

Politics of Energy Trilemma in the Contemporary World. Where is the Truth?

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Abstract:

Energy access continues to lead to conundrums in many forms. One of such forms of conundrum is the endless competition and imbalance of politics, economics, and environment, which form trilemma of energy policy and which in turn hinders energy access and deepens energy poverty. This study argues that energy trilemma can be resolved through Energy Good Governance (EGG). Energy good governance provokes debates on both neoliberal and conservative discourses on energy access and efficiency. It argues that equality, rule of law; respect for human rights, accountability and transparency should form the quintet of Energy Good Governance (EGG). To clearly comprehend the EGG, the study appraises the applicability and the implementation of equality, rule of law, respect for human rights, accountability and transparency in energy projects in South Sudan, the East African Community (EAC) and the European Union (EU). Moreover, the study assesses the national energy policies of South Sudan, regional and global energy policies.

While the study in detail evaluates the energy access and poverty, it critically analyses the 2015 Paris Agreement, particularly, its impact on national, regional and international levels energy trilemma. Although energy access remains a problem as its impacts energy poverty and halt energy transition, energy access can be improved through EGG policy and in particular, through deepening economic development energy policies for South Sudan and the region. The study deploys case study of South Sudan, EAC and EU in understanding the conundrums of energy access. The study also analyzes the impact of Russia-Ukraine war on global access to energy. It uses process tracing in deepening the comprehension of the casual chains and casual mechanisms in energy trilemma paradox. While the study concludes the importance of energy good governance as the true way of resolving energy trilemma, it recommends future studies on the impact of energy good governance on energy transition in East Africa.

Keywords: Energy, trilemma, access, transition, poverty, policy, good, governance

1. Introduction:

Energy trilemma has remained one of the critical problems in energy industry. While the trilemma revolves around imbalance and competing goals of politics, economics and environment, it also revolves around energy security, energy finance, and climate change mitigation. Although at the

global level, the trilemma led to the impediment of energy access, it has also remained the barrier to energy access at regional and national levels. This has led to energy poverty. While energy poverty could be felt across the world, it is much felt at the continental Africa, East African region and more

importantly at the national level in South Sudan. Then, why is this case? What is energy trilemma? How has it hindered energy access? How does energy trilemma impacts on energy poverty and energy transition? Could energy good governance solve energy trilemma? How do international, regional and national energy laws and policies tie together? This paper shall answer these and other pertinent questions. The paper is organized as follows: section one introduces the topic and methodology. Section two discusses the concept of energy trilemma from relevant literature. Section three discusses politics of energy trilemma in the world. Section four discusses case studies on relevant energy laws and policies, energy access and poverty in South Sudan, the East African Community and the European Union. Section five discusses the solution to energy trilemma using Energy Good Governance (EGG). Section six concludes and section seven gives a direction for future research.

On the methodology, the paper combines process tracing and case studies to flush out the trilemma and its hindrance to energy access at national, regional and international levels. The overall strength of processing tracing lies on generation of casual chains and analysis of casual mechanisms while case study shows the existence of casual mechanisms with a particular chosen case (George and Bennet, 2005).

2. Understanding energy trilemma:

In philosophy, a trilemma is a choice amongst three unfavorable options. In politics, it is known as 'incompatible trio' and in economics, it is also known as the 'impossible trinity': a trade-off between three objectives, in which two are pursued at the expense of the third (Setyowati, 2020). However, the energy trilemma appears to be different: meeting it requires achieving all three objectives, although within the parameters of the particular wishes or interests of the actor in question.

Thus, leading energy scholars such as Heffron, Nalule, Setyowati, Olawuyi, Pereira, Wifa, Babajide, Innocencio to mention but a few are yet

to unanimously agree on the conceptualization of energy trilemma from empirical literature. While they emerged from different school of trainings and thoughts, these scholars have converged on the compromise on the definition of energy trilemma. According to Raphael Heffron etal (2015), energy trilemma is conceptualized as triangle that explains the imbalance of politics (energy security), economics (energy finance) and environment (climate change) and most importantly the competing aims of each of the above (Heffron, 2015). Other energy scholars such as Nalule (2019) and Setyowati (2020) also conceptualized energy trilemma as a term mostly used to describe a balance that sees the achievement of three issues: energy security, energy equity and environmental sustainability. Energy security is a concern over whether there will be sufficient resources to meet the world's energy requirement in the years ahead or not and this creates uncertain in the energy world.

Besides, Raphael Heffron (2015) further emphasizes that energy trilemma can also be described as finding a balance between energy security, economic impact and environmental sensitivity (Heffron etal, 2015). The overall scholarly consensus is that there must be three issues that are placed in a triangle and they must have competing aims and endeavor to balance each other in the global energy laws and policies implementation. In the context of this paper, energy trilemma is understood as competing goals in balancing of politics (energy security), economics (energy finance) and environment (climate change mitigation), which should be resolved through Energy Good Governance (EGG).

Energy Trilemma

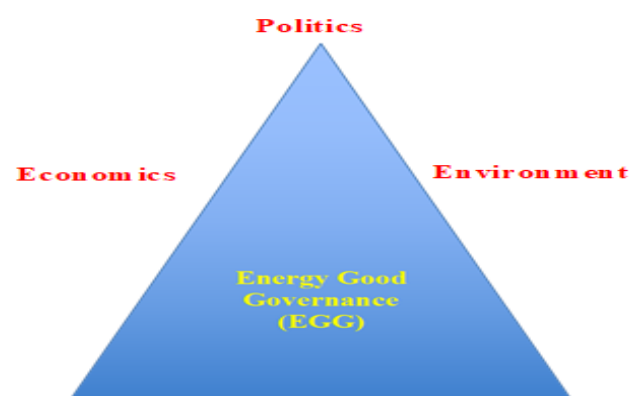


Fig 1: Source: Author

3. Politics of energy trilemma in the world:

The failure of great powers in the world to advocate and support access for energy for all has led to energy poverty. These great powers include the United States of America, the United Kingdom, France, China and Russia. While it can be highly argued that the problem of energy poverty is particularly rampant in Africa, it is a global phenomenon (Ayuk, 2022). It is important to note that a quarter of world population lacks access to energy, and of the 32 countries around the world with an electrification rate of less than 50%, 26 of these countries are located in Sub-Saharan Africa. The region electrification rate average is just 27% and the rural areas average is a mere 9% (IEA Report, 2019). Even where electrification rates are high, connected households may not have reliable energy because of voltage fluctuation of frequent outages. Access to energy is often determined by the quality and consistency of local grid. That is the reason why 'blackouts' are common occurrence in many African countries.

Energy poverty can cause dangerous choices. Without access to modern-day energy sources, the livelihood, well-being and health of millions of people around the world are diminished by the harmful energy options they have at their disposals. In large swaths of Sub-Saharan Africa, a big number of population cooks over stoves burning solid fuels, including biomass fuels such as wood, animal waste, agriculture residues and coal. Each year, millions of deaths worldwide, most of them women and children needs quick attention in energy access. Besides, it is estimated that 59% million household around the globe rely on kerosene for indoor lighting (Ayuk, 2022). It is a known fact kerosene fumes are linked to lung cancer, heart disease, pneumonia and other health problems. Kerosene lamps are also a leading cause of many house fires in developing world. Energy poverty also curtails access to clean water for about 46% of Sub-Saharan Africa, Without the energy-based technologies for purification and distribution of water supplies, Africans are needlessly subjected to diseases, poor hygiene and inadequate sanitation.

4. Case studies, relevant energy laws, policies, energy access and poverty

Case studies are drawn from South Sudan, the East African Community, and the European Union in discussing the energy trilemma, relevant laws, policies, energy access and poverty.

4.1. South Sudan

Emerging from decades of civil war and violence from Sudan, South Sudan does not have any signed energy law and policy but a draft. The energy industry is divided into electricity/power, hydrocarbons sector as well as renewable energy sector. The electricity/power sector has an act of parliament, 2011, which is narrowed and only covered the South Sudan Electricity Corporation (SSEC). While the Ministry of Energy and Dams remains as a regulator, South Sudan Electricity Corporation (SSEC) remains a technical commercial arm of the government as far as power generation, transmission, distribution and sale of electricity across South Sudan is concerned and moreover, it represents Government of South Sudan interest in power sector (Deng, 2022). It gets its policy guidance from the Ministry of Energy and Dams (MED). In the hydrocarbons sector, which is oil and gas sector, there is Petroleum Act 2012, Petroleum Revenues Management Act 2013, Environmental Regulations, 2015, Local Content Regulations, 2019 and State-Owned Company (NILEPET) Act 2019. All these hydrocarbon laws focus on the regulation and commercialization of oil and gas of South Sudan. While the Ministry of Petroleum is a regulator, the State-owned Company, Nile Petroleum Corporation (NILEPET) remains the commercial wing of the Government of South Sudan, representing the government interest in the downstream, midstream and upstream business of oil and gas sector (Chol, 2016).

4.2. Energy access and poverty in South Sudan

After attaining her independence in July 2011 from Sudan, South Sudan immediately enacted South Sudan Electricity Corporation (SSEC) Act, 2011 as argued above. This piece of legislation regulates the establishment of SSEC, and its mandate as the

commercial wing of the government as far as generation, distribution and sale of electricity is concerned. The Ministry of Energy and Dams remains with regulatory powers as argued earlier. South Sudan has been struggling to streamline its power supplies to the capital city of Juba and its ten states towns including three administrative areas. The country's demand for electricity currently stands at 300MW and is expected to increase to 1,500MW by 2040 (Gatluak, 2024). The estimated installed capacity for the country power consumption, which previously stood at 131MW, was recently increased to 141MW with added capacity. Of the approximated 12.5 million populations, only 3.7% of the South Sudanese is connected to the electricity grid (Deng, 2022).

Whereas the 3.7% of South Sudanese is accessible to electricity power, this percentage has continued to fail to access this electricity power. The challenge has been the source of power. The Government of South Sudan uses 9 Wasilla generators of total capacity of 33 MW. This capacity is not adequate for Juba and other ten states plus three administrative areas capitals of South Sudan. Thus, it is Juba, which has been connected with 9 generators only. However, the challenge to the constant power supply in Juba is to do with mismanagement and lack of funds to buy fuel from East Africa on time. The SSEC has been faced with deep-seated corruption, structural conundrums and neglect. Moreover, the Government of South Sudan through the Ministry of Finance and Economic Planning has never availed the budget of SSEC. The budget is always in figures but the cash has never been available in the last 12 years (Gatluak, 2024). When the Ministry of Energy and Dams realized the challenge, it privatized the generation, distribution and sale of electricity in form of joint venture of SSEC with Ezra Development Group Company on 48:52 equity ratio-basis that led to the formation of Juba Power Plant Company. In deepening this venture, both partners then formed Juba Electricity Distribution Company (JEDCO) as a special purpose vehicle to distribute the electricity and carryout maintenance.

African Development Bank through the Ministry of Energy financed the electricity project in Juba. Hence, Juba Power Plant Company contracted China Power Company to install the transmission lines in Juba. While poor South Sudanese citizens celebrated installation of transmission lines, the quality of electric poles was compromised as most them fell during stormy days. Nonetheless, the established electricity tariffs to common South Sudanese appear problematic due to the volatility of the local currency, lack of supervision and investments in the sector. This has triggered complaints from the citizens about the high cost of electricity in the town of Juba (Deng, 2022). Challenges in the energy sector exist because key components of the electricity supply governance such as equality, accountability and transparency have been overlooked. With lack of access of electrical power to South Sudanese people, energy poverty levels have been compounded, as energy is a source of prosperity. While it was necessary to private electricity generation and distribution in South Sudan, it should not have been privatized further by SSEC which its self is a commercial arm of the government. It is supposed to directly generate the electricity, sale and distribute it as it is done in East Africa. This would have made electricity cheap and affordable then joint venturing with Ezra that has made the electricity quite irregular and very expensive in South Sudan and in the region.

At the international level, South Sudan signed the 2015 Paris Agreement for Climate Change on 22nd April 2016. However, it has never implemented the requirements of the Agreement. The country still relies heavily on fossil fuels by 99.9% for energy consumption (Chol, 2016). The renewable energy is not yet tapped. The directorate of renewable energy at the Ministry of Energy exists in the structure and it has never rolled out any initiative or policy on renewable energy (Mozersky and Kammen, 2024). Yet, World Bank continues to fund Government of South Sudan projects including the Juba Power Plant that was funded by African Development Bank through intermediary funds of World Bank. Whereas South Sudan

participated in many Conferences of Parties (COPS), it participated in COP29 Conference on Climate Change in November 2024 held at Baku, Azerbaijan. Although the theme of this COP29 “investing in a livable planet for all” was reiterated, the Government of South Sudan is yet to any implement any resolutions of the COPs held so far.

4.3. Panoramic overview of the East African Community (EAC) regional energy cooperation

The East African Community (EAC) is a regional bloc of eight partners of Kenya, Uganda, Tanzania, Rwanda, Burundi, South Sudan, DR Congo and Somalia. The community has passed three protocols that guide the integration with a mission of deepening and widening the cooperation. These protocols include Customs Union, Common Market and Monetary Union. The protocol on the last leg of integration, which is Political Confederation, is yet to be approved by summit of heads of state and government. While article 101 of EAC Treaty of 1999 stresses on the importance of energy infrastructure and energy access cooperation in the EAC region, the speed of implementation of this article is very slow. However, the community has infrastructure division that houses energy projects. Annually, the EAC partner states organize petroleum conference and exhibition to showcase the importance of petroleum energy resource to the region. In November 2017, the EAC adopted the energy security framework that endeavors to solve energy trilemma and energy security for all in the EAC (Hailu, 2017). While the framework is yet to be implemented in full, efforts are being realized with EAC energy cooperation's that are being seen today. For instance, Uganda had invited the five partner states of EAC to invest 40% of shares in Kabaale refinery. While the refinery is designed for 60,000 barrels per day (bpd), the EAC countries will have 24,000 bpd if they invest 40% of shares. This spirit of collective investments in the region energy sector shall go along way in resolving the competition and the imbalance play between energy security, energy finance and climate change mitigation in securing energy efficiency (Nalule,

2019).

On the East African Crude Oil Pipeline (EACOP), the same cooperation has been envisaged. Uganda and Tanzania agreed to invest together in this project that shall be energy game changer in the East Africa region and beyond. The pipeline, which is 1,443km, is owned by various consortia, making up of TotalEnergies with 62%, China National Offshore Oil Corporation (CNOOC) with 8%, Uganda National Oil Company (UNOC), represented by Uganda National Pipeline Company (UNPC) with 15% and Tanzania Petroleum Development Corporation (TPDC) with 15%. In August 2021, the total project cost was reported as US\$5 billion. Of the total, the owners of the pipeline as equity investment will raise \$2 billion and the remaining \$3 billion will be borrowed from external sources (Barigaba, 2021). On 1st February 2022, the parties signed the Final Investment Decision (FID) in Kololo in Kampala that set the project for implementation. While the implementation of EACOP will be a daunting task given that cut-throat politics may delay it, it is a vital energy project that can enhance energy efficiency and reduce energy poverty in the EAC region.

At the international level, the EAC partner states signed the 2015 Paris Accord and developed a road map in November 2016 to implement the Agreement articles. While the implementation of 2015 Paris Agreement is quite slow, majority of partner states such as Rwanda, Kenya and Tanzania have progressed in the implementation.

4.4. Panoramic overview of the European Union (EU) energy cooperation

The European Union (EU) is a political and economic union of 27 member states in geographical Europe. The EU has strong energy policies and laws. It has legislative power in the area of energy policy for most of its existence; this has its roots in the original European Coal and Steel Community. From empirical literature, the introduction of a mandatory and comprehensive European energy policy was approved at the meeting of the European Council in October 2005,

and the first draft policy was published in January 2007 (Frank, 2008). In term of resolving its energy trilemma of energy security, social impact and environmental sensitive, the EU rolled out its 2007 energy policy which focuses on five key areas: increase competition in the domestic market, encourage investment and boost interconnections between electricity grids, diversify energy resources with better systems to respond to a crisis; establish a new treaty framework for energy cooperation with Russia while improving relations with energy rich states in Central Asia, South America and North Africa; use existing energy supplies more cost effectively while increasing renewable energy commercialization; and finally increase funding for new and relevant energy technologies (Metsola, 2016). With Russia-Ukraine war, the energy cooperation of EU and Russia has been cut. While the EU did not want to sanction the energy sector of Russia, the United States courted EU into full fledged economic sanctions of the Russian State.

Due to its energy policy, the energy access to European citizens had increased drastically. For instance, 91% of 748 million European populations are connected to electricity (Word Bank Report, 2022). This energy consumption (electricity, coal, biomass, renewables to mention but a few) is both generated in European Union as well as imported outside the European Union (Bhatia and Angelou, 2015). In emphasizing this, the EU member states in 2006 had a gross inland energy consumption of 1,850 million tones of oil equivalent of which 46% of the energy consumed was produced within the

member states while 54% was imported (Held, 2008). The three largest suppliers of natural gas to the European Union are Russia, Norway and Algeria that amounted for about three quarters of the imports in 2019. There is a strong dependence on Russian energy that the EU has been attempting to reduce and that has remained difficulty.

Besides, the EU energy policy has stressed on climate change mitigation and respect to the 2015 Paris Agreement. It has heavily emphasized on renewable energy and complete transition from fossil fuels. Hence, the COP26 UN conference on climate change in Glasgow was truly the European Union desired. That is why today, the European Investment Bank has made it a condition that all those who need to access its funds must have energy policies that are built on renewable energy and indeed being implemented in doing away with fossil fuels. Whereas this conversation of total transition to renewable energy is still suicidal to the African Petroleum Producers, the EU has let the grey cat out of the golden bag for having walked the conversation. Although the African countries seems not interested in abandoning the fossil fuels, the World Bank has already conditioned its funds access to countries that have rolled out renewable energy policies and which are being implemented today. This World Bank condition, coupled with European Investment Bank (EIB) and that of UN will compel the continental Africa to dance to the renewable tunes. While Africa and particularly, Sub-Saharan Africa (SSA) emits only 3.6% of carbon dioxide and its Western friends of EU and US combined emit 25% of carbon dioxide, Africa has been cornered and it has to roll out and implement renewable energy policies and climate smart programmes as soon as possible.

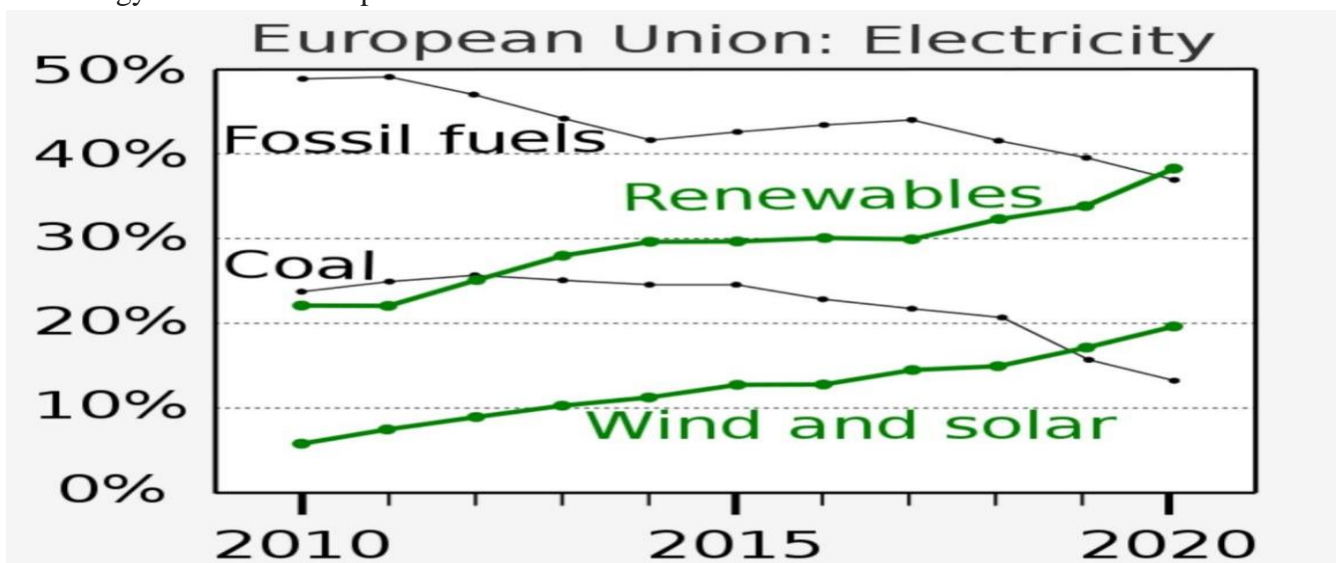


Fig 2. Source: EU Energy Pool.

As it can be seen from the graph, renewables have taken over fossil fuels in 2020.

5. Resolving energy trilemma through Energy Good Governance (EGG)

To resolve energy trilemma, countries and regions must promote energy good governance. According to Randy Quinn and Linda Dawson (2019), good governance refers to the management of affairs of a government in a way that is fundamentally free of corruption but with due regard to equality, rule of law, mutual respect of peoples' rights and their dignity (Quinn and Dawson, 2019). Besides, Alina Pippidi and Michael Johnston (2017) refer good governance to setting and implementation of rules, policies, laws, and regulations in tandem to accountability and transparency and fundamental respect to human rights (Pippidi and Johnston, 2017). Hence, energy good governance refers to balance implementation of equality, rule of law, respect to human rights, accountability and transparency in provision of energy services. Whereas the triangle of energy trilemma of politics (energy security), economics (energy finance) and environment (climate change mitigation) can be quite sophisticated, the application of energy good governance can resolve energy trilemma as it is discussed below:

-Equality. It is important for South Sudan and the EAC to provide energy services such as electricity, fuel, Liquefied Petroleum Gas (LPG) on equal basis to its citizens. The European Union (EU) has done so well in providing equal energy services to their citizens.

-Rule of law. It is vital to provide energy services base on the law of the land. What does constitution, law, regulation or policy say about this energy service acquisition? South Sudan and the East African Community have not adequately implemented the energy related policies, laws and regulations and that is why the energy access is very low and energy poverty is quite high. Energy justice has been highly compromised in the provision of energy services in East Africa.

-Respect to human rights. Human right is a key component of good governance. In resolving energy trilemma, energy good governance ensures that countries adhere to principles of human rights. As government provides energy related services, it should always respect the rights of citizens. The EU has progressed in respect to human rights, as the European Court of Human Rights remains the most serious court on earth.

-Accountability. As national and regional governments provide energy related services, they must be accountable to the citizens and the citizens in turn should be accountable to the governments.

-Transparency. Both national and regional government should ensure that information related to the energy policies, laws, projects and revenues is made public. Besides, information is key in balancing politics, economics and environmental issues and it is important in achieving energy security and justice.

Quintet of Energy Good Governance (EGG) is presented here below via Venn Diagramme.



Fig 3. Source: Author

6. Conclusions:

Energy trilemma can lead to lack of energy access and energy poverty. This has been showcased in the case of South Sudan where only 3.7% of the population of 12.5 million people is connected to electricity and where 96.3% is languishing in energy poverty. Although the EAC has framework for energy cooperation, this cooperation has not been deepened. Kenya and Tanzania have taken the lead in partnering in the EACOP, which its Final Investment Decision (FID) was approved on 1st February 2022 and its implementation is yet to be seen. While South Sudan and the EAC lack energy access despite their richness in energy resources, the EU has enhanced enormous energy access to its citizens. 91% of 750 million citizens are connected to electricity. This has lessened energy poverty. Both South Sudan and other EAC partner states are yet to implement the resolutions of 2015 Paris Agreement. Although World Bank has given restriction to fund projects that are climate smart and geared towards renewable energy; this has not been done in the case of South Sudan. The EU continued steadfast with its journey of fulfillment of 2015 Paris Agreement in transiting fully to renewable energy. While energy trilemma has remained a challenge in attaining energy efficiency, the truth is that it can be resolved through energy good governance (EGG) as demonstrated vividly above in Venn Diagramme.

7. Recommendation for further research

While I don't claim to have the monopoly of knowledge in energy law and policy, future research is hereby recommended on the impact of EGG in accelerating the East Africa region in energy transition from fossil fuels to renewable energy.

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