

Exploring the unknowns of international open innovation: The case of CEC Africa Investments Limited

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Abstract

The purpose of the study was to explore open innovation with a view to develop a framework for CEC Africa Investments Limited that could be employed to integrate open innovation opportunities into its operations to enhance firm growth. The study investigated the development of an open innovation framework specifically tailored for Copperbelt Energy Corporation (CEC) Africa Investments Limited, a prominent player in Zambia's energy sector, to enhance firm growth and improve competitive positioning. The research recognizes the critical role of innovation in driving organizational performance, particularly within emerging markets, where resource constraints and unique challenges demand adaptive strategies. Using a qualitative case study approach, based on interpretive phenomenological analysis as well as content analysis the data from 20 participants, including executives and management staff reviewed the potential of two primary types of open innovation—collaborative and inbound innovation—as strategic tools for fostering growth. Collaborative innovation involves engaging both internal and external stakeholders to co-create value, while inbound innovation emphasizes the integration of external knowledge and expertise to enhance internal capabilities. These approaches were identified as pivotal for addressing organizational challenges and unlocking new opportunities, such as renewable energy investments and lean operating structures. The study also uncovers significant barriers to the adoption of open innovation, including financial constraints and organizational resistance. Financial priorities, such as debt restructuring and achieving financial stability, were found to limit resources available for innovation. Additionally, organizational challenges, including insufficient funding and a lack of structured innovation processes, further impede the integration of open innovation practices. To address these challenges, the study proposes a comprehensive framework for open innovation, focusing on three critical components: effective change management to facilitate organizational adaptation, targeted training and communication to build an innovation-driven culture, and strategic collaboration with external experts to bring in fresh perspectives and specialized knowledge. The framework aims to create an enabling environment for open innovation, ensuring its alignment with organizational objectives and market demands. Though some studies have stressed the importance of collaboration between industry and academia like the University of Zambia and Copper belt University as suggested in this study, there is a need to study the impact of these collaborations in greater detail.

Keywords: international open innovation, Africa

DOI: 10.7176/JETP/15-1-06

Publication date: May 28th 2025

Background

Open Innovation happens to be one of the most important topics in innovation management and has gained importance among SMEs (Wang and Tang, 2013). Firms can achieve market success by adopting open innovation practices by creating innovative goods (Freel, 2006). Open innovation approaches allow sustainable innovation and support the firm's Research and Development (Rand D) activities by increasing the pool of opportunities by creating starting points outside the firm (Carroll et al., 2017). Open innovation facilitates interaction and knowledge transfer among all the relevant stakeholders (Saguy, 2016; Van Lancker et al., 2016). Open innovation practices foster product uniformity and positively influence performance (Rajala and Westerlund, 2012; Alawamleh et al., 2018).

In today's rapidly evolving global business landscape, open innovation stands as a cornerstone of competitive advantage, growth, and sustainability for organizations across industries. The continual shifts in markets, technological advancements, and customer preferences necessitate a proactive approach to innovation for maintaining relevance and market leadership (Tidd and Bessant, 2019). While innovation has been extensively studied and acknowledged within developed economies, its significance and dynamics in emerging markets,

such as Zambia, remain relatively underexplored and it is one business strategy that CEC Africa Investments Limited could benefit from

CEC Africa Investments Limited was born out of the pan-African investment division of one of the oldest private sector utilities in Africa with a history of over 60 years of operations. It was incorporated in the Republic of Mauritius as an investment holding company on 7 February 2013 under the Mauritian Companies Act 2001, (CEC Africa, 2022). The Company was established with a mandate to develop, finance and operate power projects across Sub-Saharan Africa. CEC Africa has been quoted on the Lusaka Securities Exchange since 2016 and presently has over 3,000 shareholders. It is governed by a board with a Pan-African composition including Nigerian, Mauritian, and Zambian directors. CEC Africa Investments has shareholding in KANN Utility Company Limited, a Nigerian registered investment holding company which in turn owns 60% equity in Abuja Electricity Distribution Company Limited (AEDC), (CEC Africa, 2022).

CEC Africa falls within the energy sector and energy transition requires huge shifts in power generation, distribution, and consumption. Technological, social, and organizational innovations are at the core of these changes. Technological because new or improved technologies are necessary for, e.g., energy generation, efficiency, and storage, social as users and communities commence to play new roles as producers and funders of local energy transitions, and organizational because companies must adapt their business models (BMs) to take advantage of market opportunities and reduce financial risks. Therefore, new BMs and Business Model on open Innovation (BMoI) have been mentioned as fundamental for the energy transition due to the need to meet climate change and incorporate digitalization and decentralization trends (Frei et al., 2018; Dranka and Ferreira, 2020) which can be a particularly difficult task for electricity utilities. This is because, until the mid-1990s, utilities were often owned or controlled by the state operating as quasi-monopolies, especially in Europe (Burger, 2016). Additionally, innovation was not seen in the same way it is today, “as a tool for competitive differentiation” (Burger, 2016: 352), but rather as a mean to provide customers with reliable energy supply. Since then, the electricity industry has experienced widespread liberalization (Monastyrenko, 2017), which resulted in deep changes in the strategies adopted by energy utilities, including strategies for innovation and collaboration. The ‘open movement’ and governance shifts have also modified consumers' needs and expectations towards energy services (Greco et al., 2017).

Innovation is a key determinant of a firm's success (Ramadani et al., 2019; Tse et al., 2015). Firms that do not innovate will decline in terms of performance or may even go bankrupt (Ratten, 2016; Wilkinson and Thomas, 2014). Adopting innovation refers to the “successful exploitation of new ideas”. This combines (i) new ideas: involving new products or processes or services; (ii) exploitation: the application of ideas; and (iii) success: innovation is adopted by the market from the point of view of the target firm regarding increasing profitability (Rivard, 2000). While the literature on open innovation is well-established, a gap persists in the nuanced understanding of how innovation is pursued, navigated, and realized within emerging markets, particularly within the African context. This gap is especially pronounced when examining industries critical for development, such as the energy sector. Existing research often gravitates toward studies within established economies, leaving a dearth of comprehensive insights into the innovation dynamics specific to emerging markets.

The Research Problem

The Zambian energy sector, as exemplified by CEC Africa Investment Limited, operates within a context of rapid transformation. Despite other firms demonstrating firm growth, CEC Africa Investment Limited has not been increasing its revenue and has been unable to meet its financial demands as shown in table 1.1. Firms that have integrated open innovation have demonstrated improvements in both financial and nonfinancial firm performance (see Katila and Chen, 2008; Leiblein and Madsen, 2009; Leiponen and Helfat, 2010; Zhou and Wu, 2010). CEC Africa Investments Limited had been underperforming since 2016 as shown in Table 1.

Table 1: 5 YEAR PROFITABILITY SCHEDULE

Group					
<i>In thousands of USD</i>	2020	2019	2018	2017	2016
Revenue	347,316	712,934	264,455	216,771	230,338
Gross (loss)/Profit	54,526	423,152	(52,514)	(49,312)	(27,445)
Net loss	(61,486)	329,007	(315,877)	(312,633)	(347,701)
Total equity	(109,775)	(98,935)	(820,865)	(318,647)	48,599
Total assets	444,488	490,137	597,061	412,944	396,280
Net current liabilities	(310,098)	(361,830)	(1,417,926)	(94,297)	(444,879)

A number of measures have been attempted and have yielded little improvement. It was not known at the time of the study why the CEC Africa Investments Limited's board and management had not considered open innovation as a way to increase revenue and enhance firm growth. As such, the purpose of the study was to explore the state of application of open innovation with a view to develop a framework for CEC Africa Investments Limited that could be employed to integrate open innovation opportunities into its operations to enhance firm growth. Business Management financing and investment behaviour of latecomer firms on the energy scene have not been a topic of interest, especially in Low Medium Income economies, such as Zambia. However, no research has systematically discussed the adoption capability of open innovation and the liquidity challenges that firms face in the context of open innovation. Given this state of affairs, it is not possible if CEC Africa Investment Limited would be in a position to take advantage of the current economic environment in Zambia to mitigate its current financial position and win competitive advantages.

Conceptual Framework

The assumptions being advanced in this study are that the CEC Africa Investment Limited ought to embrace open innovation (Box 1) in selected preferred types of investments for the fund to grow. Investments are taken as the immediate commitment of money (Bodie et al., 2007) not consumed but kept aside with a view to generating higher future income and/or increasing its innate value in the future to spur investments fund growth (Box 2) in the expectation of reaping future benefits irrespective of the form it takes. This Conceptual Model of Open Innovation focuses on the interaction between dimensions of open innovation and firm growth. The model is being used as a guide to structure the study. The assumptions are that if CEC Africa Investments Limited was to adopt open innovation (Box 1), where it could source ideas and solutions from external sources, in addition to relying on internal resources, to drive innovation there is likelihood of firm growth (Box 2).

Box 1

Box 2

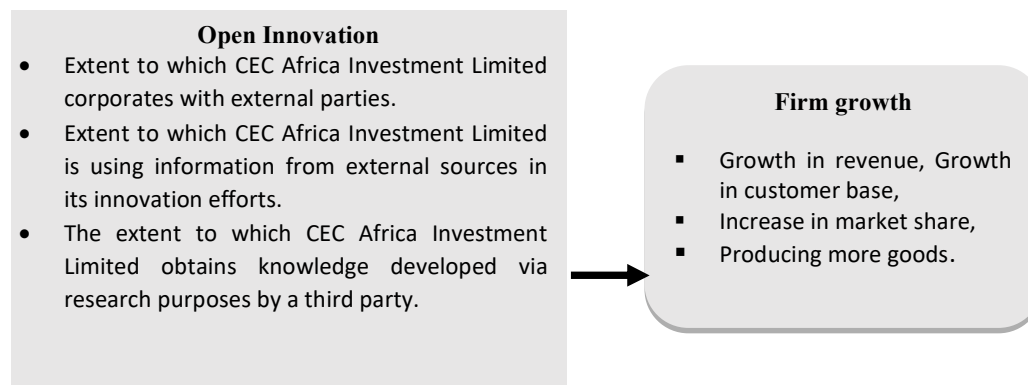


Figure 9: Conceptual Model of Open Innovation

Research gap

The review of literature shows that open innovation research regarding firms is mostly undertaken in Asia mainland, Europe and America and very little is done in Africa. From the previous empirical work, studies have only concentrated on the adoption of open innovation but have not discussed innovation influence on firm performance among large organizations (Lichtenthaler, 2008; Van de Vrande et al., 2009; Tian and Feng, 2010; Gumus and Cubukcu, 2011; Al Mulhim, 2021). There exists a paucity of studies that have been conducted to investigate open innovation adoption approaches and firm performance from a qualitative perspective and the available quantitative studies are in the framework of European and American firms (Mazzola et al., 2012; Cozzarin, 2004; Santos et al., 2014; Manogna and Mishra, 2021). Even though open innovation has been much researched, a grey area still exists concerning technological firms like CEC. Innovation practices, i.e. open innovation practices and a firm's growth, are related (Roper, 1997; Huang et al., 2010; Chesbrough and Crowther, 2006; Lee et al., 2015; Rayyes and Valls-Pasola, 2013). Previous researchers (Sisodiya et al., 2013; Lee et al., 2015; Wang et al., 2015; Zhang et al., 2016; Lopes et al., 2017) indicate that firms adopting open innovation practices achieve higher financial performance, improve the market value and build sustainable performance. While Choi et al. (2016) conclude that firms adopting open innovation practices negatively impact firm performance, Santos et al. (2014) neither confirms nor negates that innovation drives firm performance. It can be noted that these studies have not discussed the individual effect of inbound practices and outbound practices on firm performance. Hence, there is a clear need to investigate inbound and outbound open innovation approaches and firm performance.

The Research Focus

The case selection rationale allows a gain of concrete, contextual and in-depth knowledge about the subject of open innovation. CEC Africa Investments as the focal case study is rooted in both its influential stature within the Zambian energy sector. The company's eminence as a key player in the energy industry renders it a compelling and pertinent subject for analysis. This prominence creates a fertile ground for investigating the nuanced role that innovation plays in steering growth and cultivating sustainable progress. By probing the innovative landscape within the context of such a prominent player, this case study promises to yield insights

that resonate beyond the bounds of the organization itself, contributing to a broader understanding of how open innovation catalyses transformative financial sustainable development.

Research Design and Methodology

Given the dynamic and non-linear characteristics of open innovation, this study opts to employ a case study exploratory approach. Case study methods are well suited to study dynamic issues (Fu et al., 2018) like open innovation. Case studies are fitted to answer “how” and “why” questions (Yin, 1994) “what”, “why” and “how” questions (Blaikie, 2010).

Although exploratory phenomenological case study research suffers from low external validity (Bryman, 2001), it better enables us to understand the research question in this study. An exploratory case study helps construct substantive theories for an in-depth understanding analysis of the complex phenomenon related to open innovation. Second, a case design allows researchers to build a substantive model with a replication logic, with the case confirming or disconfirming inferences drawn from the others (Yin, 1994).

This was an existential phenomenological inquiry. Phenomenology is utilized to explore the lived experiences of individuals at CEC Africa Investments, providing in-depth understanding of their perceptions and interactions with open innovation practices. This approach is essential for capturing the essence of human experiences and ensuring that the findings reflect the genuine dynamics within the organization (Smith, 2013; van Manen, 2014).

Population and Sampling

The main departments in CEC Africa Investment Limited are finance and Administration. The eligible population for the study were only persons who have decision making positions at the level of policy formulation, monitoring and actualization. Therefore, 20 participants were enlisted using maximum variation purpose type of sampling. These individuals were selected based on the assumption that they possess knowledge and experience with the phenomenon of interest and thus were able to provide information that is both detailed (depth) and generalizable (breadth) (Njobvu and Mwanza, 2023).

Data Collection Process

Semi-structured, individual, in-depth interviews were conducted privately and anonymously with the participants. An unstructured interview was created to structure opening questions to direct the interviews. Individual interviews took place during the week after obtaining ethical approval. To avoid loss of information, all interviews were doubly audio-recorded for subsequent transcription and analysis (Green and Thorogood, 2014). At the same time, field notes of the highlights were taken. All the interviews started as follows, “From your point of view as a supervisor, how do you look at performance of CEC?” and they ended with the question “Is there anything else you would like to add?” The average duration of the individual interviews was approximately 30 min. Data collection stopped once all the individual interviews with eligible people were conducted. No problems were detected and no interviews needed to be repeated.

There interviews were conducted with key informants and these were CEC Africa Investments' executives and employees in management.

Data Analysis Methods

The data collected from interviews was analyzed using interpretive phenomenological analysis as well as will undergo content analysis (Braun and Clarke, 2006). Individual and group interviews were initially transcribed by another researcher (I.S.-H.). Using the ATLAS.ti 7.5 software, a hermeneutical unit was created for the grouping and analysis of these transcripts. The texts obtained were interpreted and encoded by the researcher through an adaptation of the 5 stages developed by Fleming and collaborators (2003), according to the research method and using the hermeneutical philosophy (Van Manen's, 1997; Braun and Clarke's, 2006). The different themes, subtopics and units of meaning identified were extracted inductively with the aid of the detailed analysis of the transcripts of the different interviews. Similarly, the study participants had the opportunity to review the

transcripts of their interviews to correct possible errors. To support the analysis of the obtained results, only the most relevant citations were considered.

Findings

The data collected has allowed for the study to categorize the experiences of our participants into themes, revealing how the process of open innovation is shaped by the interplay of individual, organizational, and contextual factors within the company. In our exploration, existential phenomenology has proven invaluable. It has enabled us to focus sharply on specific experiences related to open innovation, bringing them into sharper relief with detailed and nuanced descriptions. These descriptions are grounded in the robust evidence derived from the first-hand accounts of our participants, providing an understanding of the phenomena under study. The findings which appear in this chapter are informed by Gadamer's hermeneutical phenomenology, which uses the interpretation of the text as a tool to understand the experiences and expectations of the participants (Gadamer, 2007). To render an interpretation, the researcher uses citations from extant literature to amplify the narratives. The findings of this study were reported following the consolidated criteria for reporting qualitative research (COREQ) were followed (Tong et al., 2007).

These narratives from individuals directly engaged in shaping the open innovation practices at CEC Africa present perhaps the most potent data available, offering rich insights into the lived reality of enhancing firm growth through open innovation. We now present our findings structured around these five emergent themes, each elucidating different facets of developing an open innovation framework at CEC Africa. The findings are presented using research questions as organising tools.

Demographic Characteristics

Table 2 details the professional roles and departmental affiliations of 20 participants. By showcasing a range of departments such as finance, quality control, and corporate services, among others the table highlights the interdisciplinary perspectives included in the study. Understanding these demographic dynamics is crucial for evaluating how diverse departmental insights might influence or drive the adoption of open innovation practices within the company. This diversity can provide a multifaceted view of how open innovation could be integrated across different segments of the organization, reflecting on both the opportunities and challenges specific to each department.

Table 2: Demographic Characteristics of Respondents

Category	Sub-category	Number
Male		12
Female		8
Years Worked	0 – 4 years	6
	5 – 7 years	9
	8+ years	5
Department	Finance	5
	Management	8
	Other	7

The demographic characteristics of the respondents show a diverse group with 12 males and 8 females. The distribution of years worked indicates that 6 respondents have been with the company for 0 to 4 years, 9 have worked for 5 to 7 years, and 5 have over 8 years of tenure. The respondents come from various departments, with 5 in Finance, 8 in Management, and 7 in other departments. This demographic mix illustrates a well-rounded workforce with a balanced gender representation, a range of experience levels, and a variety of departmental backgrounds.

Table 3: Summary Gender Distribution and Experience Statistics

Gender	Number of Participants	Mean Years of Experience	SD of Years of Experience
Male	12	7.75 years	3.20 years
Female	8	7.00 years	3.16 years

Table 3 provides insights into the gender distribution and the depth of experience within the company. With details on the mean years of experience and the variability (SD) of tenure among male and female participants, the table highlights the extent of institutional knowledge and industry expertise available to contribute to discussions on innovation. The balance of gender and the spread of experience levels can affect how open innovation is perceived and implemented, as diverse experiences may lead to a richer variety of ideas and approaches to innovation. This understanding is essential for framing the development of an open innovation framework that is inclusive and considers varied viewpoints and experiences within the company.

Potential types of open innovations that CEC Africa Investments Limited could consider adopting

The study findings revealed that CEC Africa Investments Limited would consider not adopting out bound innovation but more of inbound innovation. Inbound innovation refers to the extent to which firms access technology or external resources available to complement existing resources. Participants believed that with this type of innovation, it would increase the options for new product development input and advances effective new product processes, both of which facilitate corporate performance. Of the four types of inbound innovation which are technology scouting, horizontal technology collaboration, vertical technology collaboration and technology sourcing, the most likely ones to be adopted are horizontal collaboration and vertical technology collaboration. Together branded as open collaborative innovation are strategies that combine internal behavioural efforts with external ideas, technologies, and expertise to drive innovation. They constitute a forward-thinking approach that can help organizations: develop cutting-edge solutions, address complex challenges, and accelerate growth.

Relating to horizontal technology collaboration CEC Africa staff spoke about opening the product development process for extending the collaboration with actors or partners outside the value chain of CEC Africa. Three items were possible for this construct, all of which address the practice of cooperating with other firms (competitors and/or non competitors), networking to exchange experiences/ knowledge with partners, and benefiting from important inputs from partners. By collaborating with Maposa Solar and CEC PLC, CEC Africa has a large pool of resources, knowledge and experience to venture into a new and developing market. Furthermore, knowledge from institutes such as University of Zambia and Copperbelt University will enhance creativity and innovation. The institutes will offer a fresh and outside perspective for CEC Africa which will intern improve efficiency and effectiveness.

Regarding vertical technology collaboration, CEC Africa staff spoke about stakeholder collaborations with customers and suppliers. Customers satisfaction can be achieved by understanding present and potential customer needs is essential in launching the solar project as this is a new product for CEC Africa. Furthermore, supplier relations are key to the development and distribution of the product.

Subtheme 1.1: Collaborative Innovation

Collaborative innovation involves engaging both internal and external stakeholders in the innovation process. This approach leverages a diverse range of perspectives and resources, which fosters a more comprehensive and effective innovation ecosystem. Respondents highlighted the significant potential of collaborative innovation in enhancing the company's capabilities. They pointed out that working with external experts and other companies brings fresh perspectives and crucial solutions that might not be available within the organization.

Participants emphasized that collaborative open innovation integrates internal efforts with external expertise, enhancing the overall innovation process. For instance, one respondent noted.

"Collaborative open innovation is the best type of innovation. It embraces both internal and external."

Another added,

"Working in conjunction with other companies to develop new products has shown great potential."

These insights reflect a strong belief in the power of collaboration to drive innovation and create value. Furthermore, the value of external partnerships was repeatedly stressed. Participants indicated that collaborating with external experts brings new ideas and approaches that can significantly benefit the company. For example, one respondent stated.

"We have found that collaborating with external experts brings fresh perspectives and solutions."

Another echoed this sentiment, saying,

"External partnerships have been crucial for our innovation strategies."

These quotes illustrate the perceived importance of collaborative innovation in leveraging external knowledge and capabilities to complement internal strengths.

Subtheme 1.2: Inbound Innovation

Inbound innovation focuses on integrating external knowledge and expertise into the organization. This approach allows CEC Africa Investments Limited to leverage innovations and insights from outside the company, thereby enhancing its internal capabilities and staying competitive in the market. Respondents emphasized the critical role of inbound innovation in maintaining a competitive edge and continuously improving the organization's processes and products.

Participants highlighted the importance of scanning the external environment to identify new opportunities and trends. This proactive approach ensures that the company remains aware of emerging innovations and can incorporate them into its operations. One respondent explained,

"Inbound open innovation helps us integrate external knowledge and expertise."

Another added,

"Constantly technology scouting allows us to stay ahead in innovation."

These statements highlight the necessity of being attuned to external developments to drive innovation within the company.

The incorporation of external expertise was also seen as a key benefit of inbound innovation. Respondents noted that bringing in external experts provides new insights and capabilities that enhance the company's internal operations. For example, one participant mentioned

"Bringing in external experts has provided new insights and capabilities."

Another stated,

"Looking outside our organization has helped us identify new opportunities and trends." With the current energy crisis in Zambia, there is market for expansion into solar energy products.

These quotes reflect a recognition of the value that external knowledge and expertise can bring to the organization's innovation efforts.

Investing in renewable energy projects emerged as a strategic priority that offers long-term sustainability and new growth opportunities for CEC Africa Investments Limited. Respondents highlighted the importance of exploring green energy markets, such as biodiesel and solar, which present new avenues for growth and align with global trends toward sustainability.

Participants consistently emphasized that investments in renewable energy are crucial for the company's strategic development. One respondent noted.

"Investing in renewable energy projects has been a strategic priority for growth."

Another added,

"Our focus on renewable energy investments is aimed at long-term sustainability."

These statements reflect a strong belief in the potential of renewable energy projects to drive growth and ensure the company's sustainability.

Moreover, the exploration of green energy markets was seen as an important opportunity for the company. Respondents pointed out that identifying and capitalizing on opportunities in green energy is essential for the company's future growth. For example, one participant stated,

"Exploring green energy markets like biodiesel and solar presents new growth avenues." Another echoed this sentiment, saying, "Identifying opportunities in green energy has been key to our innovation strategy."

These insights highlight the strategic importance of renewable energy projects in the company's growth plan.

Motives and circumstances for Not Embracing Open Innovation

With reference to research question number two which is "Why has CEC Africa Investment Limited not embraced in open innovation?" This question is linked to what could be considered as illuminating inhibitors of open innovation. This is where motives and circumstances surrounding open innovation adoption can be presented.

There are a number of determinants that have prevented CEC Africa Investments Limited from fully embracing open innovation. The primary reasons are system and personal based determinants, as detailed in Table 3.

Subtheme 2.1: System based determinants

CEC Africa has no framework in place for open innovation and this has played a significant role in limiting the company's ability to adopt open innovation strategies. Furthermore, the organization has been heavily focused on debt restructuring and achieving financial stability, which has taken precedence over innovation initiatives.

Respondents indicated that the pressing need to stabilize the company's finances has limited the resources and attention available for pursuing open innovation.

Participants consistently highlighted that debt restructuring has been a top priority due to the financial challenges faced by the company.

One respondent remarked, "Debt restructuring has taken precedence over innovation initiatives."

Another echoed this sentiment, stating, "Our financial challenges have made it difficult to focus on open innovation."

These statements reflect the company's focus on resolving immediate financial issues before investing in innovation efforts.

Moreover, ensuring financial stability has been a critical focus, which has further constrained the company's capacity to engage in innovative activities. Respondents emphasized that stabilizing the company's finances has been essential to its survival and has thus taken precedence over innovation.

For example, one participant noted, "Ensuring financial stability has been our main focus, limiting resources for innovation." Another added, "Stabilizing our finances has been critical, pushing innovation efforts to the background."

These insights illustrate how the necessity to achieve financial stability has overshadowed the potential benefits of adopting open innovation strategies.

Subtheme 2.2: Personal based determinants

Another limiting reason for not embracing open innovation is reduced motivation of employees. This is because financial stability has taken precedence. Despite, management's efforts to promote participation by collecting ideas internally, many ideas are not explored due to financial constraints. This has been demotivating the employees as their concentration is on financial stability.

One respondent highlighted that "employees are in constant survival mode; it becomes difficult to explore any innovative ideas."

Framework for Open Innovation

Developing a framework for open innovation at CEC Africa Investments Limited involves several key components: change management, training and communication, and collaboration with external experts. These elements are essential for fostering an innovative culture and ensuring the successful implementation of open innovation practices, as detailed in Table 4.

Subtheme 4.1: Change Management

Effective change management is vital for successfully integrating open innovation practices within the organization. Respondents stressed the importance of adapting the change management process to accommodate and support new innovation initiatives. They highlighted that a well-managed change process is crucial for ensuring that innovative strategies are effectively adopted and sustained.

Participants emphasized that adapting the change management process is necessary to facilitate the integration of new practices. One respondent noted, "Adapting our change management process is vital for successful innovation." Another added, "Effective change management is crucial for integrating new innovation practices." These statements reflect the recognition that change management is a critical component of implementing open innovation.

The focus on change management stresses the need for a structured approach to manage the transitions associated with innovation. By ensuring that change is managed effectively, CEC can create a supportive environment that fosters innovation and minimizes resistance to new practices.

Subtheme 4.2: Training and Communication

Training and communication are also critical components of the open innovation framework. Informing and training employees about innovation processes is essential to foster an innovative culture within the organization. Continuous communication and training ensure that employees are well-equipped to participate in and contribute to innovation efforts.

Participants highlighted the importance of training and informing employees about innovation processes. One respondent stated, “Training and informing employees about innovation processes is essential.” Another remarked, “Continuous communication and training are key to fostering an innovative culture.” These quotes underscore the necessity of equipping employees with the knowledge and skills needed to support innovation.

Effective communication and training programs help to build an understanding of and commitment to innovation among employees. By providing regular updates and education on innovation initiatives, the company can ensure that employees are engaged and actively involved in the innovation process.

Subtheme 4.3: Collaboration with External Experts

Collaboration with external experts is deemed essential for enhancing the innovation efforts of CEC Africa Investments Limited. Seeking expertise from outside the organization brings valuable knowledge and skills that can significantly boost the company's innovation capabilities. Respondents emphasized that external collaboration has been instrumental in their innovation strategies, providing new perspectives and capabilities that drive the company's growth and development.

Participants consistently noted the importance of collaborating with external experts. One respondent mentioned, “Collaborating with external experts brings valuable knowledge and skills.” Another added, “Seeking external expertise has been instrumental in our innovation efforts.” These statements reflect the perceived value of external collaboration in enhancing the company's innovation capacity.

The inclusion of external experts in the innovation process allows the company to leverage specialized knowledge and innovative practices that may not be available internally. This collaborative approach can lead to the development of more effective and impactful innovation strategies.

Table 4: Themes, subthemes, meaning units and representative quotes

Themes	Subthemes	Meaning Units	Representative Quotes
1. Types of Open Innovation Adopted	1. Collaborative Innovation	1. Embraces both internal and external	“Collaborative open innovation is the best type of innovation. It embraces both internal and external.” “Working in conjunction with other companies to develop new products has shown great potential.”
		2. Expertise from outside	“We have found that collaborating with external experts brings fresh perspectives and solutions.” “External partnerships have been crucial for our innovation strategies.”
	2. Inbound	1. Getting expertise from	“Inbound open innovation helps us integrate external knowledge and expertise.” “Bringing in external experts has provided new insights and

	Innovation	outside	capabilities.”
		2. Scouting	“Looking outside our organization has helped us identify new opportunities and trends.”
Ideal to enhance business growth	1. Renewable Energy Projects	1. Investment in renewable energy	“Investing in renewable energy projects has been a strategic priority for growth.” “Our focus on renewable energy investments is aimed at long-term sustainability.”
		2. Green energy market opportunities	“Exploring green energy markets like biodiesel and solar presents new growth avenues.” “Identifying opportunities in green energy has been key to our innovation strategy.”
2. Motives for Not Embracing Open Innovation	System based	1. Debt restructuring as a priority	“Debt restructuring has taken precedence over innovation initiatives.” “We have faced significant financial constraints that hinder our ability to innovate.” “Lack of funds has been a major barrier to pursuing open innovation strategies.”
		2. Financial stability priority	“Ensuring financial stability has been our main focus, limiting resources for innovation.” “Stabilizing our finances has been critical, pushing innovation efforts to the background.”
	2. Personal based	1.Lack of employee motivation	“Our financial challenges have made it difficult to focus on open innovation.”
3. Framework for Open Innovation	1. Change Management	1. Adapt change management process	“Adapting our change management process is vital for successful innovation.” “Effective change management is crucial for integrating new innovation practices.”
	2. Training and Communication	1. Inform employees and training	“Training and informing employees about innovation processes is essential.” “Continuous communication and training are key to fostering an innovative culture.”
	3. Collaboration with External Experts	1. Seek expertise from outside	“Collaborating with external experts brings valuable knowledge and skills.” “Seeking external expertise has been instrumental in our innovation efforts.”

Discussion of findings

The study explored the experiences and perceptions of CEC Africa Investments Limited employees regarding the potential types of open innovation that they considered adopting and ideal for firm growth as well as the why the firm has not embraced open innovation.

The types of open innovation adopted, revealed two primary types that CEC Africa Investments Limited would consider: collaborative innovation and inbound innovation. This approach aligns with findings from Sood (2020), where the benefits of collaborative efforts in promoting learning and balancing diverse stakeholder demands in the biotechnology industry. Participants in this study noted that working with external experts brings fresh perspectives and crucial solutions, reflecting a strong belief in the power of collaboration to drive innovation and create value. Similarly, Liu (2021) found that collaborative innovation in equipment and technology suppliers to the US forest sector significantly enhanced their innovation strategies. By using horizontal technology collaboration, CEC Africa can partner with competing and complementing companies in an effort to expand knowledge outside its core expertise. Vertical technology collaboration promotes partnerships with suppliers, present and potential customers as well end users. This will help CEC Africa to understand the customers' needs as they consider launching new products.

Inbound innovation, which focuses on integrating external knowledge and expertise into the organization, was seen as critical for maintaining a competitive edge. This approach is supported by Mahe (2020), who found that raising awareness about the advantages of open innovation was crucial for technological SMEs. Respondents in our study stressed the importance of scanning the external environment to identify new opportunities and trends, which resonates with Nathalie Becker and Nilsson (2020), who highlighted the importance of proactive environmental scanning in managing open innovation for sustainable product development. By technology scouting, CEC Africa can actively search and identify emerging technologies outside its organization and licensing opportunities with academic, government or nonprofit partners. This strategy can benefit CEC Africa as it is low cost and high return. Technology sourcing allows CEC Africa to acquire technology through collaboration or purchasing. By investing in an already established organization, they have an already established market.

The resources for not embracing open innovation, identified several barriers, including system and personal based. System based barriers include unclear goals for open innovation and financial constraints, particularly the focus on debt restructuring and achieving financial stability, have taken precedence over innovation initiatives. This is consistent with findings from Riihimäki (2020), who identified financial barriers and the fear of sharing confidential knowledge as significant obstacles in open innovation practices within emerging markets. Respondents in our study highlighted that the pressing need to stabilize finances has limited resources available for innovation, mirroring the challenges faced by firms in the Norwegian finance sector, as noted by Mathisen and Merok (2019).

Moreover, insufficient funds have significantly hindered the adoption of open innovation. One respondent mentioned, "We have faced significant financial constraints that hinder our ability to innovate." This finding aligns with Sadreddin (2015), who found that financial stability was prioritized over innovation in the nanotechnology industry, particularly among SMEs. The impact of these organizational barriers is significant, as they limit the company's capacity to explore and implement innovative strategies. This constraint is further supported by Gasmann (2016), who emphasized that startups in Norway incorporated elements of open innovation only when financial stability allowed.

Personal based barriers include lack of motivation of the employees as all their efforts have been concentrating on financial stability of the firm.

CEC Africa can integrate open innovation opportunities in its operation by setting clear objectives for incorporating open innovation. By developing a plan to overcome the financial constraints, CEC Africa can thrive to get financially stable. CEC Africa can incorporate inbound open innovation strategies such as technology scouting and sourcing. Due to the limited resources, technology scouting can be applied as it is low cost and high return. CEC Africa can begin by employing a dedicated or part time staff to search for licensing opportunities relevant to its interests. Furthermore, by creating an online hub where creative ideas can be shared

opens up a larger pool of ideas that can be considered. CEC Africa can also adopt collaborative strategies such as vertical and horizontal technology. These strategies will allow CEC Africa to work with competitors and complementing firms such as ZESCO, CEC Plc and Maposa Solar to expand into new markets by leveraging on each other's strengths. By including customers in the innovative process, CEC Africa can understand customers' needs better therefore assisting them to develop innovative products that meet the customers' needs. Incorporating these open innovation strategies will assist CEC Africa to create a new customer base which would increase the cash inflows.

Transparently incorporating open innovative strategies through open communication encourages the employees to embrace open innovation. CEC Africa can encourage continuous learning of employees, motivation by reward system and partnerships with the organization to drive innovative growth within the firm. change management, training and communication, and collaboration with external experts. Effective change management was seen as vital for successfully integrating open innovation practices, consistent with findings from Mahe (2020), who highlighted the importance of structured change processes in SMEs. Respondents in our study highlighted the need to adapt change management processes to support new innovation initiatives, reflecting the critical role of change management in fostering innovation, as also emphasized by Sadreddin (2015).

Training and communication were also identified as essential for fostering an innovative culture. This aligns with findings from Sood (2020), that continuous communication and training were key to building an understanding of and commitment to innovation among employees in the biotechnology industry. Respondents noted the importance of informing and training employees about innovation processes, mirroring strategies adopted by firms in the technological and equipment sectors, as noted by Liu (2021).

As such, this section covers the overarching research question which is "How can CEC Africa Investments Limited integrate open innovation opportunities into its operations?" This is demonstrable by develop a framework for CEC Africa Investments Limited that could be employed to integrate open innovation opportunities into its operations to enhance firm growth. In essence a constructive approach falling within functional pragmatism is used. Functional pragmatism according to allows the researcher to be a bricoleur to create a bricolage that could be used to transform human behaviour. In order to construct the framework, it would require using a hypothetical deductive strategy of working through the data and building what it ought to be done as a way forward. This is demonstrated in Figure 2.

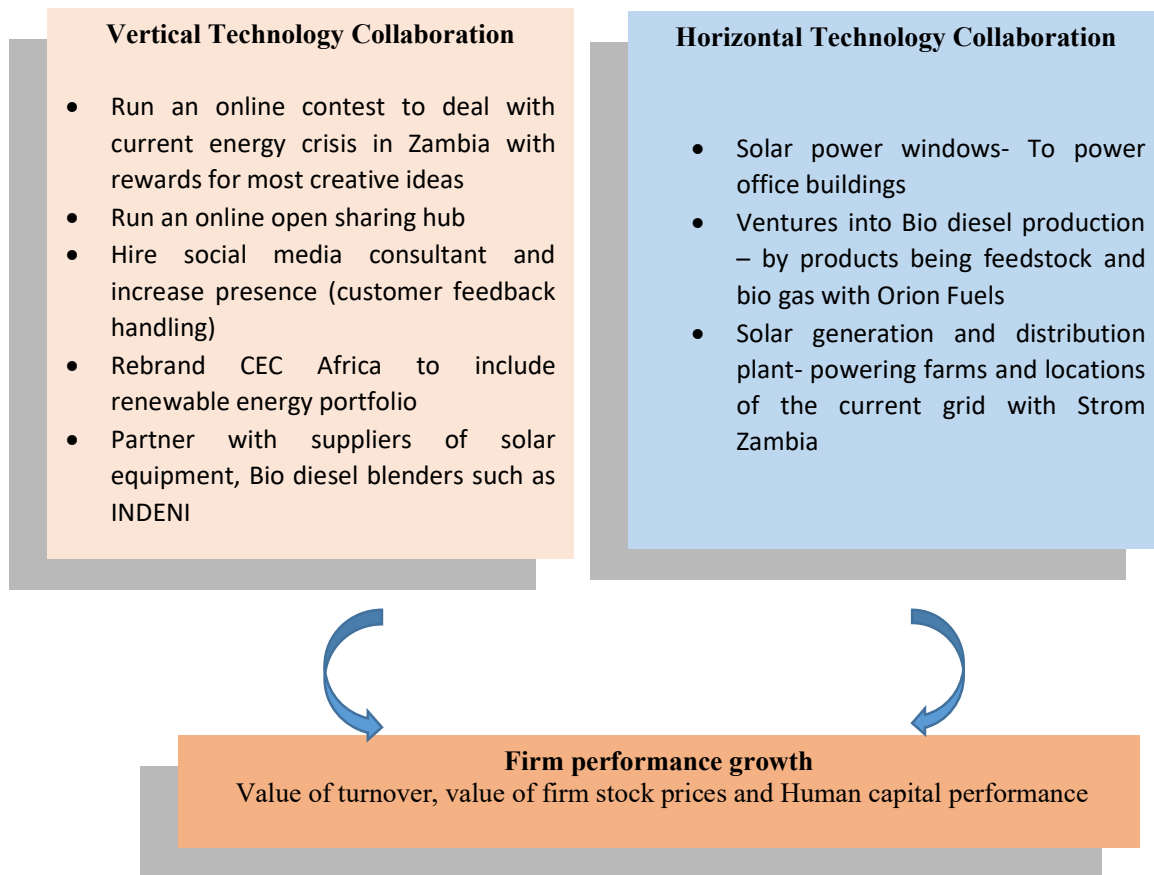


Figure 2: Open Innovation Framework for CEC Africa Investments Limited

Limitations and Significance of the study

This study has made an effort at contributing to the literature in open innovation management in a power distribution firm by advancing knowledge regarding circumstances and motives for not embracing open innovation. Although our study has attempted to fill the research gap, it has a number of limitations to take note of like all research. Though some studies have stressed the importance of collaboration between industry and academia line the University of Zambia and Copper belt University as suggested in this study, there is a need to study the impact of these collaborations in greater detail. The present study is confined to a hydro power supply industry. There is a possibility that innovation practices are more among firms that have memorandum with NORTEC, ZESCO, CBU and Technology Business Incubators attached to the universities. Hence, a study on innovation practices on these institutions will help understand the innovation ecosystem more clearly. The study is limited to CEC. Also, the sampling method is a limitation of the study for the generalization of results. Hence, this study needs to be replicated in ZESCO before results can be generalized.

However, in spite of the limitations, this study is significant for the unique contributions and the following are noted:

- 1) From a theoretical perspective, this study contributes substantially to the advancement of innovation research within emerging markets. While innovation has been extensively scrutinized in developed economies, the intricate dynamics of innovation within emerging markets, particularly within the African context, remain largely unexplored. The examination of CEC Africa's case offers a unique vantage point to delve into innovation strategies, challenges, and outcomes within a critical sector—the energy industry—set against the backdrop of an emerging market. By dissecting the complexities of innovation within this context, the study enriches prevailing theoretical frameworks and cultivates a more nuanced comprehension of the role of innovation within diverse socio-economic landscapes (Smith et al., 2020).
- 2) Shifting to practical implications, the findings of this study bear significant relevance for businesses operating in emerging markets. The trajectory of CEC Africa becomes a valuable blueprint, illustrating how innovation can be effectively navigated and harnessed within the confines of an emerging economy. The analysis of strategies, obstacles, and accomplishments of CEC Africa empowers other enterprises in Zambia and analogous contexts to extract lessons and best practices, thereby shaping their own innovation pursuits. The insights from this study offer pragmatic guidance for companies as they navigate the distinct socio-economic, regulatory, and technological challenges of emerging markets, consequently fostering more impactful and sustainable innovation practices (Gupta and Singhal, 2019).
- 3) The societal impact of this study is particularly pronounced within the context of the Zambian energy sector. This sector serves as a linchpin for economic progress and national development. By delving into the innovation strategies of CEC Africa, this research provides policymakers with valuable insights to leverage innovation in addressing energy-related predicaments, stimulating economic growth, and enhancing overall societal well-being. The findings inform the formulation of policies that stimulate innovation, attract investments, and contribute to the sustainable advancement of the energy sector and broader socio-economic objectives (Bhattacharyya and Palit, 2019). Ultimately, the study aligns harmoniously with Zambia's developmental aspirations, actively contributing to the nation's journey toward a more sustainable and prosperous future.
- 4) Furthermore, the implications of this study have the potential to transcend sectoral boundaries and inspire knowledge dissemination and cross-industry learning. The insights derived from the case of CEC Africa can reverberate across industries beyond energy, inspiring innovative practices. Given that innovation is a pivotal driver of growth across various sectors, the study's outcomes possess the capacity to permeate multiple domains, fostering a culture of continuous enhancement and adaptability (Rothwell, 2018).

Implications

The researcher believes that this study would be of interest for both scholars and practitioners. For researchers, the paper provides the basis for overcoming current limitations of OI studies in Zambia in evaluating the relationship between openness and performance.

For managers and the board, the researcher would argue that the choice in investing on development of intangibles versus acquisition leads to similar positive results in terms of economic performance, although it seems that the latter is marginally more effective than the former. In contrast, such investments do not directly affect other dimensions such as financial and human capital performance, although the researcher sees a marginally significant lagged effect of development on employment as CEC may not be at liberty to employ because of the social political economy surrounding quasi-institutions in Zambia.

Recommendations

Based on the findings of this study, the following policy recommendations are proposed to support CEC Africa Investments Limited in effectively adopting open innovation and enhancing firm growth:

- 1) Develop a Dedicated Innovation Fund- Establish a dedicated fund specifically for financing innovation projects within CEC Africa Investments Limited. This fund should be managed independently to ensure

- that resources are allocated efficiently and transparently to support both collaborative and inbound innovation initiatives.
- 2) Implement Innovation Training Programs- Mandate comprehensive training programs for employees at all levels to foster an innovative culture within the organization. These programs should cover the principles of open innovation, change management, and the practical application of new technologies and processes.
 - 3) Establish Strategic Partnerships- Create policies that encourage and facilitate strategic partnerships with external experts, research institutions, and other organizations. These partnerships should be aimed at co-developing innovative solutions and sharing best practices.
 - 4) Streamline Operational Efficiency- Implement policies to adopt a lean operating structure, including measures such as debt conversion to equity and cost reduction strategies. These policies should aim to enhance operational efficiency and free up resources for innovation activities.
 - 5) Enhance Communication and Transparency- Establish policies to ensure continuous communication and transparency regarding innovation initiatives. This includes regular updates on innovation progress, open channels for employee feedback, and transparent reporting on the impact of innovation projects.
 - 6) Monitor and Evaluate Innovation Outcomes- Develop a framework for monitoring and evaluating the outcomes of innovation initiatives. This policy should include the establishment of key performance indicators (KPIs) for innovation, regular assessments, and adjustments based on feedback and performance data.
 - 7) Support Legal and Regulatory Frameworks- Advocate for supportive legal and regulatory frameworks that facilitate open innovation. This could involve engaging with policymakers to reduce bureaucratic barriers, protect intellectual property rights, and ensure compliance with industry standards.
 - 8) Encourage Cross-Departmental Collaboration- Implement policies that encourage cross-departmental collaboration within the organization. This can be achieved through the creation of interdisciplinary innovation teams, regular innovation workshops, and collaborative projects that leverage diverse expertise and perspectives.

Conclusion

In this study, we explored the concept open innovation with a view to develop a framework for CEC Africa Investments Limited that could be employed to integrate open innovation opportunities into its operations to enhance firm growth. More specifically CEC Africa Investments Limited could enhance its current state of performance by embracing collaborative open innovation. The anticipated positive effects of the inbound activities, thus, highlight the link between such activities and innovative performance in the context of increasingly open innovation processes. Altogether, these findings deepen what could change from what was not known of previously especially the losses. The findings are particularly relevant in light of the board and managers to

understand the enablers of and barriers to successful inbound open innovation activities. However, when making the choice as to which open collaborative open innovation activity CEC Africa Investments Limited could employ, the present study provides a model depicted in Figure 5.1. The empirical findings have provided strong support for the importance of outsiders in enhancing performance.

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