2. Cameroon has very rich potentials in renewable energy resources such as solar energy, wind energy, small hydropower, geothermal energy and biomass. However, renewable energy constitutes less than 0.1% of energy mix of the country. The energy generation mix of Cameroon is dominated by large hydropower and thermal power. Cameroon ratified the Paris Agreement in July 2016 with an ambitious 20% greenhouse gas (GHG) emission reduction. This study attempts to investigate some renewable energy deployment policy-instruments that could enable the country enhance renewable energy deployment, gain energy independence, fulfill Nationally Determined Contribution (NDC) and achieve Sustainable Development Goals. It begins with an analysis of the status of energy sector in Cameroon. It further highlights the importance of renewable energy in mitigating climate change by decarbonizing the energy mix of the country to fulfill NDC and SDGs. Moreover, this study proposes some renewable energy deployment policy-solutions

to the government. Solar energy is the most feasible renewable energy source in Cameroon. Feed–in Tariffs (FiT), is the best renewable energy support policy for Cameroon. Finally, this study concludes with some recommendations such as the necessity of building an Energy Storage System as well a renewable energy information and statistics infrastructure.

Keywords: Cameroon, Energy policy, Renewable energy, Energy security, Energy storage system, Climate change mitigation, Paris Agreement, GHGs, INDC, SDGs, Solar PV

Introduction

Cameroon is a lower middle–income country located in the Central African Sub–Region and by the Gulf of Guinea, with a population of 25.87 million inhabitants (2019). Cameroon witnessed two decades of constant growth with stood at 7% until 1985 when economic crisis broke out. The government embarked on economic revival process with donor assistance and carried out some stabilization and structural adjustment programs which led to the discontinuation of medium and long–term initiatives leading to the cancellation of her debts following the Heavily Indebted Poor Countries Initiatives in 2003. Cameroon later showed a fairly healthy real economic growth even during the world economic recession of 5.6% in 2013 and 5.9% in 2014.

The energy policy of Cameroon is based on 'Vision–2035' and the 'Strategy Document for Growth and Employment 2010–2020'. Policy implementation is done in accordance with sectoral policy details such as the 'Electricity Sector Development Plan to 2035', the 'Strategy to Promote Access and Use of Domestic Gas in Cameroon', and the 'Master Plan for Rural Electrification', as well as the 'National Energy Efficiency Plan of Cameroon'. Another important document of the energy sector in Cameroon is the 'Intended Nationally Determined Contribution (INDC)' submitted to the United Nations Framework Convention on Climate Change (UNFCCC) during the Paris Agreement (Allessandro et al, 2017). During the last 21st Conference of the Parties (COP21), held in Paris in December 2015, 195 countries succeeded in reaching the Paris Agreement, whose agenda is to minimize the increase of the global average temperature below 2℃, and even 1.5℃, above pre–industrial levels (Yun Gao et al, 2017). The share of energy sources in Cameroon include 24.1 oil, 5.2 % natural gas, 5.7% hydropower, and 65% bioenergy, indicating that bioenergy comprises almost two–thirds of the total primary energy supply in Cameroon. Fossil fuels used as fuels for power generation include diesel, heavy oil, and natural gas. Accordingly, there is a need to diversify the gener–ation sources to ensure stable electricity production. Almost all bioenergy produced is used for households and the final energy demand from bioenergy was mostly from traditional biomass and used for cooking (World Bank, 2016). The government of Cameroon regards renewable energy as a valuable resource,

able to help solve the challenges of energy shortfall in the country.

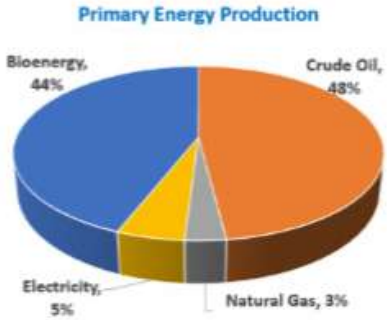
Cameroon is experiencing energy supply shortages due to the rapidly increasing population and economic growth. Only about 60% of the population currently have access to electricity and accessibility to modern conveniences is blocked, especially in remote rural and off-grid areas. This negatively affects education, health, and businesses. There is yet no renewable energy policy in Cameroon. Carrying out the policies to achieve the deployment goals and encouraging relevant industries require a relevant infrastructure for policy implementation and business. The share of the total renewable energy generation in 2035 is projected to be 12.1% of the total energy generation, which is not sufficient to satisfy the NDC target. The current electricity generation mix by source of Cameroon comprises 58% hydropower and 42% thermal power generation, while total renewable energy share is less than 0.1%. Renewable energy sources in Cameroon include solar, wind, biomass, geothermal energy, and small hydropower (Sarah Feron, 2018). However, by 2035, the Renewable Energy Master Plan of Cameroon generation target is expected to result to solar photovoltaic (6%), small hydropower (11%), bioenergy (7%), wind energy (1%) and large hydropower and thermal power (75%). Obviously, human activities and economic growth requires energy in general, and to sustain such growth of population and economic development, a stable and affordable clean energy with a vigorous energy is required to manage and preserve socio-economic development. In June 2009, the country declared a goal of establishing itself as an emerging country within the next 25 to 30 years by announcing Cameroon Vision-2035, which proposes the strategies and milestones to achieve these goals. This national development plan of Cameroon establishes mid-term goals, tasks and targets for various areas such as the elimination of poverty, become a middle-income country, a newly industrialized country, an emerging country, democracy, and a unified society.

This study begins with a presentation of the status of energy sector in Cameroon with regards to achieving an affordable, reliable and clean energy access. It went further to highlight Cameroon's ambition in responding to climate change and achieve SDGs (Ronald Wall et al, 2018). This study further proposes some policy-solutions such as FiT that could enable the country in renewable energy deployment. It finally concludes with some recommendations such as building a renewable energy storage system, information and statistic infrastructure as well as capacity building of stakeholders. The issues of renewable energy deployment in Cameroon include lack of a renewable energy policy, lack of funding, the absence of renewable energy information and data infrastructures as well as inappropriate technology. The development of renewable energy is greatly limited by the national grid conditions such as transmission and distribution infrastructures to which the renewable energy generation facility shall be connected. The lack of a renewable energy storage facility is a hindrance to huge investments. The current insecurity in the country is also a limiting factor to renewable energy deployment. The very high tax rate in the country is a very big hindrance to the sector in Cameroon. Deforestation and air pollution resulting from traditional biomass consumption such as the burning of firewood is a serious

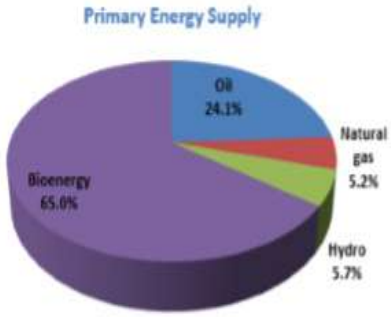
problem to the energy, environment and health sectors of Cameroon (Dumisani Chirambo et al, 2018).

Status of energy in Cameroon

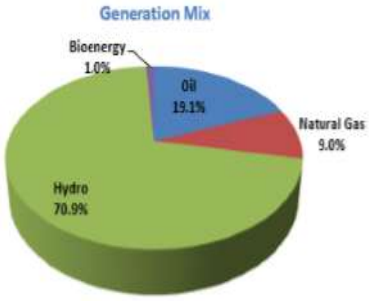
According to the International Energy Agency (IEA, 2015), the total final energy demand of Cameroon in 2013 was represented by 20.7% oil and gas products, 72.2% bioenergy and 7.1% electricity of the total, respectively. Cameroon is experiencing energy supply shortages because of the rapidly increasing popul-ation and economic growth. Cameroon has a small population scattered over a large land area. As the energy transmission and distribution network does not cover the entire country, many residents in remote areas do not have access to the national grid. The government of Cameroon is concerned about the disparity in accessibity to the grid between the urban and rural areas, despite 60% of the citizens having access to electricity. Obviously without access to electricity, accessibility to modern conveniences is



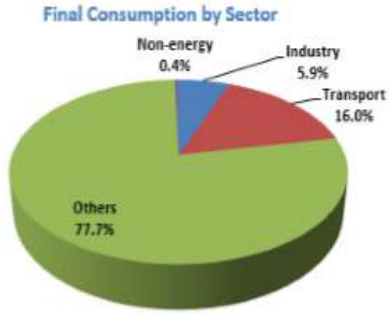
Source: MINEE(2015),KEEI(2017)



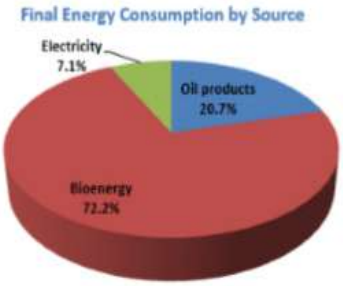
Source: KEEI(2017)



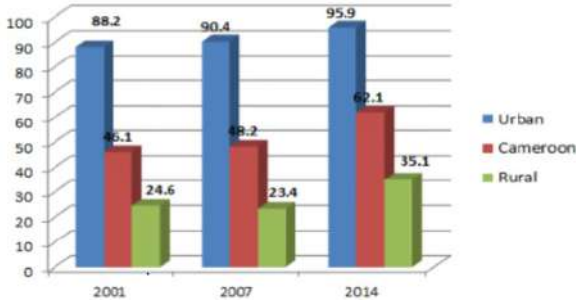
Source: IEA (2015), KEEI (2017)



Source: IEA (2015), KEEI (2017)



Source: IEA (2015), KEEI (2017)



Source: IEA (2015), KEEI (2017)

Figure 1. 2013 share of final energy consumption by sector in Cameroon

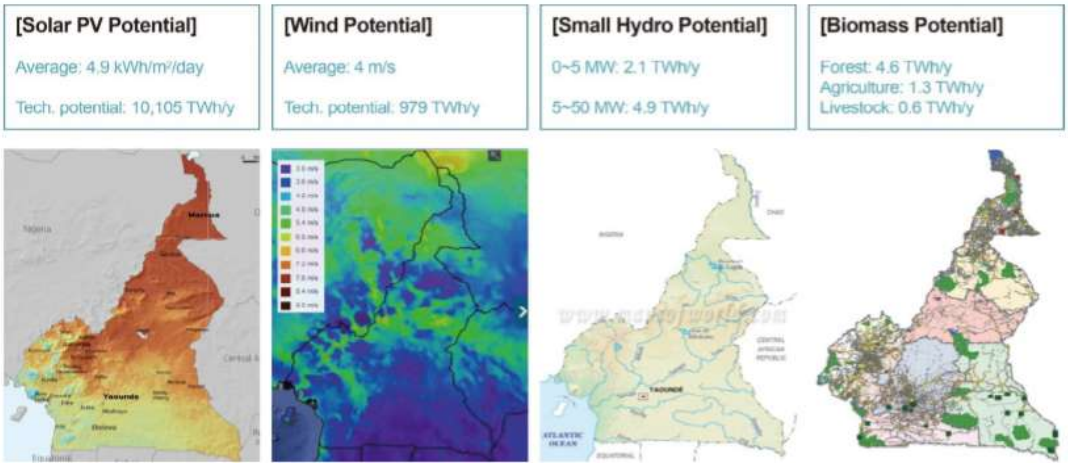


Figure 2. Renewable energy resource potentials in Cameroon

Source: IRENA (2014); Tractebel Engineering (2014); MINEE (2014,2015,2016); KEEI (2017)

blocked fundamentally. This negatively affects education and training, particularly because of lack of lighting for studies at night. In addition to this, due to difficulties in preserving medical equipment and supplies under refrigeration in the hospital and health clinics, health and environmental problems could occur, which could result in human and economic losses. Moreover, achieving the economic and social goals proposed in Vision–2035 is dependent highly on energy. Therefore, the energy demand is expected to increasing sharply. An estimation based on the GDP proposed in Vision–2035 and the energy consumption per GDP indicates that energy consumption is expected to increase by 8.2% compound annual growth rate from 2010 to 2035. SDG7 demands that by 2030 we ensure access to affordable, reliable, sustainable and modern energy for all and SDG7.2 demands that by 2030, we increase substantially the share of RE in the global energy mix (United Nations, 2015).

The final energy consumption structure of Cameroon by sector for 2013 shows that household and public services, was the main consumer of energy at 77.7% followed by transport at 16% and industrial use at quite low as 5.9%. Almost all the bioenergy produced was used for households. The final energy demand from bioenergy was mostly from traditional biomass and used for cooking. The Government of Cameroon regards renewable energy as a valuable resource, able to help solve the challenges of energy shortfall in the country. A total of 36 projects are being monitored by the renewable energy department of the Ministry of Water Resources and Energy in 2015, of these 21 projects involves the deployment of solar energy.

The case of the Cameroon rural solar project

This project was executed by Huawei Technologies Co. Ltd, through the supervision of the Ministry of Water Resources and Energy. It was achieved in two phases. Phase 1 involved 166 localities and phase 2 involved 184 localities. The project has as objective to provide electricity to rural areas in all the ten regions or provinces of the national territory. However, for security issues posed by the Boko Haram

insurgence, the Far North Region was not included in the first phase. Since 2016, the political crisis in the English–speaking North West and South West Regions has significantly affected the implementation of this project in these two regions. In the first phase, commercialization and maintenance activities have been halted in the 25 sites that have already been constructed in these two regions due to prevailing insecurities. In the second phase, implementation works were halted due to insecurity in the two regions and a 'Prime Ministerial decision' made provision for the relocation to the eight French–speaking regions. The quantities installed on site include 15 kW, 30 kW, 80 KW, 100 kW,150 KW, 200 KW and the quantities per region ranged from 8 to 25 plants. Some of the challenges encountered with this project include theft and vandalism of equipment such as Photovoltaic panels and batteries, lack of maintenance, abandonment of sites with overgrown vegetation.

Climate change, the Paris Agreement, INDC, and SDGs

The Paris Agreement aims at ensuring huge reduction in GHG emissions with the objective to promote green growth. (Lere and Oluwole, 2016). Cameroon just as most African states is singled out as a potentially vulnerable due to :(a) proximity to the equator with a very high temperature and precipi–tation (b) many regions or provinces depends heavily on natural and mineral resources as major drivers to their respective economies (c) the likelihood that the relative high degree of socio–economic and ecological heterogeneity arising particularly from the land lockedness of some of the states in the Sub–Region may further deepen the impacts of climate change United Nations. Cameroon concerted to this new climate regime by presenting her INDC at COP21 with the ambition of reducing 25% of its GHG emissions with regards to 2035 baseline scenario and later ratified this agreement in July 2016, with a NDC of 20% reduction of GHG emissions with regards to 2035 baseline scenario (Alfonso et al, 2019).

The NDC of Cameroon made provisions for a number of guidelines amongst which are: (a) a mandatory regular audits in large energy–intensive industries by enforcing regulations and standards (b) laying down building codes on thermal standards of construction and renovation and certification process (c) develop economic and incentives to promote and remove barriers for investments renewable energy (d) establish and incentivize frameworks for the development of renewable energy and remove barriers to investment (e) the control of pollution and low emission vehicles (f) a sustainable management of wood energy, improved stoves and the promotion of biogas (g) a mandatory regular energy audits in large energy intensive industries (h) promote the development of 'smart grids' in rural areas (i) strengthening and promoting interconnection with Central African Power Pool (CAPP) and the West Africa Power Pool (WAPP) (j) interconnect the three national grid (North, South and East) (k) align development plan with REDD + (Ademola et al, 2017).

Cameroon did not benefit from the Clean Develop–ment Mechanism (CDM) of the Kyoto Protocol due to lack of suitable business policies. Renewable energy has been identified as a tool to enable Cameroon fulfil NDC, mitigate climate change, gain access to an

affordable, reliable and clean energy with a 25% in the energy mix with regards 2035 baseline scenario (Lianbiao Cui and Yuran Huang, 2018).

Renewable energy deployment policy–instrument

Major stakeholders regarding renewable energy in Cameroon

The Ministry of Water Resources and Energy is the principal ministry in charge of establishing and implementing government policies related to production, transportation, and the distribution of water resources and energy, as well as the promotion of the 'Department of Renewable Energy and Energy Management'. It manages the expansion of the renewable energy deployment and the implementation of the energy saving policy. The Ministry of Finance is in charge of funding investment projects and activities. The ministry of Economy, Planning and Regional Development is charged with the responsibility of planning of renewable energy investments. The Ministry of Forestry and Wildlife and the Ministry of Livestock, Fisheries and Animal Technology are charged with biomass related services, whereas the Rural Electrification Agency and the Energy Management Committee are tasked with deploying, establishing plans and managing renewable energy. The Ministry of Environment, Nature Protection and Sustainable Development is charged with environmental considerations related to production of sustainable energy such as solar photovoltaic and biogas.

There is yet no law on the renewable energy sector in Cameroon. Appropriate laws are needed as a foundation for government activities and private participation for renewable energy deployment. Investors are not yet sure of the stability and growth potential of the renewable energy market in Cameroon. The government of Cameroon aims at laying out directions and structure of the renewable energy law, tentatively called the Renewable Promotion Act (RPA), that would serve as a foundation for implementing renewable energy–related regulations, establish new organizations, and securing finances for renewable energy deployment (Mariana et al, 2018). This RPA shall be passed into a law, laying the foundations for engagement in active executive of renewable energy deployment after 2020. Since renewable energy is significantly affected by geographical and environmental factors such as climate, topography, and soil, there is need for participation of local government and residents to collaborate with the central government for implementation. There is a need for capacity building programs for local governments for effective implementation of renewable energy projects. Cameroon need to establish a renewable energy service company (RESCO). This will increase customer's confidence and reduce concern over stability of power supply. It would also facilitate fundraising for facility construction. This program could also promote self–confidence and distributed generation development in homes and villages, while providing maintenance service by attracting private investors. It could also supply lighting and cooking equipment to areas not connected to the grid (Alexander Bisaro et al, 2018).

The business models that could promote this sector include (1) Home rental model, (2) operation and

maintenance model, (3) energy supply model. There is need for a public–private partnership in the operation of this RESCO. The government of Cameroon need to prepare a separate qualification standard for selecting contractors in the deployment process. The government ought to review the legal systems and permit standards to enable the flawless execution of the RESCO program. In addition, incentives should be introduced and tax benefits as well as low interest loans. Since there is very little or no experience in renewable energy deployment in Cameroon, middle and large scale renewable energy projects ought to be undertaken as demonstration projects. The electric car project powered by a solar plant in the University of Yaound 1, developed by the French business group 'Bollore Blue Solution' has been very successful. The 350 'Rural Solar Projects', has also been very promising. These demonstration projects thus expand the initial deployment, as well as accumulate experience for future investments. This will enable Cameroonians to participate in all the stages of the project from conception, construction, to operations thereby ensuring capacity building and technology transfer. The demonstration projects need to be developed for all renewable energy sources such as solar, wind, small hydro, biomass, etc. This would also enable policy makers to estimate the economic feasibility of the renewable energy resource and the enactment of renewable energy support policies.

Renewable energy deployment is the most ambitious and appropriate means for reducing GHG emissions as highlighted in Cameroon's NDC (Ademola et al, 2017). With regards to the global trend of renewable technology cost being much higher than fossil fuels energy, the target set by Cameroon to generate 25% of its energy from renewable energies with respect to 2035 baseline scenario is quite ambitious, particularly in the context of financing capabilities of the government and relevant market conditions. SDG7a, demands that by 2030, international cooperation be enhanced to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and an advanced and cleaner technology (Michael Jacob, 2018). This would require the cooperation of both domestic and foreign market participants. Thus there should be a separate renewable energy project development plan in Cameroon. The development of renewable energy will be limited by the national grid conditions such as the transmission and distribution infrastructure, to which the renewable energy generation facilities will be connected, and any development that overlooks this factor could result in adverse effects to stability of the national grid (Ezhilarasan et al, 2015). For example, the collapse of the whole national electricity system. Therefore, the ongoing restructuration and expansion of the transmission and distribution facilities conducted by the 'National Electricity Transmission Corporation' and the 'Energy of Cameroon S.A', must take into account such a plan. Even if there were sufficient transmission and distribution capacity, intermittence in the renewable power source such as solar and wind, leading to rapidly dropping outputs could have catastrophic results such as grid failure. Thus an emergency backup power or Energy Storage System must be acquired in advance. Cameroon needs to adopt the United States Department of Energy renewable energy deployment process with respect of institutional and regulatory framework.

The government should introduce a mandatory renewable energy installation program that requires an investment of at least 5% of the construction cost for newly constructed public buildings larger than 3000 m^2. There should be an intentional supply of 30% of the energy use of the building from renewable energy sources in the long term. A solar photovoltaic or solar water heating on the roof of all new residential and commercial buildings should be enacted into the renewable energy policy of Cameroon.

Renewable deployment support policies

There are so many renewable energy support policies which could enhance renewable energy deployment in Cameroon. These may include, feed-in-tariff, Subsidies and Loans, and tax incentives. The most suitable for Cameroon is feed-in-tariff (FiT). Cameroon need to introduce FiT in order to ensure attractive participation of the private sector. The FiT is a system that aims to promote the economic feasibility of renewable energy business by compensating for the differences between the conventional energy prices, and renewable energy produced costs. It compensates for difference in prices either through subsidies from the government or government-owned organization or by imposing levies or taxes on energy consumers. The financial burden on the government resulting from compensating for the price difference is passed on, directly or indirectly to energy consumers or the public. Irrespective of the burdens imposed on the government and consumers, renewable energy displacement could enhance social welfare by improving the quality of lives, improve health and reduce environmental hazards such as pollution, deforestation, drought and mass extinction of species. The financial resources for FiT could be gotten from government budget or income from electricity fee. In order to minimize the burden of the FiT policy a gentler approach should be adopted (Carsten Herbes et al, 2017).

The first stage is the Global Energy Transfer Feed-in-Tariff (GET-FiT), a policy-mechanism by which developed countries support less developed countries' deployment of renewable energy by granting funds for introduction and operation of FiT. The government of Cameroon could apply for implementation of this program to relevant foreign financial institutions and requesting for funds for the program from developed countries, whose energy companies are actively engaged in such a business in Cameroon. Examples of donor countries include, Germany, France, Belgium, South Korea, China, etc. In this case, Cameroon could be guaranteed of a FiT premium from foreign sponsors, which the government matches, therefore shouldering a part of the burden. Renewable energy Independent Power Producers (IPP) sells electricity power at a price contracted in advance with a transmission and distribution company. The consumer of electricity supplied from renewable energy are compensated for the difference between its wholesale and contract price with premiums funded by the government and foreign sponsors (Ana Cravinho et al, 2011).

In the second stage, Pre-FiT (PPA) program can be executed regardless of implementation of the GET-FiT Program and are introduced in the form of a tender to prevent renewable energy power producers from making excessive profits. It refers to guaranteeing the profitability of renewable power

producers through a Power Purchase Agreement (PPA) between the renewable power producer and operators. As for Pre-FiT, while a PPA contract is concluded with a power distributor, a renewable energy IPP is selected through a bid in a reverse tender, in which a reference price determined by the government considering costs, acts as a price ceiling. Decisions must be taken separately on PPA application and contract procedures, businesses and handle international investors.

In the third stage, a Tender-based FiT could be applied. This is an expansion of the PPA- based on a large-scale development projects on a national level. It should be implemented in earnest after sufficiently securing track records through a Pre-FiT system. The system should be based on the tender-based FiT recently introduced in many countries because of its strong point in ensuring stable revenue to renewable power producers while minimizing their excessive profits.

The FiT system should be operated without tender for small renewable eenergy projects in order to protect domestic power producers. FiT should thus be implemented in phases, depending on the maturity of the market of the renewable energy and capacity of the government. The initial phases constitute the GET- FiT program to lay the foundations of FiT, gradually progressing to auction-based FiT in the medium to long term. There is thus a need for a national renewable energy fund to stabilize prices in the renewable sector. The kfw and Deutsche Bank have very rich experiences in managing FiT in developing countries.

Recommendations

Establishment of institution and infrastructure for renewable energy deployment

Cameroon needs to build an energy storage system, integrate and scale-up training schools to foster man power for facility maintenance and management. Create agencies for the promotion of renewable energy. Specialized companies such as a Renewable Energy Service Company (RESCO), could stabilize the functioning of the sector. The goal of a specialized company program is to strengthen the efficiency of the deployment and the specialties of renewable energy companies by fostering qualified equipment installation companies and operational enterprises. Thus the qualification of such a company must be enacted into the renewable energy law of Cameroon.

The renewable energy potential and market in Cameroon is unpopular due to lack information and statistics on the sector. Strengthening the information dissemination services could increase the reliability of renewable energy deployment projects in the long term and could also serve as a basis for expanding the participation of domestic and international private enterprises. An autonomous energy research institute is required to enhance renewable energy data management in Cameroon.

Assessment of the renewable energy resource potential by region

The government should create a comprehensive assessment of renewable energy potential. This would aid in planning and ensure equitable regional development. Geographically, some regions of

Cameroon have more renewable energy resource potentials than others. It is thus worthwhile to assess the resource potentials over the national territory to ensure equity in regional development as well as designing investment policies. Improve collaboration between stakeholders for the development of community projects in renewable energies. Other financial instruments for rural lighting should be created such as Rural Electrification Fund.

Source of financing

Most renewable energy projects require relatively substantial amounts of initial investments before the facility construction owing to the high equipment cost and insufficient support system. Therefore, financing with public resources, and the financial support of other countries or foreign companies is common practice (Sangjung Ha et al, 2015). Foreign sources of funding may include Multilateral Development Banks, ODA, Climate Financing such as GCF, UNIDO-GEF, UNEP-Seed-Capital Assistance-Facility, etc. Cameroon should develop economic incentives to promote and remove barriers for investment in renewable energy. The government should establish incentive frameworks for the development of renewable energy and remove barriers to investment (Muhammad et al, 2019). Firstly, on large-scale development projects, a tender-based FiT is an expansion of the PPA-based Pre-FiT to a national scale. Here, a notice inviting tenders is issued after setting the tender scale and initial bidding price at regular intervals (usually 1 year or 1 quarter). Power producers participates in the tender and the government selects applicants in the order of bidders that offered the lowest price until reaching the announced amount. The selected power producer builds renewable energy facilities within a specified period and sells power on the whole sale market. Detailed management plans must be determined separately, such as related technology, evaluation criteria, guaranteed period of power purchased, participation qualifications and premium payment. There is thus a need for renewable energy agency in Cameroon to oversee and supervise the tender system. FiT should be operated in phases, depending on the maturity of the market and capacity of the government (Carsten Herbes et al, 2017). A special fund for implementation of FiT would aid the policy implementation. Hence, FiT could facilitate renewable energy in Cameroon. Since most investors are scared by the inferiority of renewable energy relative to conventional electric technology, FiT could promote renewable energy deployment process as well as renewable energy demand in Cameroon. Compensations on household renewable energy generation, consumption and supply to the grid could motivate public participation in renewable energy deployment thus ensuring the attainment of NDCs and SDGs, especially SDG7 and SDG13. FiT could also aid in renewable energy deployment in poor off-grid and rural areas thereby addressing the issue of inequalities in Cameroon. It could also enhance a balanced regional development since areas with lower renewable energy potentials are given higher FiT to investors.

Conclusion

Climate change is a global issue that presents serious socio-political and economic challenges.

Efforts at tackling them should be a concern to all, especially state actors–polluters. This becomes necessary considering that the impacts of climate change transcend national boundaries and also vary from one region to the other. There is need to urgently and proactively evolve a functional climate change regime in Cameroon to compliment the Paris Agreement (Oluwole, 2016). This paper represents an attempt to propose policies on renewable energy deployment in Cameroon given that Cameroon does not have a policy on renewable energy and the urgency of meeting the targets of the NDC with regards to the Paris Agreement and the global agenda towards SDGs by 2030 (Muhammad et al, 2019). Climate change has been defined by the IPCC as the greatest security threat of our time. Cameroon needs to upgrade international cooperation towards energy business, Climate change response, and sustainable development. (Yun Gao et al 2017).

This study reveals that solar energy is the most promising renewable energy source for meeting emission reduction targets in the electricity sector, especially if the price continues to decline over the long term. FiT is the most suitable renewable energy deployment support policy–instrument for Cameroon (Ana Cravinho et al, 2011). Inappropriate policies may result in delays or even in the cancellation of viable investments. The Government should communicate its policies to stakeholders and work to maintain credibility of these policies. In a nutshell, I acknowledge a weakness in my analysis due to of lack of sufficient data. In this regards, I would like to study on more data sources which could enable me to better analyze this subject matter.

Reference

[1] Ademola A. Adenle, Dale T. Manning, Joseph Arbiol. (2017) Mitigating Climate Change in Africa: Barriers to Financing Low–Carbon Development, 123–132

[2] Alessandra Elizondo, Vanessa Perez–Cirera, Alexandre Strapasson, Jose Fernandez, Diego Cruz–Cano (2017) Mexico's low carbon futures: An integrated assess for energy planning and climate change mitigation by 2050, 14–26

[3] Alexander Bisaro, Matteo Roggero, Sergio Villamayor–Tomas (2018). Institutional Analysis in Climate Change Adaptation Research: A Systematic Literature Review, 34–43

[4] Alfonso Carfora, Giuseppe Scandurra. (2019) The impact of climate funds on economic growth and their role in substituting fossil energy sources, 182–192

[5] Ana Cravinho Martins, Rui Cunha Marques, Carlos Oliveira Cruz. (2011). Public–private partnerships for wind power generation: The Portuguese case 94–104

[6] Cameroon: Growth and Employment Strategy Paper: Reference Framework for Government Action over the period 2010–2020

[7] Cameroon: Vision–2035

[8] Carsten Herbes, Vasco Brummer, Judith Rognli, Susanne Blazejewski, Naomi Gericke (2017) Respon–ding to policy change: New business models for renewable energy Cooperatives–Barriers perspectives' members

[9] Dennis Tirpak and Helen Adams (2011) Bilateral and multilateral financial assistance for the energy sector of developing countries, 135–151

[10] Dumisani Chirambo (2018) Towards the achievement of SDG 7 in sub–Saharan Africa: Creating synergies between Power Africa, Sustainable Energy for All and climate finance in–order to achieve universal energy access before 2030, 600–608

[11] Ezhilarasan GANESAN, Subhranhsu Sekhar DASH,

Chinmaya SAMANTA (2015) Modeling, control, and power management for a grid-integrated photo voltaic, fuel cell, and wind hybrid system, 4804-4823

[12] Korea Energy Economics Institute: Renewable Energy Master Plan of Cameroon. (2017),145pgs

[13] International Institute for Sustainable Development (2018) Missing the 23 Percent target: Roadblocks to the development of renewable energy in Indonesia, 41pgs.

[14] Lianbiao Cui, Yuran Huang. (2018) Exploring the Schemes for Green Climate Financing: International Lessons, 173-187

[15] Mariana Mazzucato, Gregor Semieniuk. (2018) Financing renewable energy: Who is financing what and why it matters, 8-22ichael Jacob. (2018) a

[16] Michael Jacob. (2018) Can carbon pricing jointly promote climate change mitigation and human development in Peru?

[17] Muhammad Idra al Irsyad, Anthony Halog, Rabindra Nepal. (2019) Renewable energy projections for climate change mitigation: An analysis of uncertainty and errors, 11pgs

[18] Oluwole Olutola (2016). Addressing Climate Change in Southern Africa: Any Role for South Africa in the Post-Polis Agreement? 395-409

[19] Richard J.T. Klein, E. Lisa F. Schipper, Suraje Dessai. (2005) Integrating mitigation and adaptation into climate and development policy: three research questions, 579-588

[20] R. Guerrero-Lemus, P. Rivero-Rodrguez, B. Diaz-Herrera, B. Gonzalez-Diaz, G. Lopez. (2013) Technical and socio-economic assessment for a Si-based low-cost cells factory in West Africa, 506-511

[21] Ronald Wall, Stelios Grafakos, Alberto Gianoli and Spyridon Stavropoulos. (2019) Which policy instruments attract foreign direct investments in renewable energy? 59-72

[22] Sangjung Ha, Thomas Hale and Peter Ogden. (2015) Climate Finance in and between Developing Countries: An Emerging Opportunity to Build On 7pgs.

[23] Sarah Feron. (2016) Sustainability of Off-grid Photovoltaic Systems for Rural Electrification in Developing Countries: A Review, 26pgs

[24] Synthesis Report. IPCC. AR5 Climate Change (2014): Mitigation of Climate Change

[25] UNFCCC: Paris Agreement (2015), 16pgs

[26] United Nations. (2015) Transforming our world: the 2030 Agenda for sustainable development,36pgs

[27] World Bank Group (2006) Cameroon Intended Nationally Determined Contribution

[28] Yun Gao, Xiang Gao, Xiaohua Zhang. (2017) The 2℃ Global Temperature Target and the Evolution of the Long-Term Goal of Addressing Climate Change-From the United Nations Framework Convention on Climate Change to the Paris Agreement, 272-278