IIMBG Journal of Sustainable Business and Innovation

Sustainable energy consumption in African higher institutions of learning: the nexus of top management commitment and institutional pressures

Received 25 October 2023
Revised 8 May 2024
Accepted 23 July 2024

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Abstract

Purpose – This study investigates the nexus of top management commitment and institutional pressures towards enhancing sustainable energy consumption in African Higher Institutions of Learning.

Design/methodology/approach – Using a structured questionnaire survey, cross-sectional data collected from 64 higher institutions of learning registered with the Uganda National Council for Higher Education were analyzed using the Statistical Package for Social Sciences (SPSS).

Findings – The findings revealed that top management commitment and institutional pressures individually associate with sustainable energy consumption. Top management commitment does not cause variations in sustainable energy consumption. However, when top management commitment coalesces with institutional pressures, they significantly predict sustainable energy consumption.

Research limitations/implications – The current study focuses on Higher Institutions of Learning in Uganda. Hence caution should be taken before generalization of findings. This study therefore sets ground for future studies to investigate sustainable energy consumption in other institutions.

Originality/value – This study tests the efficacy of top management commitment and institutional pressures on sustainable energy consumption using evidence from African Higher Institutions of Learning. It provides new directions for study in such a nascent area of critical national dimension as sustainability and climate change issues top the global agenda.

Keywords Top management commitment, Institutional pressures, Sustainable energy consumption, Higher educational institutions

Paper type Research paper

The authors are grateful to the MUBS NORAD Project for supporting research in Energy Economics and Governance. We also would like to appreciate the anonymous reviewers, editor and editorial team for the comments that helped improve this article.

IIMBG Journal of Sustainable Business and Innovation
Emerald Publishing Limited
2753-4022
DOI 10.1108/IJSBI-10-2023-0049

1. Introduction

Energy consumption has factored into the global development agenda (Huang & Huang, 2022). Thanks to the international focus on climate change and sustainability. In the African setting, even in institutions of higher learning where knowledge is the key domain, energy consumption has been seen largely as a cost issue, not a sustainability factor. Sustainable energy consumption remains important to improving the quality of life, reducing emissions, increasing the productivity of institutions, reducing energy costs, and preventing depletion and extinction of resources domicile in how the current energy supply is consumed (IEA, 2017; Harjanne & Korhonen, 2019; Henshaw, 2019). These benefits have made sustainable energy become a decision point. There is, however, scanty empirical evidence as well as literature in Uganda and elsewhere in Africa on the nexus of top management and institutional pressures on energy consumption. The choice to study higher institutions of learning was to bridge this knowledge gap as they provide a context where knowledge that guides development is generated. There have also been targets of government pilot projects.

The Government of Uganda also developed agendas to achieve sustainable energy consumption. In particular, the National Appropriate Mitigation Action (NAMA) for Integrated Sustainable Energy Solutions for institutions, the Uganda Energy Credit Capitalization Company that offers funds for promoting renewable and efficient energy consumption in institutions (households and schools). In addition, the Kampala Climate Change Action Strategy (2015) that emphasizes mitigating greenhouse gases, rational energy use and energy efficiency.

Despite the programs toward achieving sustainable energy consumption, most institutions are still reliant on unsustainable energy. Literature is replete with studies on sustainable energy, but no study has investigated sustainable energy consumption exploring the nexus of top management commitment and institutional pressures from the perspective of African Higher Institutions of Learning. Therefore, the current study fills this void using a questionnaire survey of 64 higher institutions of learning registered with the Uganda National Council for Higher Education. The results revealed that top management commitment and institutional pressures individually associate with sustainable energy consumption but coalesce to predict sustainable energy consumption.

This study therefore contributes to extant literature on sustainable energy consumption by offering original empirical evidence on the role of top management commitment and institutional pressures to sustainable energy consumption in African Higher Institutions of Learning. The study is important to energy policymakers in Uganda. The policymakers including the Ministry of Energy and Mineral Development should ensure that top managers in institutions of higher learning present energy plans, monitoring and controlling mechanisms for sustainable energy use. In addition, the Ministry of Education through the National Council for Higher Education should exert pressure on Higher institutions of Learning to comply with sustainable energy consumption guidelines.

The remainder of the paper is as follows: Section 2 provides the theoretical underpinning and Section 3 provides the conceptual analysis. The research methodology is provided in Section 4. The study results are provided in Section 5 and the discussion in Section 6. Section 7 provides the conclusion, Section 8 presents the implications and finally, Section 9 presents study limitations and areas for further research.

2. Theoretical underpinning

Two theoretical frameworks, the institutional and upper echelons theories were chosen to anchor this study. These interface at different levels of the organization. The Institutional theory factors into how organizations internally and externally respond to environmental contingencies. In addition, the upper echelons theory explains how managers shape the strategic direction of their organizations.

2.1 Institutional theory

According to the Institutional Theory, institutions work as forces upon which individuals and organizations conform to by creating social pressures and restrictions, setting boundaries for what is accepted and what is not (DiMaggio & Powell, 1983; Bagire, Arinaitwe, Kakooza, & Aikiriza, 2024). These forces are categorized into normative, coercive and mimetic pressures (DiMaggio & Powell, 1983; Davidsson, Hunter, & Klofsten, 2007; DiMaggio & Powell, 2000). Normative pressures originate from professionalism, coercive derive from powerful organizations while mimetic stem from uncertainty. These pressures shape organizations' work processes (DiMaggio & Powell, 1983; Wijethilake, Munir, & Appuhami, 2017; Tukamuhabwa, Mutebi, & Ojok, 2023; Bagire *et al*., 2024). For example, professional values regarding sustainability stimulate energy consumption behaviors. Coercive pressures from powerful organizations for example, ministry of Energy and Mineral Development, National Environment Management Authority and National Council for Higher Education may compel higher institutions of learning to consume energy sustainably. Regarding mimetic pressures, actions of competitors influence organizations to modify work methods (Wang, He, Xia, Meng, & Wu, 2018).

2.2 Upper echelons theory

Hambrick and Mason (1984) postulated that senior managers are the central players in building, structuring and organizing the resources that provide a maximum advantage. They further argue that organizational choices reflect the top management's values and cognitive bases. Thus, the positive beliefs of top managers about the usefulness of sustainable energy consumption result in positive managerial actions. In addition, Upper echelon theory suggests that executives' experiences, values and personalities greatly influence their interpretations of the situations they face and, in turn, affect their choices (Dubey, Gunasekaran, Childe, Papadopoulos, Hazen, & Roubaud, 2018). Ilyas, Hu, and Wiwattanakornwong (2020) posited that top management background, experience and personality play an important role in organization outcomes and practices. Therefore, this paper advances that top managers' belief in sustainability determines energy choices in institutions of higher learning. In addition, top managers' practices such as rewarding efficient actions, and establishing internal energy policies and targets play a role in the sustainable energy consumption of an institution.

3. Conceptual analysis

3.1 Energy consumption

Energy consumption involves determining the available alternatives and emergency energy plans of the organization (Prasad, Sheetal, Venkatramanan, Kumar, & Kannojia, 2019). For instance, the consumption of cost saving energy alternatives such as renewable energy.

The energy sector plays a pivotal role in the development of a nation particularly through energy resource planning (Prasad, Bansal, & Raturi, 2014). Energy planning refers to the roadmap for meeting the energy needs of an entity or nation with due consideration of the multiple factors surrounding the energy within a given nation (Solangi, Tan, Mirjat, & Ali, 2019). On the other hand, sustainable energy planning relates to the man-made long-range policies which use the available resources to meet the energy needs of an individual or entity or organization while preserving the environment for the foreseeable future of a local, national, regional and globe at large (Abdullah & Najib, 2016). Additionally, Strielkowski, Lisin, and Astachova (2017) suggested that sustainable energy planning necessities the planning team to determine how much energy is demanded and how much energy is supplied. This was also emphasized by Prasad *et al.* (2014) that sustainable energy planning is dependent on smooth and uninterrupted energy supply and demand. In addition, Hussain Mirjat *et al.* (2018) postulated that the energy planning process is paramount to handling sustainability concerns. It involves identifying efficient supply options, minimum cost solutions, reliable to meet the

present and future energy demands and environmentally sensitive. It focuses on optimal energy mix to meet the demand considering economic, technical, environmental, social, risk, uncertainty and political stability while Kumar *et al.* (2017) posited that an adequate planning system is essential to overcome rising energy demand with a vision of sustainable development. According to Bush and Bale (2019) energy planning tools are essential toward shift to low carbon energy. Planning reduces the overall annual cost of energy through the maximization of the overall system efficiency. In addition, Ervural, Zaim, Demirel, Aydin, and Delen (2018) posited that energy planning involves checking alternative energy strategies and developing long-range policies that guide the future of local, national, regional and global energy systems. This agrees with Silva and Nasirov (2017) who stated that energy planning facilitates development of an energy matrix to handle environmental concerns as well as challenges associated with high energy demand and dependence on fossil fuels. Prasad *et al.* (2014) had confirmed that energy planning is a roadmap for meeting the energy needs of a nation and is accomplished by considering multiple factors such as technology, economy, environment and the society that impact the national energy issues.

3.2 Top management commitment

Top management commitment in this study is conceptualized as top management beliefs and practices (Banerjee, Iyer, & Kashyap, 2003; Rodríguez, Pérez, & Gutiérrez, 2008; Zhang, Wei, & Zhou, 2018). Liang, Saraf, Hu, and Xue (2007) and Dubey *et al.* (2017) conceptualized top management commitment as top management beliefs and top management participation. Where top management beliefs relate to subjective psychological state regarding the potential of enterprise resource planning while top management participation relates to behavior and actions performed to facilitate enterprise resource planning. Also, Tzempelikos (2015) explained it as a demonstration of top management's belief in the importance of key account management.

According to Wang and Liu (2019), top management commitment can be measured as commitment from the senior managers and cross-functional cooperation for environmental improvement. Wang *et al.*'s study introduced the aspect of cooperation as an aspect of top management commitment. Relatedly, Colwell and Joshi (2013) conceptualized top management commitment as an emotional commitment, conviction, intention or a strong attitude toward pursuing a goal in terms of commitment to reform and capacity for change. This resonates well with previous scholars Tan and Abdul-Rahman (2008) who posited that management commitment is the dedication by the management toward certain matters. Based on the aforementioned, top management commitment is conceptualized as top management practices and top management beliefs. This is well articulated in Arinaitwe, Bagire, Tukamuhabwa, and Sulait (2024) indicating that top management commitment manifests in top management participation, support and beliefs. Therefore, the current study advances that in the context of sustainable energy consumption in higher institutions of learning, aspects of cooperation (Wang *et al.*, 2018), participation (Dubey *et al.*, 2018) and support (Liang *et al.*, 2007; Arinaitwe *et al.*, 2024) represent top management practices that enhance sustainable energy consumption. In addition, strong attachment, conviction and attitude (Meyer & Allen, 1997; Colwell & Joshi, 2013; Tzempelikos, 2015) represent top managers' beliefs that stimulate sustainable energy consumption.

3.3 Institutional pressures

According to DiMaggio and Powell (1983), institutional pressures are engines of isomorphism in organizations. DiMaggio and Powell (1983) describe institutional pressures as coercive, normative and mimetic that influence the behavior of organizations. Indeed, DiMaggio and Powell (2000) posit that institutional pressures catalyze change among organizations through normative, coercive and mimetic mechanisms (DiMaggio & Powell, 1983; Davidsson *et al.*, 2007; Bagire *et al.*, 2024). For instance, organizations change work conditions and processes

to conform to social norms (Zhang *et al.*, 2018). Regarding coercive pressures, organizations change behavior due to demands of powerful agencies (Wijethilake *et al.*, 2017; Tukamuhabwa *et al.*, 2023; Bagire *et al.*, 2024). Likewise, mimetic pressures encourage imitation of best-in class rivals (Bananuka, Bakalikwira, Nuwagaba, & Tumwebaze, 2021; Tukamuhabwa *et al.*, 2023; Bagire *et al.*, 2024). Studies linking institutional pressures to sustainability actions are evident (Jain, Choudhary, Panda, Jain, & Dey, 2023). Notably, existing studies such as Jain *et al.* focused on the sustainability performance of the oil and Gas sector in India. Studies in the Ugandan context like (Kaawaase, Bananuka, Tumwebaze, & Musimenta, 2022) indicate that government regulations promote sustainable practices in manufacturing firms. A recent study (Bagire *et al.*, 2024) found that institutional pressures determine the energy orientation of institutions but did not investigate the nexus between top management commitment and institutional pressures.

3.4 Top management commitment, institutional pressures and sustainable energy consumption

Sustainable energy consumption is dependent on a trade-off between energy supply and energy demand (Strielkowski *et al.*, 2017). Sustainable energy consumption remains vibrant to reach the global need of sustainable energy for all, reduced carbon emissions and reduced financial burden (Prasad *et al.*, 2019). Energy consumption involves defining available alternatives and energy plans of the organization. Every school needs to precisely clarify its cardinal purposes for energy installation; for lighting, cooking, heating, teaching, etc. Abdullah and Najib (2016) suggested that the sustainable energy consumption output is to determine an energy sustainability framework tailored to meet an institution's energy needs. Understanding the types of energy required by the school is of paramount importance while analyzing the environment, economic and social sustainability of the energy, i.e. solar, wind, oil and hydropower (Strielkowski *et al.*, 2017).

Neves and Leal (2010) argued that the sustainable development criterion includes environmental, economic and social. Environmental criterion includes the reduction of greenhouse gas (GHG) emissions, air pollution and depletion of natural resources which are caused by limited or inefficient supply chain and inefficient energy use. Economic criterion includes the reduction of fossil fuel dependence and an increase in local investment in renewable energy (RE) and energy efficiency projects that generate business and wealth. Social criterion includes the improvement of Fairness and Justice, human health safety and improvement, the creation of jobs, greater comfort and the involvement of citizens in decision-making processes (Prasad *et al.*, 2014). Studies such as Neves and Leal (2010) suggest replacing centralized energy systems with a decentralized energy management approach to harness sustainability benefits. Qudrat-Ullah, Akrofi, and Kayal (2020) confirmed that sustainable energy consumption is largely centralized limiting involvement of economic actors in different contexts.

Furthermore, the role of internal and external actors to energy consumption of organizations is evident (Bagire *et al.*, 2024). Additionally, sustainable energy initiatives are dependent on economic actors' rational decisions. Logically, the interaction of actors remains fundamental to sustainable practices. For instance, El-Garaihy, Farag, Al Shehri, Centobelli, and Cerchione (2024) found that internal and external factors drive sustainability orientation in companies. However, literature on the combined contribution of external and internal actors to sustainable energy consumption remains downplayed. Therefore, it stands important to integrate sustainable energy consumption with different planning agencies and engage different planning bodies. Subsequently, the following hypothesis is proposed;

H1. Top management commitment and institutional pressures will have a positive and significant association with sustainable energy consumption.

3.5 Top management commitment and sustainable energy consumption

From the upper echelon's theoretical perspective, strategic choices in the organization are influenced by values and managers' interpretation of reality (Hambrick & Mason, 1984). The upper echelons theory proposes that organizations reflect their top management team's cognitive bases and personalities (Hambrick, 2007; Abatecola & Cristofaro, 2020). Based on the premises of upper echelons theory, this study advances that top managers influence energy consumption choices. Thus, the commitment of the top management team drives the energy consumption behavior of an organization (Nunayon, Olanipekun, & Famakin, 2020; Patel, Shah, & Trivedi, 2022; Arinaitwe *et al.*, 2024). This is because top managers' characteristics such as value for sustainability shape the organization's energy consumption decisions (Ma, Kor, & Seidl, 2022). For example, Kaawaase *et al.* (2022) asserted that managers' commitment through involvement in establishing firm-level energy policies and encouraging efficiency enhance sustainable use of energy. Also, Dion, Evans, and Farrell (2023) found that sustainable development practices are integrated into organizational plans by the top management team while (Mehrajunnisa, Jabeen, Faisal, & Mehmood, 2022) asserted that the commitment of top management is an enabler for sustainable practices in firms. According to Vrchota, Řehoř, Maříková, and Pech (2020) top management teams that believe in sustainability tend to enforce principles of sustainability in their corporate strategies. This agrees with König, Löbbe, Büttner, and Schneider (2020) who stated that embedding energy efficiency in a company's strategy drives energy efficiency in SMEs. Alqershy, Shi, and Anbar (2024) found that top management support is significantly associated with social responsibility performance. Additionally, Garri (2022) stated that management support for sustainable development drives firms' sustainable practices. This is confirmed by Ruiz-Ortega, Córcoles-Muñoz, Parra-Requena, and García-Villaverde (2023) who found a positive impact of sustainability orientation on social and environmental performance. Indeed, top managers committed to reducing carbon footprint focus on renewable energy use and practices such as energy efficiency in a built environment. More so, organizations that perceive efficient practices as beneficial tend to adopt such practices for competitiveness (Cagno, Trianni, Spallina, & Marchesan, 2017). This in turn stimulates the allocation of resources to renewable projects, efficient use of energy and energy audits to monitor energy consumption. Indeed, Nunayon *et al.* (2020) findings indicate that top management commitment drives efficient energy management. As a result, the following hypothesis is proposed;

H2. Top management commitment in institutions of higher learning will have a positive and significant relationship with sustainable energy consumption.

3.6 Institutional pressures and sustainable energy consumption

The efficacy of institutional pressures to sustainability practices is widely acknowledged (Acquah, Essel, Baah, Agyabeng-Mensah, & Afum, 2021; Klymenko & Lillebrygfjeld Halse, 2022; Roxas & Marte, 2022). Based on the assertions of institutional theory, this study argues that coercive, mimetic and normative pressures enhance sustainable energy consumption (DiMaggio & Powell, 1983; Bananuka *et al.*, 2021; Bagire *et al.*, 2024). In a dynamic environment, business and legal aspects influence organizations' methods of work, structures and systems (Yacob, Peter, & Chin, 2022). For instance, coercive pressures originating from powerful agencies and customers have an upper hand on the behavior of organizations (Tukamuhabwa *et al.*, 2023). Chu, Wang, & Lai (2019) indicated that customer pressure enhances orientation to green innovation practices among Chinese third-party logistic providers. Li, Ye, Dai, Zhao, and Sheu (2019) added that customers' green demands influence the adoption of green practices in Chinese firms. Logically, customers' preference for green products exerts pressure on organizations to observe sustainable practices such as real-time energy monitoring and switching off idle lights, computers and production lines. It is hence deduced that the demands of major customers influence firm actions. Additionally, organizational practices are stimulated by government requirements such as onsite energy

saving, energy performance ratings and government measures to promote energy conservation for a sustainable energy future. Indeed, government bodies prompt the adoption of sustainable practices to protect the environment (Enshassi, Ayash, & Mohamed, 2018). Additionally, König *et al.* (2020) found that institutional influences increase the likelihood of energy efficiency decisions among manufacturing enterprises in Europe. In the same vein, Nunayon *et al.* (2020) avowed that government policies and regulations drive efficient consumption of energy in public universities. More so, Afeltra, Alerasoul, and Strozzi (2023) noted an interplay between regulations and green innovations. Furthermore, normative pressures emanate from industry professional expectations which in turn influence organizational methods of work. Industry norms determine organizations' methods of work such as monitoring energy consumption during production. Nguyen *et al.* (2023) found that green reputation pressures enhance the sustainable performance of manufacturing firms. Alsaid (2021) found an interplay between social sustainability pressures and management accounting systems among state-owned enterprises in Egypt. Similarly, Roxas and Marte (2022) found that social pressures influence millennials to ecofriendly brands in Philippine.

Mimetic pressures stem from imitating structures of other organizations due to uncertainty (Liu, Niu, Bao, Suk, & Shishime, 2012; Dubey, Gunasekaran, Papadopoulos, & Childe, 2015; Jain *et al.*, 2023). These pressures manifest in mimicking the actions of successful organizations (Ali & Johl, 2023). Mimetic pressures drive firms in the same industry to adopt energy-saving practices competitiveness (Ahmed, Najmi, Arif, & Younus, 2019). Studies such as Xu, Chin, Liu, and He (2023) indicate that actions of industry peers promote imitation of certain practices. For example, organizations imitate actions such as energy auditing and conducting site walk-throughs to monitor energy use. In the end, such practices result in meeting planned energy targets, energy savings and reduced energy costs leading to sustainable operations (Wijethilake *et al.*, 2017; Bag & Pretorius, 2022).

Generally, there is a consensus that institutional pressures impact sustainable practices. For example, Kalyar, Shoukat, and Shafique (2020) found that institutional pressures have an impact on green supply chain practices in Pakistan. Acquah *et al.* (2021) findings indicate a positive and significant relationship between institutional pressures and the adoption of green manufacturing practices in Ghana. Roxas and Marte (2022) study revealed that institutional pressures drive sustainable consumer behavior in the Philippines. Also, Huang and Huang (2022) stated that institutional pressures motivated enterprises to undertake green practices in Taiwan's electrical and electronics industry. Recent studies such as Anlesinya, Amponsah-Tawiah, Dartey-Baah, Adeti, and Brefo-Manuh (2023) noted the efficacy of institutional pressures on the sustainability practices of companies in Norway. Arinaitwe *et al.* (2024) found that institutional pressures influence sustainability practices such as energy management. Despite several studies investigating institutional pressures and sustainable practices in developed and developing contexts, literature on sustainable energy consumption in higher institutions of learning remains underrepresented. Finally, the following hypothesis is proposed:

H3. In Institutions of higher education, institutional pressures will be positively associated with sustainable energy consumption.

4. Methodology

This study was premised on positivism as a philosophical belief (Saunders, Lewis, & Thornhill, 2012). This dimension of epistemology stipulates that knowledge is a matter-of-factness. It is real but can adequately be understood through practicality. Therefore, a cross-sectional research design based on the works of Setia (2016) was used. Data were collected from top managers in institutions of higher learning in Uganda using a self-administered questionnaire anchored on a 5-point Likert scale. The instrument was tested and passed the threshold for both validity and reliability as per recommendations by Field (2009). In addition,

ethical basics were taken care of in conducting the research for instance respondents were assured of confidentiality (Saunders, Lewis, & Thornhill, 2012). They are clusters of many energy consumers from easily measurable and controllable connections. The data used were obtained from the National Council of Higher Education (2018), the governing body for higher institutions of learning in Uganda to develop our sampling frame. The education sector was selected as an interesting environment where the government of Uganda tested programs to promote sustainable energy. Some institutions were eliminated from the list based on an outline of parameters that were developed from preliminary assessment. These included level of accreditation, establishment, location, ownership and size. These exogenous variables when handled at that early stage ensure cleaner data to the model estimations.

5. Results

5.1 Sample demographics

The study was based on managers in top positions. Given the centrality of the study variables, we chose to collect data from any two of these from each institution. However, the unit of analysis was the institution and therefore personal data was not emphasized in our analysis. We got usable data from 64 institutions, many of which had existed for more than 10 years. This gives a good basis that the managers have experienced the dynamics of the top management commitment as well as the institutional pressures. The National Council of Higher Education, the sector regulator, has a framework in which energy availability for routine work is certainly a key issue. The employee level was also assessed as well as the student demographics. Principally, the student's enrollment was in ranges above 250 and staff within 50 range on the high side. In an earlier study, Bagire *et al.* (2024) studied the same sector focusing on institutional pressures and organizational resources using the same demographics. The study was driven by the assumption that energy consumption in these institutions is a factor of the interaction between these factors. They advanced the argument that institutional pressures and organizational resources are strong factors in sustainable energy consumption. They seem to have negated the role of top management. In this study therefore, picking on the same demographics, we did not contradict Bagire *et al.* (2024) but enact a debate that top management commitment and institutional pressures may have a reversal effect on energy consumption.

5.2 Correlation results

Correlation analysis was used to determine the degree of association between the study variables. This involved summarizing the relationship between variables and describing the strength and direction of the global variables as indicated in Table 1.

Table 1. Correlation analysis results

Variable	1	2	3	4	5	6	7
TMT commitment 1	*1*						
TMT practices 2	0.879**	1					
TMT beliefs 3	0.764**	0.364*	1				
Institutional pressures 4	*0.314*	*0.23*	*0.272*	*1*			
Coercive pressure 5	0.440**	0.267	0.498**	0.558**	1		
Normative pressure 6	0.170	0.021	0.278	0.865**	0.374*	1	
Mimetic pressure 7	0.215	0.272	0.021	0.862**	0.205	0.596**	1
Sustainable energy consumption	*0.571***	*0.553***	*0.355**	*0.573***	*0.333*	*0.316*	*0.624***

Note(s): **Correlation significant at 0.01. *Correlation significant at 0.05
Source(s): Created by authors from data analysis

The study results reveal that the association between top management commitment and institutional pressures (0.314) is not significant. This is rather interesting considering a step ahead to the constructs. This finding contradicts previous studies such as Dubey *et al.* (2018) emphasizing that institutional pressures are translated into reality by top management commitment. Further, the constructs behave in the same way, save for top management beliefs and coercive pressure that turned a significant association. This implies that top management beliefs on coercive pressures draw management to environmental consciousness on energy issues.

Testing Hypothesis 1: The results showed that top management commitment and institutional pressures are associated with sustainable energy consumption. Thus, H1 was accepted.

The correlation results for the dependent variable are different; all are positive and significant for the global and sub-variables, save for coercive and normative pressure. The results justify Jain *et al.* (2023) that top management practices and beliefs are vital in sustainability efforts while Bananuka *et al.*'s (2021) related study in a similar setting revealed that institutional pressures are positively related to sustainability practices. The results further support H2 and H3. Further analysis by regression was done to confirm the prediction power of top management commitment and institutional pressures on the variation of sustainable energy consumption. The results are as indicated in Table 2.

5.3 Regression results

In Model 1, a number of control variables were entered. As noted earlier, these have been found to have an influence on our study variables (Isingoma-Wakaisuka, Ibanda, Naluwooza, & Namaganda, 2020; Huang & Huang, 2022). Number of staff and students directly factor into how much energy is consumed, day and night. Older institutions have facilities that are aged and might be inefficient in energy consumption control. The results were exciting academically but could be intriguing for practice. All the factors combined are not predictors of sustainable energy consumption. This resonates well with previous findings such as Bananuka *et al.* (2021) who found that firm characteristics are not significant predictors of sustainability practices. There was, however, positive and negative coefficients within these exogenous variables. It was outside our model to test the power of each alone; it is possible that those with positive betas are significant predictors on their own. Researchers could not find support for this in extant literature. The authors might only base on related studies indicating that firm characteristics such as ownership structure and resource envelope are significantly

Table 2. Hierarchical regression

Variables	Model 1	Model 2	Model 3
Type of institution	1.465	1.071	0.953
Institutional facilities	−0.506	−0.318	−0.388
Number of students	0.370	0.360	0.370
Age of institution	0.266	0.287	0.774
No of academic staff	0.205	0.102	−0.095
Non-academic staff	−0.606	−0.589	−0.465
TMT commitment		0.406	0.057
Institutional Pressures			0.678
Rsq	0.565	0.639	0.790
Adjusted R	0.331	0.398	0.617
Rsqr change	0.565	0.073	0.151
F. change	2.415	2.434	7.889
Sig	0.081	0.145	0.017

Source(s): Authors' creation

associated with sustainable practices (Huang & Huang, 2022; Sendawula, Bagire, Mbidde, & Turyakira, 2021).

In model 2, TMT commitment was entered. The F change was slightly low and the model remained non-significant. And finally, when institutional pressures was added in model 3, there was a very significant rise in the F-statistic. The model became statistically significant indicating that model 3 is plausible. Further, the finding implies that institutional pressures is a key driver in the variations of sustainable energy consumption. The variables combined predicted 61.7% of sustainable energy consumption in higher institutions of learning in the Ugandan context.

6. Discussion of findings

The global concern on sustainability has triggered institutions of higher learning to focus on sustainability. Similarly, the education sector in Uganda has recently witnessed Higher institutions of learning attention to sustainability through research. This is due in part to the commitment of the international community commitment through funding energy research. For example, institutions of higher learning in Uganda like Makerere University Business School were supported to engage in research relating to sustainability. Much as institutions are engaged in research, it remains bothering whether their energy consumption reflects sustainability. If not, the key drivers of sustainable energy consumption may not be known, therefore a hypothesis that top management commitment and institutional pressures have a positive and significant relationship with sustainable energy orientation was proposed.

The findings reveal that the positive relationship between top management commitment and sustainable energy consumption was not significant. This implies that top management commitment does not cause variations in sustainable energy consumption. The findings contradict previous studies (Nunayon *et al.*, 2020; Yusliza *et al.*, 2019; Lawrence, Nehler, Andersson, Karlsson, & Thollander, 2019). Contextually, top management commitment does not individually predict sustainable energy consumption.

Furthermore, the findings reveal a positive and significant relationship between institutional pressures and sustainable energy consumption. This finding implies that in composite institutional pressures significantly predict sustainable energy consumption in higher education institutions of learning. This then denotes that regulatory forces, professionalism and peers' actions reinforce the focus on sustainable energy consumption. The finding is consistent with the doctrines of institutional theory by DiMaggio and Powell (1983) which postulate that firms observe institutional pressures for sustainable operations. The finding also resonates with previous findings of Jain *et al.* (2023) who found that institutional pressures are significantly related to sustainable practices in India. Also, the findings rhyme with the findings of Leal Filho *et al.* (2018) who asserted that policies promote sustainability practices of universities while Yacob *et al.* (2022) found that legal aspects influence organizations' methods of work. Remarkably, several studies are conducted in developed contexts with limited focus on developing context save for Nunayon *et al.* (2020) and Yacob *et al.* (2022). This necessitates further investigation of sustainable energy consumption in the developing context which this study addresses.

Finally, the hypothesis that top management commitment and institutional pressures have a positive and significant association with sustainable energy consumption was supported. This implies that top managers in higher institutions participate in the formulation of government regulations and industry standards concerning energy consumption. The finding is distinct in several empirical studies (e.g. Dubey *et al.*, 2018; Kitsis & Chen, 2021; Huang & Huang, 2022) that have majorly investigated the influence of institutional pressures on top management commitment downplaying the role of top management commitment to institutional pressures. Thus the dominant focus on institutional pressures influencing top management commitment implies a top-down and bottom-up approach. The uniqueness of our findings is that to realize sustainable energy consumption institutional pressures such as

regulations and industry professional norms should be aligned with the beliefs and practices of top management teams. The assertions of the upper echelons theory and the institutional theory properly support the study findings.

7. Conclusions

This study intended to test the nexus of top management commitment and institutional pressures on sustainable energy consumption. Energy consumption has become a key issue in institutional management in Uganda and elsewhere. Today many calls have come up for green energies due to the heavy costs of nonrenewal power usage, especially in large consumption settings like educational institutions. The venture into this study was the mind of identifying how the factors coalesce as an initial step to proposing a configuration model for better energy consumption. The result has opened up our minds to further scholarly scrutiny.

8. Study implications

The results of this study have important implications for academicians, policymakers and administrators in higher institutions of learning about sustainable energy consumption. For academicians, this study provides initial evidence on the association between top management commitment, institutional pressures and sustainable energy consumption. The study results suggest that top management commitment and institutional pressures are individually associated with sustainable energy consumption and coalesce to predict it. It is disturbing and thus calls for a more in-depth study of the underlying factors why the former was not a significant predictor. A factor analysis of the dimensions could reveal more than the global variables. For, policymakers, the results are important for policy development given that society imitates the way they use the energy and institutions of higher learning can act as a benchmark for sustainable energy consumption. Accordingly, policymakers should consider financing mechanisms that enhance institutional pressures for improved sustainable energy consumption.

Furthermore, administrators in African higher institutions of learning should be committed to improving sustainable energy consumption. They should participate in establishing energy performance indicators and encourage practices such as switching off idle energy. Additionally, they should develop positive beliefs about sustainable energy consumption. Further, administrators should allocate finances to train stakeholders on sustainable energy practices, recognize those that use energy efficiently and invest in efficient technologies. More so, top management should consider establishing energy responsibility centers. In case of financial constraints, African institutions should seek financing from relevant national and international bodies. Finally, top managers should establish institutional-level energy policies in tandem with national policies to improve sustainable energy consumption.

9. Study limitations and further research directions

There are some limitations worth mentioning. These results are limited to institutions of higher learning whose setup involves a multiplicity of actors on energy usage than managers. Future research could consider other sectors such as health and transport. Secondly, the study was done in Uganda where energy issues are still in the low-economic spectrum, as a developing country.

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