

INVESTIGATION

Environmental Accounting from the Sustainability Reporting Standards: A Study of Sustainable Companies in Mexico

Contabilidad Ambiental desde las Normas de Información de Sostenibilidad: Estudio de las empresas sustentables en México

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Abstract

The objective is to identify the application of Environmental Accounting from the Sustainability Reporting Standards (SRS) in sustainable companies listed on the Mexican Stock Exchange (BMV), through environmental items and the Basic Sustainability Indicators (BSIs), energy consumption subsection. This research, based on the Three-Dimensional Accounting Theory and the Sustainability Reporting Standards (BSIs), is documentary. Environmental accounting variables and SDG 7 are studied. Likewise, the financial and sustainability reports for the 2023 fiscal year of 30 sustainable companies listed on the BMV are used, and worksheets are used as a data collection tool. Addressing SDG 7 from the perspective of Environmental Accounting and BSIs is the unique feature of the study. The results show that, during the 2023 fiscal year, companies accounted for investments, certifications, and property, plant, and equipment environmental related to SDG 7. Through the IBSO-energy approach, it is identified that companies have an area of opportunity to shift more toward sustainable consumption. It is concluded that Environmental Accounting and IBSO have a positive impact on the conservation of the planet, as they promote business decision-

making in a sustainable environment.

Key words: Accounting, Sustainability, Environment, Sustainable Development.

JEL Codes: M41, Q56

Resumen

El objetivo es identificar la aplicación de la Contabilidad Ambiental desde las Normas de Información de Sostenibilidad (NIS) en las empresas sustentables de la Bolsa Mexicana de Valores (BMV), a través de las partidas ambientales y los Indicadores Básicos de Sostenibilidad (IBSO), subsección consumo de energía. Esta investigación, fundamentada en la teoría Tridimensional de la Contabilidad y las Normas de Información de Sostenibilidad (NIS), es documental. Se estudian las variables de contabilidad ambiental y el ODS 7. Asimismo, se utilizan los reportes financieros e informes de sostenibilidad, ejercicio 2023, de 30 empresas sustentables de la BMV, y se aplican fichas de trabajo como instrumento de recolección de datos. Abordar el ODS 7 desde la Contabilidad Ambiental y las IBSO es la originalidad del estudio. Los resultados muestran que las empresas, durante el ejercicio 2023 con relación al ODS



7, contabilizaron inversiones, certificaciones y propiedad planta y equipos ambientales. A través de la IBSO-energía se identifica que las empresas tienen como área de oportunidad transitar en mayor proporción a un consumo sustentable. Se concluye que la Contabilidad Ambiental y las ISBO tienen un impacto positivo en la conservación del planeta, pues favorecen la toma de decisiones empresariales en un entorno sustentable.

Palabras clave: Contabilidad, Sustentabilidad, Medio Ambiente, Desarrollo Sostenible.

Códigos JEL:M41, Q56

1. Introduction

The lack of natural resources, global warming, and the impact that organizations, civil society, and the State have on the planet's resources have been issues that have been analyzed and discussed throughout history at various international meetings. To cite a few examples: the Stockholm Treaty in 1972, the Brundtland Treaty in 1987, the Earth Summit in 1992, the 2030 Agenda in 2016, etc. In light of the various agreements reached at the aforementioned events, nations have implemented policies to promote the care of the planet, motivating various disciplines to make proposals for the care and conservation of natural resources.

Accounting is one of the disciplines that is not exempt from addressing the issue of environmental care. Given society's need to address environmental issues, a branch of accounting has emerged focused on recording and quantifying the environmental impact generated by companies, allowing for control of the damage caused to the environment by the development of their activities and the corrective measures to minimize it. This type of accounting is known as Environmental Accounting or Green Accounting.

Environmental Accounting has been widely developed with the 2030 Agenda and the 17 Sustainable Development Goals (SDGs), and through the issuance of sustainability reports, companies address and disclose the actions they take to achieve these goals. It should be noted that companies in Mexico required to issue these reports are those listed on the Mexican Stock Exchange (BMV).

Sustainability reports are documents that reflect goals achieved, challenges, and areas of opportunity in environmental, social, and corporate governance matters. The reported information includes data on affordable and clean energy, a topic covered by SDG 7. Therefore, the objective of this research is to identify the application of Environmental Accounting, based on the Sustainability Reporting Standards (SRS), in sustainable companies of the (BMV), through environmental items and the Basic Sustainability Indicators (BSIs) energy consumption subsection.

This research answers the following questions: 1.- How has Environmental Accounting been applied in sustainable companies listed on the BMV (Mexican Stock Exchange) to achieve SDG 7 during the 2023 fiscal year? 2.- What is the absolute and relative value of the IBSO-Energy of sustainable companies listed on the BMV (Mexican Stock Exchange) in fiscal year 2023?

2. Theoretical framework

2.1. Generalities of Environmental Accounting

According to Chérrez (2021), Environmental Accounting is a tool for incorporating the environment into a company's overall management and generating economic information for decision-making. Díaz, Baujín, and Hernández (2024) argue that it constitutes an effective and timely instrument for identifying, assessing, reporting, and managing business performance, as well as its social and environmental impact. Castro (2020) argues that it is the conception and analysis of both financial and non-financial information to contribute to a sustainable organization.

From the perspective of Álvarez, Gálvez and Castro (2019), Environmental Accounting is a branch of Social Accounting, and a system that allows measuring and reporting qualitative and quantitative data about the environmental impacts caused by companies, in order to evaluate them for decision-making and so that their actions and production processes are friendly and respectful of the environment, contributing to a better quality of life for society.

Derived from the above concepts, Environmental Accounting is a tool that allows for the analysis, evaluation, measurement, and recording of impacts

and activities related to the environment and natural resources through documented control of financial, non-financial, qualitative, and quantitative data. Through these practices, it is possible to generate information for decision-making, which encompasses social, economic, and environmental aspects.

Among the objectives of Environmental Accounting is the management of environmental degradation in organizations' production processes. Martínez and Sánchez (2019) mention that the relationship between the environment and information systems is the company's responsibility, as there are risks that must be managed and disclosed to stakeholders, especially investors, so that they can make decisions based on viable, complete, and transparent information.

Based on what was proposed by Muñoz and Enciso (2021), Environmental Accounting has as secondary objectives to improve internal and external communication, decontaminate financial information that omits environmental items, recognize and reveal the negative environmental effects in traditional accounting practice, and identify and modify existing conflicts between traditional and environmental accounting criteria.

There are multiple theories that underpin Environmental Accounting. One of them is the three-dimensional accounting theory; Mejía et al. (2014) define it as a systematic and integrative proposal for the quantitative and qualitative assessment of the three assets that constitute it: environmental, social, and economic. They also mention that this theory develops with the implementation of new accounting paradigms, based on bioaccounting, socioaccounting, and economic accounting.

Another theory related to Environmental Accounting is the so-called stakeholder theory. González (2007) states that this theory emerged with the aim of being a strategic management theory, which allows for a new business paradigm where the company is not just a matter for the owner and employees, but must be understood from the agents involved in it, making possible a plural understanding of the company. Likewise, this theory supports the idea that the information generated by organizations through accounting on environmental issues is not only communicated to decision-makers and employees, but also enables their involvement to contribute to the care and conservation of natural resources.

For its part, the theory of utility for decision-making is also linked to Environmental Accounting. This theory, from an accounting perspective, justifies the need to generate financial and non-financial information that integrates both positive and negative aspects of the company's operations, including the impact on the environment. For Santos et al. (1997), this theory supports that the information provided to users should be as useful as possible in decision-making, through quantitative information that includes environmental aspects.

In summary, the aforementioned theories are linked to Environmental Accounting based on the following: 1.- The three-dimensional theory of accounting supports the integration of environmental impact into the financial information of organizations, 2.- The theory of usefulness for decision making justifies the importance of the information generated through accounting considering all aspects of the company, including the environmental aspect, so that it is useful in decision making, and 3.- The theory of stakeholders, which supports that accounting information should seek the involvement of users of financial and non-financial information, in order to contribute to the care and conservation of natural resources.

Environmental accounting regulations

In the face of globalization, there is a need to align international accounting standards with a national context. In this regard, the Mexican Council for Research and Development of Financial Reporting Standards (CINIF) issues Financial Reporting Standards, which are presented in this paper as NIF. These Mexican standards govern the financial information generated by companies and are currently in the process of converging with International Accounting Standards.

Regarding the environment, there are some NIF series that address the issue of the environment, although with little clarity. For example, NIF C-9, property, plant, and equipment, which, according to López (2019), from an environmental perspective, refers to property, plant, and equipment acquired for safety or environmental reasons, such as the acquisition of solar panels, wastewater treatment plants, waste treatment plants, among others, to minimize environmental impact.

Another series of NIFs related to the environment is NIF C-9, provisions, contingencies, and



commitments. Regarding the environmental issue, Murrieta, Ricárdez, and Vega (2018) state that past events whose existence is independent of future actions should be recognized as provisions. From this perspective, an example of this would be environmental fines or the costs of repairing environmental damage, which must be recognized in the financial statements.

Given the scarcity of natural resources, climate change, and the lack of accounting standards related to the environment in an international context, the International Sustainability Standards Board issues the International Sustainability Financial Reporting Standards (IFRS-S). According to Urgilés and Narciza (2024), these have a global scope and aim to achieve comparability and transparency in international markets. Their regulations are structured in IFRS S1 and IFRS S2. The former establishes requirements for the disclosure of information on environmental, social, and governance risks and opportunities, while the latter is responsible for the disclosure of climate-related information by companies related to climate change.

In a national context to achieve IFRS-S convergence, the Mexican Financial and Sustainability Reporting Standards Council issues the Sustainability Reporting Standards (SRS) to integrate social, environmental, and economic aspects into a company's financial reporting. These standards are structured in two series: SRS A-1 and SRS B-1. The first establishes general standards for the disclosure of sustainability information, referring to the general requirements and conceptual framework for the preparation and disclosure of information. The other series, SRS B-1, addresses the disclosure of Core Sustainability Indicators (BSIs), describing the metrics for measuring and evaluating an organization's environmental, social, and governance performance.

IBSOs, based on the Sustainability Reporting Standards (2025:54), "are metrics that enable an entity to assess its performance and identify sustainability risks and opportunities (environmental, social, and governance)." The IBSOs addressed in this study are energy consumption indicators, indicators related to SDG 7, a goal that, according to the United Nations website (paragraph 1), "aims to ensure access to affordable and clean energy." According to the

Sustainability Reporting Standards, this indicator informs the entity of its energy consumption over a given period. It should be noted that the absolute value of energy consumption for the reporting period is determined using the formula described in Table 1.

Table 1. Formula for the absolute value of energy consumption in the reporting period.

Formula	Abbreviations	Description
CEVA= CENR+CER	CEVA	Energy Consumption Absolute Value
	CENR	Non-Renewable Energy Consumption
	CER	Renewable Energy Consumption

Source: Prepared by the authors (2025) with information from the Sustainability Reporting Standards (2025:125)

Because renewable and non-renewable energy use different units of measurement, the Sustainability Reporting Standards (2025:82) describe the application of conversion factors to standardize results in terms of the unit of measurement. Therefore, this research uses the megawatt-hour (MWh) as the unit of measurement, as it is identified in companies' sustainability reports as the most predominant unit of measurement.

Another SDG 7-related indicator that will be applied in this study and is part of the IBSO-energy consumption indicator is the one related to renewable energy. Based on the NIS, it informs the entity about the amount of renewable energy consumption over a given period. In this study, this indicator is expressed in megawatt-hours (MWh). The formula in absolute value is shown in Table 2.

In this study, the results section shows the data from the application of the formulas described in Tables 1 and 2. The relative values for energy consumption and renewable energy consumption are also shown; the formulas applied are shown in Tables 3 and 4, respectively.

Table 3 identifies that, to determine the Relative Value Energy Consumption (CEVR), the Absolute Value Energy Consumption (VECA) is divided by the Net Income (IN) of the entity, and the result represents the amount of energy consumed for each peso of net income that the entity has.

Table 2. Formula for renewable energy consumption, absolute value.

Formula	Abbreviations	Description
CERVA = CCPFR + CECRVCPFR + CERANC	CERVA	Renewable Energy Consumption Absolute Value
	CCPFR	Consumption of Fuel from Renewable Sources (Biofuels and Biomass)
	CECRVCPFR	Consumption of Electricity, Heating, Refrigerants and Steam, Purchased and from Renewable Sources
	CERANC	Consumption of Self-Generated Renewable Energy that is Not Used as Fuel

Source: Prepared by the authors (2025) with information from the Sustainability Reporting Standards (2025:125)

Table 3. Energy Consumption Formula in the Reporting Period Relative Value

Formula	Abbreviations	Description
CEVR = CEVA / IN	CEVR	Energy Consumption Relative Value
	CEVA	Energy Consumption Absolute Value
	IN	Net Income

Source: Prepared by the authors (2025), with information from the Sustainability Reporting Standards (2025: 125)

Table 4 shows that to determine Renewable Energy Consumption in Relative Value (REVC), the entity's Absolute Renewable Energy Consumption (REVC) is divided by its Absolute Energy Consumption (VEC), and the result represents the percentage of renewable energy used relative to the company's total energy consumption. The more dependent the company is on renewable sources, the more sustainable it is.

2.2. Sustainable Development Goal 7: Affordable and Clean Energy

In response to the diverse environmental, social, and economic problems worldwide, the countries comprising the United Nations (UN) held a meeting in 2015 to approve the 2030 Agenda for Sustainable Development, a document that integrates “a transformative vision toward economic, social, and environmental sustainability” (UN, 2016: 5). This

Table 4. Renewable Energy Consumption Formula Relative Value

Formula	Abbreviations	Description
CERVR = CERVA / CEVA	CERVR	Renewable Energy Consumption Relative Value
	CERVA	Renewable Energy Consumption Absolute Value
	CEVA	Energy Consumption Absolute Value

Source: Prepared by the authors (2025) with information from the Sustainability Reporting Standards (2025: 125).

agenda includes 17 SDGs, which “aim to serve as a roadmap for the international community to achieve a much-needed balance between economic growth, social justice, and environmental protection” (Gómez, 2022: 1).

Regarding the environment, there are some SDGs linked to the care and conservation of natural resources, such as SDG 7. It should be noted that the care of natural resources has as its background some fundamental events that set the tone for the approach of the SDGs related to the environment. One of them is the Brundtland Report, which sets out the need to care for the environment to ensure that future generations can meet their needs (UN, 1987). As part of this study, the concept of sustainable development emerges. For Madroñero and Guzmán (2018: 125), from a less simplistic perspective, the concept “has a political, social, economic and ecological connotation that establishes that the interaction of such concepts must occur in a balanced way” (Madroñero and Guzmán, 2018: 125).

The world currently faces several challenges, one of which is energy from fossil fuels, which generates unimaginable amounts of greenhouse gases that contribute significantly to climate change. On the other hand, Guerra et al. (2024) point out that modern society needs a transformation to mitigate the negative impacts on the environment due to energy production, which is why we must opt for the implementation of renewable and sustainable energy systems.

According to the United Nations (2023), SDG 7 seeks to guarantee access to affordable, reliable, modern, and sustainable energy, as this is essential for global development across all sectors and society as a whole. This goal has five targets with actions aimed at energy efficiency and proposes the use of clean, current, and sustainable technologies for energy savings and the possibility of migrating to the use of renewable energy.



According to Pecci (2020), SDG 7 seeks to implement clean energy technologies, prioritizing solutions to current global problems and enabling energy distribution to isolated areas lacking electricity; it also promotes energy efficiency by reducing greenhouse gas emissions. Thus, SDG 7 proposes that energy efficiency can be achieved through consumption management or with efficient technologies and equipment from renewable sources.

In relation to the previous paragraph, sustainable or clean energy brings multiple benefits. Aponte (2023) mentions that any person, national and international organizations, and productive sectors can obtain environmentally friendly energy, such as solar, wind, biomass, or lithium-ion batteries, generating an environmental and economic strategy to minimize costs, environmental impact, and greenhouse gas emissions.

2.3. Sustainable companies in Mexico

The Mexican Stock Exchange (Mexico City) identifies companies known as sustainable companies, whose performance is based on three fundamental pillars: environment, society, and governance. These companies are listed on the Mexican stock market using the S&P/BMV Total Mexico ESG (Environmental, Social, and Governance) index. Kitchener and Perera (2020) note that the aforementioned index was launched on June 22, 2020, with the aim of measuring stock performance, maintaining broad market exposure, and simultaneously aligning with the values of sustainability-focused investors by integrating environmental, social, and corporate governance data.

Based on Flores and Ortiz (2025), this sustainable index seeks to represent the performance of the Mexican stock market for a group of companies that stand out for carrying out sustainable activities. For their part, Ortiz et al. (2025) contribute that this index reflects a growing trend toward sustainable investments with the connection between sustainability and profitability, attracting investors who value social responsibility and operational efficiency, increasing the value of their shares.

Companies included in this index are considered sustainable companies and are classified by sectors such as telecommunications services, industrial services, materials, non-basic consumer goods

services, frequently consumed products, financial services, and healthcare. These companies are required to issue annual sustainability reports, making them publicly available on their official websites. These reports are used in this research as a means of obtaining data, as they are documents through which companies demonstrate their commitment to the environmental, social, and corporate environment.

3. Methodology

This research is documentary-based, with a mixed-method approach, a cross-sectional design, and a descriptive scope. The study's overall objective is to identify the application of Environmental Accounting (EIA) based on Sustainability Reporting Standards (SRS) in sustainable companies listed on the Mexican Stock Exchange (BMV), through environmental items and the Basic Sustainability Indicators (BSIs), energy consumption subsection. Similarly, 30 publicly traded variable capital stock companies (S.A.B. de C.V.) listed on the BMV with the Environmental, Social, and Governance (ESG) index are analyzed.

The companies studied are: Grupo Televisa, América Móvil, and AXTEL from the telecommunications services sector; GMéxico Transportes, Grupo Traxion, Orbia Advance Corporation, Grupo Aeroportuario del Pacífico, Grupo Rotoplas, Corporación Inmobiliaria, and Controladora Vuela Compañía de Aviación from the industrial sector; CEMEX, ALPEK, and Grupo México from the materials sector; ALSEA, El Puerto de Liverpool, and Grupo Elektra from the non-basic consumer goods services sector; Arca Continental, Coca-Cola FEMSA, Fomento Económico Mexicano, Grupo Bimbo, Kimberly-Clark de México, and Wal-Mart de México from the frequently consumed products sector; and BMV (Mexico City Stock Exchange), Fibra Uno Administración, Grupo Financiero Banorte, Prologis Property México, Qualitas Controladora, Regional, and CI Banco from the financial services sector. The healthcare sector is also being studied with Genomma Lab Internacional.

The companies described above were selected based on the following inclusion criteria:

- a) *Companies listed on the BMV (Mexican Stock Exchange) with the ESG index.* These companies

were used because the BMV requires the issuance of sustainability reports, which makes the study's feasibility in terms of access to information difficult.

- b) *Sustainable companies listed on the BMV (Mexico City Securities Market) that made their sustainability reports publicly available during the data collection period for this research (February-July 2025).* Open access to sustainability reports facilitated the study.
- c) *Sustainable companies that have sustainability reports updated with the 2023 fiscal year.* Data collection was carried out during the period February-July 2025; during that time, the most recent information corresponded to the 2023 fiscal year, which is why the companies described in the previous paragraphs were included.

Companies not listed on the Mexican Stock Exchange (BMV) were excluded from this study, as access to sustainability information is limited. Similarly, companies listed on other stock exchanges were excluded, as the study focused on companies established in Mexico.

Study variables

The study variables of this research are environmental accounting and SDG 7. The former is defined as a method and tool that allows for qualitatively and quantitatively measuring, recording, and reporting the environmental impact derived from the activities of sustainable companies. SDG 7 is defined for this study as a goal of the 2030 Agenda for Sustainable Development, which seeks to guarantee universal access to modern and sustainable energy, with renewable sources that allow for improved energy efficiency.

Data collection technique and instrument

Document analysis was used as a technique, and three data collection forms were used: the first was used to capture the application of Environmental Accounting related to compliance with SDG 7, where environmental accounting items such as investments, plant and equipment ownership, and certifications were identified; the second form recorded the companies' energy savings and dissavings; and the last recorded the calculation of the EBSOs related to SDG 7.

Regarding the documents analyzed, these are the 2023 sustainability and financial reports published on the official websites of the BMV's sustainable companies.

Limitations

The study was limited to analyzing the 2023 fiscal year for companies considered sustainable in 2022. Some sustainability reports did not include quantitative data on energy consumption.

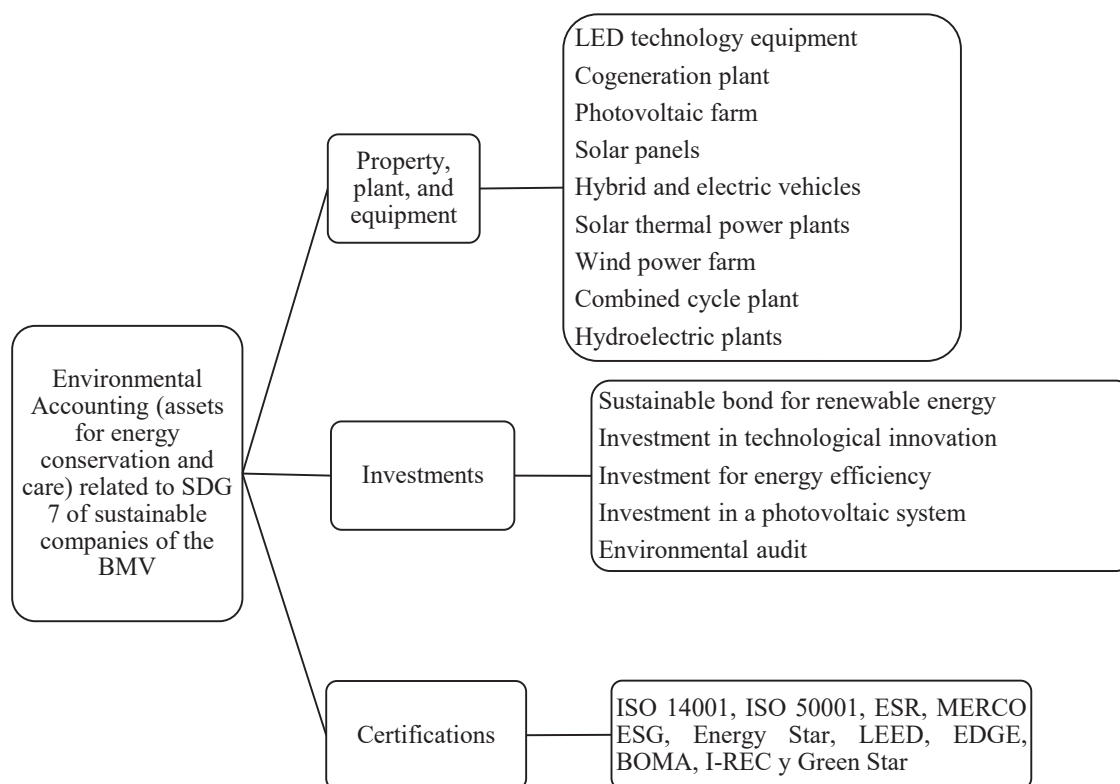
4. Results and discussion

When applying the first data collection form, it was identified that 12 of the 30 sustainable companies (40% of the population) report, in monetary terms in their sustainability reports, the value of their assets allocated for energy care and conservation through the concepts of investment, property, plant, equipment, and environmental certifications. All sustainable companies report qualitatively the expenditures made for the benefit of the environment, including the aforementioned assets and rights.

Regarding SDG 7, sustainability reports identify that companies acquired energy-efficient equipment and renewable energy sources, investments and sustainable bonds in clean and sustainable energy, as well as energy-related environmental certifications. Regarding the identified data, López (2019) states that acquiring environmentally and energy-friendly equipment helps migrate to clean energy sources, minimizing the environmental impact of entities' operations and reducing costs.

Figure 1 shows the qualitative data from the application of Environmental Accounting to achieve SDG 7 through the acquisition of assets for energy conservation and care. The environmental assets identified were: property, plant and equipment, investments, and certifications. The first environmental asset includes: solar thermal cogeneration plants, hydroelectric plants, and combined-cycle plants, with the goal of migrating toward renewable energy sources and reducing dependence on polluting energy.

Figure 1. Environmental Accounting (assets for energy care and conservation) related to SDG 7 of the BMV's sustainable companies.



Source: Prepared by the authors using data from the 2023 sustainability reports published on the official websites of sustainable companies.

Continuing with Figure 1, the investments that sustainable companies make in energy conservation and care are shown, such as technological innovation, environmental audits, and sustainable renewable energy bonds. Finally, some certifications in Figure 1 include ISO 14001, ISO 5001, international renewable energy certifications (I-REC), LEED, Energy Star, and other assessments, which indicate that sustainable companies meet sustainability and energy efficiency standards.

The comparative analysis of the IBSO permeates business decision-making for the benefit of the care and conservation of natural resources, in this case, energy. Table 5 shows the energy consumption and savings of the sustainable companies of the BMV, classified by business sector, specifically the energy consumption in 2022 and 2023 expressed in kilowatt-hours (kWh), as well as the savings and dissavings of each of the companies resulting from the comparison of the year 2023 in relation to the year 2022. Likewise, it is identified that 9 companies, which represent 30% of the population subject to study, have had energy savings in the 2023

fiscal year; This is due to the actions implemented to achieve energy efficiency and the application of Environmental Accounting linked to SDG 7. The identified companies are: Axtel, Orbia Advance Corporation, Grupo Rotoplas, Corporación Inmobiliaria VESTA, Cemex, Grupo México, Grupo Elektra and Fomento Económico Mexicano.

Regarding Table 5, on energy savings and dis-savings, Salazar, Guzmán, and Bueno (2018) state that energy efficiency plays a fundamental role in optimizing energy consumption, with economic and environmental benefits for organizations. Based on the results of this study, it represents an area of opportunity for 70% of the sustainable companies in the BMV by generating greater energy savings and contributing to a sustainable environment.

Regarding the calculation of the BSOs related to SDG 7 for sustainable companies listed on the BMV for the 2023 financial year, the indicators for the energy consumption subsection were determined. The results obtained are found in Table 6, which identifies the energy consumption and renewable

Table 5. Energy consumption and savings of sustainable companies in the BMV for the year 2023

Business sector	Sustainable companies	Energy consumption 2022 (MWh)	Energy consumption 2023 (MWh)	Energy savings (+)/dis-savings (-) obtained in 2023 (MWh)
Telecommunications services	Grupo Televisa	356,618.00	443,562.88	-86,944.88
	América Móvil	6,492,660.00	6,671,755.00	-179,095.00
	AXTEL	108,470.00	101,946.00	6,524.00
Industrial sector	G Mexico Transportes	N/I	N/I	N/I
	Grupo Traxion	2,107,702.00	2,230,023.00	-122,321.00
	Orbia Advance Corporation	7,074,787.00	6,528,698.00	546,089.00
	Grupo Aeroportuario del Pacifico	117,205.00	126,276.00	-9,071.00
	Grupo Rotoplas	57,085.00	56,205.00	880.00
	Corporación Inmobiliaria VESTA	1,706,959.00	799,773.00	907,186.00
	Controladora Vuela Compañía de Aviación	651.21	676.80	-25.59
Materials services	CEMEX	56,424,000.00	53,131,000.00	3,293,000.00
	ALPEK	N/I	N/I	N/I
	Grupo México	7,333,789.00	7,245,856.00	87,933.00
Non-basic consumer goods services	ALSEA	N/I	N/I	N/I
	El Puerto de Liverpool	577,269.67	607,668.84	-30,399.17
	Grupo Elektra	264,100.00	225,470.83	38,629.17
Frequently consumed products	Arca Continental	474,162.73	525,334.73	-51,172.00
	Coca-Cola FEMSA	1,157,061.11	1,085,930.55	71,130.56
	Fomento Económico Mexicano	12,717,950.00	11,740,066.11	977,883.89
	Grupo Bimbo	8,430,484.17	8,597,240.56	-166,756.39
	Kimberly-Clark de México	2,672,267.50	2,795,634.17	-123,366.67
	Wal-Mart de México	32,500,000.00	35,000,000.00	-2,500,000.00
Financial services	Bolsa Mexicana de Valores	3,252.00	3,512.00	-260.00
	Fibra Uno Administración	153,460.60	153,915.39	-454.79
	Grupo Financiero Banorte	142,675.87	148,685.53	-6,009.65
	Prologis Property México	9,831.00	9,967.00	-136.00
	Qualitas Controladora	49,592.45	53,069.11	-3,476.66
	Regional	10,996.37	14,281.00	-3,284.63
	CI Banco	7,537.47	9,662.52	-2,125.06
Health	Genomma Lab Internacional	22,367.56	37,682.33	-15,314.77

N/I: Data not identified in the 2023 sustainability reports. Source: Prepared by the authors using data from the 2023 sustainability reports published on the official websites of sustainable companies.

energy consumption indicators, expressed in absolute and relative values, calculated using the formulas in Tables 1, 2, 3, and 4.

Regarding Table 6, 28 companies, representing 93.33% of the study population, provided data for calculating the absolute value of the energy consumption indicator. The results show that

sustainable companies have an average energy consumption of 4,960,221.11 MWh. Because the absolute value of energy consumption includes both renewable and non-renewable energy, it is advisable to prioritize consumption from renewable energy sources and reduce dependence on energy from sources that harm the environment.

Table 6. Results of registration form 3: Calculation of the IBSO related to SDG 7 of the sustainable companies of the BMV for the 2023 fiscal year.

Business sector	Sustainable companies	IBSO Energy consumption absolute value (MWh)	IBSO Energy consumption relative value (MWh/\$)	IBSO Renewable energy consumption absolute value (MWh)	IBSO Renewable energy consumption relative value (%)
Telecommunications services	Grupo Televisa	443,562.88			
	América Móvil	6,671,755.00	0.00008258	2,535,266.90	38.00%
	AXTEL	101,946.00	0.00000931	15,279.00	14.99%
Industrial sector	G Mexico Transportes				
	Grupo Traxion	2,230,023.00	0.00349145	2,301.00	0.10%
	Orbia Advance Corporation	6,528,698.00	0.00004508	640,216.00	10%
	Grupo Aeroportuario del Pacífico	126,276.00	0.00001303	15,697.00	12.43%
	Grupo Rotoplas	56,205.00	0.00000463	9,359.00	16.65%
	Corporación Inmobiliaria VESTA	799,773.00	0.00014240	138,559.28	17.32%
	Controladora Vuela Compañía de Aviación	676.80	0.00000488		
Materials services	CEMEX	53,131,000.00	0.01505186	19,127,160.00	36.00%
	ALPEK				
	Grupo México	7,245,856.00	0.00013916	2,364,348.00	32.63%
Non-basic consumer goods services	ALSEA	542,298.61	0.00000711	164,405.00	30.32%
	El Puerto de Liverpool	607,668.84	0.00003116	238,263.97	39.21%
	Grupo Elektra	225,470.83	0.00003762	34,608.06	15.35%
Frequently consumed products	Arca Continental	525,334.73	0.00002483	182,944.94	34.82%
	Coca-Cola FEMSA	1,085,930.55	0.00005369	457,513.88	42.13%
	Fomento Económico Mexicano	11,740,066.11	0.00015311	4,045,611.11	34.46%
	Grupo Bimbo	8,597,240.56	0.00002150	1,442,716.11	16.78%
	Kimberly-Clark de México	2,795,634.17	0.00005244	185,561.94	6.64%
	Wal-Mart de México	35,000,000.00	0.00067843	12,777,777.77	36.51%
Financial services	Bolsa Mexicana de Valores	3,512.00	0.00000089		
	Fibra Uno Administración	153,915.39	0.00000839	30,783.08	20.00%
	Grupo Financiero Banorte	148,685.53	0.00000280	7,434.28	5.00%
	Prologis Property México	9,967.00	0.00066305	765.00	7.68%
	Qualitas Controladora	53,069.11	0.00001400		
	Regional	14,281.00	0.00000246		
	CI Banco	9,662.52	0.00000802	2,822.23	29.21%
Health	Genomma Lab Internacional	37,682.33	0.00000229		

Source: Prepared by the authors using data from the 2023 financial and sustainability reports published on the official websites of sustainable companies.

The result of the relative value of the energy consumption indicator, in Table 6, shows that 27 companies, representing 90% of the organizations studied, disclosed data for analysis. The average energy consumption of the companies studied is 0.00076830 MWh per peso of net income. Therefore, it is advisable for entities to reduce this value in order to consume less energy and increase production while having higher incomes, thus making consumption more efficient.

Regarding the absolute value of the renewable energy consumption indicator in Table 6, 22 companies, representing 73.33% of the study population, were identified as providing data for its calculation. The results show an average of 2,019,063.34 MWh, indicating the value of energy consumption from renewable sources. Based on the results obtained, it is advisable to increase renewable energy consumption.

On the other hand, to calculate the relative value of the renewable energy consumption indicator, 22 companies, representing 73.33%, provided data for analysis, resulting in an average of 22.56% renewable energy consumption relative to total energy consumption. Therefore, based on the results of this study, it is advisable to maximize this percentage and prioritize renewable energy consumption so that companies can achieve large-scale sustainability.

5. Conclusions and implications

It is concluded that Environmental Accounting has been applied to meet SDG 7 on affordable and clean energy in sustainable companies listed on the BMV reported in fiscal year 2023. Likewise, it is concluded that Environmental Accounting has a significant impact on the conservation and protection of natural resources.

Environmental accounting in companies helps record the damage caused to natural resources by the development of their economic activities. Therefore, accounting recognition favors decision-making that benefits the planet, permeating the company's sustainability in the market. Accounting recognition of environmental impact has a positive relationship with the financial value of organizations in the stock markets.

Companies that apply Environmental Accounting contribute to solving global challenges, such as the

SDGs, particularly SDG 7. Furthermore, they tend to reduce costs by transitioning to renewable energy, as well as attract investors who take sustainability into account, through a positive relationship between the environment and financial profitability.

IBSOs facilitate decision-making that benefits the environment, as data interpretation encourages decision-makers and stakeholders to reflect on the actions companies are taking to benefit the planet. It also allows them to identify areas of opportunity so that future generations have the resources to meet their needs.

NIS are a significant step toward contributing to the care and conservation of natural resources from an accounting perspective. The lack of environmental accounting regulations has been discussed for years. Currently, NIS contributes to filling the theoretical gap regarding the accounting recognition of the environmental impact caused by organizations' business activities.

Future studies propose a comparative analysis of the application of IBSOs in publicly traded organizations across various economies around the world. This will aim to identify how these companies contribute to environmental protection, based on data collected from the application of metrics issued by national and international accounting bodies.

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