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THE ADOPTION OF PHOTOVOLTAIC ENERGY IN MICRO AND SMALL ENTERPRISES: AN INSTITUTIONAL LOGIC OF SUSTAINABILITY APPROACH

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Abstract: As culture with its set of values, beliefs and intentions, influences organisations' strategies, institutional logic can, therefore, support the understanding of how such aspects influence sustainability practices. This study aims, therefore, to understand the existence of institutional logic of sustainability in business decisions regarding the electricity source. The research is qualitative with interviews and documentary research as data collection techniques. The empirical field was made up of micro and small companies that use clean sources of electricity. A holistic institutional logic of sustainability did not guide the decision-making process regarding the electricity system. Furthermore, the reasons for choosing photovoltaics were predominantly based on economic aspects (cost reduction), without considering environmental and social aspects. We also evidenced that participants conceptualise sustainability as a management practice, but it has not yet been institutionalised in such organisations. This study contributes to the understanding of how and why organisations plan and practice sustainability, addressing the research gap. Furthermore, it aligns with Goal 7 "Clean and affordable energy" of the Sustainable Development Goals.

Keywords: Micro and Small Enterprises; Renewable Energy; Institutional Logic; Sustainability.

A ADOÇÃO DA ENERGIA FOTOVOLTAICA EM MICRO E PEQUENAS EMPRESAS: UMA ABORDAGEM INSTITUCIONAL DA LÓGICA DA SUSTENTABILIDADE

Resumo: Como a cultura, com seu conjunto de valores, crenças e intenções, influencia as estratégias das organizações, a lógica institucional pode, portanto, apoiar a compreensão de como esses aspectos influenciam as práticas de sustentabilidade. Este estudo visa, portanto, compreender a existência de uma lógica institucional de sustentabilidade nas decisões empresariais relativas à fonte de eletricidade. A pesquisa é qualitativa, com entrevistas e pesquisa documental como técnicas de coleta de dados. O campo empírico foi composto por micro e pequenas empresas que utilizam fontes limpas de eletricidade. Uma lógica institucional holística de sustentabilidade não orientou o processo de tomada de decisão em relação ao sistema de eletricidade. Além

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disso, as razões para a escolha da energia fotovoltaica basearam-se predominantemente em aspectos econômicos (redução de custos), sem considerar os aspectos ambientais e sociais. Também evidenciamos que os participantes concebem a sustentabilidade como uma prática de gestão, mas esta ainda não foi institucionalizada nessas organizações. Este estudo contribui para a compreensão de como e por que as organizações planejam e praticam a sustentabilidade, preenchendo uma lacuna na pesquisa. Além disso, está alinhado com o Objetivo 7 "Energia limpa e acessível" dos Objetivos de Desenvolvimento Sustentável.

Palavras-chave: Micro e Pequenas Empresas; Energias Renováveis; Lógica Institucional; Sustentabilidade.

1 INTRODUCTION

Sustainability has increasingly become an area of interest for academics, governments, and businesses, as it has been a driver for innovation, efficiency and organisational value (Silva *et al.*, 2022). Debates on sustainability in organisations generally start from the concept of the Triple Bottom Line (Elkington, 2004), which approaches sustainability as the integration of environmental, social, and economic dimensions. Additionally, the cultural dimension has emerged as a critical element in sustainability studies, particularly in the Latin America context (Fritz & Silva, 2018; Pereira *et al.*, 2023a). However, there is still a need to deepen theoretical and empirical knowledge about the motivations and changes towards sustainability (Alves & Silva, 2020; Cervi & Christopoulos, 2024).

To understand how institutional context influences institutional changes for sustainability, the perspective of institutional logic (IL) emerges. This perspective has also been used to understand the processes by which institutions emerge and change (Cervi & Christopoulos, 2024). Institutional logic refers to systems of cultural elements in which people, groups, and organisations seek to understand and evaluate their daily activities by organising them in time and space. It includes values, beliefs, and normative expectations linked to a coherent and discernible pattern (Haveman & Gualtieri, 2016). Institutional logic, therefore, reveals what the organisation represents as well as its goals for society. When individuals or organisations identify with collective identities of a group, it is the institutional logic that exerts its effects on them (Thornton & Ocasio, 2008).

Institutional logic can, therefore, support the understanding of how organisations outline and implement effective sustainability strategies and practices. The interface of institutional logic with sustainability allows the analysis of shared values translated into practices that materialise sustainability in organisations (Cervi & Christopoulos, 2024). In this sense, the institutional logic of sustainability (ILS) is an appropriate theoretical approach to understand how organisations achieve sustainability, encompassing ideas of institutional logic, practices, and sustainability (Silva & Figueiredo, 2017; Strambach & Pflitsch, 2020). It is necessary to better understand sustainability as a practice and how to achieve changes towards sustainability, those responsible for them, the implementation strategies and how such changes occur and evolve in practice (Cerbone & Maroun, 2020).

In organisations, there are different logics, which are dynamic and influence actors, who elucidate them and translate them into actions (Anderson-Gough *et al.*, 2022). Business strategies and practices focused on sustainability are, therefore, guided by the values and goals of those who manage the organisations and by pressures arising from the

environment in which they operate or from agents such as government, society and/or competition (Rechene *et al.*, 2017).

In this context, decision-making about the source of electrical energy that companies use is a relevant factor in terms of sustainability. The decision on which source to adopt can save natural resources and reduce greenhouse gas emissions (Razmjoo *et al.*, 2019), helping to reduce socio-environmental problems caused by traditional non-renewable sources of energy (Silveira, 2018). Furthermore, analysing the best decision for the source of electrical energy is aligned with the Goal 7 of the Sustainable Development Goals, which deals with clean and affordable energy, ensuring access to viable, sustainable, and modern energy sources for all (ONU, 2015). Decision-making becomes even more relevant when it comes to small enterprises. Beyond the number of enterprises, small companies are important for the Brazilian economy because they generate jobs and incomes, support inequality reduction, knowledge dissemination in the regions where they are located, and the development of new technologies (Neves *et al.*, 2024). However, these companies often face difficulties in accessing credit and have a relatively low longevity rate. Therefore, decision-making about energy sources can impact the competitiveness and longevity of small companies.

Based on these arguments, the research question emerges: *is there an institutional logic of sustainability in decision-making in micro and small companies regarding sources of electrical energy?* This study analysed the existence of an institutional logic of sustainability in decision-making in micro and small companies regarding sources of electrical energy. To this end, a qualitative study was conducted with seven Brazilian small companies.

Despite the growing debate on sustainability, the concept has often focused on profit to the detriment of real environmental and social results (Silva & Figueiredo, 2017). This study is relevant as it presents empirical evidence on the occurrence of the ILS in micro and small companies in the adoption of cleaner energy sources. According to SEBRAE (2023), small companies represent the type of enterprise that grew the most in the country in 2023, being responsible for generating more than 1.1 million jobs in Brazil in that year (G1, 2024). This study contributes to the understanding ofn how and why organisations plan and practice sustainability (Silva & Figueiredo, 2017).

This study is organised into four sections. The first section presents the concepts and theoretical approaches that support this research. The second section describes the methodological procedures adopted in the operationalisation of the research. The results are presented and discussed in the fourth section. The last section addresses the conclusions, the study limitations, and suggestions for future studies.

2 THEORETICAL BACKGROUND

This section presents the main theoretical elements that guided the study, covering the following themes: institutional logic, institutional sustainability logic, and sustainability in small companies, with a focus on energy issues.

2.1 Institutional Logic

The impact of the institutional perspective on the functioning of organisations has intensified (Silva & Figueiredo, 2017; Sharma *et al.*, 2020; Strambach & Pflitsch, 2020). Organisational changes do not occur only due to crises/disruptions but also due to organisational responses to the institutional complexity in which logics operate (Safari *et al.*, 2020). The institutional perspective helps to identify fundamental values to understand the formation of practices in a given context (Alves & Silva, 2020). Therefore, individuals, groups, and organisations use institutional logic to evaluate and give meaning to their daily activities through elements connected to a coherent and discernible pattern, based on culture, values, beliefs, and normative expectations (Haveman & Gualtieri, 2016). These elements directly impact the organisational environment, directing the search for organisational legitimacy (Carvalho *et al.*, 1999).

Institutional logic leads individuals or organisations to identify with collective identities of a group, thus exerting its effects on them (Thornton & Ocasio, 2008). As culture, values, beliefs, and intentions influence the strategies of organisations, IL constitutes a relevant method for understanding such influences, aiming at the collective construction of organisational practices and behaviours (Alves & Silva, 2020). Therefore, based on an institutional perspective, it is possible to identify the different rationalities that permeate the organisational space. By doing this, shared values may be considered as an object of research, seeking to understand the IL formation process (Rechene *et al.*, 2017).

Changes in the environment in which companies operate have driven them to adapt to meet the requirements of the external environment and create their legitimacy, leading to institutional isomorphism (Thornton & Ocasio, 2008). According to DiMaggio and Powell (1983), institutional isomorphism is a way of gaining legitimacy within the organisational field in response to different types of institutional pressures. These isomorphic pressures lead organisations to seek an acceptable model, imitating other successful organisations or following industrial or professional standards to achieve greater legitimacy, status, and reputation (DiMaggio & Powell, 1983). Institutional isomorphism allows the organisation to analyse external phenomena and make changes to its organisational behaviour (Souza *et al.*, 2016). As an IL is formed, the level of change and the result of institutional isomorphism must be considered (Silva & Figueiredo, 2017).

In institutional contexts, there are different logics that are interpreted and translated into different practices by the actors (Cervi & Christopoulos, 2024). Several institutional logics are carried out simultaneously, since society is formed by the composition of a set of different institutions. Therefore, different institutions have different classifications and perspectives on the interactions between individuals, organisations, and society (Silva & Figueiredo, 2017). For the study of IL, some central aspects are relevant: the sources of identity, the sources of legitimacy, the bases of the mission, the bases of the strategy, the investment logic, the governance mechanisms, institutional entrepreneurship, the sequence of events, and the change of structure (Alves & Silva, 2020). It is worth noting that the institutional entrepreneur represents the individuals or organisational actors who contribute to organisational change (Silva, 2015).

Considering these arguments, it is understood that IL should seek to consider the level of change, the result of institutional isomorphism, and the diffusion of practices and behaviours in contributing to the institutional environment. Literature has advanced in the application of institutional logics to understand institutional change in the field of sustainability (Alves & Silva, 2020; Cervi & Christopoulos, 2024). This interface has been gaining interest from researchers, managers, and government officials. Thus, it is necessary to advance research on the functioning of institutional logics from the perspective of organisational change for sustainability (Cervi & Christopoulos, 2024).

2.2 Institutional Logic of Sustainability

Institutional Logic of Sustainability (ILS) refers to a theoretical approach that helps in understanding how sustainability is practiced by organisations by incorporating the ideas of institutional logic and sustainability practices (Silva & Figueiredo, 2017). The development and repetition of attitudes and behaviours in organisations can be considered as an organisational practice (Cervi & Christopoulos, 2024; Strambach & Pflitsch, 2020). In this study, therefore, sustainability is understood as a practice and can be considered as the result of interactions between agents and socially produced structures, through the production and reproduction of actions that are part of daily routines (Silva, 2015). The interlinkage of institutional logics with the field of sustainability supports the understanding of how shared values become sustainability practices in organisations (Cerbone & Maroun, 2020). Sustainability practices are understood as methods of promoting sustainability in the daily operations of organisations which are results of sustainability understandings (Anderson-Gough *et al.*, 2022).

Munck *et al.* (2013) argue that organisations, when carrying out their activities, consume not only financial resources, but also environmental and social resources. In this sense, it is worth highlighting that they need to seek positive results that contemplate the three pillars of sustainability (economic, social, and environmental), the Triple Bottom. Line – TBL (Elkington, 2004). The economic dimension comprises continuous innovations aimed at ensuring the survival of the organisation in the market in which it operates, maintaining the organisation' economic and financial profit. In turn, the environmental dimension encompasses the concern of rethinking the current ways of producing and consuming to ensure that ecosystems can maintain their self-repair or resilience capacity. Finally, the social dimension involves the eradication of poverty and the definition of the standard for a dignified life, with fair and equitable distribution of natural resources among all inhabitants of the planet (Nascimento, 2012). The focus on strategies and practices aimed at the three dimensions of TBL would result in the achievement of sustainability (Oliveira *et al.*, 2012). By understanding and interpreting the logics that shape the contexts in which companies operate, managers can develop a common language and aim to shape and practice sustainability (Cervi & Christopoulos, 2024).

A more sustainable organisation aims for positive results in all three dimensions, which will guide its decision-making (Cervi & Christopoulos, 2024). As sustainability issues have become more global and essential, companies are realising that they also need to involve their supply chain partners in more sustainable initiatives (Pereira *et al.*,

2023a). Thus, the adoption of sustainability practices in organisations seeks to improve the organisational image and gain credibility among consumers and suppliers (Costa *et al.*, 2020). In this sense, according to institutional theory, the adoption of sustainability practices in organisations can be a pathway for legitimacy (Alves & Silva, 2020).

Pereira *et al.* (2023b) argue that sustainability practices are formed and consolidated to respond to pressures from society, government, and competition. In this way, organisations have been pressured to seek more sustainable ways of acting, aiming for better results regarding social and environmental issues (Pereira *et al.*, 2021). Therefore, organisational sustainability becomes a central component of various market and society relations (Alves & Silva, 2020). Regarding sustainability practices, Silva and Figueiredo (2017) emphasise the importance of raising sustainability beyond levels proposed in organisational standards and structures, but towards a more practical vision, considering what the organisation does and caring about the meaning of these acts for the public and society. This justifies the need to deepen theoretical and empirical knowledge about sustainability practices in organisations and the motivations for such (Alves & Silva, 2020).

If socio-environmental projects, investments in sustainability, and a set of standards and procedures that support sustainable actions are implemented in organisations, those involved will be transformed and will adapt to these organisational practices (Silva & Figueiredo, 2017). ILS is, therefore, an approach that helps in understanding how sustainability has been practiced in the organisational context as well as in the construction and institutionalisation of sustainability practices (Alves & Silva, 2020). This study based on the existence of an institutional logic focused on sustainability regarding the choice of electricity source by micro and small companies. The context in which sustainability practices are constructed and institutionalised is considered in our study (Silva & Figueiredo, 2017).

In this scenario, institutional entrepreneurs act as facilitator of new sustainable practices that were not previously considered. It is worth noting that the institutional entrepreneur provides an incentive for change, as change enables innovations and modifications (Silva & Figueiredo, 2017). Considering that sustainability aspects are linked to laws, decrees, and resolutions, the government can also play the role of institutional entrepreneur in the formation of ILS (Alves & Silva, 2020). As a result of a sequence of events that contribute to such a structural change, the implementation of sustainability practices occurs (Alves & Silva, 2020). Thus, the opportunity arises to study the four dimensions present in the formation of ILS (see Table 1): institutional entrepreneur, sequence of events, structural change, and sustainability practices.

Table 1 – Elements of the institutional logic of sustainability

Dimensions	Description
Institutional Entrepreneur	It refers to the professional who motivates the change, constituting the internal incentives necessary for a change in the organisation structure (Alves & Silva, 2020).
Sequence of Events	It consists of the main events that contributed to the change, continuity and impact of the event(s), creation of diagnoses or predictions, existence of external pressures and incentives and proactive behaviour actions (Rechene *et al.*, 2018).
Change of structure	It is related to changes in individual rules or organisational structures, where actors are forced to associate, even if they have different cultures. Adaptation to the use of technologies, acceptance, decision-making process and definition of strategies (Rechene *et al.*, 2018).
Sustainability Practices	Structure promoting sustainability methods within the daily operations of organisations, as well as creating new routines, procedures and communication with *stakeholders* (Alves & Silva, 2020; Pereira *et al.*, 2023a).

Source: Created by the authors. Based on Alves & Silva (2020) and Rechene *et al.* (2018).

This study focuses on understanding the influence of the four dimensions of ILS on decision-making regarding the source of electrical energy in micro and small companies. Thus, identifying the knowledge of the managers of these small companies about sustainability and the changes towards sustainability practiced by such organisations was relevant.

2.3 Micro and Small Enterprises and Sustainability

The importance of micro and small companies lies in their contribution to improving society's quality of life. These businesses are the main generators of jobs and income in Brazil, while also contributing to reducing inequalities (Neves *et al.*, 2024). In Brazil, the Law of micro and small companies was instituted in 2006 to regulate the provisions of the 1988 Constitution. The Law standardised the concept of micro and small companies by classifying them based on their annual gross revenue.

According to Neves *et al.* (2024), these small companies are created by two main motivations: necessity and opportunity. Some of them arise out of necessity, and they are an alternative for survival, given the entrepreneur's need for income. In turn, these businesses that arise out of opportunity are formed by people who can perceive market needs, based on a business opportunity. In relation to the entrepreneur, they emerge from internal or external demands. When the demand is internal, these companies are created out of necessity, while when the demand is external, they are created out of opportunity. However, regardless of the kind of motivation, in Brazil, the longevity of these companies is short. According to SEBRAE (2023), 30.2% of the businesses closed their activities within five years of operation.

Besides access to credit or lack of knowledge, Neves *et al.* (2024) indicate that other variables are relevant to small companies' survival. They indicate factors related to inequality,

workforce, unemployment and family planning are negatively associated with the survival of those companies.

Corporate sustainability has been increasingly considered not only as an environmental initiative but also as a strategy that generates value through the search for better economic, social, and environmental results (Benites & Polo, 2013). There is an incentive for small companies to survive in competitive markets, increase revenue, generate jobs, and adopt more sustainable practices. The urgency of inserting sustainability in the organisational context is also related to the reduction of the social and environmental impacts of companies' operations and the reduction of the use of natural resources.

Beyond the great incentive for innovation and competitiveness, there is an increasing concern about sustainability regarding electrical energy sources (Segura *et al.*, 2015). Electrical energy has been increasingly necessary for companies due to the increased use of electrical and electronic equipment (Costa *et al.*, 2020). In this sense, there are alternative energy sources known as clean energy sources. By adopting a clean energy system, such as photovoltaic energy, for example, the investor user can count on significant benefits (Dantas & Pompermayer, 2018). Considering that the capture of solar energy leads to lower environmental impacts, especially when compared to generation from fossil fuels, a company has less impact on the environment through its operations than using the traditional energy source (Costa *et al.*, 2020). Photovoltaic energy is a cleaner source of electricity, fully renewable and comes from an abundant source in nature, making it one of the most sustainable (Pereira *et al.*, 2017).

In Brazil, most states already have exemption from taxes on the Circulation of Goods and Services (ICMS) for regions with micro or mini photovoltaic generation, in addition to tax incentives offered by several cities for energy generation through the solar energy system (Costa *et al.*, 2020). A strong and accounted-for political program is, therefore, essential to achieve energy sustainability goals (Razmjoo *et al.*, 2019). However, there is still a need to reduce the current barriers that hinder the growth of solar energy in Brazil, such as a lack of financing, excessive taxation, a lack of public policies, and a lack of knowledge of the technology (Dias *et al.*, 2017).

Accompanied by the search for more sustainable organisational practices, there are technological innovations that allow for good use and make their implementation viable. In 2012, the National Electric Energy Agency (ANEEL), the institution that regulates the electricity sector in Brazil, published Normative Resolution 482/12, which established the model for compensating excess energy generated, such as on sunny days, for example, by injecting it into the utility grid, obtaining credits that could be used on rainy days or at night. According to Canal Solar (2020), studies by the Brazilian Association of Photovoltaic Solar Energy (ABSOLAR), based on data on investments made in the area since 2012 and considering government revenues and the generation of new jobs in the country, caused by the solar sector, it was reported that for each investment of R$ 1 (one real – Brazilian currency) in small and medium-sized photovoltaic systems, the sector presents a return of more than R$ 3 in electrical, economic, social and environmental gains to the population.

Furthermore, according to Elgamal and Demajorovic (2019), in a global scenario, the renewable energy sector has been growing, supported by government policies, aiming

to reduce CO_2 emissions and seeking greater energy security. According to Razmjoo *et al.* (2019), the use of renewable energy sources has great potential to adequately replace energy generation through fossil fuels, in the quest to achieve energy sustainability. Thus, the relevance of studying the adoption of more sustainable energy sources by small companies is highlighted, according to the ILS.

3 METHODOLOGY

This research is classified as qualitative (Cardano, 2017). The investigation was carried out in organisations regarding the institutional logic of sustainability, considering the macroenvironment in which they operate, and raising current questions about sustainability practices in organisations and how they are institutionalised.

The research empirical field consisted of micro and small companies that use cleaner sources of energy. The companies operate Minas Gerais, in southeast Brazil. The snowball technique was used as the criterion for selecting participants. This technique is a sampling technique using reference chains, creating a type of network (Baldin & Munhoz, 2011; Teddlie & Yu, 2007). The sampling began with the convenience of contacting one initial participant, who indicated others. The following participants, therefore, were also important to recruit other participants. The saturation criterion was adopted as the themes and ideas were very similar among the participants. It justifies, therefore, this criterion for ceasing data collection. We stopped the interviews when no further significant new data emerged (Eisenhardt, 1989; Teddlie & Yu, 2007). The research involved managers of seven companies in the retail and services sector (5 micro-enterprises and 2 small companies) (see Table 2). According to SEBRAE (2013), micro-enterprises in these sectors are those that employ up to 9 people and small companies employ 10 to 49 people.

Primary data collection took place during 2023 and was conducted through semi-structured interviews, with an interview script (Nunes *et al.*, 2016). The interviews were previously scheduled and conducted in person with the managers of the organisations under study. The interview's audio was recorded with the permission of the participants and later transcribed. To triangulate the data, secondary data were also collected from reports on the topic (see Appendix 1).

Table 2 – Characterization of the participants

Interviewee	Business Sector	Time of implementation of the photovoltaic energy	Interviewee Position in the company
E1	Restaurant	4 years	Owner
E2	Bakery	3 years	Owner
E3	Stationery	2 years	Owner
E4	Hotel	5 years	Owner
E5	Department Store	3 years	Manager
E6	Supermarket	2 years	Manager
E7	Butcher shop	4 years	Owner

Source: Research data, 2023.

Data were analysed through content analysis. Content analysis is a set of analysis techniques regarding communications, obtaining, through systematic means and goals of describing the content collected, indicators that allow the deduction of knowledge about the variables collected (Câmara, 2013). To this end, the analysis categories of these studies were analysed based on the four dimensions of the ILS: institutional entrepreneur, sequence of events, change of structure, and sustainability practices. These dimensions are exposed both in the study by Alves and Silva (2020) and in Rechene *et al.* (2018) as elements of analysis of ILS in organisations.

For internal validation, several rounds of analysis and, consequently, categorisation were undertaken to ensure that all information presented in the interviews was included. To ensure external validity, we presented the preliminary analysis at an international conference on management so that other researchers could assess and comment on the paper development, as suggested by Seuring & Müller (2008).

4 RESULTS AND DISCUSSION

To analyse the formation of ILS in micro and small companies that adopted the photovoltaic solar system, the influential organisational actors and the dimensions of sustainability of the Triple Bottom Line (economic, social and environmental) were considered. The findings are presented according to the following topics: (i) ILS in the organisations studied, (ii) Elements of the organisations' ILS and (iii) Managers' knowledge about the importance of sustainability actions.

4.1 Institutional logic of sustainability in the organisations studied

ILS analyses support a better understanding of how sustainability has been practiced in the organisational context, seeking, through the institutional perspective, to identify the different rationalities that make up the organisational space (Rechene *et al.*, 2017). Thus, it is relevant to improve the understanding of the presence or absence of their influence on managers' decision-making and who are the main involved actors. In Table 3 are presented the roles played by the organisational actors that contribute to the ILS formation core in the analysed companies.

Table 3 – Role of organisational actors

Actors	Description	Role in the formation of ILS
Managers	Business Owners/ Managers.	Institutional Entrepreneur is the one who takes the initiative to implement the photovoltaic systems, enabling changes in management practices based on sustainability.
Government	Public Management Bodies (ANEEL)	Responsible for creating regulatory resolutions regarding solar energy as an alternative energy source.
Companies Suppliers	Supply companies Photovoltaic system	Companies that offer photovoltaic services and materials to the end customer.
Financiers	Banks	Resources for investment

Source: Research Data (2020). Based on Rechene *et al.* (2017).

The leadership of managers in the decision to adopt sustainable practices was identified, with the economic aspect as the main driver. This is evident in the arguments of E4 and E5: "We *had high energy consumption, and it was a way I saw to save money"* (E4). *"What we mainly considered was the issue of saving money [...] it was consuming a large part of our revenue, so we thought there was no reason not to do it"* (E5). Therefore, the process of acquiring photovoltaic solar energy as an energy source in the organisations under study was led by the owners and managers of the respective companies, mainly in the search for cost reduction. E5 also adds: *"First we think about saving money, but of course any change that generates clean energy is a contribution".*

Government incentives, however, were not present in the decision-making process of managers regarding the adoption of clean energy sources within the context studied. Several managers expressed concern that potential government taxation could hinder future investments in this market, as can be seen in the following statement: *"In fact, we were racing against time because they were going to tax, so the government was actually going to make this part more difficult, it wouldn't be as viable, so we arranged it so that we wouldn't enter after this part that would be taxed"* (E5). This is a regulatory review started by ANEEL in 2018, known as solar taxation. This new review is considering removing compensation for part of the electricity tariff granted to those who produce their own energy, resulting in the payment of new tariffs. This could make the market less attractive and, consequently, reduce sustainable practices in this regard.

It was evident that the most recent discussions about promoting corporate sustainability were a factor considered by a small proportion of managers when making decisions about purchasing a photovoltaic system. Improving management practices, although considered by all interviewees as an important factor in decisions about sustainable practices, it was not one of the drivers for implementing the photovoltaic system. Furthermore, the only other sustainability initiative mentioned was about recycling and reusing waste.

Therefore, it can be stated that the companies analysed did not have ILS, in their entirety, guiding the decision to implement the photovoltaic system. Although a small part already promoted other sustainable practices, it was found that the main objectives identified by the managers were focused only on cost reduction (only the economic aspect of sustainability). In addition, there are no government incentives to further promote sustainability in these organisations.

4.2 Elements of the institutional logic of sustainability of organisations

In view of the theoretical discussion presented in this paper, it is essential to analyse each of the dimensions of the ILS formation process (Rechene *et al.*, 2017), namely: (i) institutional entrepreneur, (ii) sequence of events, (iii) change of structure and (iv) sustainability practices. We considered the main variables that influence managers' decision-making regarding the acquisition of the photovoltaic system.

4.2.1 The institutional entrepreneur

Considering the idea of institutional entrepreneurship, the existence of effective leadership on the part of managers was identified, driven by the search for innovations and solutions that improve productivity and generate economy (cost reduction with electricity bills). Some of the managers (E1 and E4) mentioned social sustainability actions (improve employees work quality, in this case), based on cost reduction: *"[...] we are even able to pay employees better thanks to this economy we have"* (E1).

> *It is an investment that has a significant recovery in time and money savings [...] indirectly, if I am not spending too much on energy, I can sometimes even invest more in employees, relationships, communication and entertainment. (E4)*

Some managers (E3, E4 and E5) stated environmental aspects as a great advantage of joining the photovoltaic system. There is evidence of this thinking in the arguments of E5 and E4: *"In addition to preserving the environment and making the world more sustainable, there is also the issue of economy"* (E5). *"The photovoltaic system produces energy without harming the environment, without contaminating...*" (E4).

This evidence is related to the literature. Munck *et al.* (2013) emphasise that the economic viability of the business is a central piece of sustainability. In this regard, it is essential to have economic outcomes so that the investment being attractive to the managers (Oliveira *et al.*, 2012). However, organisations, when operating, they consume not only economic, but also environmental and social resources. There is also a need to achieve positive results in these aspects as well (Munck *et al.*, 2013).

Although managers mentioned social and environmental aspects, strategic sustainability was less explored by participants. There is great emphasis on exploring the economic pillar, with no broad view of sustainability concepts in organisational decision-making (Munck *et al.*, 2013).

Another potential institutional entrepreneur would be the government, since sustainability aspects are linked to the legislation (Alves & Silva, 2020). There was stated about the lack of initiatives and incentives from the government for more sustainable actions in the organisational field. Most of the interviewees (E6, E5, E4, E2, and E1) highlighted the need for incentives and initiatives from the government for greater sustainable actions in the region, as mentioned by E6: *"this should have greater incentives from the government for companies, right? [...] Today, setting up a photovoltaic plant costs a lot. If you go to the bank, the interest rates are very high, it is not very attractive."*

Public policies have been highlighted as a driver to achieve energy sustainability goals (Razmjoo *et al.*, 2019). Silva and Figueiredo (2017) state that companies will adopt sustainable practices if the governments invest in sustainability and implement supportive standards.

The participant managers have, therefore, performed as institutional entrepreneurs in the analysed context, motivating changes in the energy system in their organisations and creating the internal incentives for this change. However, the motivation is more focused

on economic aspects, with few glimpses of the social and environmental results proposed in the TBL.

4.2.2 Sequence of events

The rise in electricity costs in Brazil in recent years, combined with the growing use of electrical and electronic equipment in organisations (Costa *et al.*, 2020), represented a relevant cost to companies. These high costs for companies have driven them to turn to photovoltaic energy in order to reduce these costs, as we can see in the statements of (E4) and (E5): *"I had a high energy consumption and it is a way to save money"* (E4). *"The energy was consuming a large part of the revenue, so we thought there was no reason not to do it"* (E5).

Some managers (E1, E4, E5, and E6) expressed concern about current issues related to processes management and sustainability – topics that, as Silva and Figueiredo (2017) explain, have sparked ongoing discussions in the field of institutional analysis. It is evident in the following arguments by E5 and E1: *"In the past, people even talked about it, but in practice they didn't do it. It was very nice to talk about, but nobody did anything. Today I can already see a change" (E5). "We see a lot of talk in these current governments about deforestation and climate issues, so we have to raise more awareness, and each one of us has to do our part" (E1)*. This demonstrates the need for companies to form and consolidate sustainable practices to respond to pressures from society and competition (Rechene *et al.*, 2017).

Despite not being cited by interviewees as a motivation, ANEEL's Resolution 482/12 offers clear advantages to photovoltaic energy users. However, the new regulatory review – solar taxation – applied by ANEEL that began in January 2023, presents itself as a possible barrier perceived by managers, since a charge is applied to those who use solar energy connected to the electricity grid, which is the case for all the companies under analysis, leaving them somewhat insecure about the referred market.

Corporate sustainability to enhance a company's image and increase its credibility with consumers and suppliers (Costa *et al.*, 2020) was stated by E6: *"Many customers today prefer more sustainable companies, right, it's a question of image".*

Furthermore, one of the participants mentioned that when he was approached by a solar panel service company, he did not sign up due to lack of financial resources. However, some time later, a bank financing opportunity played a fundamental role in his acquisition of photovoltaic energy, that is, in this specific case, this sequence of events contributed to the change.

Therefore, companies' search for cost reduction has led them to a sustainable energy system, which has important environmental and social impacts on the development of organisational sustainability. However, it is important to align government actions with companies in general so that there are greater investments in the search for corporate sustainability. In a global scenario, there has been growth in the renewable energy sector supported by government policies, aiming to reduce CO_2 emissions and to seek better energy security (Elgamal & Demajorovic, 2019).

4.2.3 Change of structure

Regarding the structural change dimension, from implementing the photovoltaic system, the organisations showed no structural or cultural change, such as creating new standards or behaviours aimed at sustainability. The reason for this is that the studied companies prioritise financial returns over environmental and social dimensions in their operations. Changes were therefore only observed in the financial aspects of the businesses. This is because the energy they generated was fed into the electricity supplier company, which led to a reduction in their electricity costs.

There is a change in the structure of the normative resolutions made by ANNEL, which influenced the decision-making of managers regarding the adoption of the photovoltaic energy system. Therefore, we can mention the latest normative resolutions made by ANNEL as impactful events in the decision-making regarding the acquisition of the photovoltaic system.

The analysed companies have successfully adopted this new technology, which, in addition to generating direct benefits for the companies' operations, also highlighted the environmental dimension of sustainability. Thus, (E4) and (E5) mentioned: *"it produces energy without contaminating the environment, without harming it, just by using the sun's energy, you are producing energy"* (E4). *"In addition to helping the environment, which is one of the most important, for us to do our part as a company, it also reduces costs" (E5).*

4.2.4 Practices of Sustainability

The participants view photovoltaic energy as a key source because its use causes minimal environmental harm. They see positive outcomes related to all three areas of sustainability: economic, environmental, and social. In this regarding, E3 and E4, stated: *"With sustainability, we can use our own resources to sustain ourselves, and reduce costs"* (E3). "If *all investments were self-sustainable, like photovoltaic energy, nature would certainly be much less affected"* (E4).

The adoption of this sustainable practice – clean energy – generates savings in resources that can be redistributed to new applications, can add value to the company's image and reduce negative environmental effects (Razmjoo *et al.*, 2019). Photovoltaic system addresses all the three pillars of sustainability being viable and attractive option to managers (economic), reducing the negative impacts on natural resources (environmental) and generating savings that allow managers to act fairly with their workers, partners and society (social).

Sustainability practices were already being practiced in three of the analysed companies (Department Store, Stationery Store and Supermarket), as evidenced by the following arguments: *"Even with photovoltaic energy, we continue to save energy, we aim to save energy anyway [...] we also reuse paper"* (E3). *We are starting work on a new green energy project. This will be in addition to our existing sustainability efforts, such as not using chemical cleaning products, saving water, and recycling cardboard.* (E6). E5 also mentioned its partnership with a local collector for cardboard recycling. This shows that some managers

are committed to achieving environmental and social results, which is helping to build a culture of sustainability within the organisation.

Therefore, some of the companies analysed, albeit in a subtle way, have sustainability present in their IL, legitimised by the sustainability practices mentioned, as the repetition of attitudes and behaviours in organisations can be considered as an organisational practice (Silva, 2015), promoting a complete relationship between the three TBL variables, necessary to achieve sustainability (Oliveira *et al.*, 2012).

Therefore, the promotion of sustainability within the daily operations of organisations reinforces the formation of sustainability practices, which can become institutionalised, supporting the formation of ILS (Alves & Silva, 2020).

4.3 Managers' understanding of the importance of sustainable actions

Among the participants, some companies (E3, E5, and E6) had sustainability initiatives before implementing solar energy. E3 provides a clear example, noting that even with the financial benefits of producing their own energy, employees are still instructed to conserve power, reduce waste and minimise losses. E5 and E6 reported a partnership with a local collector for recycling cardboard. In addition, E6 argues *"We do not use chemical products for cleaning, and we save water".*

Economic dimension was the most frequently addressed in the statements about organisational practices and sustainability. Regarding the reasons for implementing photovoltaic energy, E2 and E5 argued: *"We implemented it to reduce costs with electricity, despite having a long-term return. So, it is more of an economic issue"* (E2). *"It is an expensive investment, but the return comes"* (E5). As previously stated, economic viability is one of the essential parts of sustainability. However, the participants predominantly focus on this aspect, although some also highlight the importance of environmental and social gains.

Regarding the environmental pillar, all managers mentioned the importance of the rational use of natural resources. However, there is a lack of implementation of these ideologies in organisational practices, as can be seen in the following argument: *"We think, right, about more sustainable practices. We have to try to implement them, try to put them into practice, but we have this mindset"* (E1). This corroborates Silva and Figueiredo (2017) on the importance of elevating sustainability to more practical levels, promoting the sustainable concept beyond an ideological vision that is only close to common sense.

Regarding the social dimension, two managers (E1 and E4) mentioned the possibility of more investment in *stakeholders,* due to cost reduction. This is linked to initiatives with workers, partners and society, as can be seen in the following arguments: *"If I am not spending too much on energy bill, I can even invest more in employees, relationships, communication, informality, entertainment"* (E4). *"We have had several gains; we have even been able to pay employees better thanks to this savings we have"* (E1). This shows that these managers are beginning to consider social sustainability, even though the idea is still in its early stages for them.

Therefore, managers seem to have a superficial understanding of the three pillars of sustainability. Their knowledge is closely linked to practice, which is a result of interactions

between agents and socially produced structures, through the production and reproduction of actions that are part of daily routines (Silva, 2015).

5 CONCLUSIONS

Our findings indicate that a more economic approach to sustainability is focused within these companies. Some managers recognise the other sustainability dimensions as important, but they are not properly institutionalised within their organisations The findings indicate, therefore, that there is a current process of ILS formation in the context analysed. The participating managers understand sustainability as a management practice, but it is not yet properly institutionalised in the organisations. Not all aspects of ILS were identified in the decision-making process for the acquisition of the photovoltaic system. The findings indicate that the main focus to adopt photovoltaic energy was linked to economic aspects.

Regarding the dimensions of ILS present in organisations, it seems that they exist but are still incipient. The 'institutional entrepreneur' dimension is evident because organisational managers have been the main promoters of the use of photovoltaic energy. Regarding the 'sequence of events', the highlights are the increase in electricity costs in Brazil in recent years and the increased use of electrical and electronic equipment in organisations, which has generated high costs for companies. In the 'change in structure' dimension, no structural changes were identified that focused on sustainability as an organisational practice; only changes in the financial aspects of companies were found (i.e., reducing energy costs). Regarding the 'sustainability practices' dimension, some sustainability practices (e.g., recycling, water and energy savings) were the main mentioned in the analysed companies. While in their early stages, these initiatives have introduced some sustainability practices into the organisational routine. This can lead to them becoming institutionalised and contribute to a more comprehensive integration of sustainability into the company's values.

Regarding managers' understanding of sustainability, few mentions of the social and environmental dimensions were identified. This shows that they still do not fully understand sustainability and that this may be one of the reasons why ILS did not base its decision on photovoltaic energy. Therefore, it became clear that there is a need for an advancement in the strategic management vision focused on sustainability, so that companies could achieve effective results in all three dimensions.

From a theoretical perspective, this study contributes to studies related to the application of ILS in organisations, as the findings relate it to the decisions about cleaner energy systems adoption. This is because there is a need to deepen theoretical and empirical knowledge about more practical views of sustainability in companies. The study contributes to the approach of ILS in the context of micro and small companies, which, for the most part, have more limited resources when it comes to knowledge about sustainability management. The empirical evidence from this study highlights the importance of including the three dimensions of sustainability in business strategies. The study also highlights the need for public policies aimed at encouraging the adoption of clean energy by companies, since the government must play the important role of institutional entrepreneurs in the formation of ILS in promoting deeper corporate sustainability.

One limitation of this study is its narrow focus on sustainability as a management practice. The complexity of the topic meant our analysis was largely confined to the economic and environmental dimensions, with only a superficial look at the social and cultural aspects. Future research should aim to provide a deeper understanding and more effective strategies to help managers and government officials act as institutional entrepreneurs, thereby accelerating the adoption of clean energy in Brazil.

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APPENDIX

Document	Year	Source	Quotation
Report 1	2024	Exam	*The solution for micro and small businesses to reduce their expenses may come from the sky: the sun, which has become a great ally for generating electricity in a clean and sustainable way through so-called photovoltaic solar energy systems.*
Report 2	2024	Sheet	*The main consumers of photovoltaic energy are small companies, mainly suppliers of goods and services.*
Report 3	2023	Market and Consumption	*In addition to reducing impacts on the environment and climate change, this technology promotes a significant reduction in the electricity costs every month, without the need for photovoltaic panel installations or membership fees.* *The data revealed by the Sebrae survey indicated that SMEs are concerned about other aspects of sustainability. Among the concerns are controlling water consumption, managing paper consumption and separating waste in selective collection.*
Report 4	2023	Solar Empire	*Many business owners are unaware of the benefits of solar energy and do not know how to implement it in their businesses.* *[...] 60% of those interviewed considered solar energy a viable option for reducing electricity costs.*
Report 5	2019	Stoyan Energy	*Reducing costs is the main reason given by micro and small business owners when choosing to install a solar energy system.* *Next comes the sustainability factor, considered the second most important by the survey participants.*
Report 6	2021	Fecommerce	*It makes perfect sense that companies in a difficult time would look at their current energy bill more closely, and the retail, service and other sectors are waking up to the savings that this technology can bring.*
Report 7	2023	Exam	*Whether due to pressure from consumers, who are increasingly aware of companies' environmental and social practices, or the need to reduce operating costs, sustainability is now becoming one of the main missions of entrepreneurs.* *Data from the Small Business Pulse Survey, by Sebrae and IBGE (2023) show that the use of solar energy is adopted in 14% of small businesses.*
Report 8	2023	State	*Businesspeople point to the use of clean energy to reduce costs.*
Report 9	2023	BV Sheet	*The main reason for installing a power generation system is financial. One of the main costs for companies and industries is energy.*
Report 10	2021	SEBRAE	*The use and production of renewable energy, which has the capacity to reduce costs and modernize companies, is an important factor in competitiveness and, therefore, disseminating this information is one of Sebrae's roles.* *One of the paths to conscious consumption is the use of renewable energy which, in addition to reducing costs, promotes autonomy, reduces intermittency and, consequently, increases the competitiveness of companies.*