SOCIAL SCIENCE REVIEW ARCHIVES
ISSN Online: 3006-4708
ISSN Print: 3006-4694
https://policyjournalofms.com

Role of Independent Power Producers in Africa

Raiss Fatima[1], Syed Ali Abbas Abidi[2,] Hamza Khalil Chaudhary[3]

[1,2,3] Department of law, Shaheed zulfiqar ali Bhutto University. raissabbas@yahoo.com saaa@szabul.edu.pk hamza.khalil@szabul.edu.pk

DOI: https://doi.org/10.70670/sra.v3i1.460

Abstract

Africa has gone through economic and urban transformation for which demand for sustainable power has been on the rise. The aim of the research article is to explore the role of independent power producers in Africa. The secondary data collection is done by selecting 6 articles from 2016-2024. The research article concludes that IPPs are credible in as far as capacity expansion and development of renewable energy is concerned though such an endeavor requires sound regulations, planning, and competitive investment environments. It is recommended that the government should focus on robust regulatory frameworks, replication of successful IPP models in Africa, incentivizing adoption of renewable energy, strengthening PPP (Public Private Partnership) and tailoring IPP strategies to local context for ensuring sustainable generation of electricity in Africa.

Keywords: Independent Power Producers (IPPP), Africa, Kenya, South Africa, Sub-Saharan Africa.

Introduction

Background and problem

Africa has gone through economic and urban transformation for which demand for sustainable power has been on the rise in the last few years (Jain & Jain, 2017). Thus, today many African countries still experience severe electricity deficiencies, which slow down the development of their economies and the improvement of people's well-being despite the fact that the continent is rich in natural resources. Hence, Independent Power Producers (IPPs) in the continent's energy sector was developed considering these challenges (Morar, 2019). Unlike state-owned utility companies, IPPs are tenders who finance own construction and operation of the power plant using innovative methods and best available technology (Jain & Jain, 2017). Their role has been participatory most especially in increasing the generation capacity of electricity, source diversification and the introduction of renewable energy systems. The increase of IPPs is quite in tandem with other programs globally, which have aimed at the liberalization of energy and its market structures making it competitive (Morar, 2019). While holding the promise of improving the quality of Africa's energy sector, the results of IPPs have been decidedly mixed in previous studies with localised problematic areas (Davies, 2021; Ndlovu & Telukdarie, 2020). IPP projects have improved the levels of power generation, and also integrating the renewable energy into national grids (Jahns, 2023; Nkoana, 2018). There however are challenges ranging from regulations, finance, and infrastructure. However, there is a lack of a coherent general research approach to investigate and understand more about IPPs' roles and capacities in Africa. Thus, this research aims at describing a complex role of IPPs in electricity generation, and renewable energy development across Africa. In this regard, it seeks to establish policy implications that explain success or failure of IPP projects; financial structures and technicalities that exist and/or are applicable so as to shape the objectives of IPP projects (Mokhethi, 2020; Ayamolowo, Manditereza, & Kusakana, 2022). In this

regard, the study aims at shedding light on these dynamics so as to understanding how IPPs can better contribute to the improvement of the energy deficits and other continental developmental initiatives in Africa. The research article will explore the role of independent power producers in Africa.

Aim

The aim of the research article is to explore the role of independent power producers in Africa.

Objectives

- To analyses the role of independent power producers towards electricity generation capacity in Africa.
- To explore the role of independent power producers towards renewable energy in Africa.
- To analyses the factors that influence the success and failures of independent power producer projects in Africa.

Literature Review

Independent Power Producers (IPP)

Independent Power Producers (IPPs) are persons or companies which produce the electric power and sell it to the consumers, utility companies or any other buyer (Davies, 2021). Unlike the state-owned power utilities, IPPs are profit-motivated organizations and therefore undertake their business activities in manner as contract-based such as Power Purchase Agreement (PPA). They have appeared as principal driving forces in the international energy market, especially in the areas where the public utility companies fail to adequately address the escalating energy needs. Ndlovu and Telukdarie (2020) mentioned that IPPs introduce foreign investment, superior technologies and effective management practices that are often absent in the normal public sector undertakings. Jahns (2021) mentioned that IPP encompass different forms of energy production: the traditional ones, like oil, gas or coal and non-traditional ones, for example, nuclear, water, and the new age renewable energy like the solar, wind or even the bio mass energy. The emergence of IPPs is more or less linked with the political process of liberalization and deregulation of energy sectors, wherein governments look forward to private capital to invest in the power sector besides their investment (Jahns, 2021). This model has received support in many area of the world especially in the developing nations where the energy infrastructure is poor and basic public utilities are scarce. Thus, IPPs are considered to be the solution to the energy deficit, increase in electricity availability and energy security (Jahns, 2021). However, success of IPPs requires that these come in right environment, access to credit and, infrastructure.

Role of Independent Power Producers in Africa

The state of energy in Africa can be described as dynamic. It is characterized with challenges and also opens up opportunities for IPPs in the future energy market of Africa. Currently, most African countries are perished with energy crisis despite the fact that millions of people in these countries do not have proper access to electricity (Nwaiwu, 2021). The energy deficit poses a problem because it slows down economic development, restricts industrial progress, and degrades the standards of living. The role of IPPs has evolved over the years and can be seen as players in filling these roles since they bring in the necessary capital for the development of energy infrastructure, bring in new technologies and add to the mix of technologies available for the power sector (Akrofi & Antwi, 2020). IPPs increase the generation capacity of electricity, especially where public utilities have lagged in meeting demand (Akrofi & Antwi, 2020). For example, IPPs promote the generation of electricity in South Africa especially in the area of renewable energy. South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) is probably one of Africa's most effective IPP programs, mobilising Billions of dollars in private capital and helping massively boost renewable energy generation in the country. Ibrahim et al. (2021) mentioned that in Kenya, IPPs have played the central role to advance the country's

geothermal energy capabilities and make Kenya amongst the premier geothermal producing nations of the global world. In Nigeria where energy deficits have always been a major problem, IPPs have played a role in enhancing power generation. While concerns still exist over distribution and sustained stability of the electricity grid. In many parts of the continent, IPPs are playing a pivotal role of contributing to the sources of energy other than fossil fuels and enhancing the utilization of renewable energy.

Electricity Generation

The history of power generation in the African region has been defined by the large state-controlled monopolies mainly dependent on hydropower and fossil-based sources (Aboagye et al., 2021). Nevertheless, as a result of constantly growing population and economic production rates more attention is paid to electrical energy generation and supply, which often outstrips the capacities of many public utilities (Akrofi & Antwi, 2020). This has led to a high rate of power rationing such as load shedding and black outs becoming the new normal in many African countries. In response to these problems, IPPs have emerged to increase the required power output. They participate in the electricity generation in Africa, through attracting private capital, most of which is in forms of PPPs (Aboagye et al., 2021). Such partnerships enable people in public and private organizations to share risk, thus easing the exercise of funding large energy projects. Further, IPPs are relatively more flexible compared to State-Owned Enterprises (SOEs). Tshey can develop and obtain new technologies, and implement new strategies that can foster improved efficiency of electricity generation (Akrofi & Antwi, 2020). Concerning IPPs' contribution to electricity generation in Africa, the issue of diversification of energy sources is also inseparably connected (Laaroussi et al., 2023). Some of the IPPs are participated in the renewable energy sectors like solar, wind and geothermal sectors that have more role to play in the energy sector of the continent. For example, IPPs have played a crucial role in the development of Solar Noor Ouarzazate solar Complex Moroccan which is the largest concentration of solar power plant globally. This project not only adds more electricity to the power generation capacity of Morocco but also supports Morocco's renewables target of generating 52% renewable power by 2030 (Laaroussi et al., 2023). There are still some issues faced in electricity generation by the IPPs includes a poor network of the electricity grid in some areas hampers the IPP's prospects of delivering power to consumers. Mitigating these challenges is crucial to obtain the best out of IPPs in Africa's power mix.

Renewable Energy

IPP's are demonstrating a critical presence of renewables in Africa's energy mix as renewable energy gains traction. The continent has enormous and comparatively unexplored RE capacity in solar, wind, hydro, and geothermal power sources (Strielkowski et al., 2021). Regarding these resources, IPPs have been the most active, making sure that investment and experience arrive to manufacture extensive-scale renewable power plans. Moreover, Nwaiwu (2021) highlighted that renewable energy is prominent for offering clean, sustainable power to sections of the world that are yet to benefit from a national grid system. This is especially so given that many rural places in Africa especially within the developing nations do not \get to enjoy the convenience of electricity. It is claim that IPPs play crucial role in developing off-grid as well as mini-grid renewable power supply which can serve such regions. For instance, IPPs in Tanzania have constructed mini solar and wind power that provides electricity to villages and thus enhance the lives of thousands of persons in the region (Strielkowski et al., 2021).

IPPs' renewable energy projects are also instrumental in controlling greenhouse gas emission and the effects of climate change (Nwaiwu, 2021). Since most of the African countries are adversely affected by Climate change, utilizing renewable energy is, therefore, not just an economic necessity, but also, an environmental necessity. This process is being facilitated by IPPs by financing more renewable energy projects than the fossil fuel based ones. Mayeda and Boyd (2020) mentioned that, despite the fact that IPPs are actively developing renewable energy sources, Africa's experience is not without its pitfalls. Several challenges have however continued to persist, with one of them being financing since renewable

energy projects usually call for huge capital investment in the initial stages. Nwaiwu (2021) mentioned that the political frameworks and business regulating surroundings can pose a challenge, specifically through complications involving acquisition of permits in some countries and unclear policies. Tackling these challenges is critical in achieving optimum use of renewable energy in the African region.

Factors Influencing Success and Failures of IPP Projects in Africa

Essentials such as regulatory requirements, financial issues, technical aspects and socio-political factors all play a big role in determining whether IPP projects in Africa are successful or not as highlighted by İnal et al., (2022). Regulatory environment is among the most important factors that necessarily influence the insurance industry. The government sometimes expropriated IPP projects, thereby discouraging private investments through lack of stable and transparent regulatory environment. Sarkodie and Adams (2020) highlighted that IPPs are more likely to work in countries where regulations are providing and unambiguous. Nevertheless, in the areas that are characterized by a high level of uncertainty or excessive complexity of regulation, IPPs can encounter various problems. Another important success factor is financial aspects that relate to the implementation of IPP projects. With respect to the financial resources, funding is usually a challenge, especially for renewable energy sources which needs huge capital outlay as mentioned by Sarkodie and Adams (2020). Nwaiwu (2021) highlighted that, IPPs use equity, debt and grants most of the time to fund projects and these funding modes may not always be easily available in Africa. Also, another important factor that hampers the viability of IPP projects is the capacity of PPA agreements in a particular country or region. IPP's risks that deserve a special mention include; When PPAs are not honoured or PPAs are torn anew in an unfavorable manner for IPPs, then huge losses may be realized. The technical factors that affect IPP projects include the access to labor, facilities and relevant technology. Nonetheless, due to the dependency factor of some African countries to lack of grid infrastructure, the chances that IPP may deliver electricity to the consumer may be hampered, thus minimizing the project's result as mentioned by Nwaiwu (2021). Moreover, based on future IPPs performance, the uptake and implementation of new technologies aim at improving the efficiency and environmental friendliness of the electricity generation.

Methodology

Research Design

This research uses a qualitative research design because it is effective when investigating issues that are multiple, interconnected, and which occur in certain contexts for instance, the operations of IPPs in Africa. Qualitative research design supports in-depth information and descriptive data (Muzari, Shava, & Shonhiwa, 2022). As a qualitative study, this research was able to explore the dynamics of IPP projects' success and failure and their role in electricity generation and renewable energy. This research, therefore, tries to capture the context, especially through the meanings, experiences, and interpretations of the different stakeholders, of the diverse and sometimes intertwined relations that may not be revealed by probability data.

Research Philosophy and Approach

The study is underpinned by the interpretivist paradigm, which entails acknowledging the notion of reality as social constructionism. Interpretivism can be of importance for this rationale given the objective of the study is to unravel how different entities like the policy makers, investors, and the communities at large, understand IPPs in Africa. Interpretivism philosophy accepts the fact that reality is multidimensional and multi-factorial made up of social, economic as well as political conditions as mentioned by Okoli (2023). These factors can be examined well using the interpretivist approach, as it enables to gain the understanding of the nature of the IPPs' experiences based on the detailed analysis of cases and contexts.

It uses the inductive method of developing concepts and hypotheses from the amassed data and information rather than using hypothesis testing approach. This approach is suitable for the study since it enables the emergence of themes and patterns in the data exposition (Kyngäs, 2019). It follows that through inductive analysis, the study seeks to build sensible appreciation of the successes and failures informing IPP projects in Africa and their results for electricity generation and integration of renewables.

Data Collection

Secondary data collection is used in the current research article. Secondary data collection the researcher uses previous studies and journals for collecting data (Jain, 2021). The data collection is conducted through secondary sources consisting of peer-reviewed articles published between the years 2016 and 2024. The timeframe is chosen as it highlights the developments in the IPP sector in Africa that correspond to the current trends, problems, and solutions from 2016-2024. Secondary data is especially useful in this regard as it enables one to review existing literature, without having to necessarily conduct extensive empirical research, thereby coming up with a good background of the general area of focus as well as noting possible research voids. The process of collecting materials will entail a thorough search of the internet using google scholar, JSTOR, and Science Direct with specific keywords relevant to the study area. Keywords will consist of the following: "IPP electricity generation", "renewable energy IPPs", "success factors IPP projects", "challenges IPP Africa" "Independent Power Producers (IPPP)", "Africa", "Kenya", "South Africa", "Sub-Saharan Africa". The use of these keywords allows to focus on the required materials that are worked out in relation to the definite countries, regions, and types of energy sources.

Data Analysis

Data gathered from the selected peer-reviewed articles are analyzed qualitatively, using a technique called thematic analysis which seeks to identify, describe, and report patterns of meaning (themes) within the data Xu and Zammit (2020). Hence, thematic analysis is appropriate for this study because it helps to categorize the data and expose the most prominent and frequently encountered patterns of the subject under consideration, in this case – the implementation of IPPs in African countries.

Ethical Consideration

The ethical considerations for the research that is based on secondary data includes academic integrity and plagiarism (Taherdoost, 2021). For this, the researcher makes sure that the content taken from the previous studies are not copy pasted. Only the ideas from the study are taken which are then referenced appropriately.

Analysis and Discussion

Analysis

Role of Independent Power Producers in Electricity Generation in Africa

The participation of Independent Power Producers (IPPs) in electricity generation in Africa is arguably one of the very important subject matters of the present energy systems. The formation of this theme is made upon the constantly growing demand for stable, non-intermittent and more varied sources of energy for Africa's population, as well as to overcome energy poverty. Essex et al. (2023) highlighted on reshaped priorities of government institutions in managing energy transitions, with a focus on South Africa's case. The study also states that the role of government ability and policies with political backing as crucial to effective energy transitions, including in countries like the South Africa, where the energy system is proved to be a central arena of patchy progress and multifaceted rivalry. Thus, this source focuses on the role of government power and authority in creating environment that will help IPPs to bring their expertise and efficiently support generation of electricity. Eberhard and Naude (2016) examines the South African REIPPPP which is one of the success stories of IPPs and their integration into the national grid. The REIPPPP has been hugely benefiting the procurement of private sector

funding resulting to more than 6,328 MW of renewable energy. The experience of this programme shows that IPPs can become such a solution capable of significantly increasing generation capacities and at the same reducing costs due to competitive tenders. Therefore, the theme of IPPs in electricity generation in Africa is about the necessity for resource diversification and acknowledgement of the private sector as a key participant in the matter of Africa's energy issues.

Role of Independent Power Producers in Renewable Energy in Africa

The second theme focuses on the measures that IPPs are taking to increase the consumption of renewable energy in Africa. This theme is developed due to the increasing energy demand and realizing the fact that the traditional energy sources have negative footprints on the environment. Akinbami, Oke, and Bodunrin (2021) highlighted on the difficulties coming from conventional electricity generation in South Africa such as the high emission of the greenhouse gas. The employment of various renewable energy sources such as biomass, wind and solar energy is pictured as a more effective solution to these impacts but also as a solution which provides reliable electricity. Smarte et al. (2024) builds on this by comparing how South Africa is the largest investor in renewable energy within the African continent. Such comments as the development of an adequate setting and the use of technologies that are friendly to the environment are underlined as the source emphasizes the need for the expansion of renewable energy. The article also leaves an understanding that for renewable energy to become a part of the energy system thus bringing the benefits the assistance of IPPs can be crucial in the aspects of technology, policy, and infrastructure. The theme concludes that, IPPs have a crucial responsibility in the future of renewable energy necessary for the sustainable energy future of Africa. IPP's play a significant role in opening the development and integration of the renewable energy sources by making efforts to reduce the environment effect of energy production and ensuring the availability of energy security.

Factors Influencing Success and Failures of IPP Projects in Africa

The third theme deals with the different variables that the determine success/failure of IPPs in the context of Africa. This theme is developed based on various gaps that exist in the literature in terms of the market structures, regulation, and planning that influence the application of IPPs and their results. Eberhard, Gratwick, Morella, and Antmann (2017) gives details on various factors likely to influence the effectiveness of IPP projects. It is relevant to a firm's investment climate for compliance with essential regulatory provisions, adequate planning, and efficient procurement systems. Other typical issues discussed by the source includes Africa finding difficult in attracting IPP investment, those with better planning and regulation ability comparatively come to better results, such as South Africa and Kenya.

Davies (2021) source stresses the importance of clarity and auditeness, especially with reference to stakeholders that greatly boost the planning success ratios. Due to the interaction between key factors such as the planning of necessary capacities, and competitive procurement practices, reliable PPAs with an off-taker utility, private investment can be attracted to IPP projects and its sustainability assured. Thus, it is evident that IPP project outcomes are closely linked with other factors that shape African investment, policy, and regulation. Thus, it is essential to have a proper plan for IPP projects, competitive procurement, and a creditworthy off-taker utility to make the projects sustainable.

Discussion

Analyzing the role of independent power producers towards electricity generation capacity in Africa

Exploring the environment of IPPs in electricity generation in Africa included the involvement of private sector as a necessity and a compulsion which was founded by Essex et al. (2023). Also, Essex et al. (2023) focuses on IPPs and generation, and speaks to the need for access to power, the reliability, sustainableness, and diversification of sources in a context of Africa's energy demand. Referring to the first source, it focuses on the civil authorities' centrality to energy transition initiatives with a reference to South Africa. Thus, it reasons that political leadership and politically relevant policies are

indispensable for effective energy transformation. Although this perspective can be backed up by the observation of the issues discussed above that point to a slow evolution of the South African energy system, some criticism has been made concerning the role of government institutions on their own. In comparison, Ibrahim et al. (2021) founded that government policies are sometime contradictory and can be influenced by various interest hence underlying the hitches encountered by IPPs in providing electricity. Eberhard and Naude (2016) founded that on South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) contributes to the counter narrative of how a proper government launched programme can bring IPPs into the grid. True to its objective, the REIPPPP has engorged a lot of private equity investment and the procurement of over 6 328 Mega Watts of renewable energy capacity. This success has been used to endorse the idea that IPPs can make a key change in generation of electricity. However, critics like Adedoyin, Ozturk, Agboola, Agboola, and Bekun (2021) and Aboagye, Gyamfi, Ofosu, and Djordjevic (2021) founded that the same results cannot be achieved in other African countries because the socio-political infrastructure specially the regulatory environment is not well developed in many African countries. Also, the aggressive tendering procedures which in one way or the other have yielded cost reduction impacts in South Africa is not so successful in markets that are not highly competitive or markets where private sector is relatively undeveloped.

Exploring the role of independent power producers towards renewable energy in Africa

There is problem of conventional electricity generation in South Africa; especially the issue of GHG emissions as founded by Akinbami, Oke, and Bodunrin (2021). The generation of electricity using biomass energy, wind energy and solar energy is described as a possible solution to these effects on the environment. According to the source, IPPs play a very important role of facilitating the development of renewable energy technologies. This perspective has much backing as the advantages of using renewables for energy have been singled out as having positive impacts on environment. However, Amoah, Kwablah, Korle, and Offei (2020), founded that the costly capital requirements and the problems inherent to technical intimate character of renewable energy projects have lowered the potential of the sector to grow within the African continent, especially in the less developed monetary zone. They also underscore the requisite of needing serious government support and International funding for such projects to work. In comparison, Smarte et al. (2024) focused on how South Africa is leading the investment in renewable energy in Africa. It emphasizes on coming up with an enabling environment and tapping on technologies that are friendly to the environment in order to enhance renewable energy. This view has been supported by the major argument formulated by other researchers that only through technology advancement, proper policies and infrastructure development one can think of any transition to the renewable energy sources. In contrast, Amoah, Kwablah, Korle, and Offei (2020) indicated that the focus on renewable energy would obscure the deficiencies in the current energy infrastructure as well as the urgent energy availability gaps in many African countries.

Analyzing the factors that influence the success and failures of independent power producer projects in Africa

There are success factors of IPPs and also the failure factors that affects IPP projects across Africa as founded by Eberhard, Gratwick, Morella, and Antmann (2017). Eberhard, Gratwick, Morella, and Antmann (2017) founded and gave explanation on factors that influence the results of the IPP projects which includes investment climate for compliance with essential regulatory provisions, adequate planning, and efficient procurement systems. Thus, the improvement of the IPP projects in countries like South Africa and Kenya is due to the better planning and regulatory environment. However, there is assertion from other scholars Davies (2021) and Mayeda and Boyd (2020) stating that the element of political stability, community involvement, and social acceptance is left out in the global evaluation of the investment climates and regulatory structures. They point out that more analysis on the macro context and specific provincial environment is required in order to achieve sustainable IPP projects.

Therefore, the discussion above shows that IPPs are credible in as far as capacity expansion and development of renewable energy is concerned though such an endeavor requires sound regulations, planning, and competitive investment environments.

Conclusion

It has been concluded by the above analysis and discussion that In this regard, IPPs hold the position of delivering diversified and sustainable energy solutions to the continent's demands. Some examples like REIPPPP of South Africa show how properly designed programmes are able to mobilise a substantial private capital to improve the energy capacity. However, these achievements depend on strong legal environments, governments' support, and investment environments, issues that are not homogeneous in Africa. Considering the usage of IPPs as a solution for the environmental issues connected with conventional energy generation using renewable resources, one should recall several obstacles consisting in high initial costs and complex technical conditions. Also, the consideration of long-term perspectives has to be coupled with the acute problem of energy poverty prevailing in many African territories. Therefore, IPPs are decisive for Africa's energy future; however, they depend on proper governance, enabling policies, and global cooperation. Thus, owing to the various intricate factors, for IPPs to realize its goal, African countries need to address challenges while getting the best out of private sector participation in an energy security setting towards achieving sustainable development.

Recommendations

Based on the analysis and discussion, it is recommended for governments of various countries in Africa to improve the legal frameworks that support the Independent Power Producers while encouraging them to compete effectively to improve the provision of electricity in the country. It is therefore imperative to enhance the government structures and the allied policies as a way of boosting the investment climate (Cooksey & Kelsall, 2011). Further, replicating successful structures like South Africa's REIPPPP at a regional level may offer best practice for how IPPs can be integrated into a country's energy supply. The governments should also support the use of renewable energy sources through policies and subsequent provision of incentives that would make the available technical support and infrastructure accessible (Abdmouleh, Alammari, & Gastli, 2015). Such initiatives can be expanded by the means of PPP, especially in the areas of the developing countries where the funding is scarce. The limitations that are likely to affect the implementation of these recommendations; political instabilities in different countries, inadequate structures as well as differences in the regulatory systems of African countries. Future research should, therefore, examine specific issues that are peculiar to each part of Africa to provide specific suggestions for further IPPs adaptation. Further research could also be conducted to assess the durability to the reliance on the IPP-driven renewable energy projects on both energy security and socio-economic transformation. To get a better understanding of the factors that affect IPP and provide measures for enhancement of its success researchers should compare the information gained from this work with case studies from a greater number of different African countries.

References

Abdmouleh, Z., Alammari, R. A. M., & Gastli, A. (2015). Review of policies encouraging renewable energy integration & best practices. Renewable and Sustainable Energy Reviews, 45, 249–262. https://doi.org/10.1016/j.rser.2015.01.035

Aboagye, B., Gyamfi, S., Ofosu, E. A., & Djordjevic, S. (2021). Status of renewable energy resources for electricity supply in Ghana. Scientific African, 11, e00660. https://doi.org/10.1016/j.sciaf.2020.e00660

Adedoyin, F. F., Ozturk, I., Agboola, M. O., Agboola, P. O., & Bekun, F. V. (2021). The implications of renewable and non-renewable energy generating in Sub-Saharan Africa: The role of economic policy uncertainties. Energy Policy, 150, 112115. https://doi.org/10.1016/j.enpol.2020.112115

Akinbami, O. M., Oke, S. R., & Bodunrin, M. O. (2021). The state of renewable energy development in South Africa: An overview. Alexandria Engineering Journal, 60(6), 5077–5093. https://doi.org/10.1016/j.aej.2021.03.065

Akrofi, M. M., & Antwi, S. H. (2020). COVID-19 energy sector responses in Africa: A review of preliminary government interventions. Energy Research & Social Science, 68, 101681. https://doi.org/10.1016/j.erss.2020.101681

Amoah, A., Kwablah, E., Korle, K., & Offei, D. (2020). Renewable energy consumption in Africa: the role of economic well-being and economic freedom. Energy, Sustainability and Society, 10(1). https://doi.org/10.1186/s13705-020-00264-3

Ayamolowo, O. J., Manditereza, P. T., & Kusakana, K. (2022). South Africa power reforms: The Path to a dominant renewable energy-sourced grid. Energy Reports, 8, 1208–1215. https://doi.org/10.1016/j.egyr.2021.11.100

Cooksey, B., & Kelsall, T. (2011). The political economy of the investment climate in Tanzania. Retrieved from https://assets.publishing.service.gov.uk/media/57a08ac2ed915d3cfd000914/20110606-appp-research-report-01-cooksey-kelsall-june-2011.pdf

Davies, M. L. (2021, March 1). South Africa's contested transition to energy democracy : lessons and struggles from the Renewable Energy Independent Power Producer Procurement Programme. Retrieved from scholar.sun.ac.za website: https://scholar.sun.ac.za/handle/10019.1/109837

Eberhard, A., & Naude, R. (2016). The South African Renewable Energy Independent Power Producer Procurement Programme: A Review and Lessons Learned. Journal of Energy in Southern Africa, 27(4), 1. https://doi.org/10.17159/2413-3051/2016/v27i4a1483

Eberhard, A., Gratwick, K., Morella, E., & Antmann, P. (2017). Independent Power Projects in Sub-Saharan Africa: Investment trends and policy lessons. Energy Policy, 108, 390–424. https://doi.org/10.1016/j.enpol.2017.05.023

Essex, S., Caprotti, F., Jiska de Groot, Phillips, J., Baker, L., Wolpe, P., & Reddy, Y. (2023). The "capability" of South African energy governance to deliver urban sustainable transitions. Urban Research & Practice, 1–28. https://doi.org/10.1080/17535069.2023.2261899

Ibrahim, I. D., Hamam, Y., Alayli, Y., Jamiru, T., Sadiku, E. R., Kupolati, W. K., … Eze, A. A. (2021). A review on Africa energy supply through renewable energy production: Nigeria, Cameroon, Ghana and South Africa as a case study. Energy Strategy Reviews, 38, 100740. https://doi.org/10.1016/j.esr.2021.100740

İnal, V., Addi, H. M., Çakmak, E. E., Torusdağ, M., & Çalışkan, M. (2022). The nexus between renewable energy, CO2 emissions, and economic growth: Empirical evidence from African oil-producing countries. Energy Reports, 8, 1634–1643. https://doi.org/10.1016/j.egyr.2021.12.051

Jahns, S. (2023). How Has the Current Electricity Crisis in South Africa Affected the Development of Renewable Energy within the Independent Power Producer Procurement Programmes? Sub-Question: Which factors are impacting progress in the development of renewable energy in South Africa? Retrieved from https://lup.lub.lu.se/student-papers/record/9121116/file/9121130.pdf

Jain, N. (2021). Survey Versus Interviews: Comparing Data Collection Tools for Exploratory Research - ProQuest. Retrieved from www.proquest.com website: https://search.proquest.com/openview/6bbd0e7f4fcb5c2b0b1f1a9f52506d21/1?pq-origsite=gscholar&cbl=55152

Jain, S., & Jain, P. K. (2017). The rise of Renewable Energy implementation in South Africa. Energy Procedia, 143, 721–726. https://doi.org/10.1016/j.egypro.2017.12.752

Kyngäs, H. (2019). Inductive Content Analysis. The Application of Content Analysis in Nursing Science Research, 1(1), 13–21. https://doi.org/10.1007/978-3-030-30199-6_2

Laaroussi, A., Laaroussi, O., & Bouayad, A. (2023). Environmental impact study of the NOOR 1 solar project on the Southern Region of Morocco. Renewable Energy and Environmental Sustainability, 8, 9. https://doi.org/10.1051/rees/2023007

Mayeda, A. M., & Boyd, A. D. (2020). Factors influencing public perceptions of hydropower projects: A systematic literature review. Renewable and Sustainable Energy Reviews, 121, 109713. https://doi.org/10.1016/j.rser.2020.109713

Mokhethi, K. (2020). The impact of Independent Power Producers entering the South African electricity supply industry. Retrieved from https://wiredspace.wits.ac.za/bitstreams/f7d2dc20-785b-4ee8-8311-470d85841a61/download

Morar, J. (2019, April). The development impact of the renewable energy independent power producer procurement programme on South Africa's small towns. Retrieved August 8, 2024, from Sun.ac.za website: https://scholar.sun.ac.za/handle/10019.1/106029

Muzari, T., Shava, G. N., & Shonhiwa, S. (2022). Qualitative research paradigm, a key research design for educational researchers, processes and procedures: A theoretical overview. Retrieved from https://indianapublications.com/articles/IJHSS_3(1)_14-20_61f38990115064.95135470.pdf

Ndlovu, M., & Telukdarie, A. (2020). An assessment of the factors that influence the successes and failures of independent power producer projects. International Journal of Renewable Energy Technology, 11(2), 186. https://doi.org/10.1504/ijret.2020.108309

Nkoana, E. M. (2018). Community acceptance challenges of renewable energy transition: A tale of two solar parks in Limpopo, South Africa. Journal of Energy in Southern Africa, 29(1). https://doi.org/10.17159/2413-3051/2018/v29i1a2540

Nwaiwu, F. (2021). Digitalisation and sustainable energy transitions in Africa: assessing the impact of policy and regulatory environments on the energy sector in Nigeria and South Africa. Energy, Sustainability and Society, 11(1). https://doi.org/10.1186/s13705-021-00325-1

Okoli, C. (2023). Inductive, abductive and deductive theorising. International Journal of Management Concepts and Philosophy, 16(3), 302–316. https://doi.org/10.1504/ijmcp.2023.131769

Sarkodie, S. A., & Adams, S. (2020). Electricity access and income inequality in South Africa: Evidence from Bayesian and NARDL analyses. Energy Strategy Reviews, 29, 100480. https://doi.org/10.1016/j.esr.2020.100480

Smarte, M., Akpasi, S. O., Mzwandile Mkhize, M., Zhou, H., Moyo, R. T., & Gaza, L. (2024). Renewable energy investments in South Africa: Potentials and challenges for a sustainable transition - a review. Science Progress, 107(2). https://doi.org/10.1177/00368504241237347

Strielkowski, W., Civín, L., Tarkhanova, E., Tvaronavičienė, M., & Petrenko, Y. (2021). Renewable Energy in the Sustainable Development of Electrical Power Sector: a Review. Energies, 14(24), 8240. mdpi. https://doi.org/10.3390/en14248240

Taherdoost, H. (2021). Data Collection Methods and Tools for Research; A Step-by-Step Guide to Choose Data Collection Technique for Academic and Business Research Projects. International Journal of Academic Research in Management (IJARM), 10(1), 10. Retrieved from https://hal.science/Hal-03741847/

Xu, W., & Zammit, K. (2020). Applying Thematic Analysis to Education: A Hybrid Approach to Interpreting Data in Practitioner Research. International Journal of Qualitative Methods, 19(2), 1–9. Sagepub. Retrieved from https://journals.sagepub.com/doi/10.1177/1609406920918810